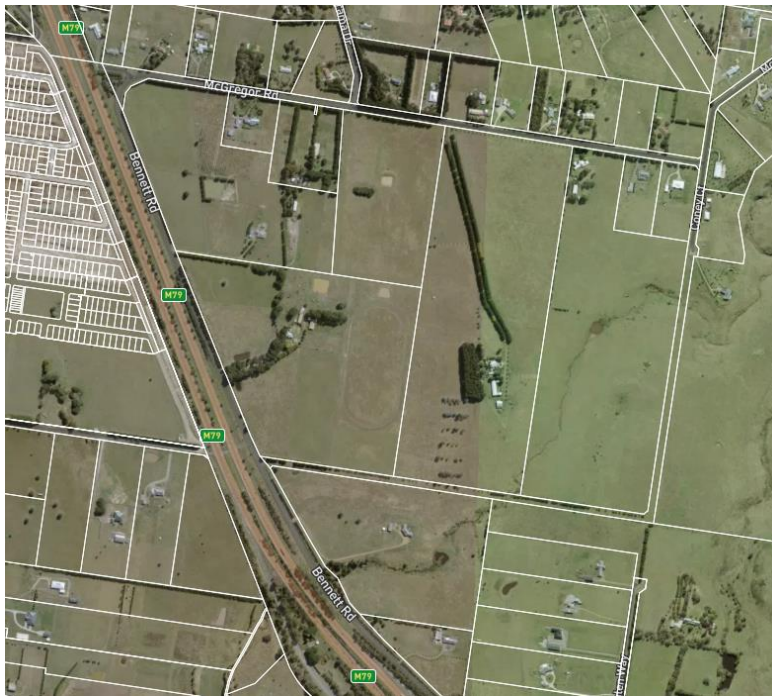




# BENNETT ROAD DEVELOPMENT PLAN

## MACEDON RANGES PLANNING SCHEME DEVELOPMENT PLAN OVERLAY SCHEDULE 18

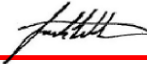
### DEVELOPMENT PLAN REPORT



DECEMBER 2021

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## 1.0 INTRODUCTION

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The Development Plan for the Bennett Road Precinct applies to the land described under the Macedon Ranges Planning Scheme, as the “Bennett Road, Gisborne, Rural Living Area Development Plan Overlay Schedule 18”. The site is on the east side of Bennett Road and south of McGregor Road and has an area of approximately 132 hectares.

The Development Plan Overlay Schedule 18 (DPO18) specifies the planning requirements for future development of the area in a Development Plan with supporting specialist assessments. These planning requirements are addressed in this report which will guide future planning permit applications for subdivision and development.

The DPO18 supports the Rural Living Zone Schedule 2 over this precinct. There are no other planning scheme overlay controls.

The Bennett Road Precinct Development Plan by Terraco outlines the site conditions and key requirements to be considered for future development.

The Development Plan is supported by the following documents:

- Development Plan Overall by Terraco
- Development Plan Concept Plans by Terraco
- Site Photo Survey by Terraco
- Servicing Report by Terraco
- Drainage / Culvert Report by Terraco
- Survey plan by JR Edwards
- Traffic Management and Impact Plan by Traffix Group
- Land Capability and Storm Water Review by Archaeo-Environments Ltd
- Sustainability Report by Archaeo-Environments Ltd
- Biodiversity Assessment: Existing Conditions by Ecology & Heritage Partners
- Flora and Fauna Targeted Survey by Ecology & Heritage Partners
- Vegetation Management Plan by Ecology & Heritage Partners
- Cultural Heritage Assessment by Archaeo-Environments Ltd
- Landscape Concept by Habitat
- Fire Statement by Regional Planning & Design Ltd
- Acoustic Report by Cogent Acoustics

## 2.0 CONTEXT

### 2.1 The Site

The site has an area of approximately 132ha around Bennett Road & McGregor Road Gisborne, 4km south-east of the town centre. Residential development is to the west side of the Calder Freeway and rural residential lots are to the north side of McGregor Road and along Panorama Drive to the north.



Figure 1: Site Location

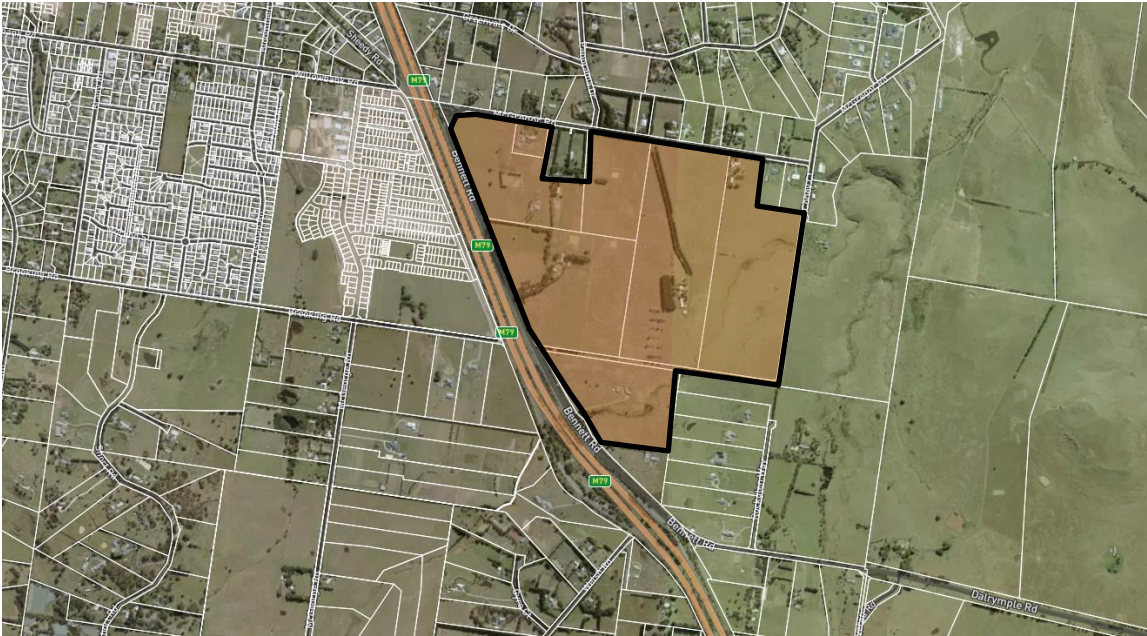


Figure 2: Aerial of Site Context

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**Figure 3: The Development Plan Area**

The site is comprised of 6 allotments as follows:

- 88 Bennett Road (Lot 1, PS343448) 16.2ha
- 128 Bennett Road (Lot 1, PS343449) 25.7ha
- 168 Bennett Road (Lot 2, PS627007) 16.6ha
- 15 McGregor Road (Lot 1, TP886104) 11 ha
- 94 McGregor Road (Lot 1, LP134525) 31.8ha
- 134 McGregor Road (Lot 1, PS633404) 27.7ha

The precinct is bound by Bennett Road to the west, McGregor Road to the north, Coney Court and an unmade road to the east and the unmade Brooking Road and 88 Bennett Road to the south. All lots include a dwelling and associated outbuildings other than 15 McGregor Road. The properties currently have rural related uses with some grazing and haymaking to maintain grass heights. A drainage line runs through the precinct from the south-west to the north-east, known as the Djerri Djerri Creek which is evident on the survey plan at Figure 4.

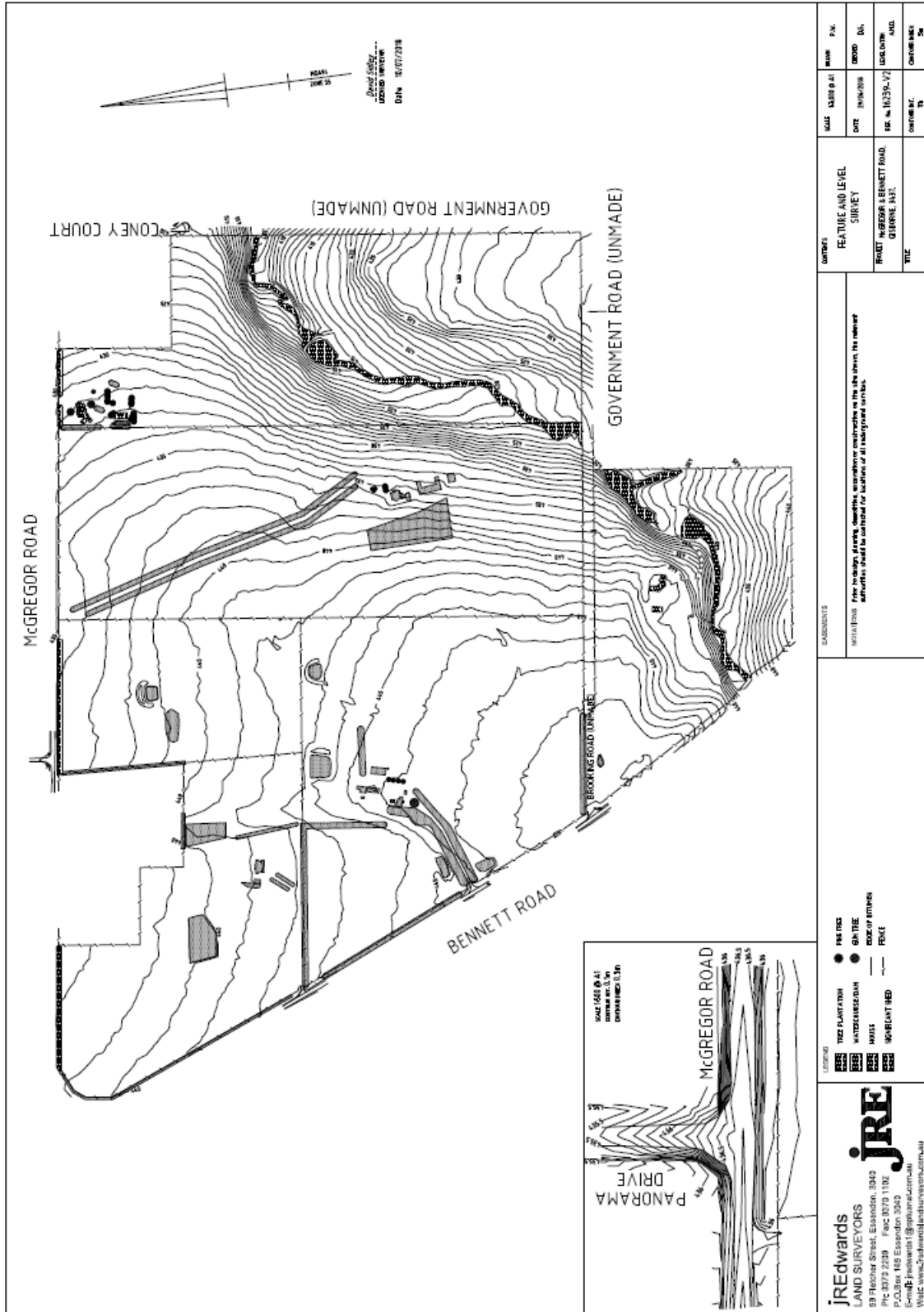


Figure 4: Survey Plan

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The precinct is largely flat to undulating, however is steep along the drainage line or watercourse particularly to the east. The precinct is described in the Sustainability Report by Archaeo-Environments Ltd as follows:

*The study area is characterised by a broad and open volcanic plain which includes an incised waterway across the south-west. The area has been almost entirely cleared of native vegetation, with minor clumps of eucalypts (predominantly grey box) and tree plantations, with the main vegetation existing as exotic plantings as driveway avenues and some cypress windbreaks and boundary plantings. There are 10 dams which are for the most part across gentle drainage depressions. The study area is fenced throughout with a range of grazing property and lifestyle properties.*

## 2.2 The Site Context

The site is designated under the Planning Scheme Development Plan Overlay Schedule 18 for rural residential lots a minimum of 2ha in area.

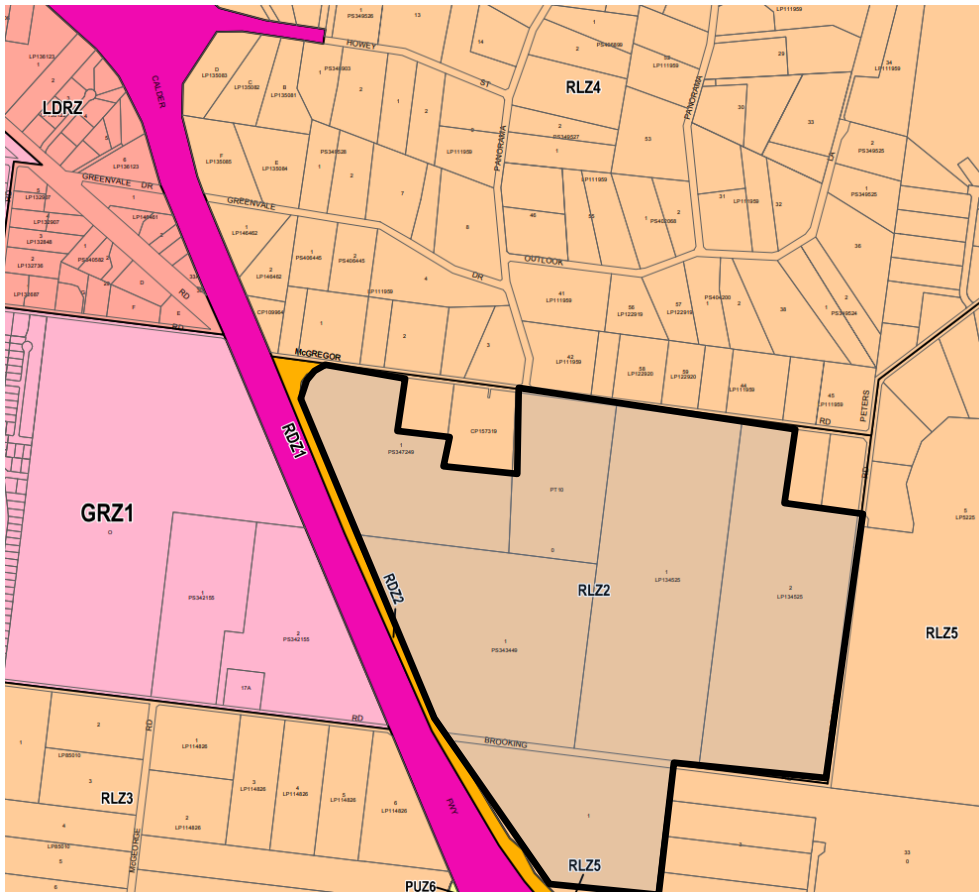


Figure 5: Macedon Planning Scheme Zone Map



The adjacent lane units are described as follows:

- Land to the north of McGregor Road comprises of rural residential lots that are mostly built upon and well established with vegetation and outbuildings. The Rural Living Zone Schedule 4 applies to this area specifying a 1 hectare lot size and lots generally range between 1 and 3 hectares.
- Land to the east and south is in the Rural Living Zone 5 which has an 8 hectare lot size with averaging provisions allowing for lesser lots to be created. Planning Permit PLN/2018/541 was issued at 21 Coney Court and 25 Dalrymple Road for a 10 lot subdivision including lots in the order of 2 hectares directly opposite the Development Plan area to the east side of Rockglen Way and south of the unmade Brooking Road.
- West of the Calder Freeway for the most part is a General Residential Zone under which standard residential subdivision is taking place.

The road access and general conditions are outlined in the Traffic Management and Impact Plan by Traffix Group as follows:

*Vehicle access for the site to/from the Gisborne township to the northwest is available via Panorama Drive and Emmeline Drive. Access to/from areas to the north of the site and Melbourne city to the southeast is available via Calder Freeway, which can also be accessed via the Panorama Drive/Emmeline Drive route, and approximately 3.5km from the south via local roads to the Coangault Road/Mundy Road freeway interchange.*

*The site has good access to central Sunbury to the southeast via two primary route options as follows: Via Dalrymple Road (to the southeast) which connects with Bennett Road directly; and Via Calder Freeway (via access ramps to the northwest).*

Local roads are outlined as follows:

- *Bennett Road is a sealed road and has a carriageway width of approximately 6.35m, which accommodates a single lane of traffic in each direction.*
- *McGregor Road is a sealed road and has a carriageway width of 7m (approximate) which accommodates a single lane of traffic in each direction.*
- *Coney Court is a cul-de-sac road which extends to the south from McGregor Road. Coney Court is a sealed road and has a carriageway width of 3.9m (approximate).*

To the north:

*Panorama Drive is generally aligned in a north-south 'loop' between McGregor Road and Outlook Lane. Panorama Drive is a sealed road and has a carriageway width of approximately 5.5m, which accommodates a single lane of traffic in each direction.*

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### 3.0 BENNETT ROAD DEVELOPMENT PLAN

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The Bennett Road Development Plan (DP) site plans prepared by Terraco are in response to the Planning Scheme DPO18 and are supported by the specialist consultant inputs.

The DP plans include the following:

1. Development Plan Overall Plan
2. Development Plan Concept Plans
3. Site Photo Survey

The DP is supported by the Survey Plan prepared for the area. The plan outlines the 6 properties in the precinct, the existing road network and the unmade road reserves. It details the site slope at 1m contour intervals, the drainage line / watercourse through the site and areas of minimal and greater slope adjacent to the watercourse.

The Subdivision Concept Plan outlines lots of the minimum 2 hectare size and a potential yield of 53 lots. The actual yield and configuration shall be determined at the planning permit subdivision stage under site analysis including waste water treatment. This particularly relates to the southern portion of 134 McGregor Road which has rocky areas.

Development is expected to commence from the north-west where there is direct availability of services, however it will be up to individual sites as to when development occurs. Building envelope setbacks from the watercourse (Djirri Djirri Creek) environs are specified where slope is steepest in 134 McGregor Road and 88 Bennett Road. The southern portion of 134 McGregor Road has a stony rise and poor soils for waste water treatment; it is shown as a “superlot” with a maximum yield of 6 lots to be dependant upon a land capability and environmental assessment.

The key features of the subdivision concept plan are:

- The concept responds to the topography and minimises cut and fill. This relates to along the Djirri Djirri Creek as the land is otherwise flat to undulating.
- The water course is to be vested in Council as a minimum 60m wide reserve, 30m to each side of the waterline and wider where shown with a Council maintenance and fire protection access track on the north side. Additional land shall form part of the reserve as shown on the subdivision concept plan.
- Dwellings and sheds are to be constructed on slopes that are flatter than 1:6.
- Buildings shall be setback a minimum 30m from the roads and 10m from side and rear boundaries while on lots abutting the creek reserve are to be setback a minimum 20m from it. These envelopes are conceptual and will be fully detailed under subdivision applications.

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- To the east of the waterway, rock outcrop elements will be addressed.
- Road construction is avoided on steep slopes illustrated by the position of the T Intersection of Brooking Road and the proposed internal north-south road positioned west of the steep land in 94 McGregor Road.
- The lot form and building envelopes will all be consistent with surrounding development.
- Retention of trees in road reserves and in the precinct where possible.
- The Coney Court road alignment is to terminate at the escarpment of the Djirri Djirri Creek for environmental and aesthetic reasons.
- The watercourse buffer also acts as a stock exclusion zone.

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## 4.0 THE DEVELOPMENT PLAN OVERLAY SCHEDULE 18

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The Development Plan Overlay at Clause 43.04-2 “Requirement before a permit is granted” states that:

*A permit must not be granted to use or subdivide land, construct a building or construct or carry out works until a development plan has been prepared to the satisfaction of the responsible authority.*

*This does not apply if a schedule to this overlay specifically states that a permit may be granted before a development plan has been prepared to the satisfaction of the responsible authority.*

*A permit granted must:*

- *Be generally in accordance with the development plan.*
- *Include any conditions or requirements specified in a schedule to this overlay*

Clause 43.04-4 states that:

*The development plan may consist of plans or other documents and may, with the agreement of the responsible authority, be prepared and implemented in stages.*

This schedule has the following directions:

- *To coordinate development and provide an integrated and safe road and path network connecting land within the development plan area with neighbouring land.*
- *To provide for a range of lot densities that respond to and manage site features and constraints.*
- *To strategically manage the features and constraints of the development area, including the protection and enhancement of drainage lines and steeply sloping land and limiting the visual intrusion of development adjacent to the Calder Freeway.*
- *To protect and manage waterways, drainage lines and adjacent escarpments.*
- *To provide sustainable access to water supplies, and allow natural run-off to be maintained to waterways within and connecting with the area.*

These directions have been applied in the formulation of the Development Plan documentation and the response to the DPO18 is outlined below.

**Clause 1: Requirements before a permit is granted****Development Contributions**

There are no external infrastructure items requiring development contributions.

There are no internal infrastructure items requiring development contributions to be apportioned.

Given the relatively small size of each landholding and the overall small lot yield of approximately 50 lots there is no staging plan, but rather sites will be developed independently based upon necessary infrastructure being provided by the developer. It would be counter productive to have a staging plan which could limit a “development ready” site from proceeding.

All infrastructure required will be contributed by each landholder as necessary to facilitate its development. Headworks charges as necessary to connect existing service locations to each lot will be borne by the individual developer in agreement with the particular servicing authority. This will be specified under a planning permit for subdivision.

Each developer will be solely responsible for the provision of all infrastructure including landscaping, paths and roads, within and fronting each development parcel and any necessary extension of roads and other servicing infrastructure such as water, electricity or telecommunications required to service the subdivision. Where there is a road to be constructed between two lots the first developer will be responsible for the entire road construction. The new east-west running road between 168 Bennett Road and 128 Bennett Road has been purposefully splayed over part of these lots. It provides for construction at a mid-point however in the event of one developing first would be on either one or the other parcels. Brooking Road will be constructed as required when development occurs by the developer that proceeds first.

The key site and road engineering matters are addressed in the Concept Plans, Servicing Report and Drainage / Culvert Sizing Report by Terraco and Traffic Impact Statement by Traffix Group.

The “Drainage/Culvert Sizing Report by Terraco outlines the culvert treatment requirements for the Brooking Road crossing of Djirri Djirri Creek. The Traffic Impact Statement outlines the required road upgrading of intersections with McGregor Road and Bennett Road. New road connections with Bennett Road and McGregor Road will feature right turn treatments. All these works will be undertaken by the applicable frontage developer as required to facilitate subdivision.

The Djirri Djirri Creek waterway is designated on the Development Plan as a waterway reserve to be vested with Council and so its transfer would not form part of any open space

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contribution. The reserve improvements including landscaping, paths and fencing will be undertaken by the affected lot under subdivision applications. An open space contribution from those subdivisions may include capital works reserve improvements, to be considered at the subdivision stage.

The Planning Scheme Development Plan Overlay Schedule 18 specifies various planning requirements which are addressed in the following section of this report.

## **Clause 2: Conditions and requirements for permits**

### **Permit conditions**

Permits for development are to have regard to specified matters as relevant. Subdivision permits will seek:

- building envelopes for dwellings and sheds.
- access and driveways.
- tree retention of non-native trees where suitable and protection of native vegetation.
- any dams on lots to be de-commissioned or modified.

These matters are all addressed in the Concept Plan and Landscape Concept.

### ***Any requirements or conditions set out in an approved development plan.***

The overall requirements and matters to have regard to are specified in the DP and the supporting reports.

***Before the issue of a statement of compliance, all lots (except for lots south of the creek line) must be connected to potable reticulated water, and any reticulated services must be installed underground.***

This will be addressed by permit condition.

### ***Before the issue of a statement of compliance:***

- ***All lots must be serviced with sealed, all weather public roads fit for fire fighting purposes at the cost of the proponent.***
- ***Any areas within 30 metres of the drainage line are to be fenced with appropriate stock exclusion fences. Fencing must be designed to minimise the impact of free ranging wildlife to the satisfaction of the responsible authority.***
- ***The stock exclusion area is to be revegetated using suitable native plant species of local provenance to the satisfaction of the responsible authority.***

The DP Concept Plan outlines a minimum 30m reserve either side of the drainage line to be vested with Council, whilst where land is steeper it is substantially wider. It shall be fenced with post and wire fencing to exclude stock as shown on the landscape concept. A landscape plan shall be prepared for the reserve as part of subdivision applications of those properties along the drainage line. The landscaping treatment shall protect and enhance native vegetation.

***Before the certification of a plan of subdivision, or at such other time which is agreed in writing by the responsible authority, the owner must enter into an agreement or agreements under section 173 of the Planning and Environment Act 1987 which provides:***

- ***Stock exclusion fencing 30m from the drainage line***
- ***The 15 metre wide planted landscape buffer along Bennett Road***
- ***Dwellings on lots on the road adjoining the drainage line must be setback 40 metres from the road frontage***
- ***Water supply infrastructure for fire fighting***
- ***The owner of the land incorporating the drainage line shown on the concept plan must provide and maintain a perimeter road/fire access track adjoining the north side of the drainage line escarpment in a trafficable condition, suitable for it to be used as a fire access track to the satisfaction of the Country Fire Authority and the responsible authority.***

These matters are all addressed in the DP and will be stipulated under a planning permit. A CFA access track is defined along the escarpment and it is supported by the Bushfire/Grassfire Management Statement by Regional Planning & Design Ltd, allowing access between Coney Court and the internal north-south road above the slope. The access will also be a maintenance track.

***Before the issue of a statement of compliance unless otherwise agreed in writing by the responsible authority:***

***On existing and proposed lots less than 4 hectares, existing man-made dams, reservoirs and bodies of water must be filled and compacted in accordance with relevant Australian Standards.***

The Subdivision Concept Plan states that:

***Dams in watercourse are to be decommissioned. All other dams are to be considered at subdivision stage for any decommissioning***

It may be that some dams are retained. This will enable detailed consideration at the appropriate time when overflow of dams in lots can be considered as it may be that overflow is not problematic or alternatively that only part filling is required.

**Clause 3: Requirements for development plan**

***A development plan, which may consist of plans and other documents, must be prepared to the satisfaction of the responsible authority. Only one development plan may be approved for the entire area covered by this Schedule. The development plan must be generally in accordance with the concept plan at sub-clause 5.0 of this Schedule***

The DP has been prepared for the land in line with the DPO18 Concept Plan and it will facilitate the consideration of permit applications for subdivision.

**General**

The DP includes a site analysis plan that identifies the key attributes and constraints of the land and its context, including: Topographical features; Landscape features; Existing buildings and infrastructure (including dams); The relationship between the land and any existing or proposed use and development on adjoining land and; Any other relevant elements or features of the land and its surrounds.

The DP includes a Subdivision Concept Plan that outlines the road network, waterway reserve, lot configuration, environmental aspects and building envelopes for lots that are adjacent to the waterway. Any building envelopes will be ratified under permit applications for subdivision. The Concept Plan outlines a wider creek reserve above the slope to its north side, north of Brooking Road. A superlot of 12.35 hectares is outlined in part of 134 McGregor Road where there is a stony rise and the plan notes as follows: "Maximum of 6 lots for 134 McGregor Road superlot subject to detailed land capability assessment, avoidance of rock outcrops to maximum extent and setback of building envelopes from the waterway reserve." The plan notes for 88 Bennett Road that: "Reserve, maintenance track, lots and building envelopes within 88 Bennett Road are subject to detailed review."

**Land Capability Assessment & Storm Water Review**

A Land Capability and Storm Water Review by Archaeo-Environments Pty Ltd maps the 5 landform types across the precinct with the most constrained for development being the watercourse and adjacent to the watercourse escarpment which are not to be developed. The report advises that:

*It is expected that there would be few constraints to wastewater disposal across the majority (73%) of the subject property. Djirri Djirri Creek and areas of rock outcrop to the east of the development area include some areas which will constrain waste water disposal. The concept plan specifies a maximum of 6 lots in this area and subject to detailed assessment under subdivision application. The EPA Septic Code (2016) recommends setbacks from waterways and*

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*features and this will include a 60m buffer of the waterway and 30m from various scattered dams in accord with Table 5 (EPA Septic Code 2016).*

The report also advises that:

*Within a minimum 2ha lot size, the proposed residential dwellings will be designed to harvest rainwater to water tanks. Engineering design plans will include retarding and management of runoff from driveways and paved surfaces. Rain water that is not harvested from the dwelling and sheds as well as rain water from access roads etc shall be retarded on site to maintain flow at current conditions.*

*At an individual lot level, it is expected that rain water runoff from dwellings and shedding would be managed to reduce run-off and retain rain water on site. It is recommended that each block will be landscaped and planted to reduce/retard run-off.*

A typical waste water and stormwater treatment is outlined in Figure 3 of the report.

### **Flora & Fauna Assessment**

Ecology & Heritage Partners has prepared 3 reports:

- Biodiversity Assessment: Existing Conditions
- Flora and Fauna Targeted Survey
- Vegetation Management

The Biodiversity Assessment was based upon surveys in 2018 and it describes the natural condition of the area as follows:

*The study area is mostly undulating cleared agricultural land with introduced grasses, planted windrows of trees and some patches of native vegetation to the south of the study area trees. Patches of native vegetation, characteristic of Plains Sedgy Wetland and Tall Marsh Ecological Vegetation Classes (EVCs) are present along the creek line (Figures 2b, 2c). Patches of native vegetation (characteristic of Stony Knoll shrubland EVC) occurs in the south-east of the study area, but this has been grazed by livestock and the patches are highly degraded (Figure 2b). One continuous patch of native vegetation (characteristic of Plains Grassland EVC), is present adjacent to a driveway planted with windrow trees, in the south of the study area*

*The majority of the study area comprises introduced and planted vegetation in the form of crops, pasture, windrows and ornamental plantings. However, there are some small areas of native vegetation scattered within the study area.*

Native vegetation is mapped in the report and the DP Concept Plan.

The Flora and Fauna Targeted Surveys report was based on subsequent surveys in late 2020 and it states that there is no Matted Flax-lily, Swamp Everlasting and Swamp Fireweed on the land nor presence of Golden Sun Moth or Growling Grass Frog.

The Vegetation Management Plan was prepared to outline treatment of the water way reserve based upon the following objectives:

- The native vegetation to be retained and protected within the waterway reserve.
- Information relating to mitigation, monitoring and control methods to be implemented to achieve ecologically appropriate on-going management of pest species within the water reserve
- Measures to minimise the spread of noxious weeds from the waterway reserve to the rest of the study area.

### **Cultural Heritage**

A Heritage Assessment has been undertaken by Archaeo-Environments Ltd. It outlines the obligations under the *Aboriginal Heritage Act* 2006 and the Aboriginal Heritage Regulations 2007.

It states that:

*Preliminary discussion with the local Registered Aboriginal Party (Wurundjeri and Woi Wurrung Cultural Heritage Aboriginal Corporation) in July 2021 advised of the Development Plan and future subdivision, Liaison with the RAP group will be included as part of any future CHMP process.*

*The future subdivision lot development of the area is directed away from the area of prime potential sensitivity, being the waterway with areas away from the water way having lesser potential for artefact presence. An aim will be to retain the current form of this area, with low impact paths and additional scattered vegetation. A detailed assessment will not be required for those parts of the reserve that are not altered. Assessment will be required around reinstated dams.*

*The 2ha lot size under the current Development Plan will mitigate against high risk of impact to Aboriginal cultural heritage, certainly compared with smaller lot subdivision. In other words the relatively small development footprint (dwelling, outbuildings, driveway etc) will allow for a large proportion of the lot to remain undisturbed. The large lot sizes when compared to a standard intensive residential subdivision such as to the west side of the Calder Freeway allow considerable capacity for potential sensitive sites to be avoided.*

*As a guide to future works, the Djirri Djirri Creek is an area of mapped Aboriginal Cultural Heritage sensitivity and under current legislation, a Cultural Heritage Management Plan (CHMP) will be mandatory for lots at 88 Bennett Road and 94 and 134 McGregor Road.*

*A CHMP is not mandatory under the Development Plan process as this stage does not propose development itself. A CHMP will be mandatory under a permit application for subdivision which is a CHMP trigger according to AHR (2018) (discussed in Section 1.2.1).*

*Aboriginal cultural heritage is provided with blanket protection in Victoria under the Aboriginal Heritage Act 2006. If any Aboriginal artefacts or sites are found during development works or at any other time, excavation must cease immediately and the local RAP (WLCCHC) should be notified for advice before work can re-commence.*

### **Infrastructure Provision Plan**

The Servicing Report by Terraco supports the Development Plan as follows:

- The proposed roads are to be constructed in accordance with Council’s Engineering Requirements for Infrastructure Construction. Typically, that includes 20m road reserves with 6.6m wide seal width (2 coat sprayed) and 1.0m wide unsealed shoulders
- There is an existing 150mm PVC water main coming off the Calder Freeway and running along McGregor Road. This main reduces to a 100mm PVC water main at Panorama Drive which continues along the northern side of McGregor Road and into Coney Court. The proposed allotments will be serviced via the existing 150mm and 100mm PVC water mains. Mains extensions and upgrades will be carried out as required to service all proposed allotments. Currently the system has sufficient capacity and pressure to provide adequate supply to this proposed development.
- The site will be treated with on-site septic systems.
- All essential services and utilities are available.

### **Sustainable development**

The Sustainability Report by Archaeo-Environments Ltd notes that the proposed development will provide for lots consistent with the Panorama Dr estate to the north, which appears to function well in terms of “sustainability” / environmental considerations.

The report describes the precinct as follows:

*The land encompasses a gently undulating volcanic terrain which falls toward the north and north-east. Water flow and local drainage is predominantly toward a defined waterway (Djirri Djirri Creek) which extends across the south-west corner of the property. Otherwise drainage across the property is via very gentle drainage swales and undefined drainage depressions. There is rock outcrop along the edge of low escarpments above the main drainage line to the east as*

*well as within a stoney rise in the south-east part of the block.*

It states that:

*The primary protection of environmental assets will include protection of native vegetation up to a minimum of 30 metres either side of the Djirri Djirri Creek line which will be retained and stock excluded. Dwellings will be set back from the drainage line buffer by at least 20 metres. Trees within the road reserve, including revegetation, will be retained where possible*

*A program of revegetation of Djirri Djirri Creek will provide habitat, erosion and flood mitigation as well as an area of passive recreation (Plate 2). In addition the wider Development Area will retain original vegetation where possible and establish a program of buffer/corridor planting, road reserve and habitat planting*

### **Subdivision layout concept**

The subdivision concept outlines the road layout, water reserve and estimated 53 lots. There will be no lot fragmentation as the waterway is proposed to be a Council reserve with lots on either side. The Concept Plan key features are:

- The concept responds to the topography and minimises cut and fill with roads and maintenance access located above areas of steep slope. Dwellings and sheds are to be constructed on slopes that are flatter than 1:6.
- To the east of the overall area, rock outcrop elements will be recognised
- Road construction is avoided on steep slopes illustrated by the position of the T Intersection of Brooking Road with the proposed internal north-south road.
- Building envelopes are specified along the watercourse being setback a minimum 20m from the waterway reserve to avoid potential flood impacts.

### **Traffic Management and Impact Plan**

The Traffic Management and Impact Plan by Traffix Group states that:

*A number of lots within the proposed Development Plan will take direct vehicle access off McGregor Road or Bennett Road. The remaining lots will utilise the internal road network to access the external road network at four locations.*

*The T intersection at the Panorama Drive/McGregor Road intersection has the capacity to readily accommodate the additional traffic without the need for modification.*

*No external traffic-related works, other than at intersections of new internal roads with Bennett Road and McGregor Road and the introduction of a BAR treatment at the existing Panorama Drive/McGregor Road intersection, are required as a result of a future subdivision at the subject site*

*Street lighting will be provided at the four site intersections with Bennett and McGregor Roads;*

*The proposed internal road reservations and intersections are in accordance with DPO18 and will provide safe connection and permeability for pedestrians, cyclists and motor vehicles, in a fashion that is typically better than existing arrangements in the surrounding area*

The DPO18 refers to new roads and a round-a-bout at the McGregor Road/Panorama Drive intersection. The assessment removes the need for a roundabout at the McGregor Road/Panorama Drive intersection on capacity grounds - a standard T-intersection has the capacity to accommodate the relatively low volume of traffic that will use this intersection.

### **Landscaping and open space**

The landscape concept by Habitat outlines an overall concept for the site including a mix of native and exotic species. It includes a list of trees and large shrubs as well as ground cover for select areas. It provides a basis under which detailed landscape plans will be prepared prior to subdivision.

The plan addresses the following key matters:

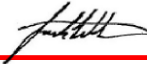
- the central 60m wide reserve cross-section of the waterway (Djirri Djirri Creek) is detailed.
- a landscape buffer up to 15m wide is to be provided to the Bennett Road frontage.
- road reserve planting will include native trees.
- native species shall be provided adjacent to the watercourse and habitat areas.
- landscaping will address the Ecology & Heritage Partners Biodiversity Assessment (flora & fauna report).
- existing exotic trees will be retained where feasible and appropriate
- Councils preferred tree list is incorporated.
- post and wire fencing is identified along the creek reserve: this will also apply to the area overall.
- watercourse dams to be de-commissioned and other dams to be considered at subdivision stage for potential modification and removal.

### **Drainage/Culvert Sizing Report**

The "Drainage/Culvert Sizing Report" by Terraco outlines the drainage catchment and culvert treatment requirements for the Brooking Road crossing of Djirri Djirri Creek as well as a pedestrian crossing south of Coney Court.

### **Bushfire / Grassfire Management Statement**

Regional Planning & Design has prepared a Bushfire / Grassfire Management Statement which details matters to be addressed under permit applications for subdivision. The Statement

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
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advises that it meets state planning policy Clause 13.02-1S Bushfire planning and the objectives of Clause 53.02 of the planning scheme.

The requirements of the report will be applied to at the time of subdivision.

### **Acoustic Report**

Cogent Acoustics Pty Ltd has prepared a road traffic noise assessment advising of noise attenuation measures necessary to protect the future occupants from noise from the Calder Freeway. This report forms part of the Development Plan. The report addresses “VicRoads Requirements of Developers – Noise Sensitive Uses (VicRoads, 2004)” The report refers to lots near the Freeway interfaces and extending in the order of 400m into the site as requiring more detailed construction as follows:

- *Residential buildings constructed within the lots highlighted in Figure 4 should be constructed in accordance with Construction Category 3 as prescribed in AS 3671:1989.*

For the remainder of the area it states that:

- *Residential buildings constructed within all remaining lots (not highlighted in Figure 4) should be constructed in accordance with Construction Category 2 as prescribed in AS 3671:1989.*

The requirements of the report at the time of subdivision will be addressed.

## 5.0 CONCLUSION

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The Development Plan and supporting reports articulate a clear framework for future subdivision and development of the Bennett Road Precinct in accordance with the Development Plan Overlay Schedule 18 and will be compatible with the pattern of adjacent development.



BAR treatments and street lights to be provided for all four proposed intersections onto Bennett Road and McGregor Road. Street light position shown indicatively.

Sheds on 128 Bennett Road to be relocated as necessary.

Roadside swales to terminate at lowpoints in road and allow overland drainage to watercourse. Locations are shown indicatively.

Combined maintenance and CFA emergency access track adjacent to escarpment. To be detailed under permit application.

30m offset from drainage centreline shown in cyan. Proposed drainage reserve/creek (black) generally follows 30m offset from centreline other than where shown. Existing dams in the drainage line are to be decommissioned. See cross sections A to D on SHEET 4 for details.

Maximum of 6 lots for 134 McGregor Road superlot subject to detailed land capability assessment, avoidance of rock outcrops to maximum extent and setback of building envelopes from the waterway reserve. Building envelopes for all lots to be setback minimum 20m from reserve boundaries.

Indicative proposed road alignment along top of escarpment. See cross section E on SHEET 5.

Culvert crossing of watercourse to be detailed in future engineering design. See cross section F on SHEET 5.

Connection under proposed permit PLN 2018541.

Reserve, maintenance track, lots and building envelopes within 88 Bennett Road are subject to detailed review.

- ### NOTES
- \* Contours shown represent approximate existing surface.
  - \* Contour interval 1m.
  - \* Road alignment to be clarified under permit application.
  - \* Drainage line/creek only flows during periods of heavy rainfall.
  - \* Drainage reserve to be vested in council is standard 60m wide and approx 30m from centreline and wider where shown.
  - \* Dams in watercourse are to be decommissioned. All other dams are to be considered at subdivision stage for any decommissioning.
  - \* Illustrative lots are shown as indicative only. Boundaries to be confirmed.
  - \* Minimum 2ha lot sizes for entire precinct.
  - \* Lots to be fully detailed under permit application.
  - \* Pedestrian paths along watercourse - see landscape plan. To be determined under permit applications at time of subdivision.
  - \* Staging of development proposed from the north-west.
  - \* See Servicing and Utilities Infrastructure Report for details on servicing and infrastructure provision to development sites. It outlines that all infrastructure cost within and adjoining development parcels and any required extension of roads and other infrastructure is to be borne by each development parcel.
  - \* Lot yield and lot configuration of 94 McGregor Road to be subject to detailed review.
  - \* Original sheet size is A1.

### BUILDING ENVELOPES

RECOMMENDED SETBACKS FOR LOTS

Front/road setback = 30m  
 Side/rear setback = 10m  
 Drainage line buffer setback = 20m

**\* Envelopes shown are for areas flatter than 1 in 6 grade to address the most sensitive land adjacent to the drainage line.**

\* Envelope areas are shown in brackets.

- ### LEGEND
- Trees within road reserve
  - Indicative rock outcrops
  - Dwelling
  - Outbuilding
  - Dam
  - Drainage line
  - Building envelope (only illustrated adjacent to drainage line)
  - Drainage line escarpment: low to moderate slope
  - Drainage line escarpment: greater slope
  - Drainage line buffer (30m as shown)
  - CFA and maintenance track
  - Rural pedestrian path/bike track
  - Existing titles
  - BAR (Basic Right-Turn) Treatment
  - Indicative drainage outfall location
  - Proposed street light at intersection

### SITE AREA AND YIELD

SUBDIVISION CONCEPT SITE	AREA	LOTS
88 Bennett Road	16.2ha	6
128 Bennett Road	25.8ha	12
168 Bennett Road	16.6ha	8
15 McGregor Road	11.1ha	5
94 McGregor Road	31.9ha	12
134 McGregor Road	27.7ha	10
<b>TOTAL</b>	<b>129.3ha</b>	<b>53</b>

Subdivision Concept Development Plan and Subdivision Concept commissioned by 128 & 168 Bennett Road, and 134 McGregor Road. A concept for the remaining area is provided as sought by DP018 (as shown dashed).

## Bennett Road Development Plan: Subdivision Concept Plan

Ver	Revision Description	Date	Checked	Approved
23	Minor Amendments	22/09/2021	J.Sens	P.Bove
22	Addressed Council Feedback	25/06/2021	J.Sens	P.Bove
21	Minor Amendments	29/07/2020	J.Sens	P.Bove
20	Addressed Council Feedback	21/07/2020	J.Sens	P.Bove
19	Amended Notations	21/02/2020	J.Sens	P.Bove
18	Amended Notations and Layout	13/12/2019	J.Sens	P.Bove
17	Amended Drainage Line Details	25/10/2019	J.Sens	P.Bove

Notes/Legend

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 Web: www.terraco.com.au

Scale (m) 1:14,000

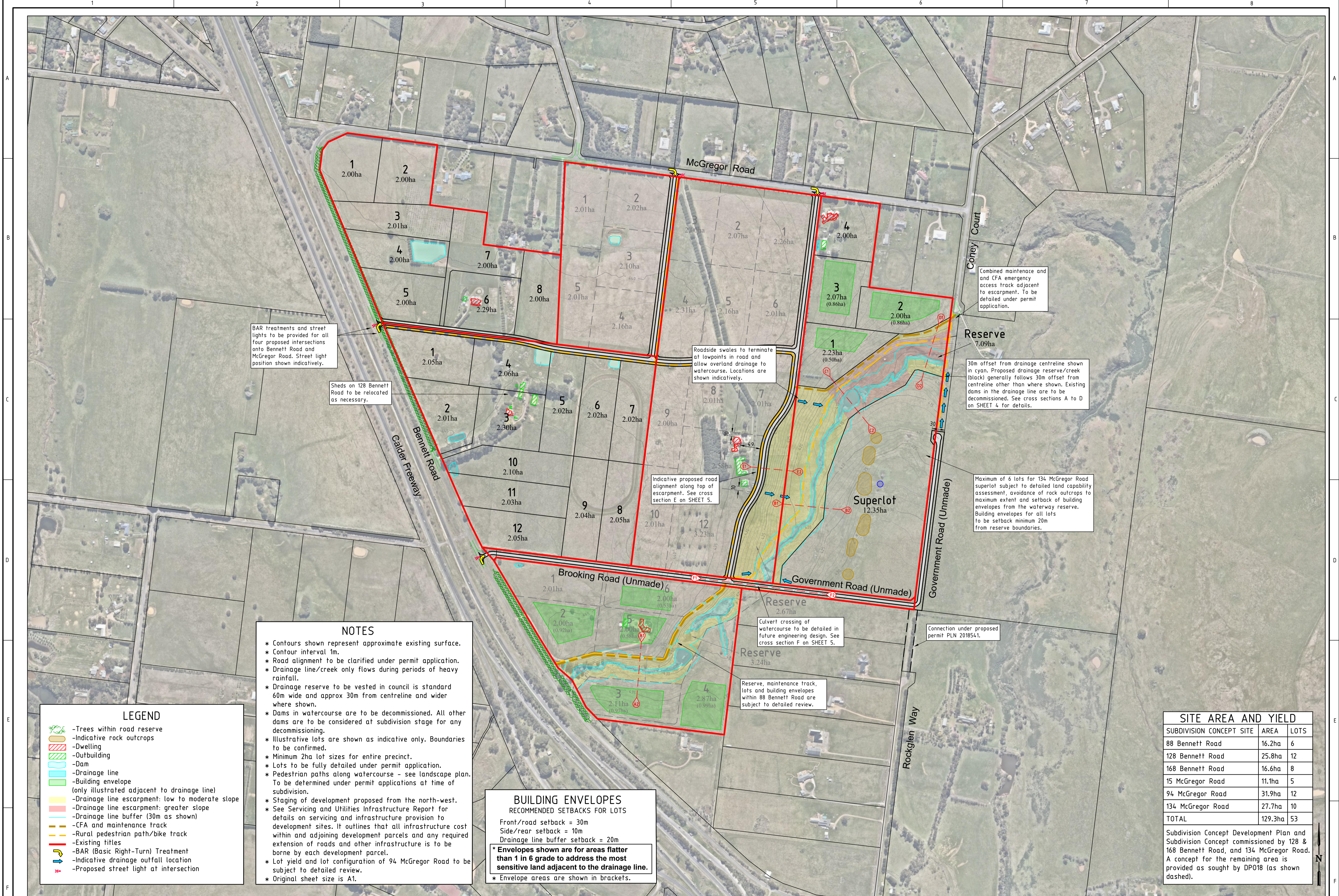
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Drawing file: 17085 Concept V23.dwg LTO Ref: - Council Ref: -

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**Bennett Road Precinct**  
**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/L**  
 Date: 16/11/2022 Version: 23  
 Authorised Officer: Jack Wiltshire  
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BAR treatments and street lights to be provided for all four proposed intersections onto Bennett Road and McGregor Road. Street light position shown indicatively.

Sheds on 128 Bennett Road to be relocated as necessary.

Roadside swales to terminate at lowpoints in road and allow overland drainage to watercourse. Locations are shown indicatively.

Combined maintenance and CFA emergency access track adjacent to escarpment. To be detailed under permit application.

30m offset from drainage centreline shown in cyan. Proposed drainage reserve/creek (black) generally follows 30m offset from centreline other than where shown. Existing dams in the drainage line are to be decommissioned. See cross sections A to D on SHEET 4 for details.

Maximum of 6 lots for 134 McGregor Road superlot subject to detailed land capability assessment, avoidance of rock outcrops to maximum extent and setback of building envelopes from the waterway reserve. Building envelopes for all lots to be setback minimum 20m from reserve boundaries.

Indicative proposed road alignment along top of escarpment. See cross section E on SHEET 5.

Culvert crossing of watercourse to be detailed in future engineering design. See cross section F on SHEET 5.

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- \* Illustrative lots are shown as indicative only. Boundaries to be confirmed.
- \* Minimum 2ha lot sizes for entire precinct.
- \* Lots to be fully detailed under permit application.
- \* Pedestrian paths along watercourse - see landscape plan. To be determined under permit applications at time of subdivision.
- \* Staging of development proposed from the north-west.
- \* See Servicing and Utilities Infrastructure Report for details on servicing and infrastructure provision to development sites. It outlines that all infrastructure cost within and adjoining development parcels and any required extension of roads and other infrastructure is to be borne by each development parcel.
- \* Lot yield and lot configuration of 94 McGregor Road to be subject to detailed review.
- \* Original sheet size is A1.

### BUILDING ENVELOPES RECOMMENDED SETBACKS FOR LOTS

- Front/road setback = 30m
- Side/rear setback = 10m
- Drainage line buffer setback = 20m
- \* Envelopes shown are for areas flatter than 1 in 6 grade to address the most sensitive land adjacent to the drainage line.
- \* Envelope areas are shown in brackets.

### LEGEND

- Trees within road reserve
- Indicative rock outcrops
- Dwelling
- Outbuilding
- Dam
- Drainage line
- Building envelope (only illustrated adjacent to drainage line)
- Drainage line escarpment: low to moderate slope
- Drainage line escarpment: greater slope
- Drainage line buffer (30m as shown)
- CFA and maintenance track
- Rural pedestrian path/bike track
- Existing titles
- BAR (Basic Right-Turn) Treatment
- Indicative drainage outfall location
- Proposed street light at intersection

### SITE AREA AND YIELD

SUBDIVISION CONCEPT SITE	AREA	LOTS
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134 McGregor Road	27.7ha	10
<b>TOTAL</b>	<b>129.3ha</b>	<b>53</b>

Subdivision Concept Development Plan and Subdivision Concept Development Plan by 128 & 168 Bennett Road, and 134 McGregor Road. A concept for the remaining area is provided as sought by DP018 (as shown dashed).

## Bennett Road Development Plan: Subdivision Concept Plan with Aerial

Ver	Revision Description	Date	Checked	Checked Date
23	Minor Amendments	22/09/2021	Drafted	P. Bove
22	Addressed Council Feedback	25/06/2021	Approved	P. Bove
21	Minor Amendments	29/07/2020	Approved	P. Bove
20	Addressed Council Feedback	21/07/2020	Approved	P. Bove
19	Amended Notations	21/07/2020	Approved	P. Bove
18	Amended Notations and Layout	13/12/2019	Approved	P. Bove
17	Amended Drainage Line Details	25/10/2019	Approved	P. Bove

Notes/Legend

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Scale (m) 1:14,000

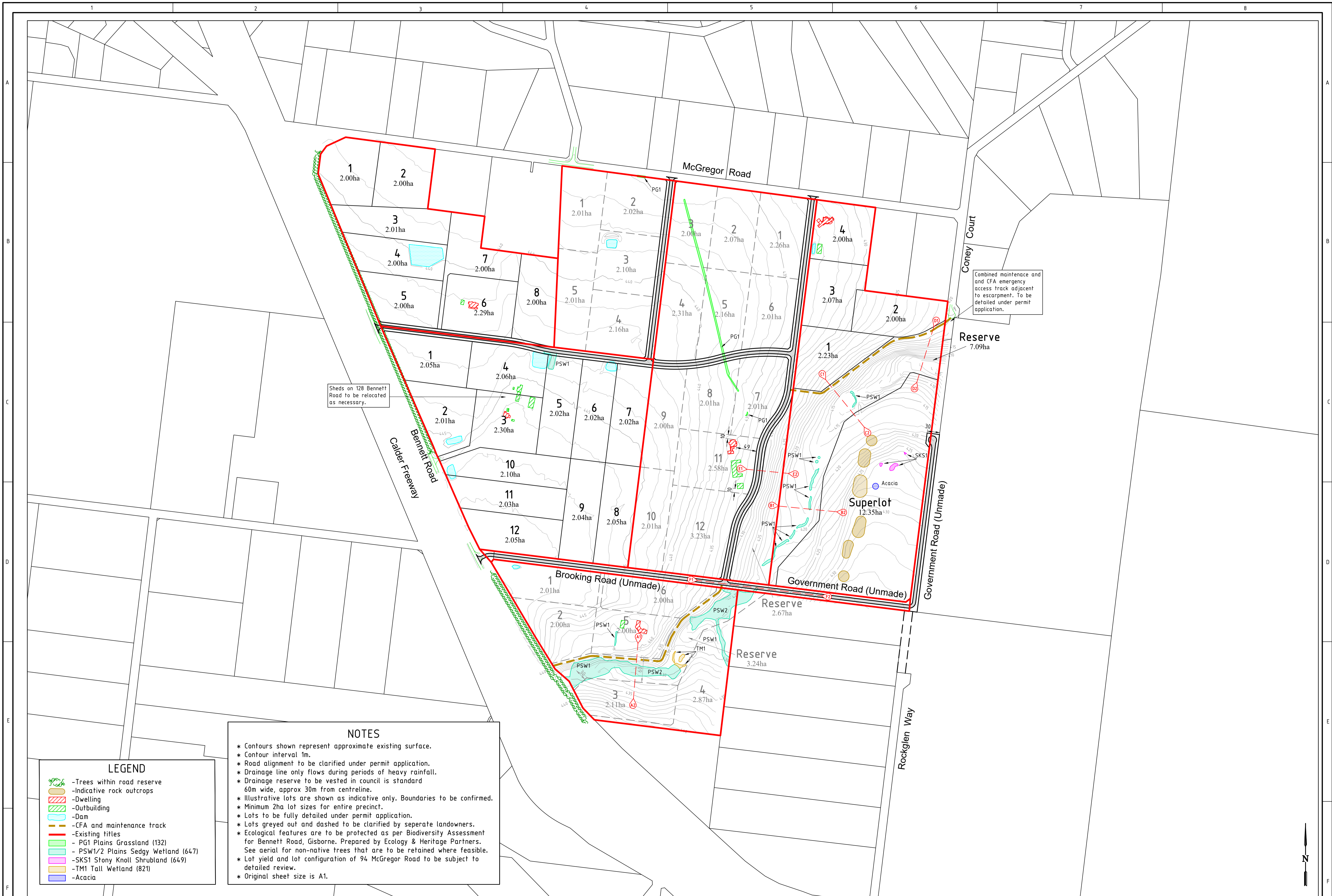
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Drawing file: 17085 Concept V23.dwg LTO Ref: - Council Ref: -

Macedon Ranges Shire Council - Gisborne

**Bennett Road Precinct  
Macedon Ranges Planning Scheme  
DEVELOPMENT PLAN: DP/2019/L**

Date: 16/11/2021 Version: 23 Sheet: 2 of 6  
Author: Jack Whitshire  
Authorised Officer: Jack Whitshire



Sheds on 128 Bennett Road to be relocated as necessary.

Combined maintenance and CFA emergency access track adjacent to escarpment. To be detailed under permit application.

**NOTES**

- \* Contours shown represent approximate existing surface.
- \* Contour interval 1m.
- \* Road alignment to be clarified under permit application.
- \* Drainage line only flows during periods of heavy rainfall.
- \* Drainage reserve to be vested in council is standard 60m wide, approx 30m from centreline.
- \* Illustrative lots are shown as indicative only. Boundaries to be confirmed.
- \* Minimum 2ha lot sizes for entire precinct.
- \* Lots to be fully detailed under permit application.
- \* Lots greyed out and dashed to be clarified by separate landowners.
- \* Ecological features are to be protected as per Biodiversity Assessment for Bennett Road, Gisborne. Prepared by Ecology & Heritage Partners. See aerial for non-native trees that are to be retained where feasible.
- \* Lot yield and lot configuration of 94 McGregor Road to be subject to detailed review.
- \* Original sheet size is A1.

**LEGEND**

- Trees within road reserve
- Indicative rock outcrops
- Dwelling
- Outbuilding
- Dam
- CFA and maintenance track
- Existing titles
- PG1 Plains Grassland (132)
- PSW1/2 Plains Sedgy Wetland (647)
- SKS1 Stony Knoll Shrubland (649)
- TM1 Tall Wetland (821)
- Acacia

**Bennett Road Development Plan: Subdivision Concept Plan with Ecological Features**

Ver	Revision Description	Date	Checked	Checked
23	Minor Amendments	22/09/2021	Drafted	
22	Addressed Council Feedback	25/06/2021	J.Sens	P.Bowe
21	Minor Amendments	29/07/2020	Sep 2021	Sep 2021
20	Addressed Council Feedback	21/07/2020		
19	Amended Notations	21/02/2020		
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Notes/Legend

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and all levels are to Australian Height Datum  
(Original Sheet Size is A1)

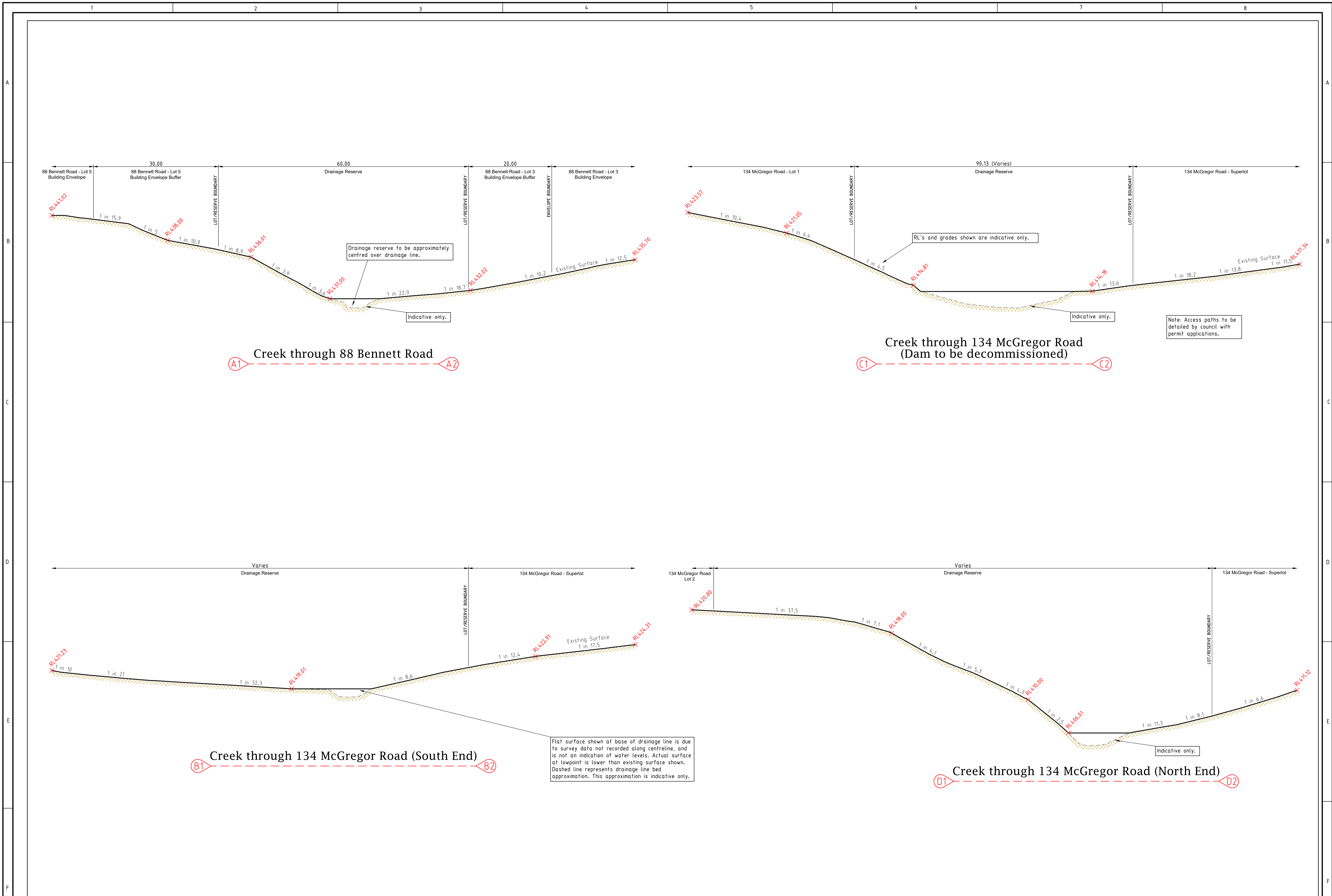
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Date: 16/11/2021 Version: 23 Sheet: 3 of 6

Macedon Ranges Shire Council - Gisborne

**Bennett Road Precinct  
DEVELOPMENT PLAN: DP/2019/L**

Date: 16/11/2021 Version: 23 Sheet: 3 of 6  
Authorised Officer: Jack Wiltshire  
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A1 Creek through 88 Bennett Road A2

C1 Creek through 134 McGregor Road (Dam to be decommissioned) C2

B1 Creek through 134 McGregor Road (South End) B2

D1 Creek through 134 McGregor Road (North End) D2

Drainage reserve to be approximately centred over drainage line.

Indicative only.

RL's and grades shown are indicative only.

Indicative only.

Note: Access paths to be detailed by council with permit applications.

Flat surface shown at base of drainage line is due to survey data not recorded along centreline, and is not an indication of water levels. Actual surface at lowpoint is lower than existing surface shown. Dashed line represents drainage line bed approximation. This approximation is indicative only.

Bennett Road Development Plan: Drainage Line Cross Sections

Ver	Revision Description	Date	Checked	Checked Date
23	Minor Amendments	22/09/2021	Drafted	J.Sens Sep 2021
22	Addressed Council Feedback	25/06/2021	Checked	P.Bowe Sep 2021
21	Minor Amendments	29/07/2020	Approved	
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18	Amended Notations and Layout	13/12/2019		
17	Amended Drainage Line Details	25/10/2019		

Notes/Legend

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All lengths are in metres and all levels are to Australian Height Datum (Original Sheet Size is A0)

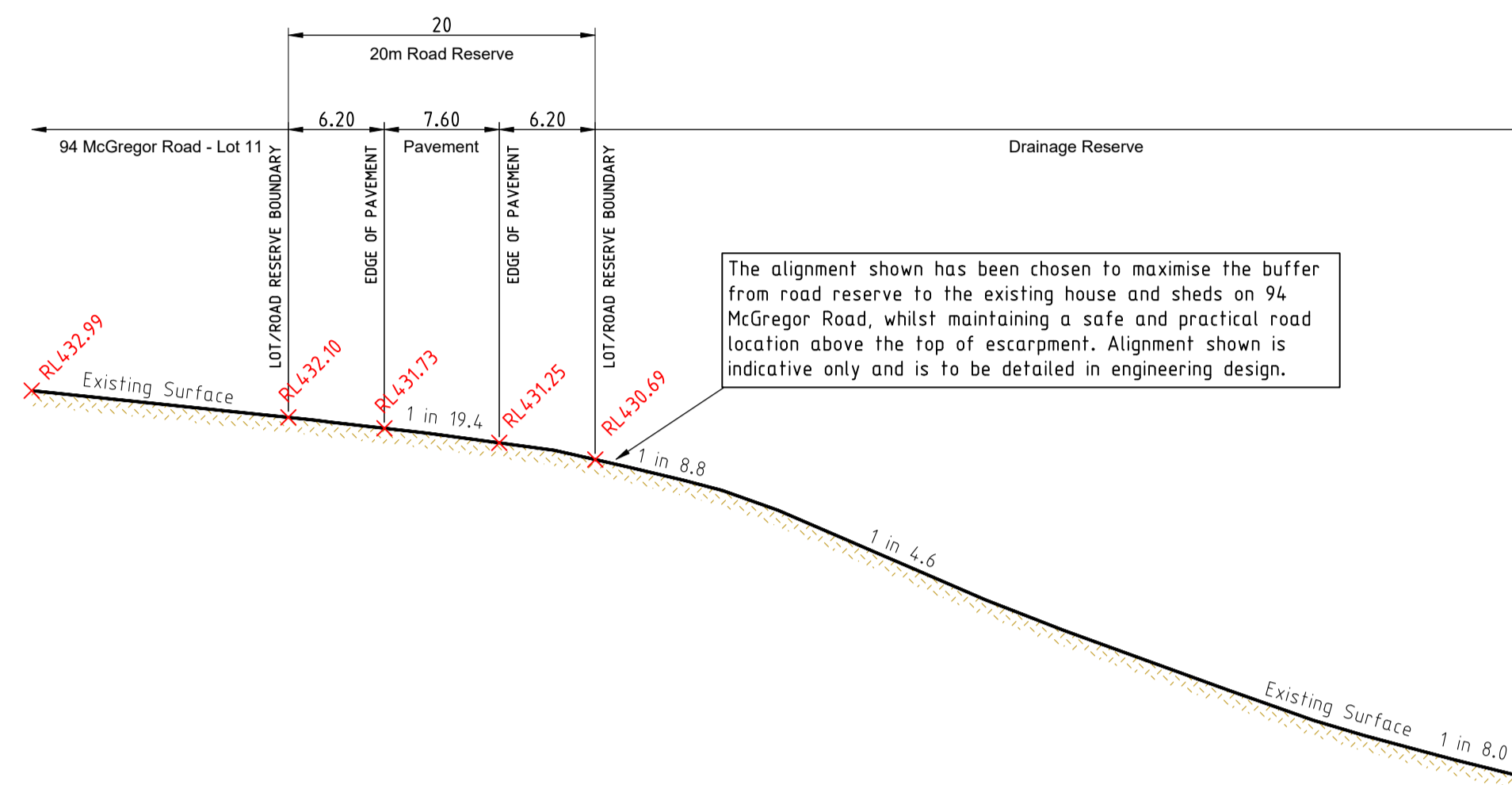
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Macedon Ranges Shire Council - Gisborne

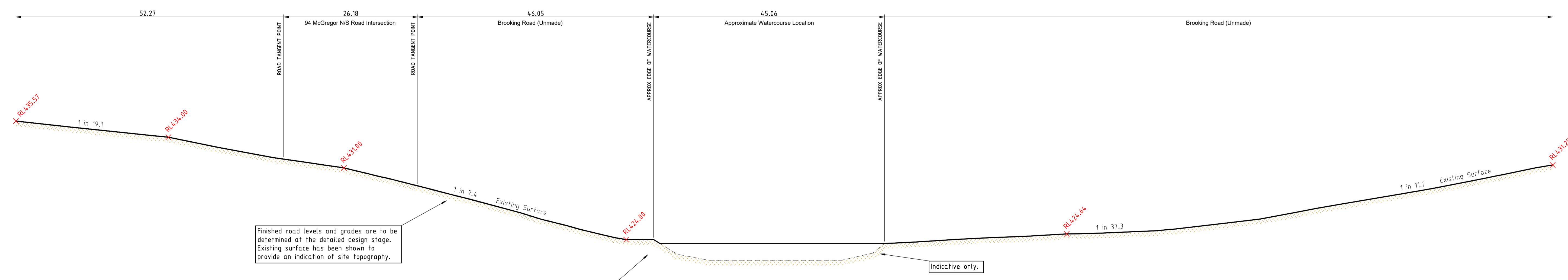
**Bennett Road Precinct  
Macedon Ranges Planning Scheme  
DEVELOPMENT PLAN: DP/2019/L**

Date: 16/11/2021 Version: 23 Sheet: 4 of 6  
Authorised Officer: Jack Wilshire

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**Road Alignment in 94 McGregor Road Cross Section**



**Culvert Crossing of Watercourse Longitudinal Section**

Ver	Revision Description	Date	Checked	Checked Date
23	Minor Amendments	22/09/2021	Drafted	
22	Addressed Council Feedback	25/06/2021	J.Sent	25/06/2021
21	Minor Amendments	29/07/2020	P.Bowe	29/07/2020
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Notes/Legend	

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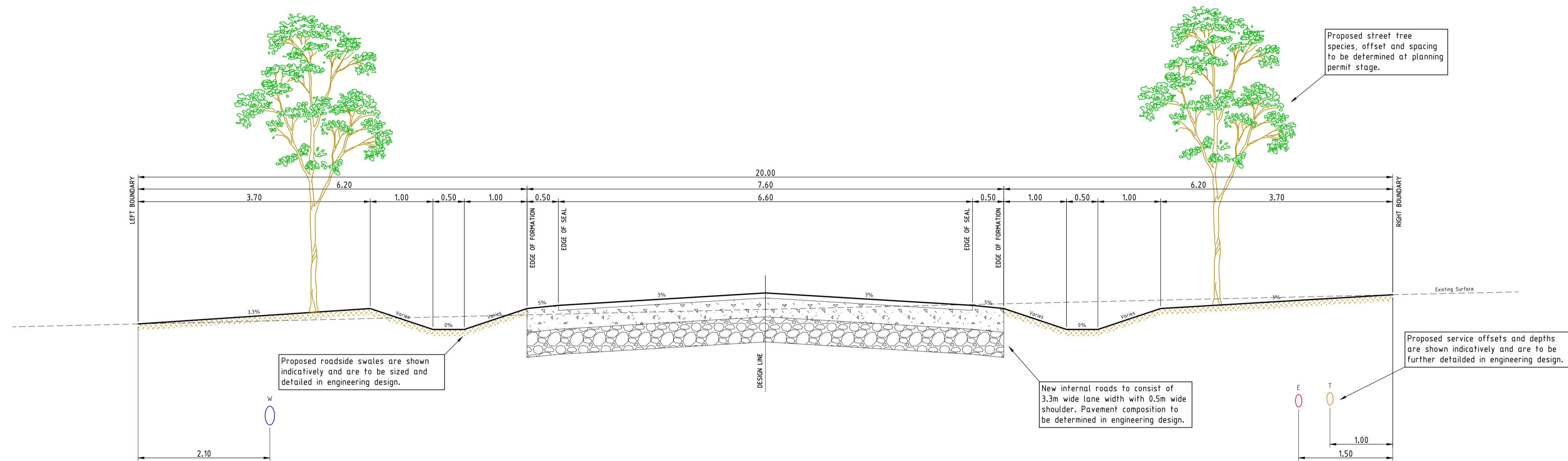
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and all levels are to Australian Height Datum  
(Original Sheet Size is A0)

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LTO Ref: -  
Council Ref: -

Macedon Ranges Shire Council - Gisborne

Bennett Road Precinct  
DEVELOPMENT RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/L  
Date: 16/11/2021  
Version: 23  
Sheet: 5 of 6  
Authorised Officer: Jack Wiltshire



Typical Cross Section - Internal Roads

Bennett Road Development Plan: Typical Road Cross Sections

Ver	Revision Description	Date	Checked	Checked
23	Minor Amendments	22/09/2021	Drafted	J.Sens
22	Addressed Council Feedback	25/06/2021	J.Sens	P.Bowe
21	Minor Amendments	29/07/2020	Sep 2021	Sep 2021
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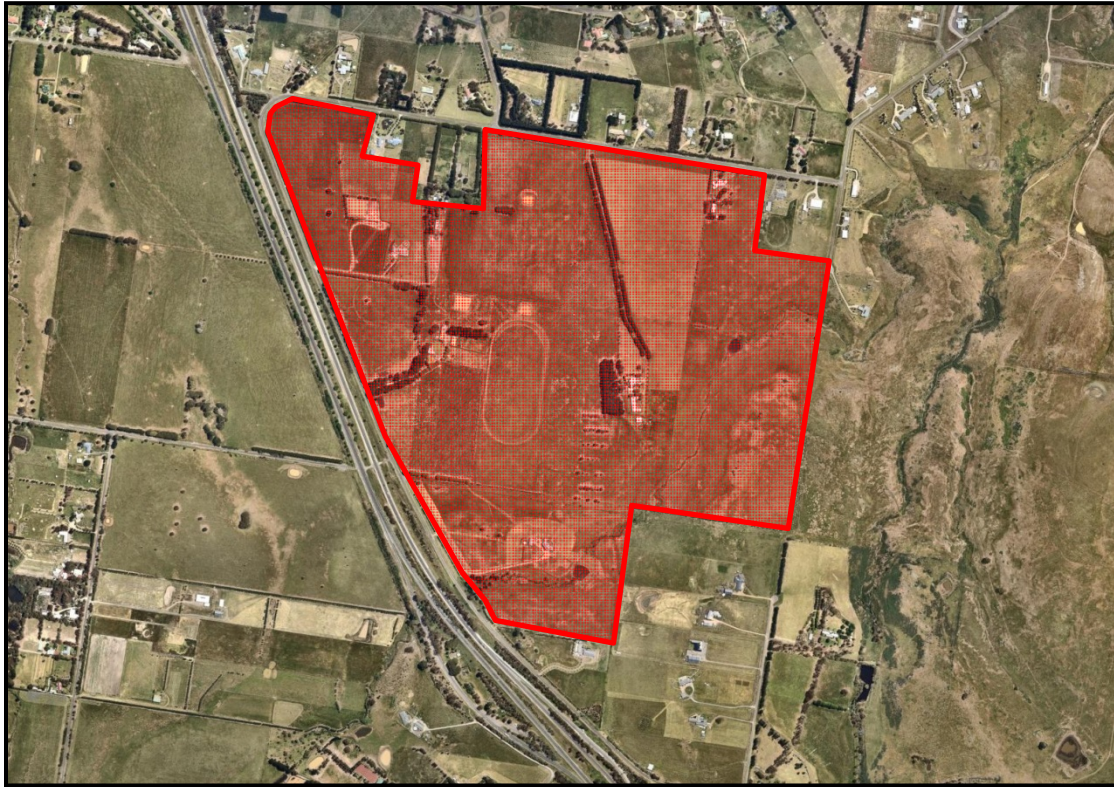
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 and all levels are to Australian Height Datum  
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Drawing file: 17085 Concept V23.dwg  
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 Council Ref: -

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Bennett Road Precinct  
**MACEDON RANGES PLANNING SCHEME**  
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 Date: 16/11/2021  
 Version: 23  
 Sheet: 6 of 6  
 Authorised Officer: Jack Wiltshire  
 Page: 29 of 371 SIGNED:

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# Bennett Road, Gisborne Drainage / Culvert Sizing Report

August 2020

## Contents

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<b>CONCLUSION</b>	<b>6</b>
<b>REFERENCES</b>	<b>7</b>

## APPENDICES

- Drawing 1 – “Location 1 – Proposed Road Crossing”
- Drawing 2 – “Location 2 – Proposed Pedestrian Crossing”
- Colebrook-White Chart – Location 1
- Colebrook-White Chart – Location 2

## Introduction

This report is to assist in the application for an Overall Development Plan at Bennett Road, Gisborne. The report details the drainage infrastructure requirements at critical locations for the proposed development.

The report assesses the catchment area of the ephemeral creek/drainage line that traverses the Development Plan area and feeds into Jacksons Creek to the east of Coney Court. The purpose of the assessment is to outline the overall indicative response for locations where vehicle or pedestrian infrastructure will be constructed over the creek.

The Development Plan does not envisage a notable increase in runoff to the creek due to the minimal 2ha lot sizes and the objective to detain and maintain lot runoff to current rural guidelines. This report is therefore focused upon drainage infrastructure at the two creek crossings denoted below.

Two locations have been identified in accordance with the Concept Plans submitted as part of the application. Location 1 is a proposed road crossing on the existing waterway that runs through the site in the unmade Brooking Road reserve. Location 2 is a potential proposed pedestrian crossing located within the existing and unmade Coney Court road reserve. Both crossings will require the installation of culverts underneath so the waterway may maintain its existing flow path.

The existing upstream culvert entering the site in the south-west corner located underneath the Calder Freeway is a 2.55m diameter circular pipe, which has likely been sized to cater for a 1% AEP (100 year storm event) due to the size and use of the road.

Council's drainage response has been considered. "AustRoads Guide to Road Design Part 5: Drainage General and Hydrology Considerations" Table 4.3 states that the suggested ARI for flood immunity for culvert and bridge drainage is 10 years. An annual exceedance probability of 5% (20 year storm event) was chosen for the calculations provided in this report, which is more conservative than AustRoads recommendations. Both culverts have been sized using the Rational Method and rainfall data as per Australian Rainfall and Runoff 2019 (ARR2019). Results from the Rational Method were then inputted on a Colebrook-White Chart to obtain approximate culvert sizes. Calculations are provided in the following sections of this report, and an overview of the rational method and its variables is provided on the following page.

A RORB model will be created at the time of subdivision of 134 McGregor Road (the lot adjoining the crossings). At that time the detailed design will be determined and will be applied as a permit condition for the development of that lot.

An initial feasibility estimate of development costs has been prepared by Terraco and included as an appendix to this report; it is a conservative estimate.



## Formulae

### ***Rational Method***

Used to calculate flow rates for each catchment.

$$Q = 0.278 * C * I * A$$

Where Q = Flow Rate (m<sup>3</sup>/s)

C = Runoff Coefficient (as per IDM Table 10)

I = Rainfall Intensity (mm/hr) (determined using BOM Rainfall IFD Charts)

A = Catchment Area (km<sup>2</sup>)

### ***Time of Concentration***

Used as an input for BOM rainfall IFD charts, to determine Rainfall Intensity.

$$t_c = 0.76 * A^{0.38}$$

Where t<sub>c</sub> = Time of Concentration (hrs)

A = Catchment Area (km<sup>2</sup>)

## Location 1: Proposed Internal Road Crossing

Location 1 is a proposed road crossing of the waterway in the Brooking Road unmade road reserve. Calculations are provided below.

See Sheet 1 (appended) for location and catchment sizes.

See Colebrook-White Chart 1 (appended) for pipe size determination.

Location 1 - Road Crossing		
ACTUAL FLOW - AEP = 5%		
Catchment Type	Runoff Coefficient C	Area A (ha)
Residential Road Reserve	0.75	28.65
Lots (2ha+)	0.30	254.73
Total	0.340	279.38

Variable	Equation	Value
Time of Concentration	$t_c = 0.76 * A^{0.38}$ (hrs) (A in km <sup>2</sup> )	1.123
Time of Concentration	$t_c * 60$ (mins)	67
Intensity	I (mm/hr)	28.4
Actual Flow	$Q = 0.278 * CIA$ (m <sup>3</sup> /s)	7.4931
Actual Flow	Q (L/s)	7493.1
Approx. Pipe Size	Colebrook-White Chart (k=0.60mm)	<b>1950mm</b>

Using the calculated flow rate (Q, L/s) above and an assumed hydraulic gradient (S) of 1 in 300 (generally the absolute flattest grade to run a pipe, and therefore the worst case scenario), and inputting those two values into a Colebrook-White chart (assumed pipe roughness k=0.60mm), an approximate pipe size was determined.

Based on preliminary studies, the proposed road crossing at location 1 will require a 1950mm circular culvert to cater for a 5% AEP storm event. A pipe arrangement of similar capacity such as a box culvert or twin culverts may also be acceptable to reduce the amount the road reserve needs to be built up, subject to detailed design and council approval.

As a cross-check, the catchment was added to the Regional Flood Frequency Estimation Model, which is freely available online. Results using this tool are provided below.

RFFE Lower Confidence Limit (5%)	= 1.58 m <sup>3</sup> /s
<b>RFFE Discharge</b>	<b>= 4.67 m<sup>3</sup>/s</b>
<b>Rational Method Actual Flow Rate (Q)</b>	<b>= 7.49 m<sup>3</sup>/s</b>
RFFE Upper Confidence Limit (95%)	= 13.80 m <sup>3</sup> /s

Actual Flow Rate (Q) calculated by hand is within the confidence limits of results provided via the Regional Flood Frequency Estimation Model.

## Location 2: Proposed Pedestrian Crossing

Location 2 is a proposed pedestrian crossing of the waterway in the Coney Court road reserve, between the existing Coney Court bowl and the proposed roads court bowl. Calculations are provided below.

See Sheet 2 (appended) for location and catchment sizes.

See Colebrook-White Chart 2 (appended) for pipe size determination.

Location 2 - Pedestrian Crossing		
ACTUAL FLOW - AEP = 5%		
Catchment Type	Runoff Coefficient C	Area A (ha)
Residential Road Reserve	0.75	28.66
Lots (2ha+)	0.30	316.98
Total	0.337	345.64

Variable	Equation	Value
Time of Concentration	$t_c = 0.76 * A^{0.38}$ (hrs) (A in km <sup>2</sup> )	1.218
Time of Concentration	$t_c * 60$ (mins)	73
Intensity	I (mm/hr)	26.8
Actual Flow	$Q = 0.278 * CIA$ (m <sup>3</sup> /s)	8.6862
Actual Flow	Q (L/s)	8686.2
Approx. Pipe Size	Colebrook-White Chart (k=0.60mm)	<b>2100mm</b>

Using the calculated flow rate (Q, L/s) above and an assumed hydraulic gradient (S) of 1 in 300 (generally the absolute flattest grade to run a pipe, and therefore the worst case scenario), and inputting those two values into a Colebrook-White chart (assumed pipe roughness k=0.60mm), an approximate pipe size was determined.

Based on preliminary studies, the proposed pedestrian crossing at location 2 will require a 2100mm circular culvert to cater for a 5% AEP storm event. A pipe arrangement of similar capacity such as a box culvert or twin culverts may also be acceptable to reduce the amount the road reserve needs to be built up, subject to detailed design and council approval.

As a cross-check, the catchment was added to the Regional Flood Frequency Estimation Model, which is freely available online. Results using this tool are provided below.

RFFE Lower Confidence Limit (5%)	= 2.42 m <sup>3</sup> /s
<b>RFFE Flow Rate</b>	<b>= 7.48 m<sup>3</sup>/s</b>
<b>Rational Method Actual Flow Rate (Q)</b>	<b>= 8.69 m<sup>3</sup>/s</b>
RFFE Upper Confidence Limit (95%)	= 23.30 m <sup>3</sup> /s

Actual Flow Rate (Q) calculated by hand is within the confidence limits of results provided via the Regional Flood Frequency Estimation Model.

## Conclusion

Location 1, the proposed internal road crossing, will require a 1950mm circular culvert or equivalent to cater for a 5% AEP storm event.

Location 2, the proposed pedestrian crossing, will require a 2100mm circular culvert or equivalent to cater for a 5% AEP storm event. Note that the need for a pedestrian crossing is yet to be determined by council, this report is simply to provide further information to assist in the feasibility for provision of a crossing at that location. An appropriate “environmental” response would suggest that such a formalised crossing as outlined would not be appropriate or needed for the rare times the creek would carry water. A crossing with culverts sized to a smaller and more frequent storm event, such as a 20% AEP, with excess flows (in more uncommon storm events) travelling over the crossing could have merit as a more appropriate pedestrian crossing solution.

Each crossing would require significant earthworks to build up the crossing in order to provide sufficient cover on the culverts, though slimmer culvert profiles of equivalent capacity may be utilised at the detail design stage to minimise this.

These results come with several disclaimers as to their accuracy. Firstly, the catchment areas were approximated based purely on contours, and do not consider roadside swales or drainage infrastructure that may introduce other catchments or remove sections of the catchment on the attached plans. Secondly, the AEP used for the preceding calculations was chosen as it is considered (in the preliminary calculations stage) to be an overestimate, as it’s likely that council may recommend a 10% or 20% AEP instead to align with AustRoads and commonly adopted guidelines, reducing pipe size requirements.

As previously mentioned, A RORB model will be created at the time of subdivision of 134 McGregor Road (the lot adjoining the crossings) to further detail requirements. The detailed design will be undertaken at subdivision stage to align with the results of the RORB model and achieve a design that is acceptable to council. The waterway crossings will be designed in accordance with Melbourne Water’s Waterway Crossing Guidelines. Detailed design of the crossings will need to be undertaken with the applicable stage of the development.

This report and associated calculations should be treated as indicative only, and details are to be clarified at the design stage.

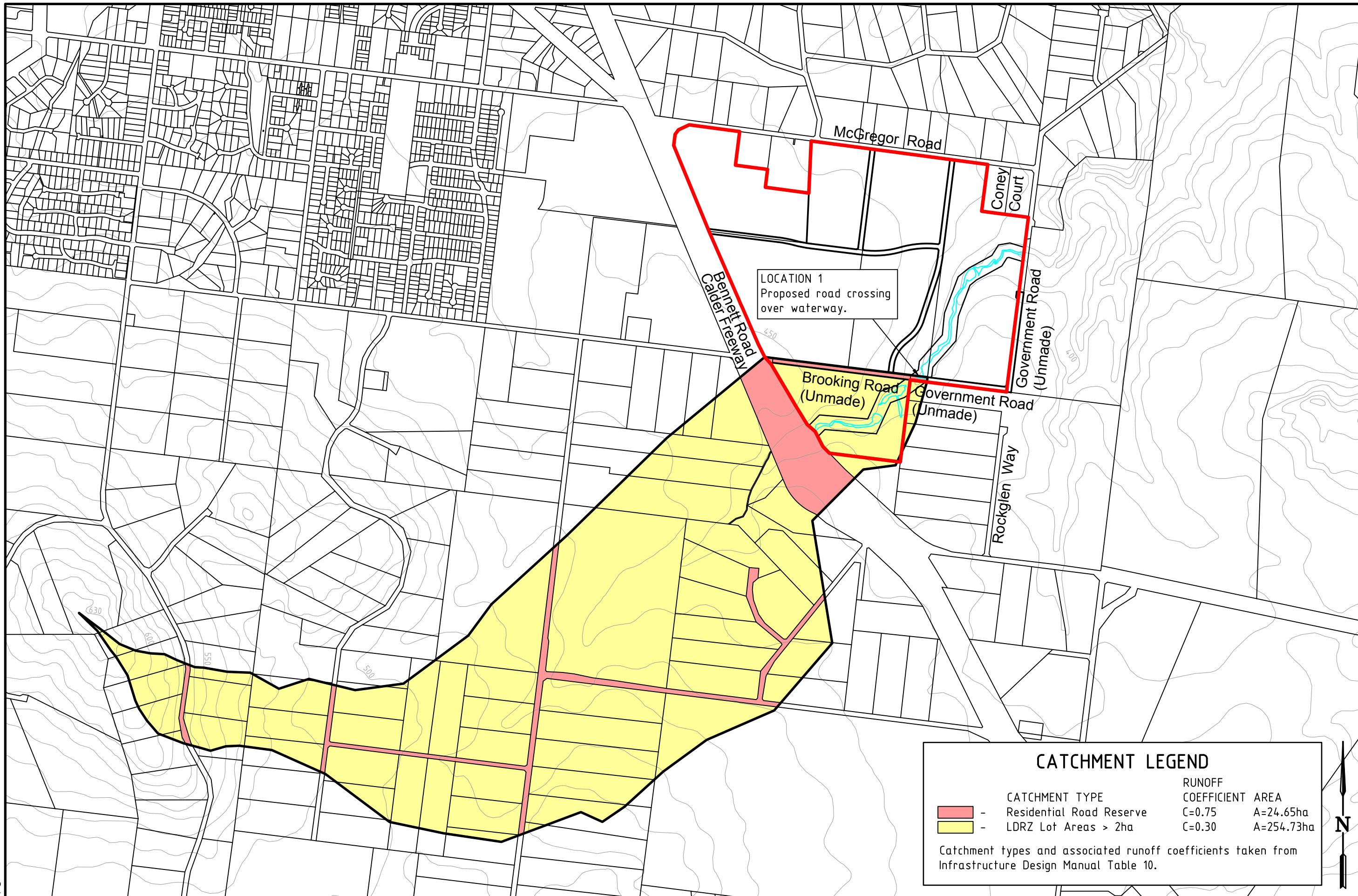
## References

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Concrete Pipe Association of Australasia. (n.d.). *Colebrook-White Charts*. Retrieved January 30, 2020, from Concrete Pipe Association of Australasia: <https://www.cpaasn.au/General/design-manuals.html>

Haddad, K., & Rahman, A. (n.d.). *Regional Flood Frequency Estimation Model*. Retrieved from Regional Flood Frequency Estimation Model: <https://rffe.arr-software.org/>

Local Government Infrastructure Design Association. (2020). *Infrastructure Design Manual*. Tongala: Local Government Infrastructure Design Association.



LOCATION 1  
Proposed road crossing  
over waterway.

CATCHMENT LEGEND			
CATCHMENT TYPE		RUNOFF	
		COEFFICIENT	AREA
	- Residential Road Reserve	C=0.75	A=24.65ha
	- LDRZ Lot Areas > 2ha	C=0.30	A=254.73ha

Catchment types and associated runoff coefficients taken from Infrastructure Design Manual Table 10.



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Ver	Revision Description	Date
6		
5		
4		
3		
2		
1	Original Issue	28/01/2020
0	Draft	-

Drafted J.Sens Jan 2020	Checked P.Bowe Jan 2020
Approved	

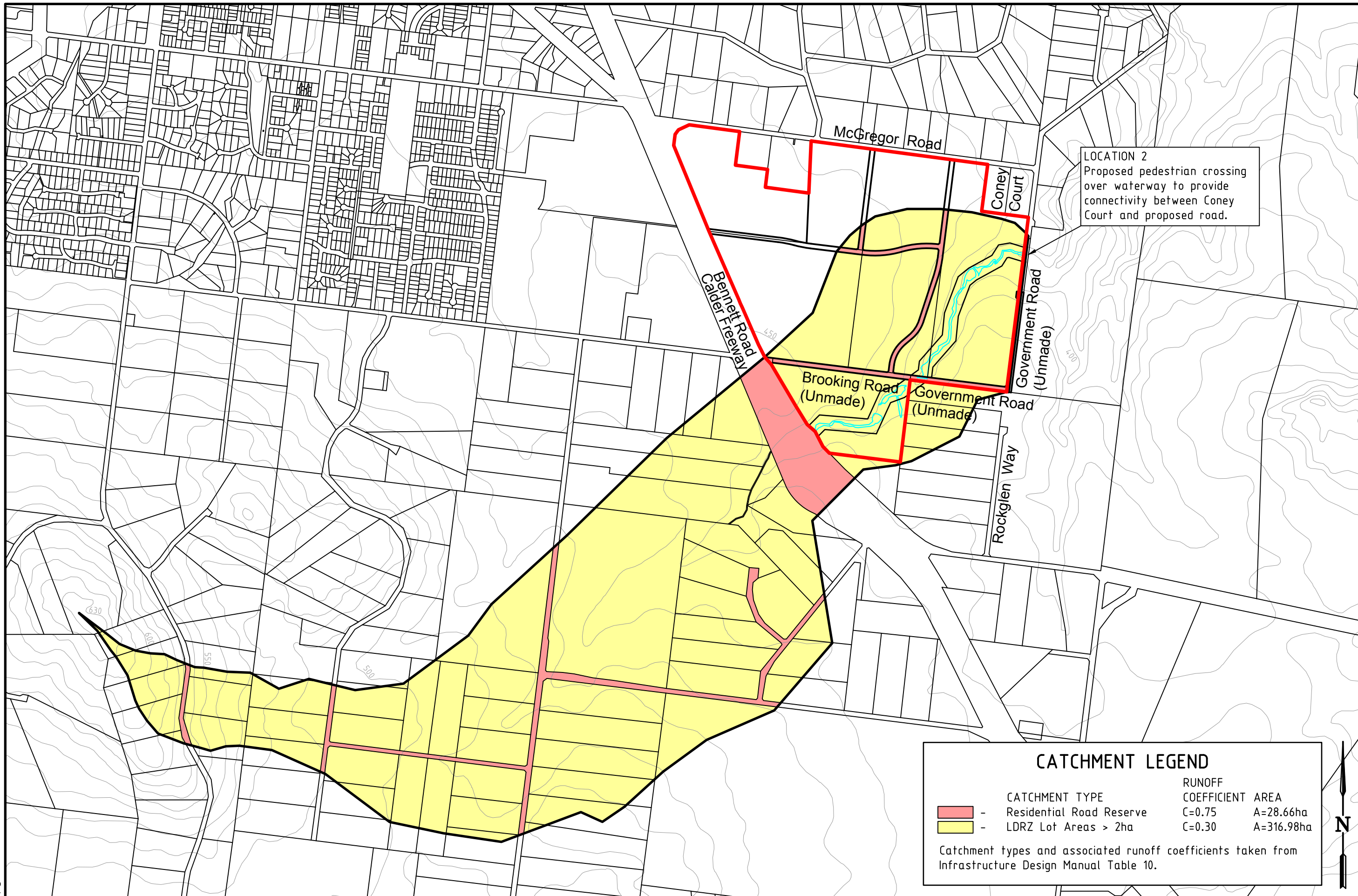
**Notes/Legend**  
Contours shown on plan indicate the approximate existing surface. Contour interval 10m.  
Indicative catchment area shown is based on existing surface contours, and does not consider existing drainage infrastructure.

**TERRACO**  
Civil Engineers  
Project Managers  
Development Consultants

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Scale (m)	NTS 
All lengths are in metres and all levels are to Australian Height Datum (Original Sheet Size is A3)	
Drawing file:	LTO Ref:
17085 Catchment.dwg	-

~~Macedon Ranges Shire Council - Gisborne~~  
**MACEDON RANGES PRELIMINARY SCHEME**  
Indicative Catchment Plan  
**DEVELOPMENT PLAN: DP/2019/1**  
Location: Proposed Road Crossing  
Date: 16/11/2022  
Authorised Officer: **Jack Wiltshire**  
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LOCATION 2  
Proposed pedestrian crossing over waterway to provide connectivity between Coney Court and proposed road.

CATCHMENT LEGEND			
CATCHMENT TYPE		RUNOFF	
		COEFFICIENT	AREA
	- Residential Road Reserve	C=0.75	A=28.66ha
	- LDRZ Lot Areas > 2ha	C=0.30	A=316.98ha

Catchment types and associated runoff coefficients taken from Infrastructure Design Manual Table 10.



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Ver	Revision Description	Date
6		
5		
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3		
2		
1	Original Issue	28/01/2020
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**Notes/Legend**  
Contours shown on plan indicate the approximate existing surface. Contour interval 10m.  
Indicative catchment area shown is based on existing surface contours, and does not consider existing drainage infrastructure.

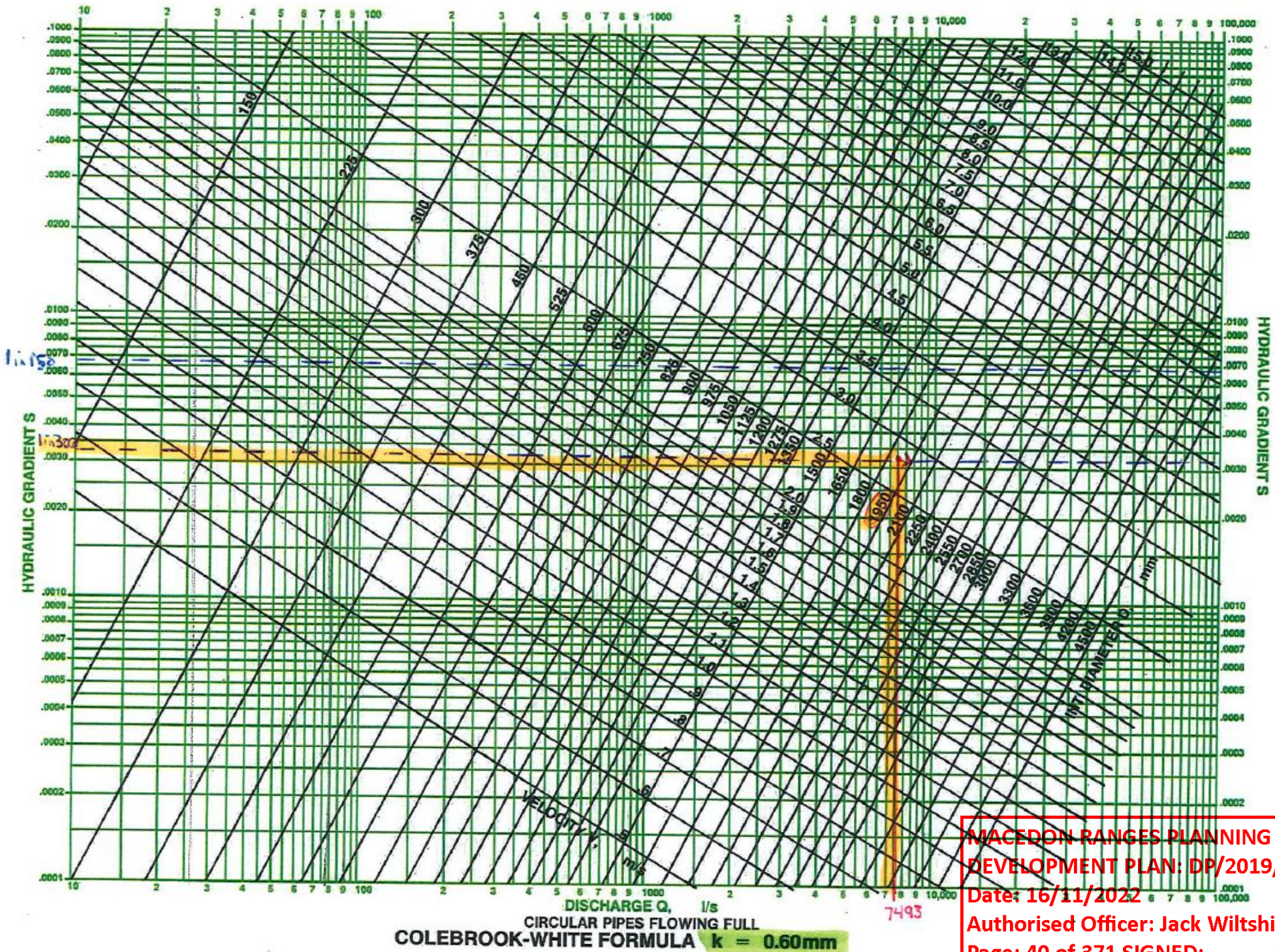
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Scale (m)	NTS
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Drawing file:	LTO Ref:
17085 Catchment.dwg	-

~~Macedon Ranges Shire Council - Gisborne~~  
~~MACEDON RANGES PRELIMINARY PLANNING SCHEME~~  
~~Indicative Catchment Plan~~  
~~DEVELOPMENT PLAN: DP/2019/1~~  
Location 2 - Proposed Pedestrian Crossing  
Date: 16/12/2022  
Council Ref: 17085  
Water Auth Ref: 17085  
Our Ref: 17085  
Version: 1  
Sheet: 2 of 2  
**Authorised Officer: Jack Wiltshire**  
Page: 39 of 371 SIGNED.

CATCHMENT L1

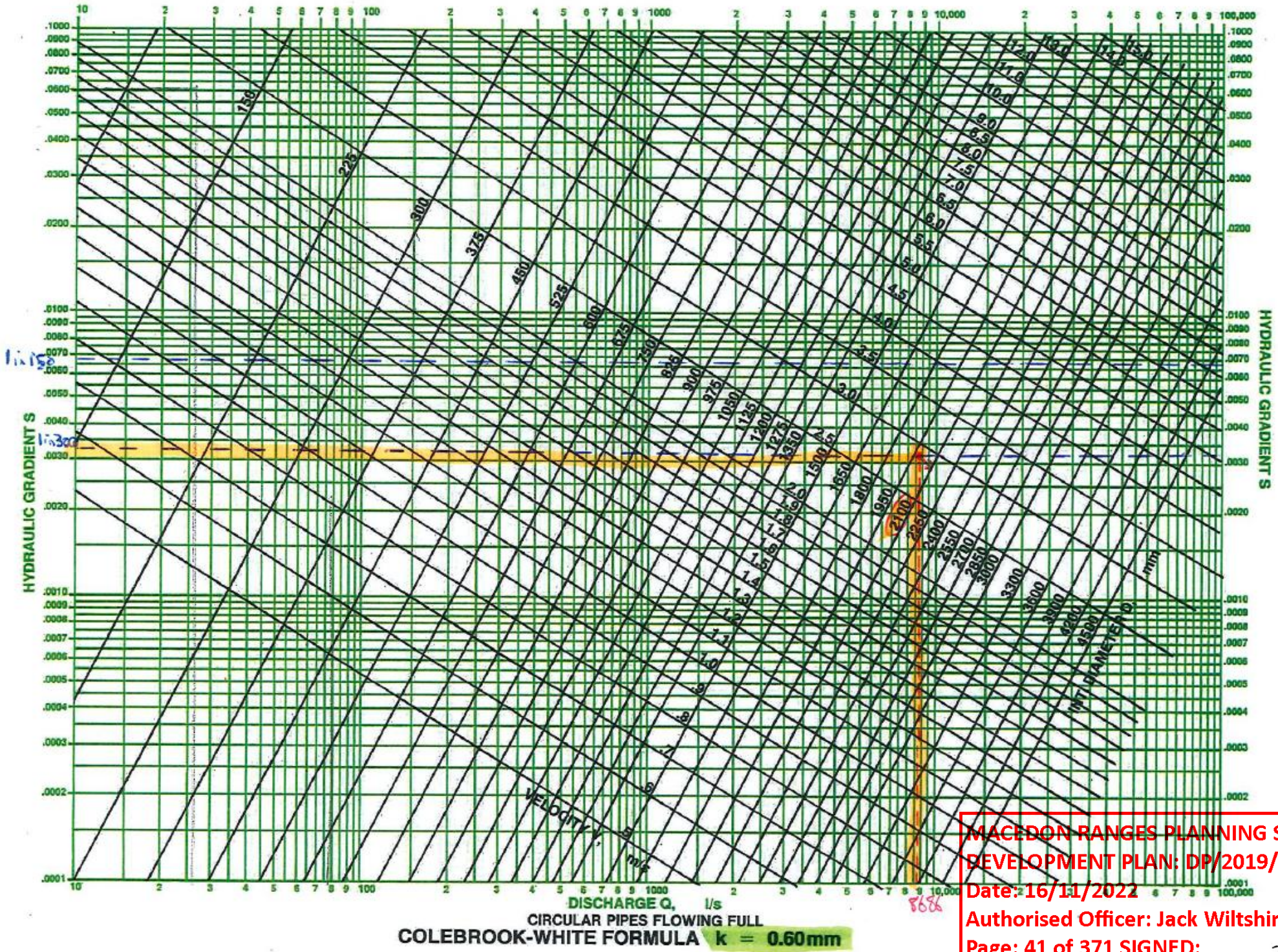


DISCHARGE Q, l/s  
CIRCULAR PIPES FLOWING FULL  
COLEBROOK-WHITE FORMULA  $k = 0.60\text{mm}$

MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
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CATCHMENT 2.2



DISCHARGE Q, l/s  
CIRCULAR PIPES FLOWING FULL  
COLEBROOK-WHITE FORMULA  $k = 0.60\text{mm}$

MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
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# Cogent Acoustics

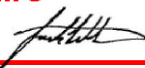
**Bennett Road, Gisborne**

**Development Plan**

**Macedon Ranges Planning Scheme**

**Acoustic Engineering Report**

**MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
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# Bennett Road, Gisborne

## Development Plan

### Macedon Ranges Planning Scheme

### Acoustic Engineering Report

**Prepared for:**

G2 Urban Planning  
670 Mt Alexander Road  
Moonee Ponds VIC 3039

**Prepared by:**

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**Project Number:** 19442

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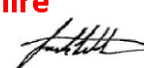
**Signature**



**Revision History**

Rev.	Date	Purpose	Prepared by:	Reviewed by:
0	24/01/2020	Draft for comment	Te-liang Chong	Irena Peoples
1	24/01/2020	Revised noise attenuation measures	Te-liang Chong	Irena Peoples
2	07/02/2020	Minor revisions	Te-liang Chong	Irena Peoples
3	07/02/2020	Updated Plans	Te-liang Chong	Irena Peoples
4	18/02/2020	For Issue	Te-liang Chong	Irena Peoples
5	3/08/2020	Amendment based on VicRoads response	Te-liang Chong	Irena Peoples
6	13/10/2021	Minor updates	Te-liang Chong	Irena Peoples

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
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## Executive Summary

G2 Urban Planning has instructed Cogent Acoustics Pty Ltd to provide acoustic engineering consulting services associated with the Development Plan for a proposed rural residential subdivision development at Bennett Road, Gisborne.

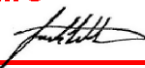
Advice in relation to the following acoustic engineering elements has been requested, and is presented in this report:

**Table 1 Acoustic Engineering Elements and Reference Criteria**

Acoustic Design Element	Reference Criteria
External noise ingress via building façade and roof	<ul style="list-style-type: none"> <li>▪ Macedon Ranges Planning Scheme Clause 21.11-1</li> <li>▪ VicRoads Requirements of Developers – Noise Sensitive Uses</li> <li>▪ AS/NZS 2107:2016</li> <li>▪ AS 3671:1989</li> </ul>

A review of the above elements has been undertaken and it is considered that the residential development will satisfy the reference criteria with inclusion of the following acoustic engineering measure:

- Residential buildings constructed within the lots highlighted in Figure 4 should be constructed in accordance with Construction Category 3 as prescribed in AS 3671:1989; and
- Residential buildings constructed within the lots highlighted in Figure 4 should have building layouts where the service areas (laundry, bathroom, garage, etc.) face Calder Freeway whilst the noise sensitive uses (bedrooms, living areas, etc.) are located away from the Calder Freeway side of the building; and
- Residential buildings constructed within the lots fronting Bennett Road should be setback no less than 30 meters from the Bennett Road lot boundary (with the 30 meter setback, the highest Sound Pressure Level at the most affected residential buildings is calculated to be  $L_{A10,18hr}$  70 dB(A)); and
- Residential buildings constructed within all remaining lots (not highlighted in Figure 4) should be constructed in accordance with Construction Category 2 as prescribed in AS 3671:1989.
- Where Construction Category 3 is recommended, specialist acoustic advice should be obtained during planning permit stage.
- Refer to Section 6.4 for details of the AS 3671:1989 Construction Categories.
- Refer to Section 8 for full details of the acoustic engineering measure.

**MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
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## 1 Introduction

### 1.1 Purpose

G2 Urban Planning has instructed Cogent Acoustics Pty Ltd to conduct a road traffic noise assessment at the site of a proposed residential subdivision at 88-168 Bennett Road and 15-134 McGregor Road, Gisborne, and to provide advice on any noise attenuation measures necessary to protect the future occupants from external noise. This report shall form part of the Development Plan support reports for this area.

This report documents the investigations and advice provided in relation to the above services.

A glossary of the acoustic nomenclature used in this report is presented in Appendix A.

### 1.2 Reference Documentation

This report is based on information contained in the following documents and drawings:

**Table 2 Reference Documentation**

Document	Prepared by	Issue
Bennett Road Precinct Development Plan; Drawing No. 17085 Face Sheet V23, 17085 Site Context V23, 17085 Layout V23, 17085 Development V23	Terraco	22/09/2021
Bennett Road Precinct: Subdivision Concept Plan with Aerial; Drawing No. 17085 Concept V23 Sheet 1 to 6	Terraco	22/09/2021
Bennett Road Development Plan Report	G2 Urban Planning	08/2019
VicRoads Request for Information; Planning Application No. DP/2019/1; VicRoads Reference No. PPR 30959/19	VicRoads	10/11/2019
Email To: Te-liang Chong CC: Brian Hogan; Thomas Cybula Subject: RE: Bennett Road, Gisborne Development Plan VicRoads Ref: PPR 30959/19	Chris King, VicRoads	Fri 31/07/2020 3:20 PM

### 1.3 Report Limitations

The following limitations are applicable with respect to the acoustic advice presented in this report:

- Cogent Acoustics has prepared this document for the sole use of the Client and for the specific purpose expressly stated in the document. No other party should rely on this document without the prior written consent of Cogent Acoustics. Cogent Acoustics undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document.
- The information contained in this document provides advice in relation to acoustics and vibration only. No claims are made and no liability is accepted in respect of design and construction issues falling outside of the specialist field of acoustics and vibration engineering including and not limited to structural integrity, fire rating, architectural buildability and fitness-for-purpose, waterproofing and the like. Supplementary professional advice should be sought in respect of these issues.
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- In preparing this document Cogent Acoustics may have relied upon information provided by the Client and other third parties, some of which may not have been verified. Cogent Acoustics accepts no responsibility or liability for any errors or omissions which may be incorporated into this document as a result.
- The recommendations, data and methodology documented in this assessment are based on the listed reference documentation. The recommendations apply specifically to the project under consideration, and must not be utilised for any other purpose. Any modifications or changes to the project from that described in the listed reference documentation may invalidate the advice provided in this document, necessitating a revision.
- Subject to the above conditions, this document may be transmitted, reproduced or disseminated only in its entirety.

## 2 Project Characteristics

### 2.1 Site Location

The project site is located at 88-168 Bennett Road and 15-134 McGregor Road, Gisborne, as shown in Figure 1.

The project comprises development of a Development Plan for a new rural residential subdivision located adjacent to Calder Freeway.

The topography in the area of the site is near flat with steep features along the drainage line or watercourse running through the southern and eastern sections of the site.



Figure 1 Aerial Image of Site (Image Source: VicPlan)



## 2.2 Subdivision Plan

Figure 2 shows the subdivision concept plan.

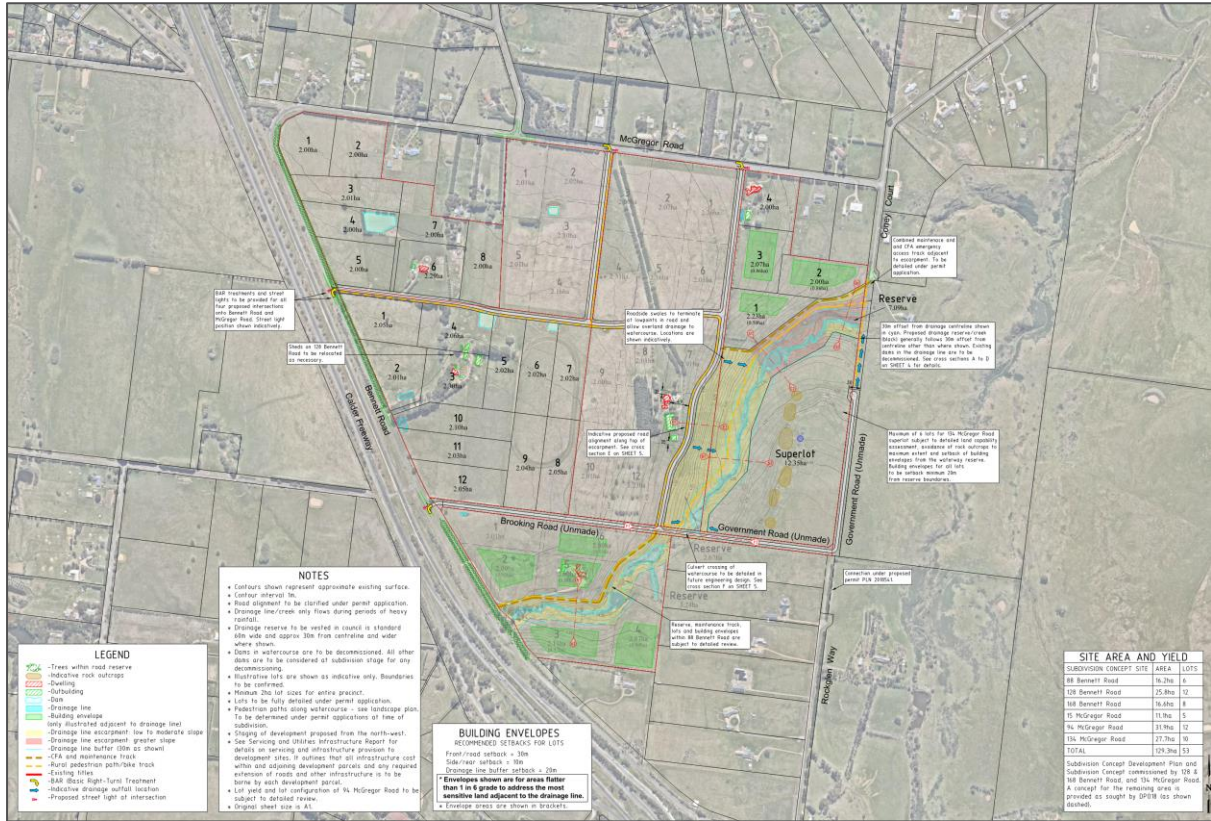
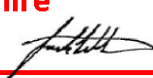


Figure 2 Subdivision Concept Plan (Image Source: Terraco)

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DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
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### 3 Town Planning Requirements

VicRoads Request for Information in relation to the Development Plan Application No. DP/2019/1 issued on 10 November 2019 specifies items that need to be addressed in the planning permit application for the development. Table 3 presents the relevant acoustic items to be addressed.

**Table 3 Relevant VicRoads Request for Information Acoustic Items**

Item No.	Item Text
2	<p>The application must review and address clause 21.11-1 of the Macedon Ranges Planning Scheme which states:</p> <p><b>Criteria</b></p> <p><i>An application for land within 100 metres of the Calder Highway and Calder Freeway should meet the following criteria:</i></p> <ul style="list-style-type: none"> <li><i>Dwellings should be designed and constructed to acoustic standards as set out in AS3671-1989 "Acoustics – Road Traffic Noise Intrusion – Building Siting and Construction" where the noise level is in excess of 60dB(A). (Note: Noise levels quoted are free field L10[18hr]).</i></li> <li><i>Other buildings providing for noise sensitive uses, should be designed and constructed to acoustic standards with interior noise levels not greater than those set out in AS2107-1987 "Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors."</i></li> <li><i>Subdivision of land that creates a lot for a dwelling should have sufficient space for a dwelling to be sited where noise does not exceed 70dB(A).</i></li> </ul>

## 4 Legislation and Guidelines

Table 4 presents a summary of the relevant legislation and guidelines applicable to the proposed development. The information contained in these documents forms the basis of the design criteria and advice presented in this report.

**Table 4 Summary of Relevant Statutory Requirements and Guidelines**

Document	Status	Relevance to this Project
Macedon Ranges Planning Scheme Clause 21.11-1 (Macedon Ranges Shire Council, 2019)	Policy	Provides acoustic criteria for an application of land within 100 metres of the Calder Highway and Calder Freeway.
AS/NZS 2107:2016 Acoustics – Design Sound Levels and Reverberation Times for Building Interiors (Standards Australia, 2016)	Guideline	Provides guidance on internal noise levels for different types of spaces. The guidance provided is relevant to the development in respect of noise intrusion from external sources.
AS 3671:1989 – Acoustics – Road Traffic Noise Intrusion – Building Siting and Construction (Standards Australia, 1989)	Guideline	Provides guidance on determining the required traffic noise reduction from outside to inside a building exposed to traffic noise, and the types of construction required to achieve acceptable internal noise levels.
VicRoads Requirements of Developers – Noise Sensitive Uses (VicRoads, 2004)	Guideline	Prescribes noise amelioration responsibility and standards of property developers of noise sensitive developments adjacent to freeways under VicRoads control.
VicRoads Requirements for Acoustic Consultants (VicRoads, 2005)	Guideline	Prescribes the method adopted by VicRoads for measurement of road traffic noise levels.

## 5 Road Traffic Noise Measurement

### 5.1 Soundscape

During the site visits on 11 and 18 December 2019, the soundscape was dominated by road traffic noise from Calder Freeway. Bird noise, insect noise, and wind-induced vegetation noise also contributed to the soundscape but were not dominant sources of noise.

### 5.2 Road Traffic Noise Levels

Environmental noise logging was performed at the site to establish the current levels of road traffic noise. The measurements were performed at a location near to the south-western boundary of the site between 11 and 18 December 2019. Details of the measurement location and measurement methodology are presented in Appendix B.

Table 5 presents a summary of the measured sound pressure levels. Hourly sound pressure levels and a graph showing the variation in noise level over the full measurement period are presented in Appendix C.

**Table 5 Summary of Measured Road Traffic Noise Levels**

Date	Measured Sound Pressure Level, dB(A)					
	Day Period			Night Period		
	L <sub>A10,18hr</sub> (6 am to 12 am)	L <sub>Aeq,16hr</sub> (6 am to 10 pm)	Max L <sub>Aeq,1hr</sub> (6 am to 10 pm)	L <sub>A10,6hr</sub> (12 am to 6 am)	L <sub>Aeq,8hr</sub> (10 pm to 6 am)	Max L <sub>Aeq,1hr</sub> (10 pm to 6 am)
Wednesday, 11 December 2019	64*	62*	64*	61	58	63
Thursday, 12 December 2019	66	64	67	62	59	64
Friday, 13 December 2019	66	64	66	61	58	61
Saturday, 14 December 2019	64	63	65	56	53	56
Sunday, 15 December 2019	62	62	66	61	58	63
Monday, 16 December 2019	62	61	65	63	59	65
Tuesday, 17 December 2019	61	60	66	64	61	66
Wednesday, 18 December 2019	66**	63**	66**	-	-	-
<b>Adopted Design Sound Level</b>	<b>66</b>	<b>64</b>	<b>67</b>	<b>64</b>	<b>61</b>	<b>66</b>

\* Partial measurement period: 12 pm to 10 pm / 12 am only

\*\* Partial measurement period: 6 am to 12 pm only.

## 6 Design Criteria

### 6.1 Macedon Ranges Planning Scheme Clause 21.11-1

Macedon Ranges Planning Scheme Clause 21.11-1 prescribes the following acoustic criteria for an application for land within 100 metres of the Calder Highway and Calder Freeway:

- Dwellings should be designed and constructed to acoustic standards as set out in AS 3671:1989 – Acoustics – Road Traffic Noise Intrusion – Building Siting and Construction (Standards Australia, 1989) where the noise level is in excess of 60 dB(A). (Note: Noise levels quoted are free field  $L_{10[18hr]}$ ).
- Other buildings providing for noise sensitive uses, should be designed and constructed to acoustic standards with interior noise levels not greater than those set out in AS/NZS 2107:2016 Acoustics – Design Sound Levels and Reverberation Times for Building Interiors<sup>1</sup> (Standards Australia, 2016).
- Subdivision of land that creates a lot for a dwelling should have sufficient space for a dwelling to be sited where noise does not exceed 70 dB(A).

### 6.2 VicRoads Requirements of Developers – Noise Sensitive Uses

VicRoads Requirements of Developers – Noise Sensitive Uses (VicRoads, 2004) provides guidelines on methods to minimise road noise impacts to noise sensitive uses within developments near a freeway. It is noted that VicRoads Requirements of Developers prescribes similar, if slightly less stringent, acoustic criteria to Clause 21.11-1 of the Macedon Ranges Planning Scheme.

On this basis, the acoustic criteria in Macedon Ranges Planning Scheme Clause 21.11-1 will therefore be adopted for the purpose of this assessment. However, VicRoads Requirements of Developers does prescribe additional requirements relevant to the project, as follows:

- Two options for noise attenuation of traffic noise from a freeway may be considered:
  - Construction of a noise barrier between the freeway and noise sensitive uses; or
  - Where the developer decides, in consultation with VicRoads and Council, that it is not desirable to erect high noise barriers, then the noise sensitive buildings adjacent to the freeway must be designed and constructed with regards to the acoustic guidelines prescribed by AS/NZS 2107:2016 and AS 3671:1989.
- The adopted noise attenuation requirements will be met for 10 years after finalisation of the development. In consideration that the development has an estimated finalisation date in 2025, the noise attenuation target should be met up to the year 2035.

<sup>1</sup> Macedon Ranges Planning Scheme refers to AS 2107:1987 which has now been superseded.

- The noise barrier should have a design life of not less than 25 years.

### 6.3 Australian Standard AS/NZS 2107:2016

Australian Standard AS/NZS 2107:2016 (Standards Australia, 2016) provides recommended internal noise levels for various types of spaces. To achieve acceptable overall internal noise levels within the development, it is considered that:

- Buildings should be designed to achieve the middle to lower end of the range recommended by AS/NZS 2107:2016 for average internal noise levels during the daytime and night-time (i.e.  $L_{Aeq,16hr}$  (6 am to 10 pm) and  $L_{Aeq,8hr}$  (10 pm to 6 am) respectively).
- Buildings should be designed to achieve noise levels no greater than the upper end of the range recommended by AS/NZS 2107:2016 during the loudest hour that the rooms are typically occupied.

Table 6 presents the adopted internal noise level design criteria based on the above approach:

**Table 6 AS/NSZ 2107:2016 Recommended Internal Noise Levels**

Type of Occupancy / Activity	AS/NZS 2107:2016 Recommended Design Noise Level Range, $L_{Aeq}$ , dB(A)	Adopted Project Design Criteria, dB(A)	
		Day or Night Average	Loudest Hour
<b>Houses and apartments in inner city areas or entertainment districts or near major roads</b>			
Living areas	35 to 45	$L_{Aeq,16hr} \leq 40$	$L_{Aeq,1hr} \leq 45$
Sleeping areas (night-time)*	35 to 40	$L_{Aeq,8hr} \leq 35$	$L_{Aeq,1hr} \leq 40$

\* The noise criteria for sleeping areas have been taken to apply during the night-time (10 pm to 6 am) only. Higher noise levels in sleeping areas are considered to be acceptable during the daytime when occupants would generally not be sleeping, provided that the daytime noise levels in sleeping areas do not exceed the adopted criteria for living areas. The noise criteria for living areas has therefore also been adopted for sleeping areas during the daytime.

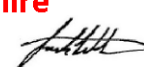
### 6.4 Australian Standard AS 3671:1989

Australian Standard AS 3671:1989 (Standards Australia, 1989) provides recommended building construction to reduce road traffic noise intrusion.

AS 3671:1989 provides recommendations based on the required Traffic Noise Reduction (TNR) which is the difference between the external noise level and AS/NZS 2107:2016 design internal noise level. Depending on the required TNR, the recommended building construction will be categorised into one of four categories ranging from standard construction to where specialist acoustic advice should be sought.

Table 7 presents details of the AS 3671:1989 required Construction Categories.

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**Table 7 AS 3671:1989 Required Construction Categories for Residential Buildings**

External Traffic Noise Level, $L_{Aeq,T}$ , dB(A)	Traffic Noise Reduction, dB(A)	AS 3671:1989 Construction Category	AS 3671:1989 Construction Category Details
≤45	≤10	1	<ul style="list-style-type: none"> <li>Standard exterior façade construction acceptable.</li> <li>Openings including open windows and doors may comprise up to 10% of the exposed façade.</li> </ul>
46 to 60	11 to 25	2	<ul style="list-style-type: none"> <li>Standard exterior façade construction acceptable, except for lightweight elements such as fibre cement, metal cladding or all glass façades.</li> <li>Windows, door, and other openings must be closed to achieve the required TNR.</li> </ul>
61 to 75	25 to 35	3	<ul style="list-style-type: none"> <li>Special exterior façade construction.</li> <li>Specialist acoustic advice should be sought.</li> <li>Acoustic performance of façade must account for the type of room, number, type, and direction of the façade and any openings.</li> </ul>
>75	>35	4	<ul style="list-style-type: none"> <li>As per Construction Category 3.</li> <li>Masonry construction, wide air gap double glazing, and fully insulated external facades are likely to be required to achieve this level of TNR.</li> </ul>

## 7 Road Traffic Noise

### 7.1 Noise Modelling

SoundPLAN version 7.4 environmental noise modelling software was used to calculate the existing and future traffic noise levels at the development.

Full details of noise modelling input parameters and data sources are presented in Appendix D.

### 7.2 Noise Model Validation

To validate the noise model, a version of the model representing the existing scenario (year 2019) was generated and used to calculate the road traffic noise levels at the noise logging position. The traffic noise levels calculated by the model were then validated against the measured road traffic noise levels, as shown in Table 8.

**Table 8 Traffic Noise Model Validation Results**

Noise Logger Location	Sound Pressure Level Parameter	Measured Sound Pressure Level, dB(A)	Modelled Year 2019 Sound Pressure Level, dB(A)	Deviation, dB
1	L <sub>A10,18hr</sub>	66	70	+4
	L <sub>Aeq,16hr</sub>	64	68	+4
	L <sub>Aeq,8hr</sub>	61	66	+5

The noise model validation results show that a deviation of between +4 and +5 dB(A) was calculated between the measured and modelled noise levels.

Therefore, a -4 dB(A) adjustment will be applied to all modelled noise levels.

### 7.3 Calculated Year 2035 Traffic Noise Levels

Year 2035 traffic noise levels were calculated by increasing the traffic volumes by the current (year 2019) annual growth rate. All other modelling parameters were unchanged. Full details of noise modelling input parameters and data sources are presented in Appendix D.

Figure 3 presents a noise contour map showing the calculated L<sub>A10,18hr</sub> traffic noise contours in year 2035 without noise attenuation measures. The presented Sound Pressure Levels include the -4 dB(A) adjustment.



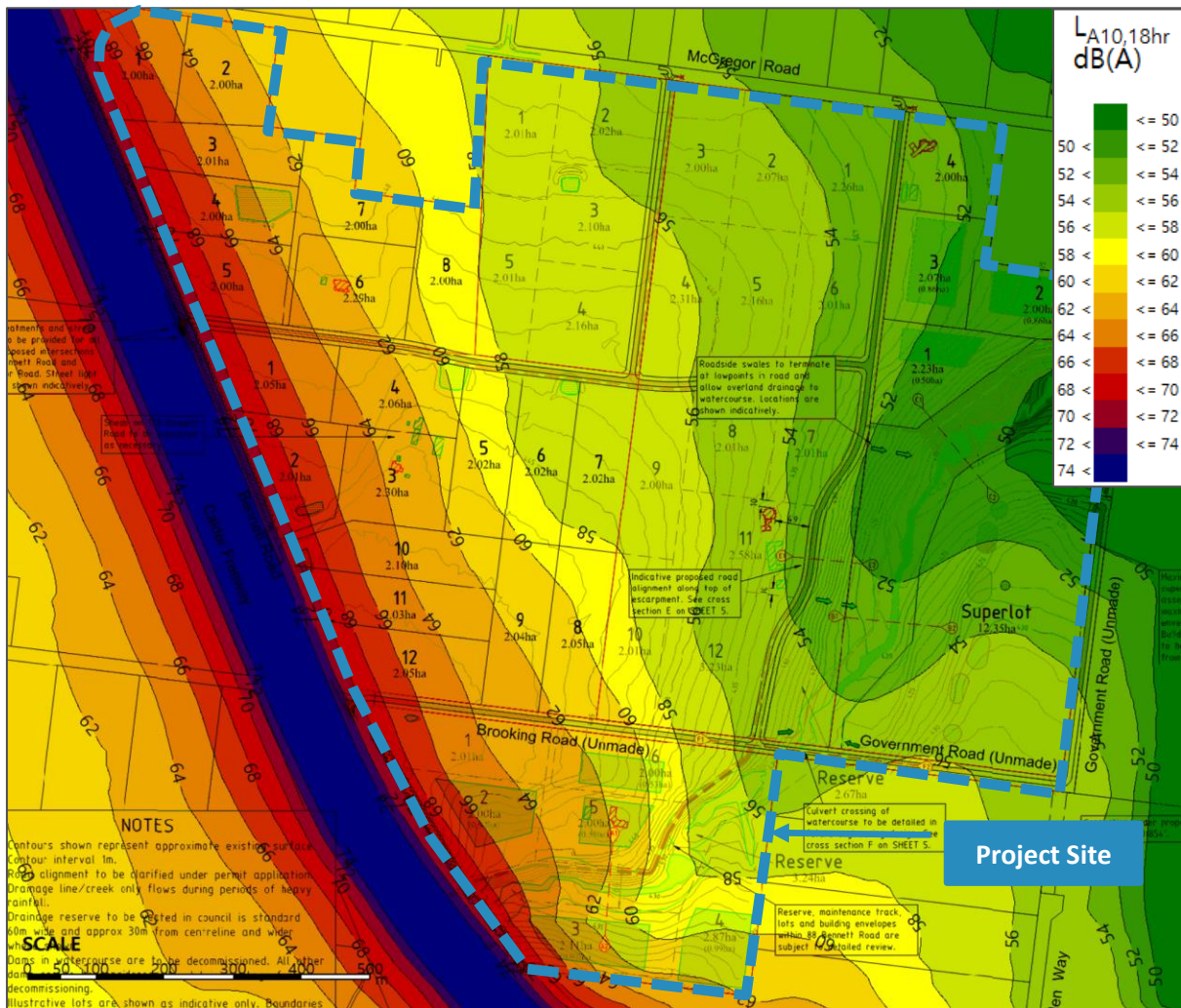


Figure 3 Calculated Year 2035  $L_{A10,18hr}$  Traffic Noise Contours

The noise modelling results indicate that noise levels at the lots adjacent to Bennett Road (and nearest to Calder Freeway) will be up to  $L_{A10,18hr}$  72 dB(A) in year 2035 without noise attenuation measures.

The minimum noise level at lots within the project site will be  $L_{A10,18hr}$  47 dB(A), which has been calculated to occur at the lots furthest from Calder Freeway.

On the above basis, noise attenuation measures will be required to satisfy the VicRoads Requirements of Developers.

## 8 Recommended Noise Attenuation Measures

The following noise attenuation measures are recommended:

- Residential buildings constructed within the lots highlighted in Figure 4 should be constructed in accordance with Construction Category 3 as prescribed in AS 3671:1989; and
- Residential buildings constructed within the lots highlighted in Figure 4 should have building layouts where the service areas (laundry, bathroom, garage, etc.) face Calder Freeway whilst the noise sensitive uses (bedrooms, living areas, etc.) are located away from the Calder Freeway side of the building; and
- Residential buildings constructed within the lots fronting Bennett Road should be setback no less than 30 meters from the Bennett Road lot boundary (with the 30 meter setback, the highest Sound Pressure Level at the most affected residential buildings is calculated to be  $L_{A10,18hr}$  70 dB(A)); and
- Residential buildings constructed within all remaining lots (not highlighted in Figure 4) should be constructed in accordance with Construction Category 2 as prescribed in AS 3671:1989.
- Where Construction Category 3 is recommended, specialist acoustic advice should be obtained during planning permit stage. The acoustic specialist should take into account the guidelines prescribed by AS/NZS 2107:2016 and AS 3671:1989. The sound insulation performance of each façade should account for the location of each room, their intended occupancy, and exposure to traffic noise.

Indicatively, Construction Category 3 will require masonry external façade construction, double glazed window units, and walls and ceilings complete with bulk insulation. Openable windows and exterior doors should be fitted with rubber-type acoustic seals. Fresh air intake or exhaust systems should be ducted, and consideration should be given to fitting acoustic attenuators or internal acoustic lining to the ductwork.

- Where Construction Category 2 is recommended, specialist acoustic advice is not required. However, lightweight external façade elements such as fibre cement, metal cladding, or all glass façades will not provide sufficient sound insulation. External façades should be of masonry construction, such as brickwork, to provide sufficient sound insulation.
- These requirements and this report shall be referenced on future subdivision permits.

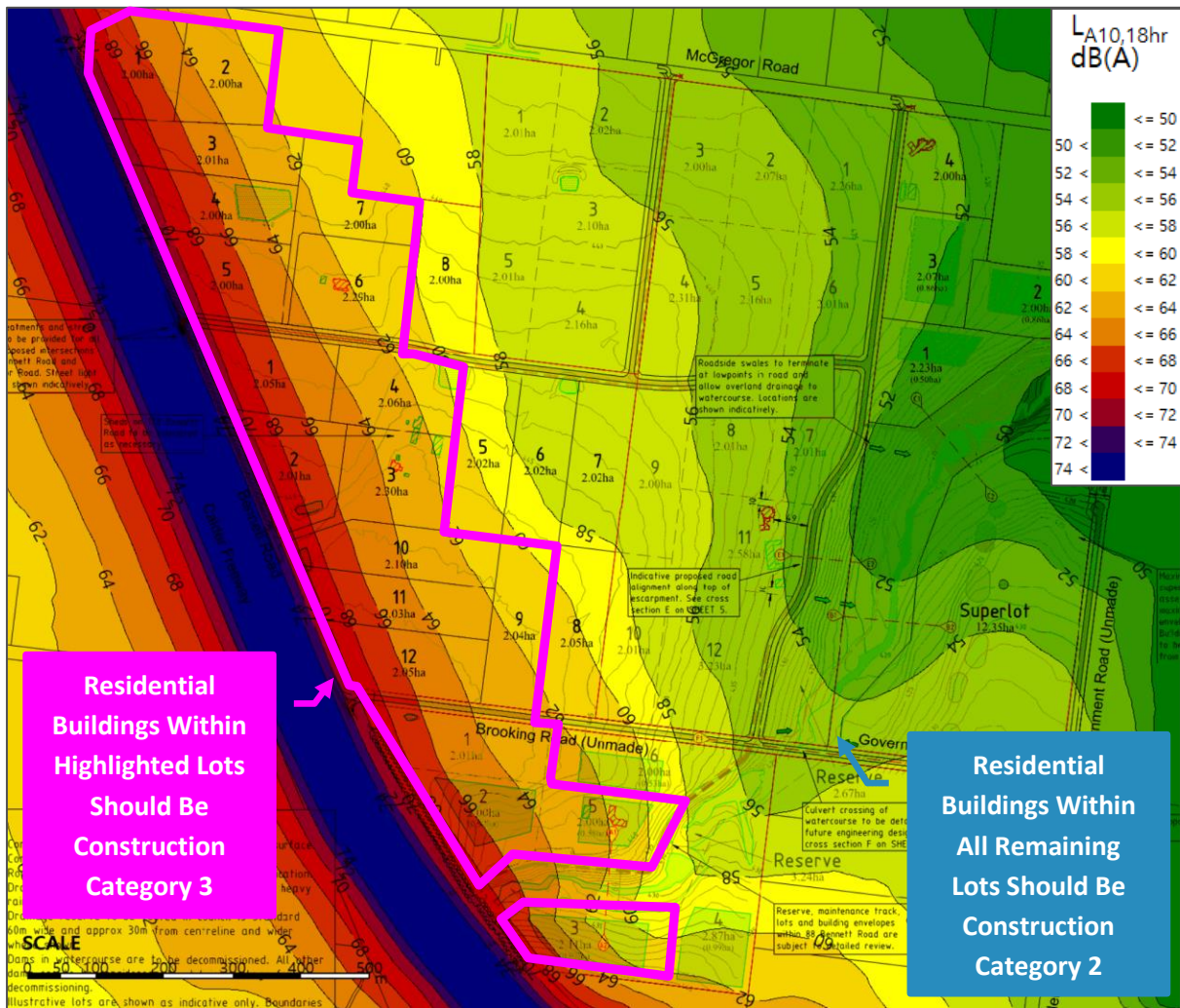


Figure 4 Recommended AS 3671:1989 Construction Categories for Residential Buildings

## 9 Conclusion

This report has presented a road traffic noise assessment for the proposed residential subdivision development at Bennett Road, Gisborne.

The assessment has been undertaken with regard to the acoustic criteria prescribed in Macedon Ranges Planning Scheme Clause 21.11-1 (Macedon Ranges Shire Council, 2019), VicRoads Requirements of Developers – Noise Sensitive Uses (VicRoads, 2004), AS/NZS 2107:2016 Acoustics – Design Sound Levels and Reverberation Times for Building Interiors (Standards Australia, 2016), and AS 3671:1989 – Acoustics – Road Traffic Noise Intrusion – Building Siting and Construction (Standards Australia, 1989).

Acoustic engineering advice for the proposed development has been presented in Section 8.

Subject to the advice presented in this report, it is considered that the Development Plan and future rural residential development will satisfy the applicable acoustic criteria.

## 10 References

Macedon Ranges Shire Council. (2019). Macedon Ranges Planning Scheme.

Standards Australia. (1989). AS 3671:1989 Acoustics – Road Traffic Noise Intrusion – Building Siting and Construction.

Standards Australia. (2016). AS/NZS 2107:2016 Acoustics - Recommended Design Sound Levels and Reverberation Times for Building Interiors.

UK DoT. (1988). Calculation of Road Traffic Noise (CoRTN). Department of Transport, Welsh Office.

VicRoads. (2004). VicRoads Requirements of Developers - Noise Sensitive Uses. Roads Corporation of Victoria, Kew.

VicRoads. (2005). VicRoads Requirements for Acoustic Consultants. Roads Corporation of Victoria, Kew.

VicRoads. (2010, July). Road Design Note (RDN 06-01). *Interpretation and Application of VicRoads Traffic Noise Reduction Policy 2005*. Roads Corporation of Victoria, Kew.

## Appendix A Glossary of Acoustic Terms

**dB / dB(A)** Decibels or 'A'-weighted Decibels, the units of Sound Pressure Level and Sound Power Level. 'A'-weighting adjusts the levels of frequencies within the sound spectrum to better reflect the sensitivity of the human ear to different frequencies at sound pressure levels typical of everyday sounds. [Unit: dB / dB(A)]

The following are examples of the decibel readings of every day sounds;

- 0 dB            The faintest sound we can hear
- 30 dB          A quiet library or in a quiet location in the country
- 45 dB          Typical office space. Ambience in the city at night
- 60 dB          The sound of a vacuum cleaner in a typical lounge room
- 70 dB          The sound of a car passing on the street
- 80 dB          Loud music played at home
- 90 dB          The sound of a truck passing on the street
- 100 dB        The sound of a rock band
- 120 dB        Deafening

**L<sub>A10,T</sub>** The value of A-weighted Sound Pressure Level which is exceeded for 10 percent of the time during given measurement period T. This is commonly used to provide an indication of the upper limit of fluctuating noise, such as characteristic of music or moderately busy traffic. [Unit: dB / dB(A)]

**L<sub>Aeq,T</sub>** The Equivalent Continuous A-weighted Sound Pressure Level measured over the period T (also known as Time-Average Sound Pressure Level). The Equivalent Continuous A-weighted Sound Pressure Level is the constant value of A-weighted Sound Pressure Level for a given period that would be equivalent in sound energy to the time-varying A-Weighted Sound Pressure Level measured over the same period. In simple terms, this can be thought of as the average sound pressure level. [Unit: dB / dB(A)]

**Sound Pressure Level** A measure of the magnitude of a sound wave. Mathematically, it is twenty times the logarithm to the base ten of the ratio of the root mean square sound pressure at a point in a sound field, to the reference sound pressure; where sound pressure is defined as the alternating component of the pressure (Pa) at the point, and the reference sound pressure is  $2 \times 10^{-5}$  Pa. [Unit: dB]

## Appendix B Noise Measurement Methodology

### Measurement Location

Table 9 presents details of the noise measurement location. Figure 5 and Figure 6 present a map and a photograph of the noise measurement location.

**Table 9 Noise Measurement Location Details**

Location Reference	Measurement Description	Microphone Height Above Ground Level
1	Traffic noise logging	1.5 m



**Figure 5 Noise Measurement Locations (Image Source: VicPlan)**



Figure 6 Noise Measurement Location 1 – Photo Facing South-West

### Measurement Procedure

Unattended environmental noise logging was performed at the site to establish the environmental noise levels. Table 10 presents details of the measurement:

Table 10 Details of Measurement Period

Location Ref.	Measurement Type		Start Time	Start Date	End Time	End Date
	Attended	Unattended				
1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11:20 AM	Wednesday 11/12/2019	12:00 PM	Wednesday 18/12/2019

The equipment was configured to provide the measurement results as a continuous series of 1 second A- and Z-weighted sound pressure levels. Metrics used for the assessment were then post-processed from this data.

A 60 mm diameter foam windscreen was installed on the microphone to minimise the effect of wind-induced pressure fluctuations on the measurements.

### Instrumentation

All acoustic instrumentation used for the measurements held a current certificate of calibration from a National Association of Testing Authorities (NATA) accredited laboratory or from the manufacturer at the time of the measurements.



A field check to confirm correct calibration of the instrumentation was performed at the beginning and end of the measurement period using a laboratory calibrated portable Sound Level Calibrator. At the time of each check the instrumentation was found to be reading correctly and the deviation between consecutive checks was found to be less than 1 dB.

Details of the acoustic instrumentation used for measurements are presented in Table 11.

**Table 11 Acoustic Instrumentation Details**

Location Reference	Instrument Description	Serial No.	Date of Last Laboratory Calibration*
1	Convergence Instruments NSRT_mk3 Type 1 Sound Level Meter	Cnp0DtU4cVUfChtCQ6hxID	14/05/2019
-	Svantek SV35 Portable Sound Level Calibrator	58054	13/05/2019

\* In accordance with AS 1055.1-1997 and National Association of Testing Authorities Guidelines, Sound Level Meters and Environmental Noise Loggers are required to have comprehensive laboratory calibration checks carried out at intervals not exceeding two years. Sound Level Calibrators require calibration annually.

### Meteorological Data

Weather observations during the monitoring period were taken from the Bureau of Meteorology Weather Station at Melbourne Airport, approximately 25 km away.

A maximum of 0.2 mm of rainfall was recorded on Wednesday 11 December 2019. No rainfall was recorded on any other day during the measurement period. The noise measurements are therefore not considered to have been affected by rain noise.

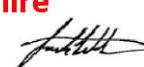
It is noted that for most of the measurement period, the wind speed at the Melbourne Airport Weather Station exceeded the 3 m/s limit as prescribed by the VicRoads Requirements for Acoustic Consultants (VicRoads, 2005). Local wind speed measurements were conducted near to the noise measurement location using a Kestrel 5500 Weather Meter. Table 12 presents the measured wind speed.

**Table 12 Measured Wind Speed at Noise Logging Location**

Location Reference	Measurement Time	Measurement Date	Measured Wind Speed, m/s
1	11:30 AM to 11:45 AM	Wednesday 11/12/2019	3.1
1	11:45 AM to 12:00 PM	Wednesday 18/12/2019	1.8

An average wind speed of 3.1 m/s was measured at the noise logging location between 11:30 am and 11:45 am on Wednesday 11 December 2019. On the same day, the Melbourne Airport Weather Station measured an average wind speed of between 4.7 m/s and 6.1 m/s (reported at 9 am and 3 pm).

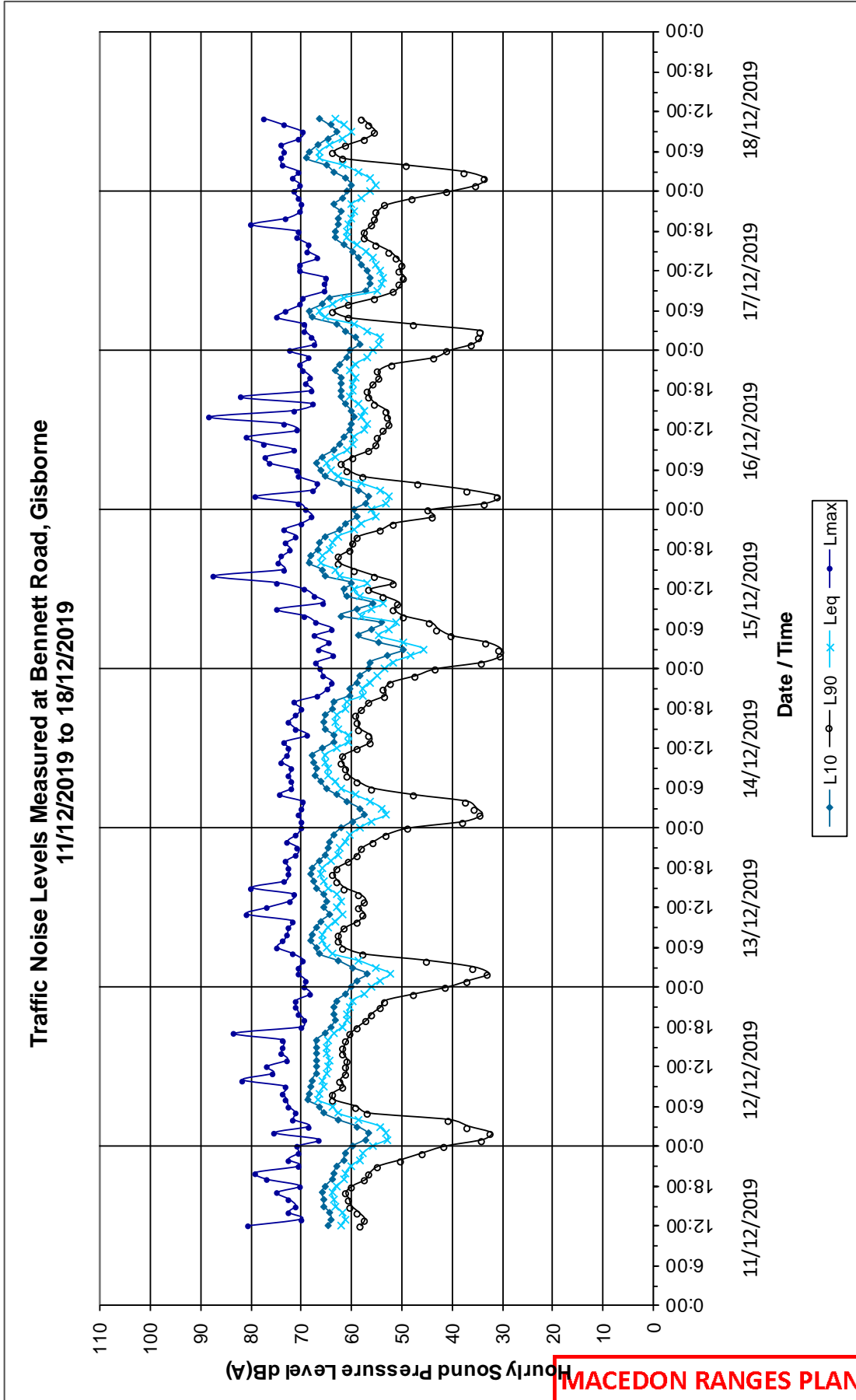
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An average wind speed of 1.8 m/s was measured between 11:30 am and 11:45 am on Wednesday 18 December 2019. On the same day, the Melbourne Airport Weather Station measured an average wind speed of between 2.5 m/s and 7.2 m/s (reported at 9 am and 3 pm).

On the above basis, it is considered that the wind speed measured at the Bureau of Meteorology Weather Station at Melbourne Airport is higher than the wind speed at the noise logging location. However, it is likely that the wind speed will have still exceeded 3 m/s at the measurement position for a prolonged period on one or more occasions. As such, the measurement results may have been affected by wind noise, but the impact is not considered to be significant.





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## Appendix D Modelling Parameters

### General

Parameter	Description
Software	SoundPLAN Version 7.4
Calculation Method	CoRTN methodology (UK DoT, 1988)

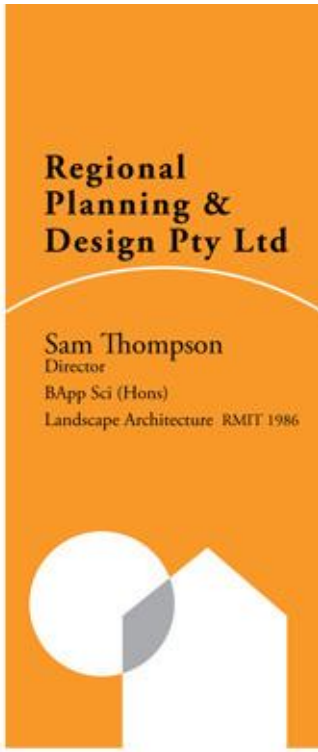
### Geometrical Parameters

Parameter	Description
Site Layout	<ul style="list-style-type: none"> <li>▪ Modelled according to the documented site plan; and</li> <li>▪ As per the latest VicPlan satellite image for the area in the vicinity of site.</li> </ul>
Terrain	Digital ground map was constructed according to topographical data from the SRTM-derived Hydrological 1 Second Digital Elevation Model from the Geoscience Australia Elevation Information System (ELVIS).
Ground absorption	All surfaces have been modelled as soft ground using a ground factor of 0.5.
Buildings	No buildings were included in the modelling.
Receptor / Noise Contour Height	1.5 m above ground level.

### Road Parameters

Parameter	Description
Road Geometry	<ul style="list-style-type: none"> <li>▪ Calder Freeway was modelled as two double-lane carriageways separated by a grass median strip. Each lane has been modelled as 3.5 m wide.</li> <li>▪ The freeway was modelled according to the elevation data from ELVIS.</li> <li>▪ No other roads were included in the model.</li> </ul>

Parameter	Description																		
Traffic Volumes	<ul style="list-style-type: none"> <li>VicRoads Open Data provided the data used to model traffic volume along Calder Freeway. Forecast year 2035 AADT was derived based on the current annual traffic growth rate. The AADTs used in the traffic noise modelling were therefore as follows:</li> </ul> <table border="1"> <thead> <tr> <th>Calder Freeway</th> <th>2019 All Vehicles AADT</th> <th>2019 %HV</th> <th>Annual Growth Rate</th> <th>2035 All Vehicles AADT</th> <th>2035 %HV</th> </tr> </thead> <tbody> <tr> <td>South-East Bound</td> <td>16,000</td> <td>11%</td> <td>2.5%</td> <td>23,752</td> <td>11%</td> </tr> <tr> <td>North-West Bound</td> <td>16,000</td> <td>8%</td> <td>2.7%</td> <td>24,505</td> <td>8%</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>The CoRTN modelling methodology uses 18-hour traffic volumes (6 am to midnight) rather than AADT volumes. To account for this difference the 18-hour road traffic volume used in the modelling was based on 95% of AADT volume.</li> </ul>	Calder Freeway	2019 All Vehicles AADT	2019 %HV	Annual Growth Rate	2035 All Vehicles AADT	2035 %HV	South-East Bound	16,000	11%	2.5%	23,752	11%	North-West Bound	16,000	8%	2.7%	24,505	8%
Calder Freeway	2019 All Vehicles AADT	2019 %HV	Annual Growth Rate	2035 All Vehicles AADT	2035 %HV														
South-East Bound	16,000	11%	2.5%	23,752	11%														
North-West Bound	16,000	8%	2.7%	24,505	8%														
Vehicle Speeds	Modelling of Calder Freeway traffic flow has been based on a posted speed limit of 110 km/h.																		
Road Surfaces	The road surface of the section of Calder Freeway adjacent to the project site is understood to be a 14/7 double/double seal. This section of Freeway has therefore been modelled with a +4 dB correction in accordance with Road Design Note 06-01 (VicRoads, 2010).																		



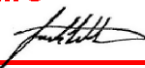
# BUSHFIRE / GRASSFIRE MANAGEMENT STATEMENT

## **Bennett Road Development Plan, Bennett Road Gisborne Ref No.19.401**



**Prepared by Regional Planning  
& Design Pty Ltd**  
13 Bridport Street Daylesford 3460  
Phone 0447 073 107

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## Disclaimer

This report has been made with careful consideration and with the best information available to Regional Planning and Design Pty Ltd at the time of writing. Before relying on information in this report, users should evaluate the accuracy, completeness and relevance of the information provided for their purposes. Regional Planning and Design Pty Ltd do not guarantee that it is without flaw or omission of any kind and therefore disclaim all liability for any error, loss or other consequence that may arise from you relying on any information in this report.

Requirements detailed in this document do not guarantee survival of the buildings or the occupants. The client is strongly encouraged to develop and practice a bushfire survival plan. It is also recommended CFA's Landscaping for Bushfire: Garden design and plant selection be read prior to developing the garden

Information and assistance including a template for a Bushfire Survival Plan is provided as part of the 'Fire Ready Kit' available through the CFA website at <http://www.cfa.vic.gov.au> or through your local CFA Regional office.

## Version Control

Report Version	Description	Date Completed	Issued to
A	Issued as a draft for discussion	3/2/2020	Client
B	General revisions	15/2/2020	Client
C	General revisions	18/2/2020	Client
D	Minor revisions	19/2/2020	Client
E	Minor revisions	27/2/2020	Client
F	Minor revisions	28/2/2020	Client
G	Revisions to landscape plan	29/11/2021	Client



# 1 SUMMARY

Summary	
Date of site visit:	18 <sup>th</sup> November 2019 and 4 <sup>th</sup> February 2020
Broad landscape setting (Technical Guide Planning Permit Applications – Bushfire Management Overlay)	2 to 3
Access requirements can be met	3.5 metre wide driveways with 4m vertical and 4.5m horizontal clearance
Water Supply Requirements	10 000 litres in non combustible tank with CFA access and fittings (as the lots are larger than 1000 m2)
Defendable Space requirements can be met	BAL 12.5
Proposed BAL construction level	BAL 12.5
Is native vegetation removal required:	No

## 2 INTRODUCTION

This Bushfire Management Statement (BMS) has been prepared to enable G2 Urban Planning to respond to the requirements of Clause 44.06 *Bushfire Management Overlay* (known from this point on as Clause 44.06), and associated Clause 53.02 *Bushfire Protection: Planning Requirements* (known from this point on as Clause 53.02) for the proposed Development Plan at Bennett Road Gisborne. While the site is not covered by the BMO, CFA requested a Bushfire Management Statement be prepared in a letter dated 29<sup>th</sup> September 2019 to the Macedon Ranges Shire.

### Methodology

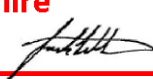
Clause 53.02-4 applies to this application as subdivision is proposed.

The BMS is in two parts

Part 1 Site description , hazard assessment and locality description

Part 2 A Bushfire Management Statement describing how the proposed development responds to the requirements in Clause 53.02 and 44.06.

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### 3 ZONING AND OVERLAYS

Clause Number	Name
35.03	Rural Living Zone
43.04	Development Plan Overlay (DPO 18)

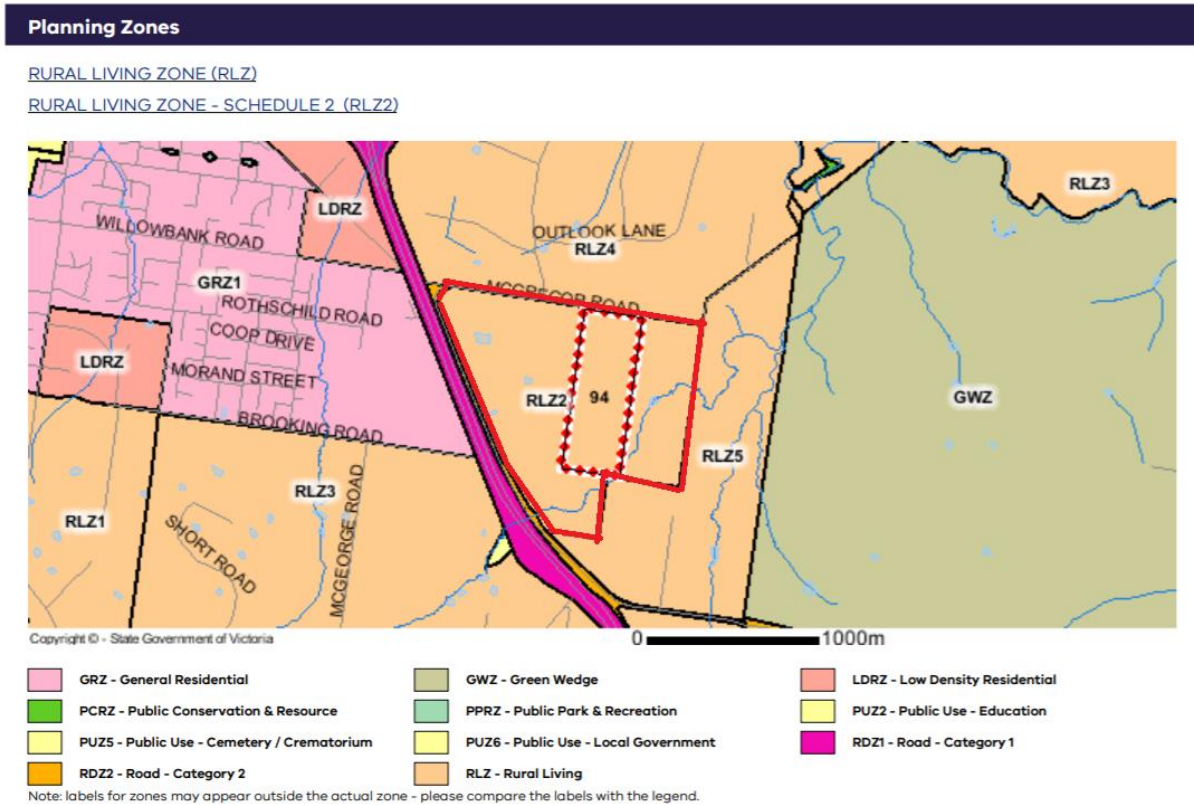
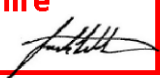


Figure 1 Zoning

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## 4 LOCATION AND BUSHFIRE HAZARD LANDSCAPE ASSESSMENT PLAN

The site is located to the south east of Gisborne. While farmland covered in mostly low threat grassland surrounding the site will reduce the hazard, the site could be vulnerable to long runs of grass fire from the north and north west and runs of fire from the south west following a wind change, which often occurs on high fire risk days in summer. Grassland to the east is less likely to pose a major threat as hot winds in summer are not usually experienced from this direction.

An approaching bushfire is likely to cause ember attack, increasing the fire risk. It is recommended the owners maintain land to the property boundaries to minimize ground fuel build up.

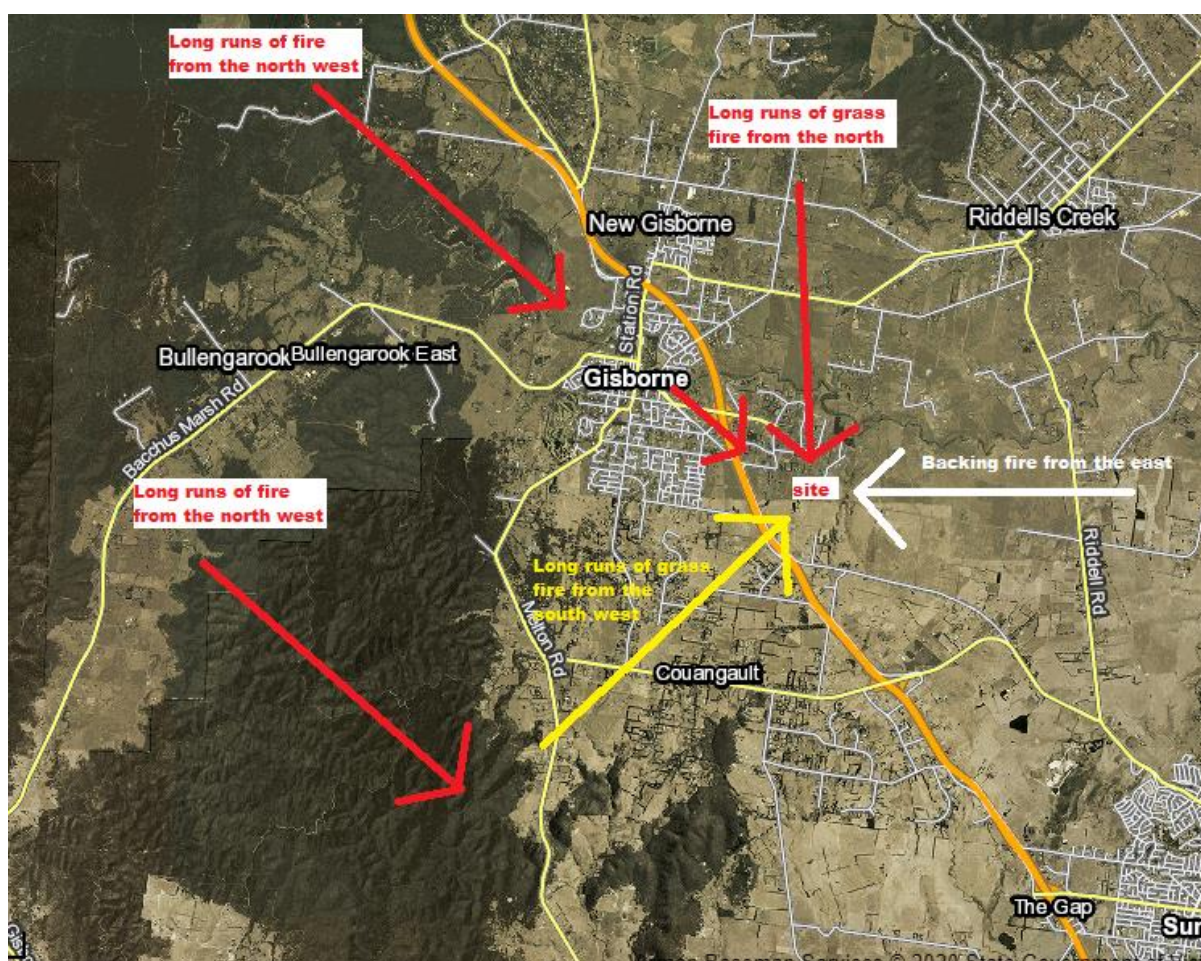


Figure 2 Location

## 5 SITE DESCRIPTION

Site shape, dimensions, size , existing use and buildings and works	
The shape of the site is:	Irregular.
The site has a total area of:	Approximately 130 ha
The current use of the site is	Grazing
The buildings or works located on the site are:	Five dwellings with various outbuildings
Site topography	Most of the site is gently sloping on an overall 0 to 5 degree gradients to the east. There is a drainage line in the southern part of the site with steeply sloping land on either side at overall 5 to 10 degrees slopes, with short slopes as steep as 20 degrees.
Site vegetation	The site is mostly covered in grassland (photos 1 to 5) There are rows of pine, cypress and some native windbreak plantings (photos 6 and 8). There is some woodland in the drainage line in the south west part of the site (photos 7 and 9)
Access	The site has good access to areas of open grassland to the west of the site via McGregors and Bennetts Roads

Site Photo



Photo 1 Looking north west across grassland towards neighbouring dwellings on the north eastern boundary of site

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Site Photos



Photo 2 Looking south west along the drainage line from the east boundary of the site



Photo 3 Looking north west across grassland in the north eastern part of the site

Site Photos



Photo 4 Looking north across grassland in the south eastern part of the site



Photo 5 Looking east across grassland in the western part of the site

Site Photos



Photo 6 Looking east along an avenue of old pine trees in the western part of the site



Photo 7 Looking east across grassland and woodland along the drainage line in the south western part of the site

Site Photos



Photo 8 Looking north east along a row of recently planted native windbreak trees on the western boundary of the site



Photo 9 Looking north east across shrubland, grassland and woodland along the drainage line in the southern part of the site

A handwritten signature in black ink, appearing to read "Jack Wiltshire".





Figure 3 Existing conditions

## 6 ACCESS

The site has vehicle access from Coney Court and McGregor Road on the north boundary (photos 10 and 11) which provide good access to open grassland to the north. The south and western parts of the site has access along an unmade Government Road (photo 12) and Bennetts Road on the west boundary (photo 13)

### Access Photos



Photo 10 Looking north along Coney Court near the entry to proposed Lots 8 and 9



Photo 11 Looking west along McGregor Road on the north boundary

Access Photos



Photo 12 Looking west along the unmade Government Road (which joins the unmade Brooking Road) on the southern boundary of the site



Photo 13 Looking north east along Bennett Road on the west boundary where the unmade government and Brooking Roads will provide access from the south and western parts of the site.

## 7 BUSHFIRE HAZARD SITE ASSESSMENT

As shown in Figure 4 and described in Appendix 1 there is mostly a mix of grassland and managed farmland with strips of trees in windbreaks within the 150 metre assessment area around the site (photos 14 to 18). To the south west is planted woodland along the Freeway verge and along the creek line beyond the 150 metre assessment area (photo 19).

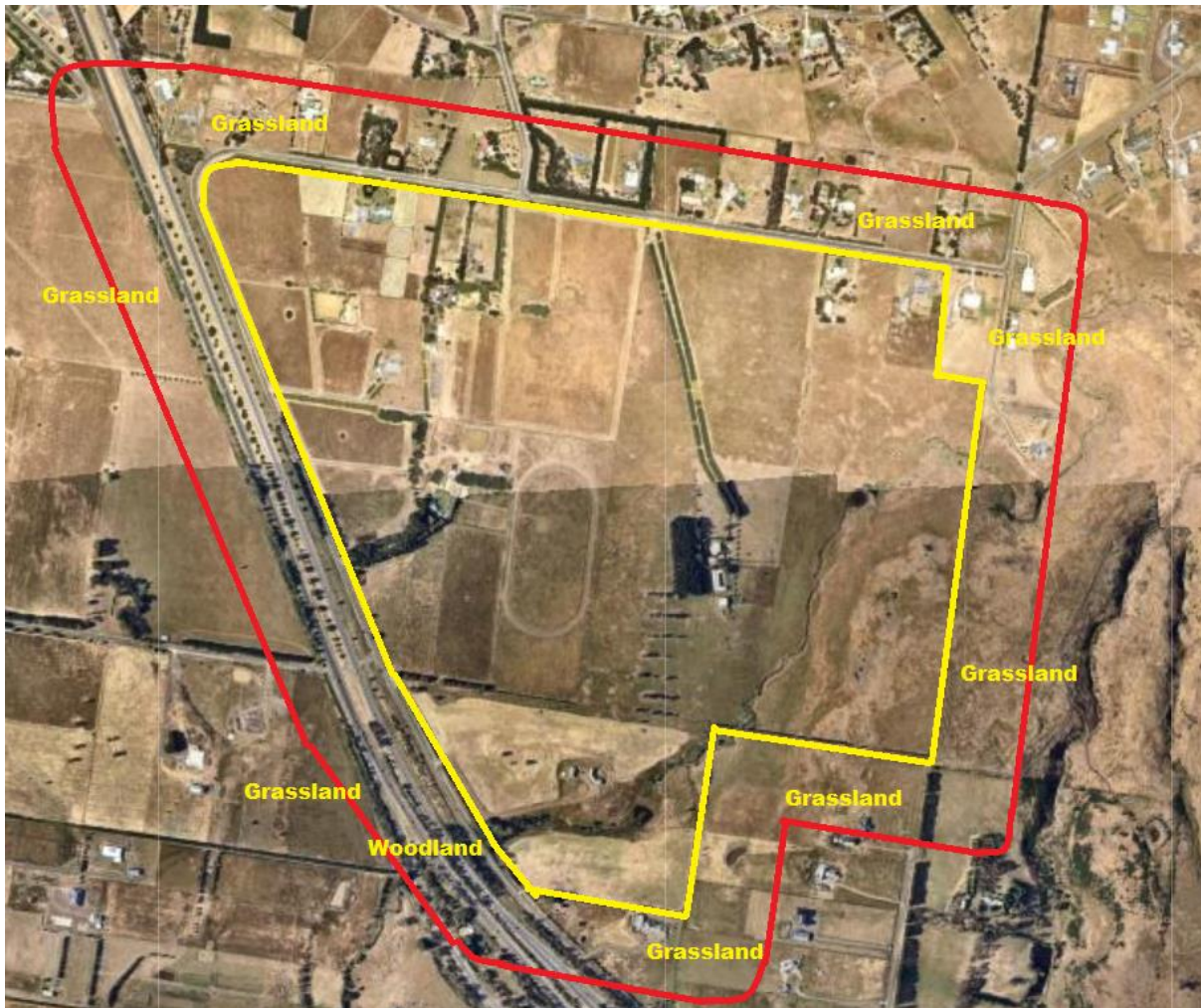


Figure 4 150 metre assessment air photo

Surrounding Landscape Photos



Photo 14 Looking south across grassland to the south of the site



Photo 15 Looking east across grassland to the east of the site

Handwritten signature of Jack Wiltshire.

Surrounding Landscape Photos



Photo 16 Looking east across grassland to the south west of site



Photo 17 Looking east across grassland and managed land towards a dwelling to the south of the site

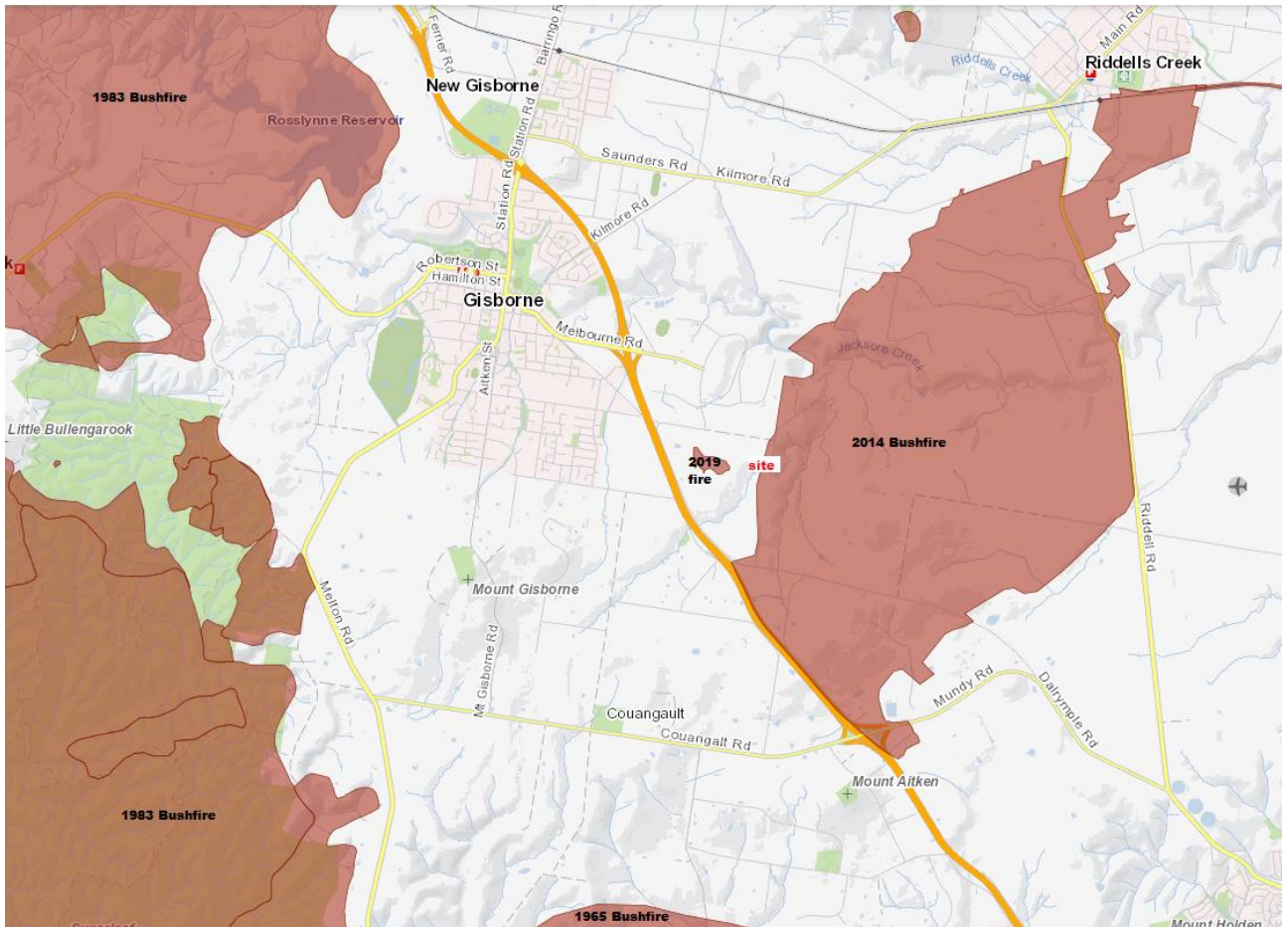
Surrounding Landscape Photos



Photo 18 Looking north across grassland to the north west of the site



Photo 19 Looking south west to woodland planted along the Freeway edge to the south west of the site

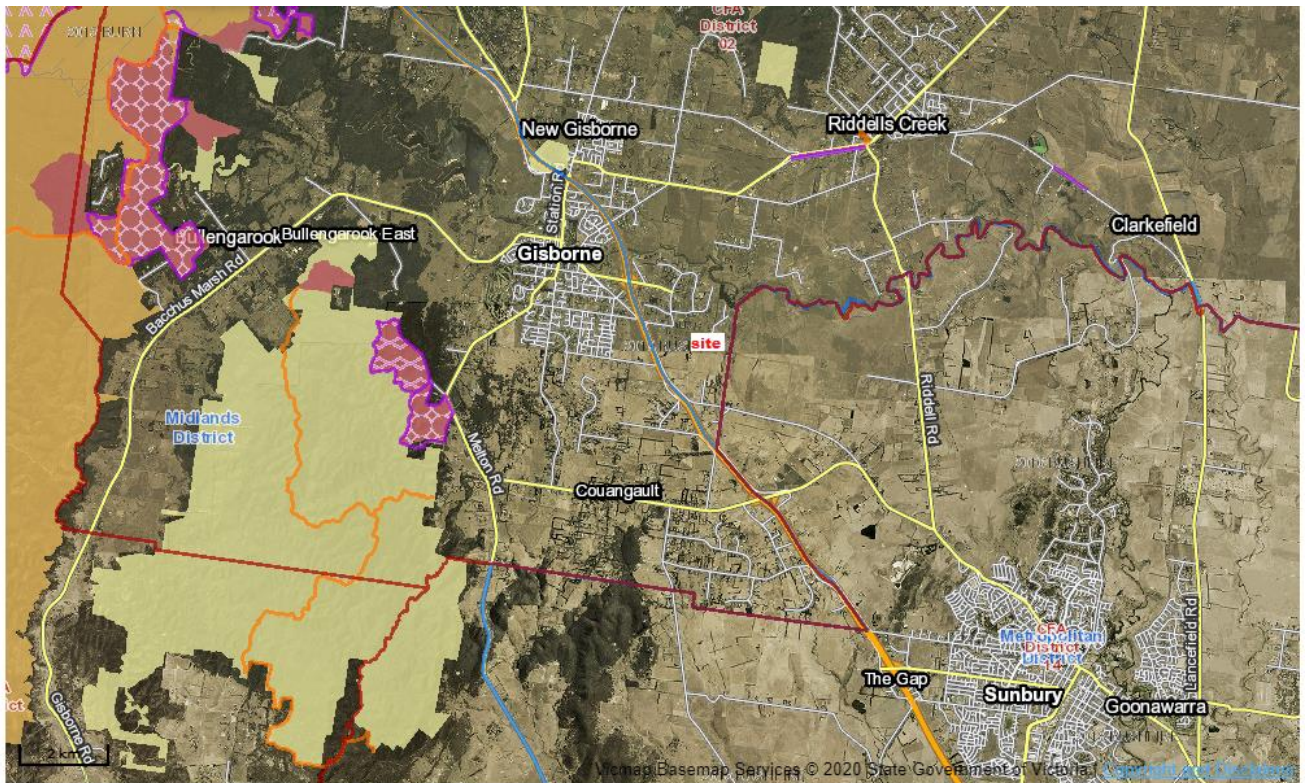


**FIGURE 7 BUSHFIRE HISTORY MAP**

The Fire History Map above shows there have been significant fires around the site with the 1983 Ash Wednesday Fires to the north west and a large grass fire to the south east in 2014 and a smaller fire in 2019. There have been fuel reduction burns to west and east since 2009 which will help reduce the risk to the site. There are also burns planned for forest to the north and west of the site in 2021 to 2022 (See Figure 8 on the following page)

In summary, the site is vulnerable to grassfire which could increase in intensity when reaching woodland in the drainage line to the south west. This needs to be considered in siting the houses, maximizing defensible space within property boundaries which will help reduce the fire risk.









## Joint Fuel Management Program

### Burn Year

-  2019/2020
-  2020/2021
-  2021/2022

-  Mechanical Works
-  Fire History - Last 5 Years
-  DELWP District Boundaries
-  CFA District Boundaries

### Fire Management Zones

-  1 - Asset Protection
-  2 - Bushfire Moderation
-  3 - Landscape Management
-  4 - Planned Burn Exclusion

**FIGURE 8 PLANNED BURNS**

## 8 DESCRIPTION OF THE DEVELOPMENT CONCEPT

The subdivision concept plan outlines minimum 2 ha lots. While the site is not covered by the BMO, it is recommended future lots be designed to enable dwellings to achieve BAL 12.5 defensible space which should be calculated based on the hazard of grassland on a 0 to 5 degree downslope for most of the site (22 metres) . Adjacent to the drainage line it is recommended dwellings be set back up to 50 metres if there are treed areas which are likely to develop the fuel load of woodland. Non habitable outbuildings could be sited closer to the hazard providing there is 6 metres separation from the dwelling if they are smaller than 100 square metres and there is 10 metres separation if they are larger than 100 square metres. The actual building setbacks required from proposed planting should be addressed at the time of subdivision,

There are 6 separate current ownerships which will all be developed separately. For the subdivision of these lots a specific fire management plan should be proposed.

A proposed access track will provide separation between the gully and building envelopes in the north east part of the site.

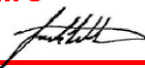
The Development Plan includes a landscape concept plan (see Figure 9 on the following page) which outlines planting along the waterway and road reserves with indicative buffer planting within the site itself. The landscaping is to be detailed in the future under planning permit applications for subdivision.

It is assumed the 60 metre wide riparian planting will develop the fuel load of woodland. This could provide a pathway for a more intense fire to travel through the site. Road side and buffer plantings are narrower strips which will not burn as assumed in AS 3959 as a 100 metre wide fire front. If fine and ground fuels are managed within windbreaks, they may assist in slowing the speed and intensity of a grassfire.

The Landscape Concept Plan specifies that detailed Landscape Plans shall be prepared for each site, together with a specific Bushfire Management Statement. At this time the defensible space and set backs required shall be specified for future dwelling locations. The actual landscaping proposed, be it low groundcover or more substantial trees, will determine the defensible space required. The concept includes an access track in accordance with the Development Plan Overlay adjacent to the escarpment and connecting Coney Court with an internal road.

AS 3959-2018 (2.2.2.3) allows vegetation to be exempt from classification where it is in a strip less than 20m wide (measured perpendicular the building elevation) that is separated from other vegetation by more than 20m (including grassland) and more than 20m from the dwelling. Windbreaks are also exempt, providing they are a single row of trees. It is therefore recommended house sites be planned within the lots in the subdivision to enable at least 20m separation from any planted rows of vegetation and that strips of vegetation be generally less than 20 metres wide.

It should be noted that all dwellings will require a BAL assessment under AS 3959-2018 for the building permits as the site is designated Bushfire Prone.

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## **Schedule of Bushfire Protection Measures**

### **Defendable space**

Defendable space will be provided extending for the distance of 22 to 50 metres or to the property boundaries from the outer edge of the dwellings and 10 metres from the edges of any non habitable outbuilding that are larger than 100 square metres. All vegetation (and other flammable materials) will be modified and managed in accordance with the following requirements:

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
- Plants greater than 10 centimetres in height must not be placed within 3m of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.
- Trees must not overhang or touch any elements of the building.
- The canopy of trees must be separated by at least 5 metres.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

### **Construction standards**

Any dwellings will be designed and constructed a minimum Bushfire Attack Level of (BAL) 12.5

### **Water supply**

A tank on each lot will hold 10 000 litres of effective water supply for fire fighting purposes which meets the following requirements:

- Is stored in an above ground water tank constructed of concrete or metal.
- All fixed above-ground water pipes and fittings required for fire fighting purposes must be made of corrosive resistant metal.
- Include a separate outlet for occupant use

The water supply must also

- Incorporate a ball or gate valve (British Standard Pipe (BSP) 65mm) and coupling (64 mm CFA 3 thread per inch male fitting).
- The outlet/s of the water tank must be within 4m of the access way and 60m of all parts of the building and be unobstructed.
- Be readily identifiable from the building or appropriate identification signage to the satisfaction of CFA must be provided.
- Any pipework and fittings must be a minimum of 65 mm (excluding the CFA coupling).

Hydrants in public roads will be provided within 120 metres of each building envelope

### **Access**

The driveways to each dwelling and the fire access tracks will provide access for trucks for fire fighting purposes which meets the following requirements:

- . A load limit of at least 15 tonnes
- Curves must have a minimum inner radius of 10m.
- The average grade must be no more than 1 in 7 (14.4 per cent) (8.1 degrees) with a maximum of no more than 1 in 5 (20 per cent) (11.3 degrees) for no more than 50m.
- Have a minimum trafficable width of 3.5m of all weather construction.
- Be clear of encroachments for at least 0.5m on each side and 4m above the access way.
- Dips must have no more than a 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle.

## 9 BUSHFIRE MANAGEMENT STATEMENT

The bushfire protection measures and assessment of defensible space will form part of Bushfire Management Statements to be prepared for each site, Clause 53.02 contains a range of sub clauses with objectives, approved measures (AM), alternative measures (AltM) and decision guidelines. The table below details which clauses are relevant to this application. The following section demonstrates how the requirements have been met for the relevant standards.

Relevant clauses and measures applicable to the proposed development.

Clause	Approved Measure	Achieved / Applicable	Justification
Clause 53.02 -3 – Dwellings in existing settlements – Bushfire protection objective	AM 1.1	Not Applicable	This is a subdivision concept plan so clauses are not applicable.
	AM 1.2	Not Applicable	
	AM 1.3	Not Applicable	
Clause 53.02 -4.1 Landscape, siting and design objectives	AM 2.1	Applicable	This future development addresses this clause.
	AM 2.2	Applicable	
	AM 2.3	Applicable	
Clause 53.02 -4.2 Defensible space and construction objectives	AM 3.1	Applicable	Applies to proposed dwellings
	AM 3.2	Not Applicable	
	AltM 3.3	Not Applicable	This is a rural living subdivision concept plan and not applicable.
	AltM 3.4	Not Applicable	
	AltM 3.5	Not Applicable	
Clause 53.02 -4.3 Water supply and access objectives	AM 4.1	Applicable	This development shall address this clause.
	AM 4.2	Not Applicable	This is a rural living subdivision concept plan and not applicable.
Clause 53.02 -4.4 Subdivision objectives	AM 5.1	Not Applicable	The site is zoned RLZ
	AM 5.2	Applicable	This development shall address this clause.
	AM 5.3	Applicable	More than 9 lots are proposed
	AM 5.4	Applicable	Applies to the common property
	AM 5.5	Applicable	More than 9 lots are proposed

### 9.1.1 53.02-4.1 Landscape, siting and design objectives

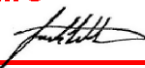
Development is appropriate having regard to the nature of the bushfire risk arising from the surrounding landscape.

Development is sited to minimise the risk from bushfire.

Development is sited to provide safe access for vehicles, including emergency vehicles.

Building design minimises vulnerability to bushfire attack.

Approved Measure	Requirement
AM 2.1	<p><b>The bushfire risk to the development from the landscape beyond the site can be mitigated to an acceptable level.</b></p> <p><b>Response:</b></p> <p>The site is located on the edge of Gisborne’s rural living area .There are dwellings constructed on managed lots to the north west and west and there are large lots to the south west that support areas of managed grazed grassland .</p> <p>There is good access to the Calder Freeway to the west.</p> <p>The proposed lots shall be able to meet the defensible space requirements for a BAL 12.5 as per the Method 1 assessment of AS 3959-2009 within the property boundaries, to be addressed at the time of the subdivision applications</p>
AM 2.2	<p><b>Buildings are sited to ensure the site best achieves the following: The maximum separation distance between the building and the bushfire hazard.</b></p> <ul style="list-style-type: none"> <li>• <b>The building is in close proximity to a public road.</b></li> <li>• <b>Access can be provided to the building for emergency service vehicles.</b></li> </ul> <p><b>Response:</b></p> <p>The dwelling sites shall enable enough defensible space surrounding the dwellings to achieve BAL 12.5 defensible space .</p> <p>The proposed dwellings will have short driveways connecting to existing roads and the proposed roads within the development, providing adequate access.</p> <p>The proposed driveways will allow for CFA vehicles to access each dwelling. Additional access will be provided between lots and vegetation along the creek line.</p>
AM 2.3	<p><b>A building is designed to be responsive to the landscape risk and reduce the impact of bushfire on the building</b></p> <p><b>Response:</b></p> <p>The new dwellings will be required to meet a BAL of 12.5 according to the construction requirements of AS 3959-2009. The construction requirements minimise the ability for ember penetration and radiant heat exposure to compromise the building integrity.</p>

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### 9.1.1 53.02-4.2 Defendable space and construction objective

Defendable space and building construction mitigate the effect of flame contact, radiant heat and embers on buildings.

Approved Measure	Requirement
AM 3.1	<p><b>A building used for a dwelling (including an extension or alteration to a dwelling), a dependant person's unit, industry, office or retail premises is provided with defendable space in accordance with:</b></p> <ul style="list-style-type: none"><li>• <b>Column A, B or C of Table 2 to Clause 53.02-5 wholly within the title boundaries of the land; or</b></li><li>• <b>If there are significant siting constraints, Column D of Table 2 to Clause 53.02-5.</b></li></ul> <p><b>The building is constructed to the bushfire attack level that corresponds to the defendable space provided in accordance with Table 2 to Clause 53.02-5.</b></p> <p><b>Response:</b></p> <p>The dwelling envelopes can be sited to achieve BAL 12.5 defendable space for proposed dwellings (in accordance with Column A of Table 2 to Clause 53.02) within the property boundaries . Defendable space is based on the hazard of woodland on a 5 to 10 degree downslope (50 metres) between house sites and the creek line and grassland on a 0 – 5 degree down slope (22 metres) in all other areas. This will be specified at the time of subdivision.</p> <p>A shed that is larger than 100m<sup>2</sup> and ancillary to a dwelling in the BMO needs to be surrounded by 10m defendable space (Table 7 to Clause 53.02) and be separated from any dwellings by 10 metres (CI 44.06 and 66.03).</p> <p>A non habitable outbuilding that is smaller than 100m<sup>2</sup> needs to be separated from the dwelling by 6 metres under Clause 3.2.3 of AS 3959-2018.</p>

### 9.1.2 53.02-2.3 Water supply and access objectives

A static water supply is provided to assist in protecting property.  
Vehicle access is designed and constructed to enhance safety in the event of a bushfire.

Approved Measure	Requirement
AM 4.1	<p><b>A building used for a dwelling (including an extension or alteration to a dwelling), a dependant person’s unit, industry, office or retail premises is provided with:</b></p> <ul style="list-style-type: none"><li>• <b>A static water supply for fire fighting and property protection purposes specified in Table 4 to Clause 53.02-5.</b></li><li>• <b>Vehicle access that is designed and constructed as specified in Table 5 to Clause 53.02-5.</b></li><li>•</li></ul> <p><b>The water supply may be in the same tank as other water supplies provided that a separate outlet is reserved for fire fighting water supplies.</b></p> <p><b>Response:</b> The lots shall provide a 10 000 litre fire resistant (concrete or steel tank) to be kept full of water for fire fighting purposes for each lot. A CFA truck will be able to drive to within 4 metres of the outlets which are positioned within 60 metres of all parts of proposed dwellings.</p> <p>The site will be serviced via existing 150 and 100mm PVC water mains and hydrants will be provided along public roads with 120 metres of each building envelope.</p>



## 53.02 -2.4 Subdivision objectives

To provide lots that are capable of being developed in accordance with the objectives of Clause 53.02 .

To specify at the subdivision stage before protection measures to develop a lot with a single dwelling on land zoned for residential or rural residential purposes.

Approved Measure	Requirement
AM 5.1	NA as the site is zoned GRZ
AM 5.2	<p><b>An application to subdivide land zoned for residential or rural residential purposes must be accompanied by a plan that shows:</b></p> <p><b>Each lot satisfies the approved measure in AM 2.1.</b></p> <p><b>A building envelope for a single dwelling on each lot that complies with AM 2.2 and provides defensible space in accordance with:</b></p> <p><b>Columns A or B of Table 2 to Clause 52.47-5 for a subdivision that creates 10 or more lots; or</b></p> <p><b>Columns A, B or C of Table 2 to Clause 52.47-5 for a subdivision that creates less than 10 lots. The bushfire attack level that corresponds to the defensible space provided in accordance with Table 2 to Clause 52.47-5 must be noted on the building envelope. Defensible space wholly contained within the boundaries of the proposed subdivision.</b></p> <p><b>Defensible space may be shared between lots within the subdivision. Defensible space for a lot may utilise communal areas, such as roads, where that land can meet the requirements for defensible space.</b></p> <p><b>Vegetation management requirements in accordance with Table 6 to implement and maintain the defensible space required under this approved measure.</b></p> <p><b>Water supply and vehicle access that complies with AM 4.1</b></p> <p><b>Response:</b></p> <p>Lots can achieve minimum BAL 12.5 defensible space within the boundaries, as described under AM 3.1.</p> <p>Water supply and access requirements can be met, as previously described under AM 4.1.</p>

## 10 CONCLUSION

### **53.02 -4.5 Decision guidelines**

The proposed development meets the decision guidelines as follows:

The State Planning Policy Framework (SPPF) outlines the broad framework for bushfire protection policy and provisions in the planning scheme. The following policy is included in this;

#### **Clause 13.02-1 S Bushfire planning**

##### *Objective*

*To strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life.*

##### *Strategies*

###### *Protection of human life*

*Give priority to the protection of human life by:*

*Prioritising the protection of human life over all other policy considerations.*

*Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.*

*Reducing the vulnerability of communities to bushfire through the consideration of bushfire risk in decision making at all stages of the planning process*

This proposal has been prepared having regard for this overarching policy

The bushfire hazard landscape and site assessment, and bushfire management statement submitted with the application meets the objectives of Clause 53.02.

Land surrounding the site is a mix of woodland, scrub, grassland and modified vegetation. The proper establishment and maintenance of defensible space on site will reduce the overall bushfire risk.

The proposed measures can be practically implemented and maintained in conjunction with the ongoing use of the land for rural living purposes. The directions of this statement shall form parts of Bushfire Management Statements prepared for each of the existing lots under the Development Plan at the time of their subdivision.

## 11 REFERENCES

CFA (2014). *Vegetation Classes: Victorian Bushfire Management Overlay*. Country Fire Authority, Burwood East, Victoria.

CFA (2011). *Landscaping for Bushfire: Garden design and plant selection*. Country Fire Authority, Burwood East, Victoria.

CFA (2012). *FSG LUP 0002 Requirements for water supply and access in the Bushfire Management Overlay (BMO)*. Country Fire Authority, Burwood East, Victoria.

Standards Australia (2009). *AS 39359-2018 Construction of Buildings in Bushfire Prone Areas*. Standards Australia, North Sydney, New South Wales.

DELWP (2017) *Planning Permit Applications – Bushfire Management Overlay Technical Guide* Department of Environment, Land, Water and Planning

DELWP (2018) *Clause 13.02-1S Bushfire planning* Department of Environment, Land, Water and Planning

[http://planning-schemes.delwp.vic.gov.au/schemes/vpps/13\\_02-1S.pdf](http://planning-schemes.delwp.vic.gov.au/schemes/vpps/13_02-1S.pdf)

DELWP (2018) *Clause 44.06 Bushfire Management Overlay* Department of Environment, Land, Water and Planning

[http://planning-schemes.delwp.vic.gov.au/schemes/vpps/44\\_06.pdf](http://planning-schemes.delwp.vic.gov.au/schemes/vpps/44_06.pdf)

DELWP (2018) *Clause 53.02 Bushfire Planning* Department of Environment, Land, Water and Planning

[http://planning-schemes.delwp.vic.gov.au/schemes/vpps/53\\_02.pdf](http://planning-schemes.delwp.vic.gov.au/schemes/vpps/53_02.pdf)

DELWP (2018) *Bushfire Fuel and Risk Management*

<https://www.ffm.vic.gov.au/bushfire-fuel-and-risk-management/joint-fuel-management-program>

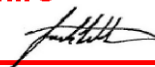
Nearmap

<http://maps.au.nearmap.com>

DELWP (2017) *Outbuildings in the Bushfire Management Overlay*

[https://www.planning.vic.gov.au/\\_data/assets/pdf\\_file/0020/107660/Outbuildings-in-the-Bushfire-Management-Overlay.pdf](https://www.planning.vic.gov.au/_data/assets/pdf_file/0020/107660/Outbuildings-in-the-Bushfire-Management-Overlay.pdf)

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## APPENDIX 3 ACCESS AND WATER SUPPLY REQUIREMENTS

**Table 4 Water supply requirements**

### Capacity, fittings and access

Lot sizes (square meters)	Hydrant available	Capacity (litres)	Fire authority fittings and access required
Less than 500	Not applicable	2,500	No
500-1,000	Yes	5,000	No
500-1,000	No	10,000	Yes
1,001 and above	Not applicable	10,000	Yes

*Note 1: A hydrant is available if it is located within 120 metres of the rear of the building*

### Fire Authority requirements

Unless otherwise agreed in writing by the relevant fire authority, the water supply must:

- Be stored in an above ground water tank constructed of concrete or metal.
- Have all fixed above ground water pipes and fittings required for firefighting purposes made of corrosive resistant metal.
- Include a separate outlet for occupant use.

Where a 10,000 litre water supply is required, fire authority fittings and access must be provided as follows:

- Be readily identifiable from the building or appropriate identification signage to the satisfaction of the relevant fire authority.
- Be located within 60 metres of the outer edge of the approved building.
- The outlet/s of the water tank must be within 4 metres of the accessway and unobstructed.
- Incorporate a separate ball or gate valve (British Standard Pipe (BSP 65 millimetre) and coupling (64 millimetre CFA 3 thread per inch male fitting).
- Any pipework and fittings must be a minimum of 65 millimetres (excluding the CFA coupling).

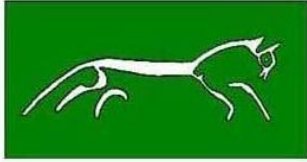
### Table 5 Vehicle access design and construction

Vehicle access (or part thereof) of a length specified in Column A implements the design and construction requirements specified in Column B.

Column A	Column B
Length of access is less than 30 metres	There are no design and construction requirements if fire authority access to the water supply is not required under <b>AM4.1</b> .
Length of access is less than 30 metres	Where fire authority access to the water supply is required under <b>AM4.1</b> fire authority vehicles should be able to get within 4 metres of the water supply outlet.
Length of access is greater than 30 metres	The following design and construction requirements apply: <ul style="list-style-type: none"> <li>▪ All-weather construction.</li> <li>▪ A load limit of at least 15 tonnes.</li> <li>▪ Provide a minimum trafficable width of 3.5 metres.</li> <li>▪ Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically.</li> <li>▪ Curves must have a minimum inner radius of 10 metres.</li> <li>▪ The average grade must be no more than 1 in 7 (14.4%) (8.1°) with a maximum grade of no more</li> </ul>
	than 1 in 5 (20%) (11.3°) for no more than 50 metres. <ul style="list-style-type: none"> <li>▪ Dips must have no more than a 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle.</li> </ul>
Length of access is greater than 100 metres	A turning area for fire fighting vehicles must be provided close to the building by one of the following: <ul style="list-style-type: none"> <li>▪ A turning circle with a minimum radius of eight metres.</li> <li>▪ A driveway encircling the dwelling.</li> <li>▪ The provision of other vehicle turning heads – such as a T or Y head – which meet the specification of Austroad Design for an 8.8 metre Service Vehicle.</li> </ul>
Length of access is greater than 200 metres	<ul style="list-style-type: none"> <li>▪ Passing bays must be provided at least every 200 metres.</li> <li>▪ Passing bays must be a minimum of 20 metres long with a minimum trafficable width of 6 metres.</li> </ul>

*Note 1: The length of access should be measured from a public road to either the building or the water supply outlet, whichever is longer.*





**Archaeo-Environments Pty Ltd**  
**heritage soils and landscape**

ABN 89 119 932 437

## **HERITAGE AND ARCHAEOLOGICAL ASSESSMENT (Aboriginal and European)**

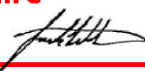
**BENNETT ROAD DEVELOPMENT PLAN  
GISBORNE SOUTH**



**Heritage Assessor**  
**Dr Chris Day**  
**Archaeo-Environments Pty Ltd**  
**ABN 89 119 932 437**

Rev4 5 August 2021

Prepared for Client  
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## INTRODUCTION

Archaeo-Environments Ltd (AE Ltd) were engaged by several landowners under the Bennett Road Development Plan (BRDP) to prepare a heritage and archaeological assessment for proposed future subdivision and development at Bennett Road, Gisborne South (the subject property). It is understood that the land is subject to Macedon Ranges Planning Scheme Development Plan Overlay 18 (DPO18) and also the Rural Living Zone Schedule 2 under the recent C110 Planning Scheme Amendment. A Development Plan is required for the property and will provide an overview document for a future planning permit application. We understand the subject property occupies an area of approx. 130ha to the south-east of Gisborne township (Fig 1 and 2).

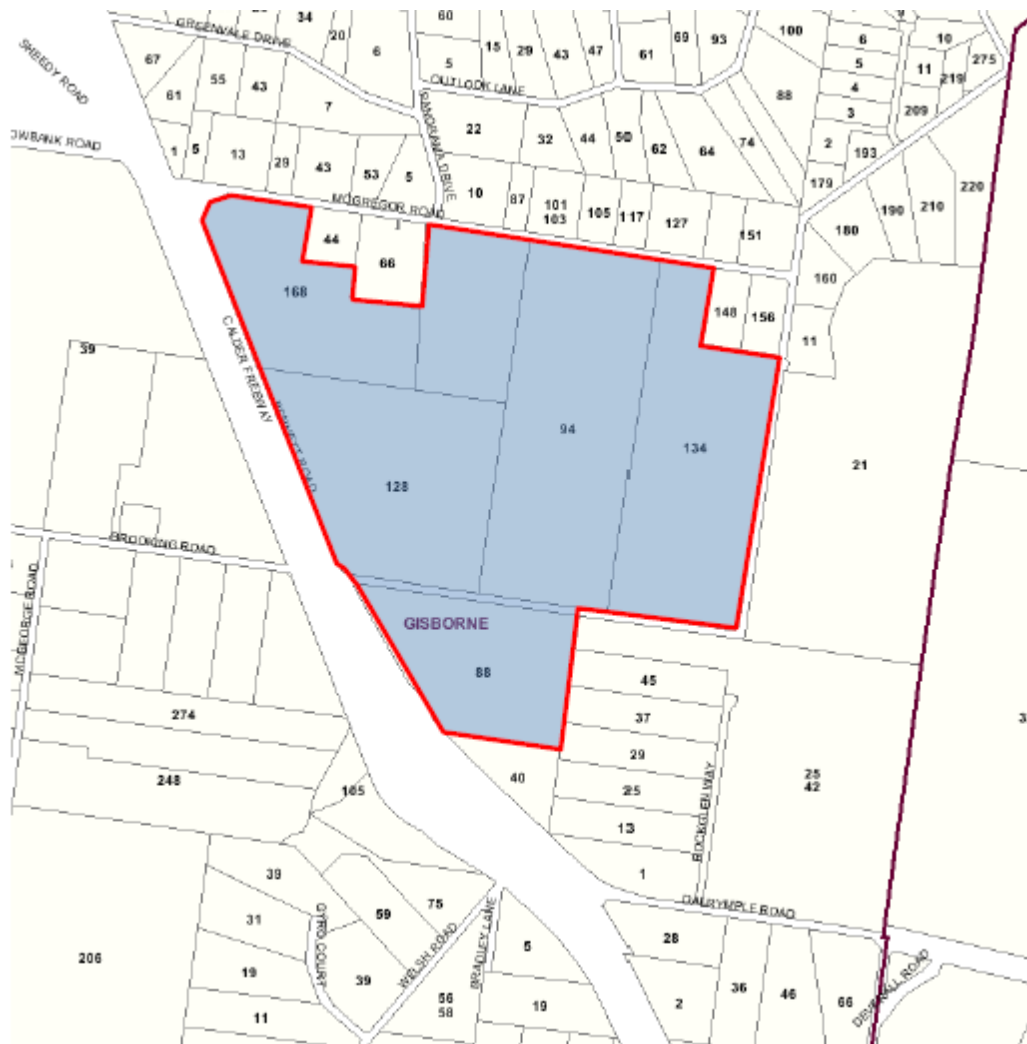


Fig 1 Location of the development area at Bennett Road, Gisborne South.

The heritage and archaeological assessment is undertaken as an overview document for a future Planning Permit Application to the Macedon Ranges Shire. The purpose of the assessment is to determine future requirements, notably protection of European heritage and/or a Cultural Heritage Management Plan (CHMP) is mandatory in accordance with the requirements of the *Victorian Heritage Act (2007)* or the *Aboriginal Heritage Act 2006* and the *Aboriginal Heritage Regulations 2007* (hereafter referred to as ‘the Act’ and ‘the Regulations’). The BRDP area is within the boundary of the Wurundjeri Tribe Land Council and Compensation Registered Aboriginal Party (RAP) area.

The assessment consists of :



- \* a summary of obligations under the *Aboriginal Heritage Act 2006* and the *Aboriginal Heritage Regulations 2018* and a definition and assessment guidelines for significant ground disturbance (SGD).
- \* An assessment of geological, archaeological and historic information, including :
  - a search of the Aboriginal heritage mapping via Government sources to identify whether any Aboriginal places or sites have been recorded on or near the subject property;
- \* An assessment of the Victorian Heritage Register and Victorian Heritage Inventory
  - a review of historical and current aerial photographs to determine the level of prior ground disturbance and landscape modification that has occurred within the subject property, and;
  - a site inspection to observe potential heritage features, ground conditions and in particular evidence of ground disturbance.
- \* a summary of the recommendations of the above, notably whether an Aboriginal CHMP is mandatory for the planned development.



Fig 2 Aerial map of the subject property at Bennett Road, Gisborne South.

## 1.0 STATUTORY OVERVIEW AND REQUIREMENTS

A review of the Aboriginal Heritage Act and Regulations provides a statutory framework for the purpose of determining whether a CHMP is mandatory for the BRDP.

### 1.1 Regulations

It is noted that a review of the Aboriginal Heritage Regulations effective May 23 1, 2018 produced some amendments relevant to CHMPs and compliance. Those amendments included the following :

- A removal of a mandatory CHMP for small lot sub-divisions (<1100m<sup>2</sup>) in most situations.
- A process for amendment of CHMPs
- An increase of fees and penalties for non-compliance
- Introduction of a Preliminary Aboriginal Heritage Test (PAHT) to determine whether a CHMP is mandatory. A PAHT is a tool in the form of a heritage assessment, prepared in standard format and evaluated by Aboriginal Victoria (AV). The purpose of the PAHT is not to replace a heritage due diligence assessment, but to provide Councils/sponsors with a formal process via Aboriginal

Victoria (AV) for whether a CHMP was mandatory or not. Discussion with AV confirmed that a PAHT was not to be used automatically if a Council or sponsor is otherwise equipped to make a CHMP decision according to their statutory decision-making role. In the case of the current development a PAHT was deemed not necessary.

## 1.2 Is a CHMP mandatory at Bennett Road Gisborne South?

Under the AHR (2007), a CHMP is required if a development is considered to be a **high impact activity** and is located within an area of **cultural heritage sensitivity**.

### 1.2.1 Is the activity a high impact activity ?

#### **A High Impact Activity**

It is our opinion that future subdivision and development of the subject property could be interpreted to be a high impact activity according to Section 46 (AHR 2007) Subdivision of land

#### *46 Subdivision of land*

(1) *The subdivision of land into three or more lots is a high impact activity if –*

(a) *The planning scheme that applies to the activity area in which the land to be subdivided is located provides that at least three of the lots may be used for a dwelling or may be used for a dwelling subject to the grant of a permit: and*

(b) *The area of each of at least three of the lots is less than 8ha*

***It is emphasised that the current assessment and Development Plan is not part of any permit or statutory authorization and therefore a CHMP is not triggered at this stage.***

### 1.2.2 Does the activity lie within an area of cultural heritage sensitivity (CHS) ?

Regulation 26 Areas of Cultural Heritage Sensitivity : Waterways states:

- (1) Subject to sub regulation (2), a waterway or land within 200 metres of a waterway is an area of cultural heritage sensitivity
- (2) If part of a waterway or part of the land within 200m of a waterway has been subject to significant ground disturbance, that part is not an area of cultural heritage sensitivity.

The subject property lies within Djirri Djirri Creek – a tributary of Jacksons Creek and mapped area of CHS – which extends across the south-west part of the property (Figure 3 and Plate 1).



Fig 3 Map showing location of Djirri Djirri Creek and 200m buffer (area of cultural heritage sensitivity).as well as surrounding artefact scatters located during recent CHMP surveys



Plate 1 View to south along Djirri Djirri Creek within the eastern part of the development area.

### 1.2.3 Is the development exempt from a CHMP on the basis of significant ground disturbance ?

Under Regulation 22 (3), the proposed activity would not require a CHMP if the 'area of cultural sensitivity' has been subject to prior 'significant ground disturbance'. Significant ground disturbance is defined in the Regulations as follows:

'Disturbance of –

(a) the topsoil or surface rock layer of the ground, or

(b) waterway by machinery in the course of digging, dredging, or deep ripping, but does not include ploughing other than deep ripping'.

### 1.2.4 Assessing Significant Ground Disturbance

Aboriginal Victoria (AV) has produced a Practice Note for Significant Ground Disturbance Practice Note which is available on their website and which supports a staged approach as follows :

#### Level 1 – Common knowledge

The fact that land has been subject to significant ground disturbance may be common knowledge. Very little or no additional information should be required from the responsible authority. For example, common knowledge about the redevelopment of a petrol station with extensive underground storage tanks.

#### Level 2 – Publicly available records

If the existence of significant ground disturbance is not common knowledge, a responsible authority may be able to provide assistance from its own records about prior development and use of land, or advise the applicant about other publicly available records, including aerial photographs.

These documents may allow a reasonable inference to be made that the land has been subject to significant ground disturbance. In such event, no further inquiries or information would be needed by the responsible authority. The particular records and facts relied upon should be noted by the responsible authority as a matter of record. For example, a former quarry site subsequently filled, but where the public records show the area of past excavation.

#### Level 3 – Further information

If 'common knowledge' or 'publicly available records' do not provide sufficient information about the occurrence of significant ground disturbance, the applicant may need to present further evidence either voluntarily or following a formal request from the responsible authority. Further evidence could consist of land use history documents, old maps or photographs of the land or statements by former landowners or occupiers. Statements should be provided by statutory declaration or similar means; for example, the construction of a former dam on a farm.

#### Level 4 – Expert advice or opinion

If these levels of inquiry do not provide sufficient evidence of significant ground disturbance (or as an alternative to level 3), the applicant may submit or be asked to submit a professional report with expert advice or opinion from a person with appropriate skills and experience. Depending on the circumstances, this may involve a site inspection and/or a review of primary documents. If there is sufficient uncertainty some preliminary sub-surface excavation or geotechnical investigation may be warranted.

## 2.0 ASSESSMENT

The BRDP area lies within an area of CHS, however an assessment is necessary to determine whether the area of CHS has been subject to significant ground disturbance. For this purpose we undertook a review of historical information, historic maps and aerial photographs to identify evidence of landscape modification and ground disturbance. A site visit was also undertaken to document site condition and evidence of ground disturbance. The various levels of evidence for significant ground disturbance above are addressed in turn below.

## 2.1 Historical setting

Accounts and maps of settlement and historic pastoral use would constitute Level 1 (common knowledge) and Level 2 (publicly available information) evidence for significant ground disturbance. On this basis it appears unlikely that Djirri Djirri Creek - the area of CHS - has been subject to SGD.

## 2.2 Review of Aerial Photography

An aerial image from 2019 shows Djirri Djirri Creek - the area of cultural heritage sensitivity which overlaps with the BRDP area (Fig 4). There does not appear to be evidence of significant ground disturbance from aerial imagery.



Fig 4 Aerial photo (2019) showing the course of Djirri Djirri Creek and surrounds across the eastern part of the BRDP area.

## 2.3 Site Inspection

A site inspection of the subject property was conducted by Dr Chris Day (AE Ltd Cultural Heritage Advisor) on the 17<sup>th</sup> May 2018. The purpose of the inspection was to observe site conditions, notably evidence of past land use and ground disturbance. No Aboriginal artefacts or sites were identified during the inspection.

The Djirri Djirri Creek and surrounds within the development area features a gentle valley with areas of bedrock outcrop. Apart from implied original tree clearance and presence of several dams, the subject area did not show evidence of disturbance in the form of significant earthworks or deep ripping. Evidence from

a site inspection would constitute Level 4 (Expert advice/opinion and site inspection) evidence for significant ground disturbance.

### **3.0 ABORIGINAL CULTURAL HERITAGE POTENTIAL**

A review of ACHRIS, the registry of Aboriginal cultural heritage held by Aboriginal Victoria indicates that several CHMP studies have been prepared in the area surrounding the development area in the past 18 months. These include CHMP 15832 approved in Nov 2019 west of the Calder Freeway and a CHMP to the immediate east which is currently in progress. Aboriginal cultural heritage in the form of stone artefact scatters have been recorded during these surveys (Fig 3) and indicate that the development area would have potential for Aboriginal heritage.

### **4.0 SUMMARY AND CONCLUSIONS**

#### **Level 1 Common Knowledge**

A review of regional land use history indicates that the subject property was part of early 19C agricultural development. The area of CHS (Djirri Djirri Creek) extends across the eastern part of the development area and – apart from several dams – is not expected to have been subject to disturbance which might be common knowledge.

#### **Level 2 Publicly Available Records and Level 3 Additional information**

In addition to published maps and reports about 19C farming activity, there is insufficient local evidence to imply significant ground disturbance across the area of CHS. The landscape shown in Plate 1 shows that the area surrounding Djirri Djirri Creek has been dammed in some areas but is for the most part under pastoral use without evidence of SGD.

#### **Level 4 Expert Opinion/Site Inspection & subsurface investigation**

Site inspection of Djirri Djirri Creek and surrounds indicated presence of several dams but overall negligible evidence of SGD.

### **5.0 FUTURE MANAGEMENT**

The Djirri Djirri Creek is the area of highest Aboriginal cultural heritage potential within the Development area. Regional predictive models have established that Aboriginal sites generally have a focus on waterways with lesser frequency > 200m from these features. Djirri Djirri Creek will not be subject to residential development.

The 2ha lot size under the current Development Plan will mitigate against high risk of impact to Aboriginal cultural heritage, certainly compared with smaller lot subdivision. In other words the relatively small development footprint (dwelling, outbuildings, driveway etc) will allow for a large proportion of the lot to remain undisturbed. The large lot sizes when compared to a standard intensive residential subdivision such as to the west side of the Calder Freeway allow considerable capacity for potential sensitive sites to be avoided.

The upgrade of the Development Area as a landscape resource will require compliance with the Aboriginal Heritage Act (2006) and Aboriginal Heritage Regulations (2018) and will include preparation of a Cultural Heritage Management Plan (CHMP) - desktop and field assessment of Aboriginal archaeological potential - across required development parcels.

As a guide to future works, the Djirri Djirri Creek is an area of mapped Aboriginal Cultural Heritage sensitivity and under current legislation, a Cultural Heritage Management Plan (CHMP) will be mandatory for lots at 88 Bennett Road and 94 and 134 McGregor Road. It is expected that any CHMP would follow standard practice in accord with AHR (2018) and include a desktop review, field walkover and test pit excavation work where necessary. Fieldwork would be focused on areas of identified Aboriginal cultural heritage potential and likely areas of impact. The results of the CHMP(s) will inform future management of any identified Aboriginal sites and might include areas of set aside or managed open space.

Preliminary discussion with the local Registered Aboriginal Party (Wurundjeri and Woi Wurrung Cultural Heritage Aboriginal Corporation) in July 2021 advised of the Development Plan and future subdivision, Liaison with the RAP group will be included as part of any future CHMP process.

The future subdivision lot development of the area is directed away from the area of prime potential sensitivity, being the waterway with areas away from the water way having lesser potential for artefact presence. An aim will be to retain the current form of this area, with low impact paths and additional scattered vegetation. A detailed assessment will not be required for those parts of the reserve that are not altered. Assessment will be require around reinstated dams.

A CHMP will be undertaken for the affected areas prior to subdivision permit applications being formalised.

## 6.0 EUROPEAN HERITAGE ASSESSMENT

An inspection of the Victorian Heritage Register or Victorian Heritage Inventory indicated that there are no registered heritage sites or features within the BRDP. A preliminary field survey (17 May 2018) did not observe features of potential European heritage value. On this basis the potential for European heritage potential across the BRDP is expected to be low.

## 7.0 RECOMMENDATIONS

1. It is our opinion that there is no evidence of significant ground disturbance within the areas of CHS (Djirri Djirri Creek) which overlaps with the eastern part of the BRDP area – according to level 1, 2, 3 and 4 criteria of AV guidelines (Section 1.2.4). On this basis and with reference to Reg 26 (2) of the AHR (2018) (1) *If part of a waterway or part of the land within 200m of a waterway has been subject to significant ground disturbance, that part is not an area of cultural heritage sensitivity.* It is our opinion that an Aboriginal Cultural Heritage Management Plan will be mandatory for the proposed activity.

2 It is our opinion – on the basis of a review of recent CHMP studies from the surrounding region – that the Djirri Djirri Creek area would have some potential for Aboriginal Cultural Heritage.

3 A CHMP is not mandatory under the Development Plan process as this stage does not propose development itself. A CHMP will be mandatory under a permit application for subdivision which is a CHMP trigger according to AHR (2018) (discussed in Section 1.2.1).

4. Aboriginal cultural heritage is provided with blanket protection in Victoria under the Aboriginal Heritage Act 2006. If any Aboriginal artefacts or sites are found during development works or at any other time, excavation must cease immediately and the local RAP (WLCCHC) should be notified for advice before work can re-commence.

5. There are no registered European heritage sites or features within the BRDP. A preliminary field survey (17 May 2018) did not observe features of potential European heritage value. The Victorian Heritage Act

(2007) provides protection for sites of heritage value and a process of management or consent should sites or features be found during development works.

Author

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## PROFILE

**Dr Chris Day Director, Archaeo-Environments Ltd**

**MIFA**

**Honorary Research Associate (Latrobe University)**

**Cultural Heritage Advisor (Victoria)**

## PROFESSIONAL HISTORY

**2014 – present Director, Archaeo-Environments Pty Ltd** - a heritage soils and landscape consultancy. Chris brings to the position over 30 years of experience in archaeology, geo-archaeological research and natural resource management.

**2007 - 2014 Principal Archaeologist, Golder Associates** – Management of a cultural heritage team at Golder Associates which included Aboriginal and European heritage work throughout Australia and management of large-scale EIA cultural and heritage impact assessments throughout Hong Kong, S Pacific and SE Asia.

Chris has prepared over 70 Aboriginal Cultural Heritage Management Plans, impact assessments and due diligence surveys in Australia including indigenous heritage consultation and survey work on both brown and greenfield sites throughout Victoria. Chris has also supervised indigenous heritage surveys and impact assessments on large energy projects in South Australia and Victoria and a heritage management plan for Hyde Park, WA. In addition Chris has overseas cultural heritage experience (field survey and community consultation) of large EIA projects in Hong Kong as well as mine feasibility assessments in Tibet, Philippines, Fiji and PNG.





# Bennett Road Precinct Development Plan

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Ver	Revision Description	Date	Checked	Notes/Legend
23	Minor Amendments	22/09/2021	Drafted J.Sens Sep 2021	
22	Addressed Council Feedback	25/06/2021	Checked P.Bowe Sep 2021	
21	Minor Amendments	29/07/2020		
20	Addressed Council Feedback	21/07/2020	Approved	
19	Amended Notations	21/02/2020		
18	Amended Notations and Layout	13/12/2019		
17	Amended Drainage Line Details	25/10/2019		

Notes/Legend



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Scale (m)  NTS  
 All lengths are in metres  
 and all levels are to Australian Height Datum  
 (Original Sheet Size is A3)  
 Drawing file: 17085\_00\_Face Sheet\_V2.dwg  
 LTO Ref: -  
 Council Ref: -

Macedon Ranges Shire Council - Gisborne

**Bennett Road Precinct**  
**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/L**  
 Date: 16/11/2021 Version: 23 Sheet: 1 of 4  
 Authorised Officer: Jack Wiltshire  
 Page: 113 of 371 SIGNED:



**NOTES**

- \* Contours shown represent approximate existing surface.
- \* Contour interval 1m.
- \* Drainage line only flows during periods of heavy rainfall.
- \* Total Area = 132.62 hectares.
- \* Original sheet size is A1.

**LEGEND**

- Trees within road reserve
- Dwelling
- Outbuilding
- Dam
- Drainage line

**Bennett Road Precinct: Site Context**

Ver	Revision Description	Date	Checked	Approved
23	Minor Amendments	22/09/2021	Drafted J.Sens	Checked P.Bowe
22	Addressed Council Feedback	25/06/2021		
21	Minor Amendments	29/07/2020		
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19	Amended Notations	21/07/2020		
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Notes/Legend

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 and all levels are to Australian Height Datum  
 (Original Sheet Size is A1)

Drawing file: 17085\_01\_Site Context V2.0.dwg  
 LTO Ref: -  
 Council Ref: -

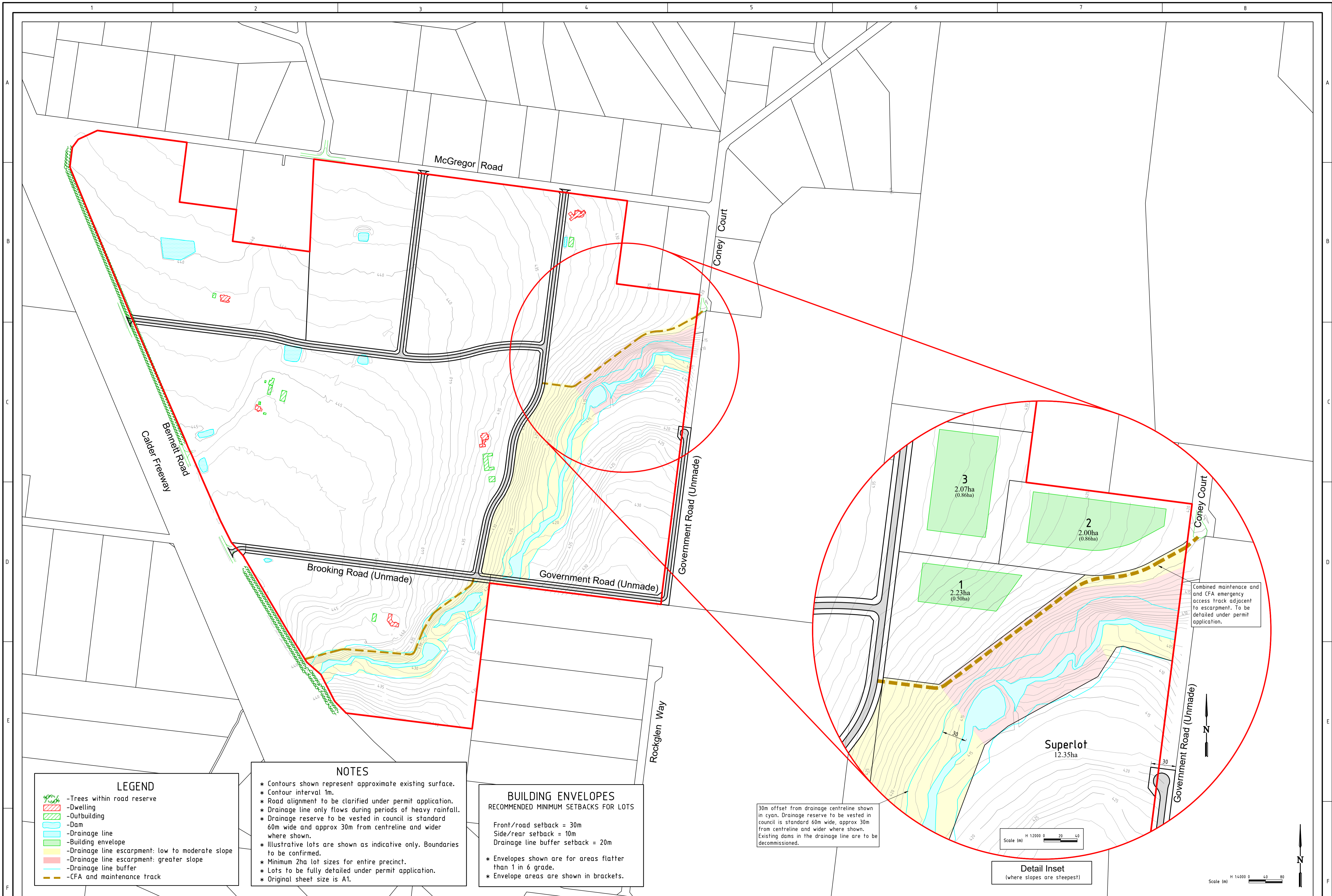
Macedon Ranges Shire Council - Gisborne

**Bennett Road Precinct  
 DEVELOPMENT PLAN: DP/2019/L**

Date: 16/10/2023  
 Version: 1  
 Sheet: 2 of 4  
 Authorised Officer: Jack Wiltshire

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**LEGEND**

- Trees within road reserve
- Dwelling
- Outbuilding
- Dam
- Drainage line
- Building envelope
- Drainage line escarpment: low to moderate slope
- Drainage line escarpment: greater slope
- Drainage line buffer
- CFA and maintenance track

**NOTES**

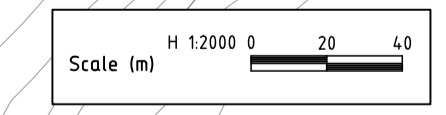
- \* Contours shown represent approximate existing surface.
- \* Contour interval 1m.
- \* Road alignment to be clarified under permit application.
- \* Drainage line only flows during periods of heavy rainfall.
- \* Drainage reserve to be vested in council is standard 60m wide and approx 30m from centreline and wider where shown.
- \* Illustrative lots are shown as indicative only. Boundaries to be confirmed.
- \* Minimum 2ha lot sizes for entire precinct.
- \* Lots to be fully detailed under permit application.
- \* Original sheet size is A1.

**BUILDING ENVELOPES**  
RECOMMENDED MINIMUM SETBACKS FOR LOTS

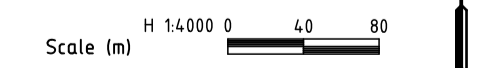
Front/road setback = 30m  
Side/rear setback = 10m  
Drainage line buffer setback = 20m

- \* Envelopes shown are for areas flatter than 1 in 6 grade.
- \* Envelope areas are shown in brackets.

30m offset from drainage centreline shown in cyan. Drainage reserve to be vested in council is standard 60m wide, approx 30m from centreline and wider where shown. Existing dams in the drainage line are to be decommissioned.



**Detail Inset**  
(where slopes are steepest)



**Bennett Road Precinct: Indicative Layout Concept Adjoining Drainage Line Escarpment**

Ver	Revision Description	Date	Checked	Checked
23	Minor Amendments	22/09/2021	Drafted	
22	Addressed Council Feedback	25/06/2021	J.Sens	P.Bowe
21	Minor Amendments	29/07/2020	Sep 2021	Sep 2021
20	Addressed Council Feedback	21/07/2020		
19	Amended Notations	21/02/2020	Approved	
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17	Amended Drainage Line Details	25/10/2019		

Notes/Legend

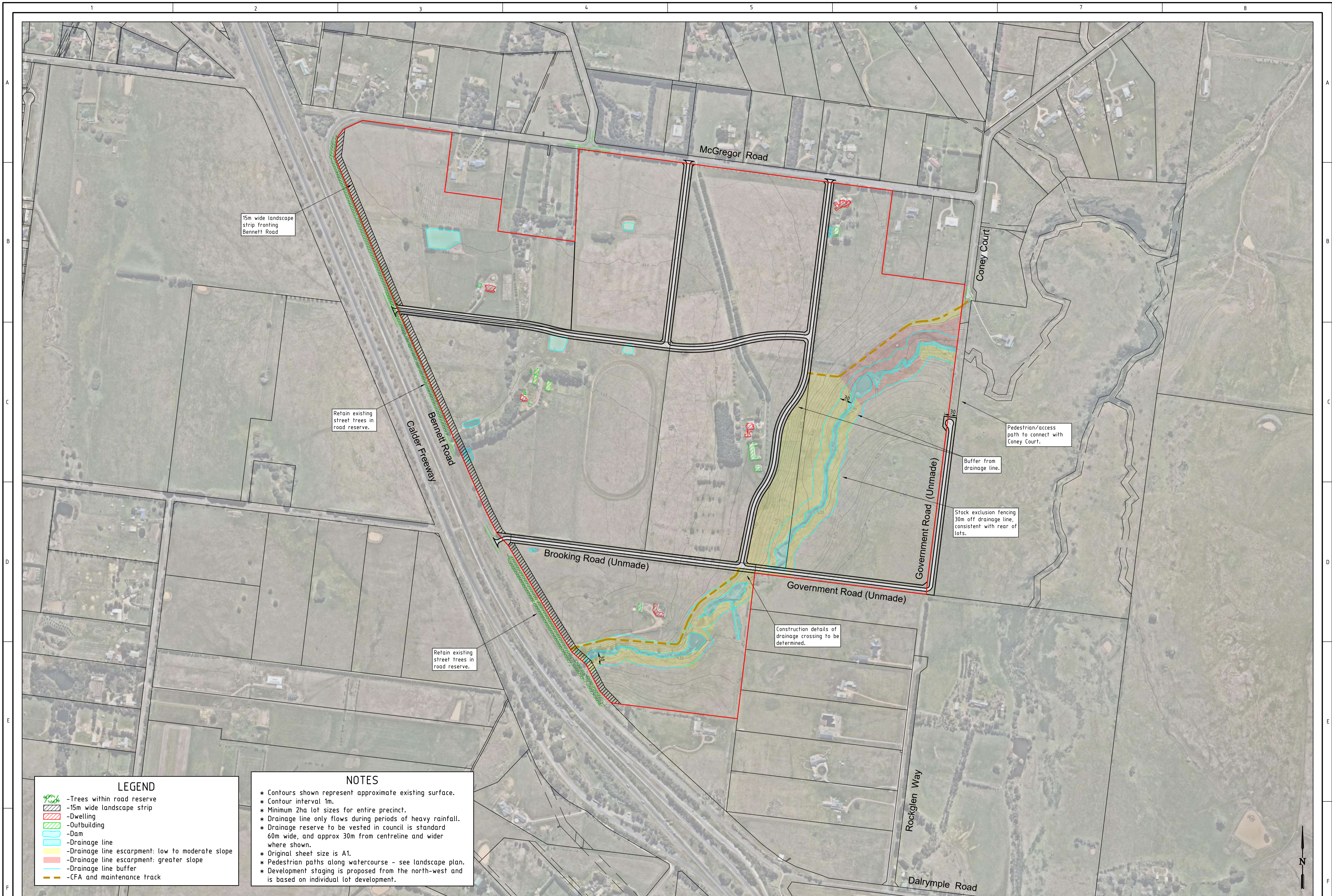


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Scale (m) SCALE AS SHOWN  
All lengths are in metres and all levels are to Australian Height Datum (Original Sheet Size is A1)  
Drawing file: LTO Ref: Council Ref: 17085 02 Layout V23.dwg

Macedon Ranges Shire Council - Gisborne  
Bennett Road Precinct  
**MALCEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/L**  
Date: 16/11/2021  
Authorised Officer: Jack Wiltshire  
Page: 115 of 371 SIGNED: [Signature]

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**LEGEND**

- Trees within road reserve
- 15m wide landscape strip
- Dwelling
- Outbuilding
- Dam
- Drainage line
- Drainage line escarpment: low to moderate slope
- Drainage line escarpment: greater slope
- Drainage line buffer
- CFA and maintenance track

**NOTES**

- \* Contours shown represent approximate existing surface.
- \* Contour interval 1m.
- \* Minimum 2ha lot sizes for entire precinct.
- \* Drainage line only flows during periods of heavy rainfall.
- \* Drainage reserve to be vested in council is standard 60m wide, and approx 30m from centreline and wider where shown.
- \* Original sheet size is A1.
- \* Pedestrian paths along watercourse - see landscape plan.
- \* Development staging is proposed from the north-west and is based on individual lot development.

**Bennett Road Precinct: Development Plan - Roads**

Ver	Revision Description	Date	Checked	Checked Date
23	Minor Amendments	22/09/2021	Drafted	
22	Addressed Council Feedback	25/06/2021	J.Sens	P.Bowe
21	Minor Amendments	29/07/2020	Sep 2021	Sep 2021
20	Addressed Council Feedback	21/07/2020		
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Macedon Ranges Shire Council - Gisborne

**Bennett Road Precinct DEVELOPMENT PLAN: DP/2019/L**

Date: 16/11/2021 Version: 1.0 Sheet: 4 of 4

Authorised Officer: Jack Wiltshire

Page: 116 of 371 SIGNED: [Signature]

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## Bennett Road Precinct, Gisborne Development Plan

Servicing and Utilities Infrastructure  
September 2021

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## Introduction

This report is to provide details in relation to servicing of a future development under the Macedon Ranges Planning Scheme Development Plan Overlay Schedule 18 (DPO18). The information provided assumes development of approximately 50 allotments within the precinct.

This report is to assist the following parcels of land to be subdivided in accordance with the attached proposed layout plan.

- 88 Bennett Road (Lot 1, PS343448), Gisborne
- 128 Bennett Road (Lot 1, PS343449), Gisborne
- 168 Bennett Road (Lot 2, PS627007), Gisborne
- 15 McGregor Road (Lot 1, TP886104), Gisborne
- 94 McGregor Road (Lot 1, LP134525), Gisborne
- 134 McGregor Road (Lot 1, PS633404), Gisborne

The combined properties have an approximate area of 132 hectares all within the Rural Living Zone (RLZ2).

All land parcels have existing permanent structures (dwellings and sheds), with the exception of 15 McGregor Road (Lot 1, TP886104), which remains unoccupied.

There is no infrastructure provision external to the Development Plan area and all infrastructure required will be contributed by each landholder as necessary as it is developed. Headworks charges as necessary to connect existing service locations to each lot will be borne by the individual developer in agreement with the particular servicing authority.

There shall be no appointment of charges between development sites. Each developer will be solely responsible for the provision of all required infrastructure to service each proposed subdivision. This includes provision of landscaping, paths and roads within and fronting each development parcel and any necessary extension of roads and other servicing infrastructure such as water, electricity or telecommunications required to service the subdivision.

There is no staging plan for commencement of development. Each parcel shall be developed depending upon required infrastructure of items being met as conditions of a subdivision approval.



## Drainage – Macedon Ranges Shire Council / Melbourne Water

Both McGregor Road and Bennett Road are rural type sealed roads with table drains on both sides. No other formalised drainage infrastructure is available in the surrounding area. A natural watercourse flows in a north-east direction through 88 Bennett Road, 94 McGregor Road and 134 McGregor Road.

Being large lots under the DPO18 (minimum 2Ha), any development will have negligible affect in relation to increased runoff. Typically, any structure (dwelling/shed) shall be connected to stormwater tanks for onsite use, which may be connected to toilets and will generally provide for some stormwater detention.

Discussions with Melbourne Water confirm that due to the large allotments any runoff will generally be overland flow to swale drains within the roads which are likely to satisfy the requirements for Water Sensitive Design (WSUD).

## Roads – Macedon Ranges Shire Council

The site is bordered by McGregor Road (to the north), Bennett Road (to the west) and Coney Court (to the east). Both McGregor Road and Bennett Road are sealed rural type roads with seal width of approximately 6m with table drains either side. Coney Court terminates at the site's north-east corner with a seal width of approximately 4m. Access to existing lots is via culverts within the table drains. None of the surrounding roads include kerb and channel or footpaths and none is justified for this rural residential subdivision.

The additional proposed roads are to be constructed in accordance with Council's Engineering Requirements for Infrastructure Construction. Typically, that includes 20m road reserves with 6.6m wide seal width (2 coat sprayed) and 1.0m wide unsealed shoulders (see attached cross section).

TraffixGroup has completed a Traffic Management and Impact Plan which further outlines that a roundabout is not required at the McGregor Road / Panorama Drive intersection. Alternatively a T-intersection will be provided further along McGregor Road to maintain traffic paths towards the township via Panorama Drive in line with the ODP requirements. The proposed intersections to external roads (4No. T-intersections), internal roads (3No. T-intersections) and the court bowl will be provided in accordance with the relevant standards and are sufficient for the projected traffic volumes.

All roadworks necessary to service a parcel of land including cycle and access paths will be undertaken at the cost of that developer at the time. At the time of development of 134 McGregor Road the individual developer shall provide a culvert crossing of the Djirri Djirri Creek at Brooking Road.

## Water – Western Water

There is an existing 150mm PVC water main coming off the Calder Freeway and running along McGregor Road. This main reduces to a 100mm PVC water main at Panorama Drive which continues along the northern side of McGregor Road and into Coney Court.

The proposed allotments will be serviced via the existing 150mm and 100mm PVC water mains. Mains extensions and upgrades will be carried out as required to service all proposed allotments.

Adam Heaton (Western Water Land Development Coordinator) advised in June 2018 that this area is supplied from the South Gisborne Storage Tank. This tank currently has a capacity of 1 Megalitre and is scheduled to be increased to 2.6 Megalitre in the future as demand warrants.

Currently the system has sufficient capacity and pressure to provide adequate supply to this proposed development.

An extension to service a parcel will be undertaken at the cost of the developer in a works agreement with Western Water.

## Sewer – Western Water

There is no existing gravity sewer available to service this proposed development. All lots will be serviced by individual on site treatment systems.

## Telecommunications – Telstra / NBN

Existing Telstra services are located along McGregor Road, Coney Court and at the intersection of Bennett Road and the unmade Brooking Road.

The site will be serviced via connections off the existing infrastructure with upgrades and extensions carried out as required to service all proposed allotments. NBN is currently unavailable in the area and is expected to be available via fixed wireless between April-June 2020. We expect development will occur after that time.

Each developer will enter into an agreement for servicing infrastructure to be delivered.

## Electricity – Powercor / Jemena

The separation boundary between two power Authorities (Powercor and Jemena) occurs within the proposed development. Powercor services 95% of the subdivision with Jemena servicing the balance of the site to the south.

There are existing overhead power supplies within the McGregor and Bennett Road reserves. Existing dwellings are serviced via overhead power connections from poles within the road reserves. Some of these supplies will be modified as part of the future development.

Upgrades to the network will be required to satisfy new demand and will be in accordance with the relevant Authority requirements.

Each developer will be required to enter into an agreement for infrastructure to be connected and delivered.

## Gas – AusNet

There is no existing gas network in the area.

Residents may install bottled gas at their discretion.

## Landscaping / Creek Reserve

Any landscaping to Bennett Road is to be undertaken by the developer of the land that fronts the road. Landscaping and improvement of the Djirri Djirri Creek reserve generally within a 60m wide creek alignment and wider where specified as indicated in the subdivision concept plan is to be undertaken at the cost of the affected landowner as detailed below. It is yet to be determined if the cost associated with the works will be considered as contribution towards public open space and to what extent. Overall, public open space contributions will apply of up to 5% of the land value, through monetary contribution or works in kind, to be administered by Macedon Ranges Shire Council. Landowners that do not abut the reserve will provide cash contributions or works in kind, as may be specified by Macedon Ranges Shire Council. This will be specified in the subdivision permit for each site.

Treatment within the Djirri Djirri Creek waterway is to be undertaken at the cost of the affected landowner, which will include;

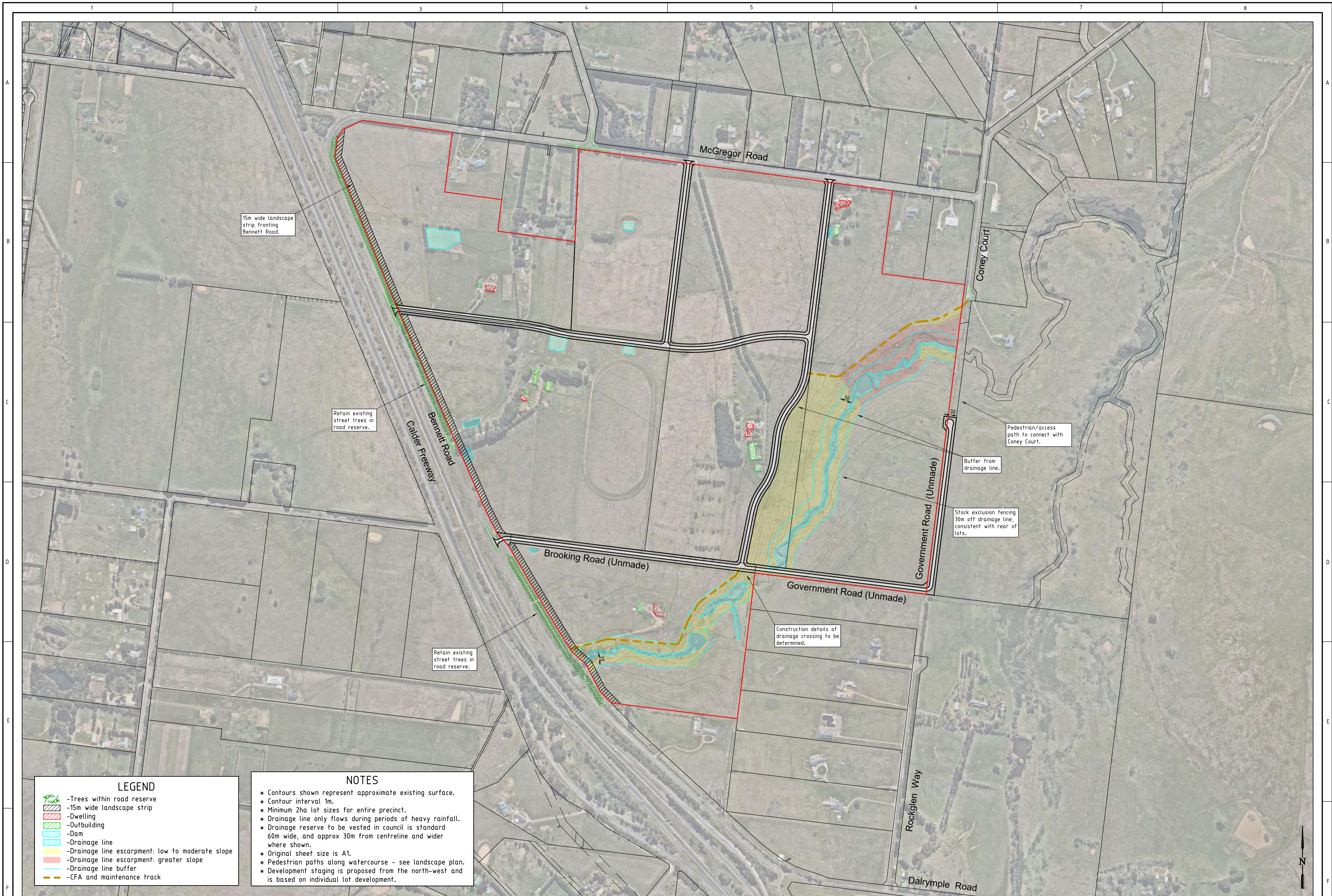
- Dam removal and creek reinstatement as required
- Weed removal
- Council maintenance / CFA track as required
- Preparation of a landscape plan, planting of vegetation in accordance with the plan and means of retaining significant vegetation.
- Fencing as required.

## Conclusion

All essential services and utilities are available nearby to fully cater for future subdivisions of approximately 50 lots.

## Attachments

- Proposed Development Plan
- Table 6 Rural Road Characteristics – Infrastructure Design Manual.
- Western Water Sewer and Water Asset Plans
- Telstra and NBN Asset Plans
- Powercor and Jemena Asset Plans



**LEGEND**

- Trees within road reserve
- 15m wide landscape strip
- Dwelling
- Outbuilding
- Dam
- Drainage line
- Drainage line escarpment: low to moderate slope
- Drainage line escarpment: greater slope
- Drainage line buffer
- CFA and maintenance track

**NOTES**

- \* Contours shown represent approximate existing surface.
- \* Contour interval 1m.
- \* Minimum 2ha lot sizes for entire precinct.
- \* Drainage line only flows during periods of heavy rainfall.
- \* Drainage reserve to be vested in council is standard 60m wide, and approx 30m from centreline and wider where shown.
- \* Original sheet size is A1.
- \* Pedestrian paths along watercourse - see landscape plan.
- \* Development staging is proposed from the north-west and is based on individual lot development.

**Bennett Road Precinct: Development Plan - Roads**

Ver	Revision Description	Date	Checked	Checked
23	Minor Amendments	22/09/2021	Drafted	P. Bove
22	Addressed Council Feedback	25/06/2021	J. Sens	Sep 2021
21	Minor Amendments	29/07/2020		
20	Addressed Council Feedback	21/07/2020		
19	Amended Notations	21/02/2020		
18	Amended Notations and Layout	13/12/2019		
17	Amended Drainage Line Details	25/10/2019		

Notes/Legend

**TERRACO**  
Civil Engineers  
Project Managers  
Development Consultants

Terraco P/L  
ABN 12 681 695 776  
9 Jewell Court  
East Bendigo, VIC 3550  
Ph: 03 5442 5399  
E: info@terraco.com.au  
www.terraco.com.au

Scale (m) 1:4000 0 40 80

All lengths are in metres  
and all levels are to Australian Height Datum  
(Original Sheet Size is A1)

Drawing file: 17085\_03\_Development\_V23.dwg  
LTO Ref: -  
Council Ref: -

Macedon Ranges Shire Council - Gisborne

**Bennett Road Precinct  
DEVELOPMENT PLAN: DP/2019/L**

Date: 16/11/2022  
Version: 1  
Sheet: 4 of 4  
Authorised Officer: Jack Wiltshire

Page: 125 of 371 SIGNED: [Signature]

Street Type	Carriageway Width	Parking	Edge Treatment	Drainage	Footpath/Cycle Provision	Surface Treatment
<b>Low Density Residential</b>						
Up to 8 lots	6.0m (20m reserve)	Not required	1.5m Shoulder	Table drains/WSUD	Generally not required	Prime and two coat seal, Final coat in 12 months
Over 8 lots	6.6m with 1.0m shoulder (20m reserve)	Not required	1.5m Shoulder	Table drains/WSUD	Generally not required	Prime and two coat seal, Final coat in 12 months
<b>Rural Type (including Farming, Rural Conservation, Rural Living and Rural Activity Zones)</b>						
Up to 8 lots	6.0m (20m reserve)	Not required	1.5m Shoulder	Table drains/WSUD	Generally not required	Prime and two coat seal, Final coat in 12 months
Over 8 lots	6.6m with 1.0m shoulder (20m reserve)	Not required	1.5m Shoulder	Table drains/WSUD	Generally not required	Prime and two coat seal, Final coat in 12 months

If development is off, or an extension to, an existing road then new road construction must match the existing road if greater than requirement called for in above table.

Street Type	Carriageway Width	Parking	Edge Treatment	Drainage	Footpath/Cycle Provision	Surface Treatment
<b>Industrial (All Zones)</b>						
Industrial Roads	8.5m (20m reserve)	No parking on carriageway or road reserve	Barrier kerb	Underground/WSUD treatment as agreed by Council	Shared path 2.5m wide One side only	Asphalt
<b>Business (All Zones)</b>						
Roads (20m reserve)	8.5m (20m reserve)	Allowed on road or reserve by agreement	Barrier kerb or semi mountable	Underground/WSUD treatment as agreed by Council	Both sides 2m wide	Asphalt

(Street types are defined in terms of length and speed, refer to Planning Scheme for definitions).

\* In some cases an edge strip may be acceptable to Council.

# Western Water : Sewer Asset Plan





**Date:**  
11/06/2019

**Sequence No:**  
84303253

**Job No:**  
16441205

**Location:**  
Bennett Road & McGregor Rd  
Gisborne  
VIC, 3437

## LEGEND

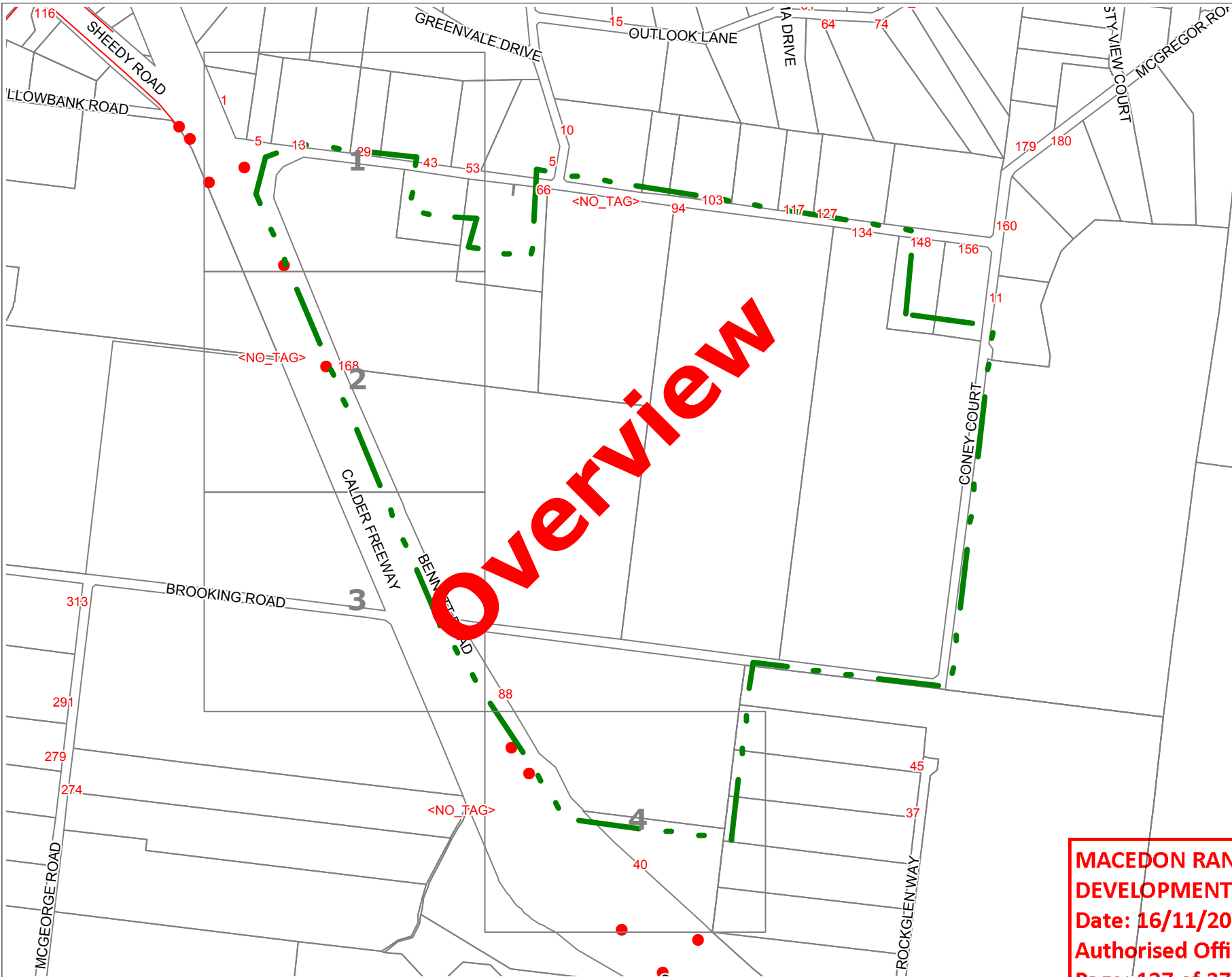
-  SEWER
-  ABANDONED MAIN

**Disclaimer:**

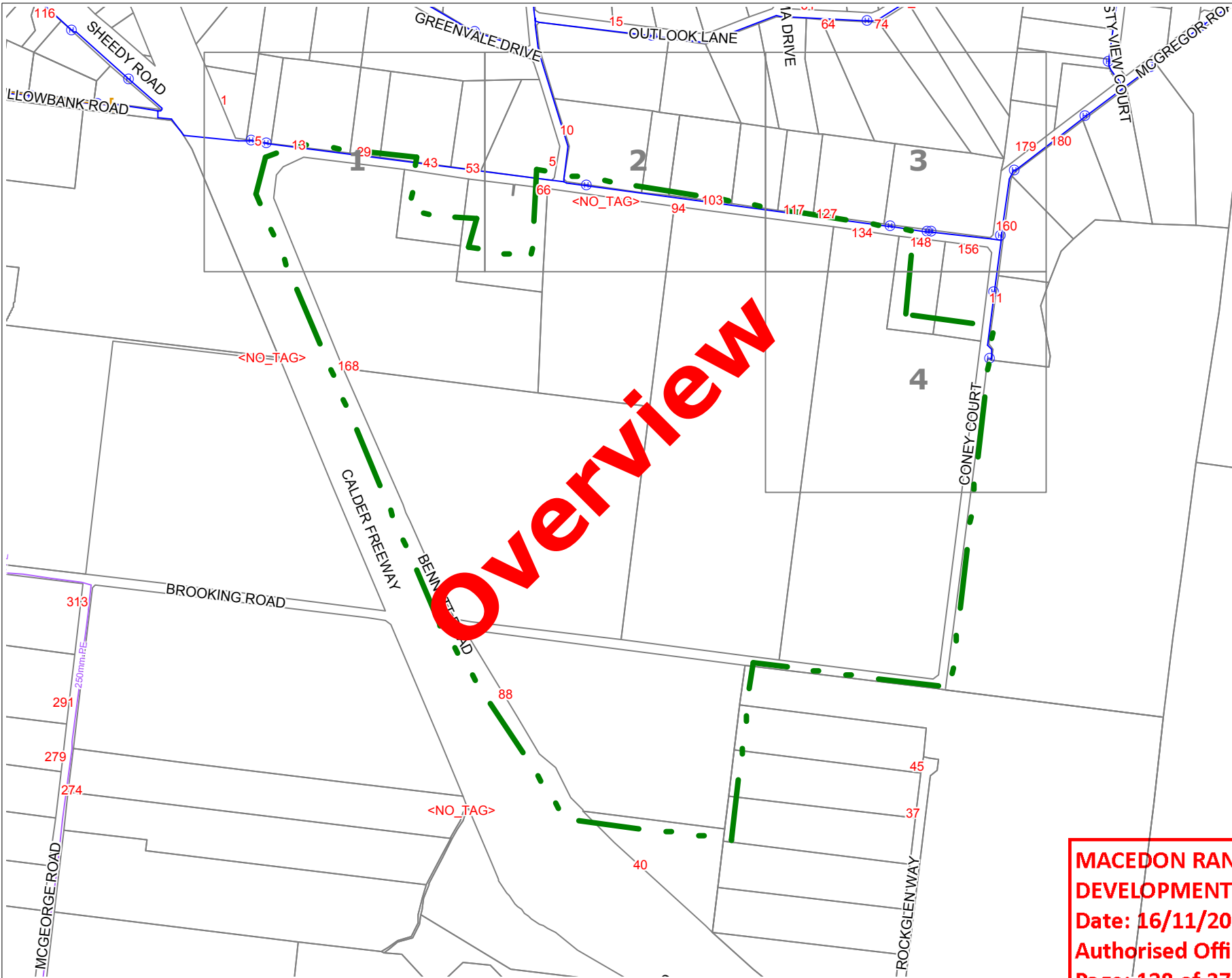
Western Water does not guarantee or make any representation or warranty as to the accuracy of this plan or associated details. It is provided in good faith as the best information available at the time. Western Water therefore accepts no liability for any loss or injury suffered by any party as a result of any inaccuracy in this plan.

**Note:**  
Assets labelled "AC" may contain asbestos material and therefore any works near these assets must be undertaken in accordance with OHS (Asbestos) Regulations 2017.

**MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
Page: 127 of 371 SIGNED:**



# Western Water : Water Asset Plan



**Date:**  
11/06/2019

**Sequence No:**  
84303253

**Job No:**  
16441205

**Location:**  
Bennett Road & McGregor Rd  
Gisborne  
VIC, 3437

### LEGEND

- POTABLE WATER
- RECYCLED WATER
- ABANDONED MAIN

**Disclaimer:**

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**Note:**  
Assets labelled "AC" may contain asbestos material and therefore any works near these assets must be undertaken in accordance with OHS (Asbestos) Regulations 2007.

Due to the placement of potable and recycled pipes in the same trench, it may be difficult to distinguish the two asset types where they have been superimposed on the plans.

**MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
Page: 128 of 371 SIGNED:**



# Western Water : Water Asset Plan



**Date:**  
11/06/2019

**Sequence No:**  
84303253

**Job No:**  
16441205

**Location:**  
Bennett Road & McGregor Rd  
Gisborne  
VIC, 3437

## LEGEND

- POTABLE WATER
- RECYCLED WATER
- ABANDONED MAIN

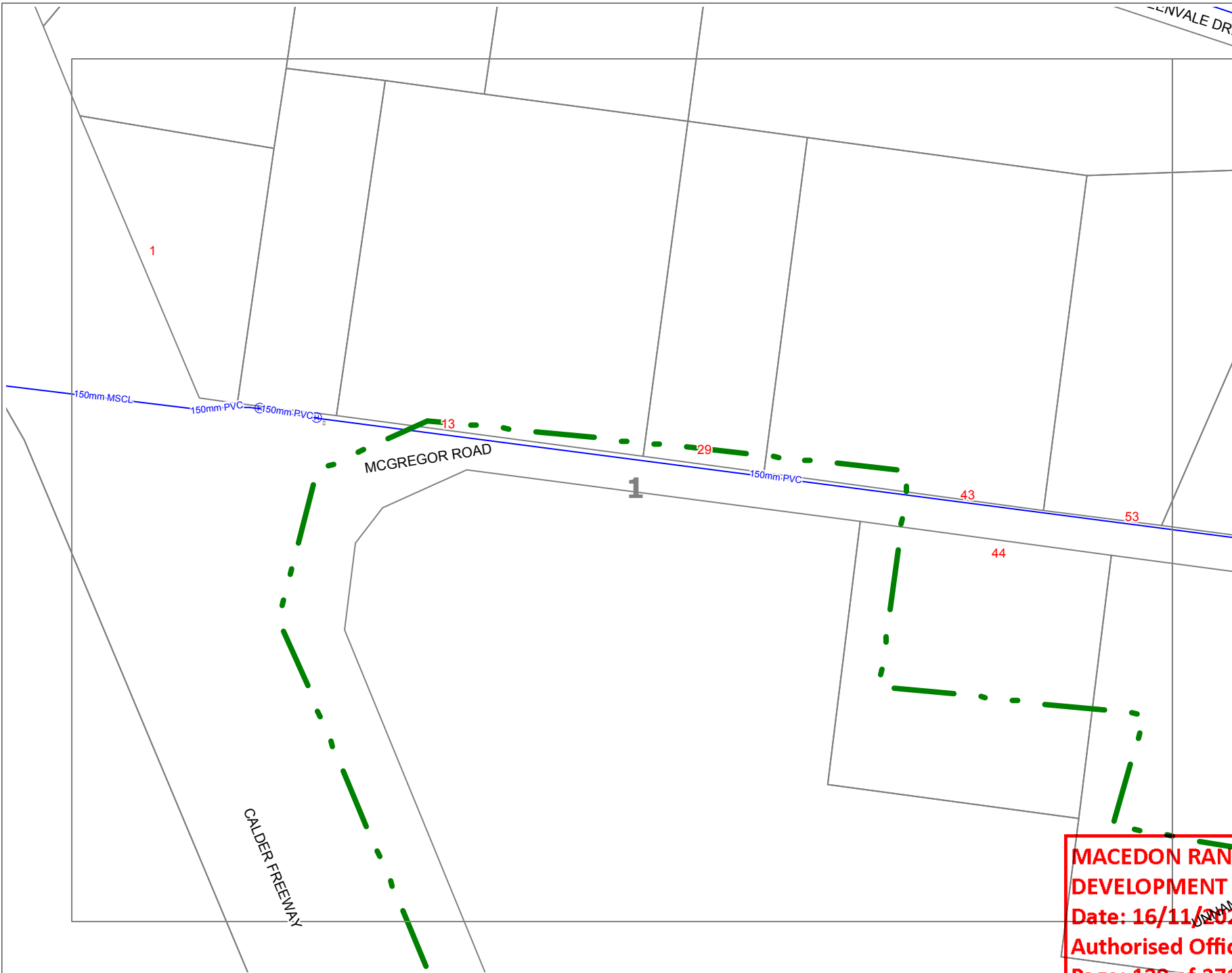
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**MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
Page: 129 of 371 SIGNED:**



# Western Water : Water Asset Plan



**Date:**  
11/06/2019

**Sequence No:**  
84303253

**Job No:**  
16441205

**Location:**  
Bennett Road & McGregor R/c  
Gisborne  
VIC, 3437

## LEGEND

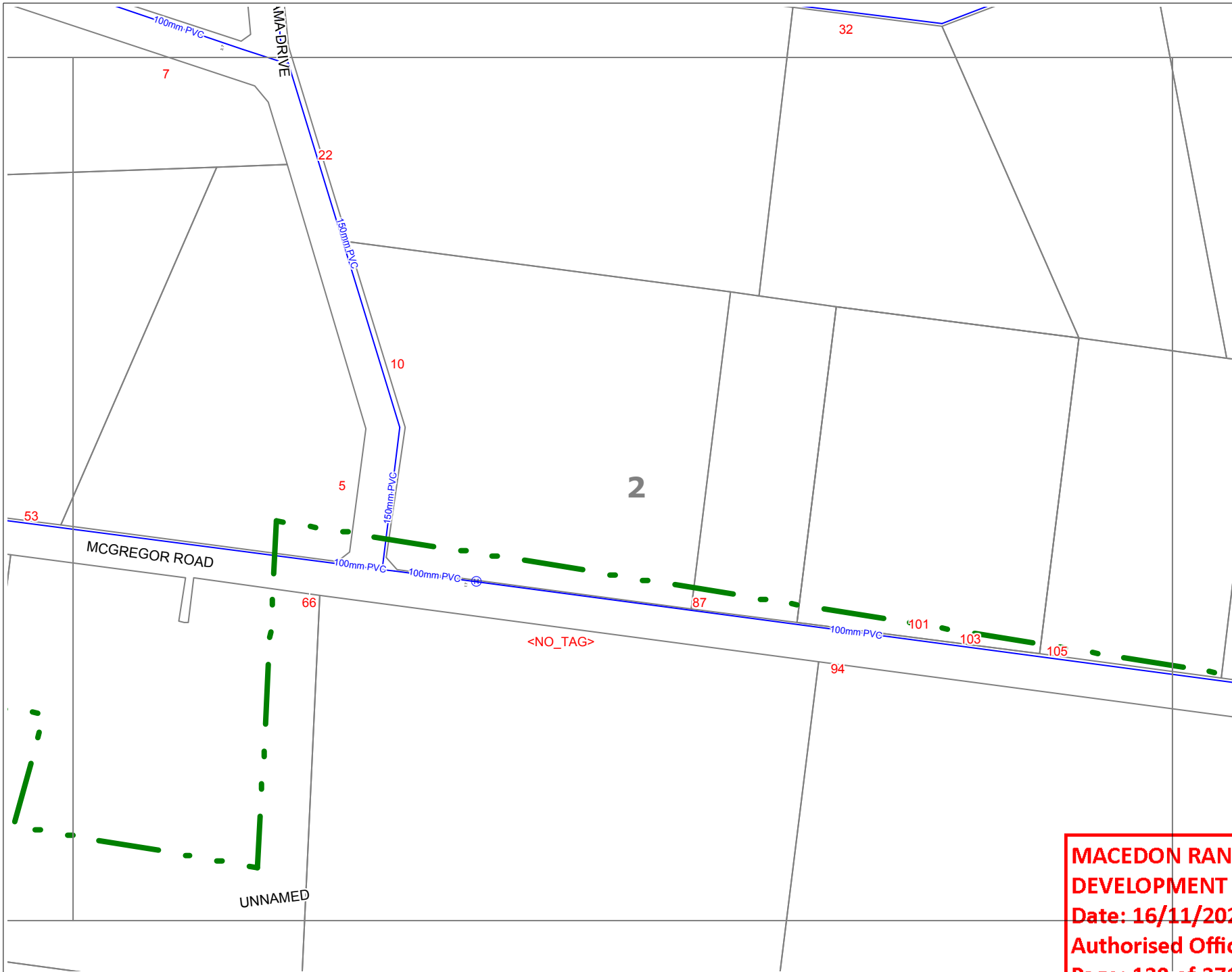
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MACEDON RANGES PLANNING SCHEME  
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 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
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**Date:**  
11/06/2019

**Sequence No:**  
84303253

**Job No:**  
16441205

**Location:**  
Bennett Road & McGregor Rd  
Gisborne  
VIC, 3437

### LEGEND

- POTABLE WATER
- RECYCLED WATER
- ABANDONED MAIN

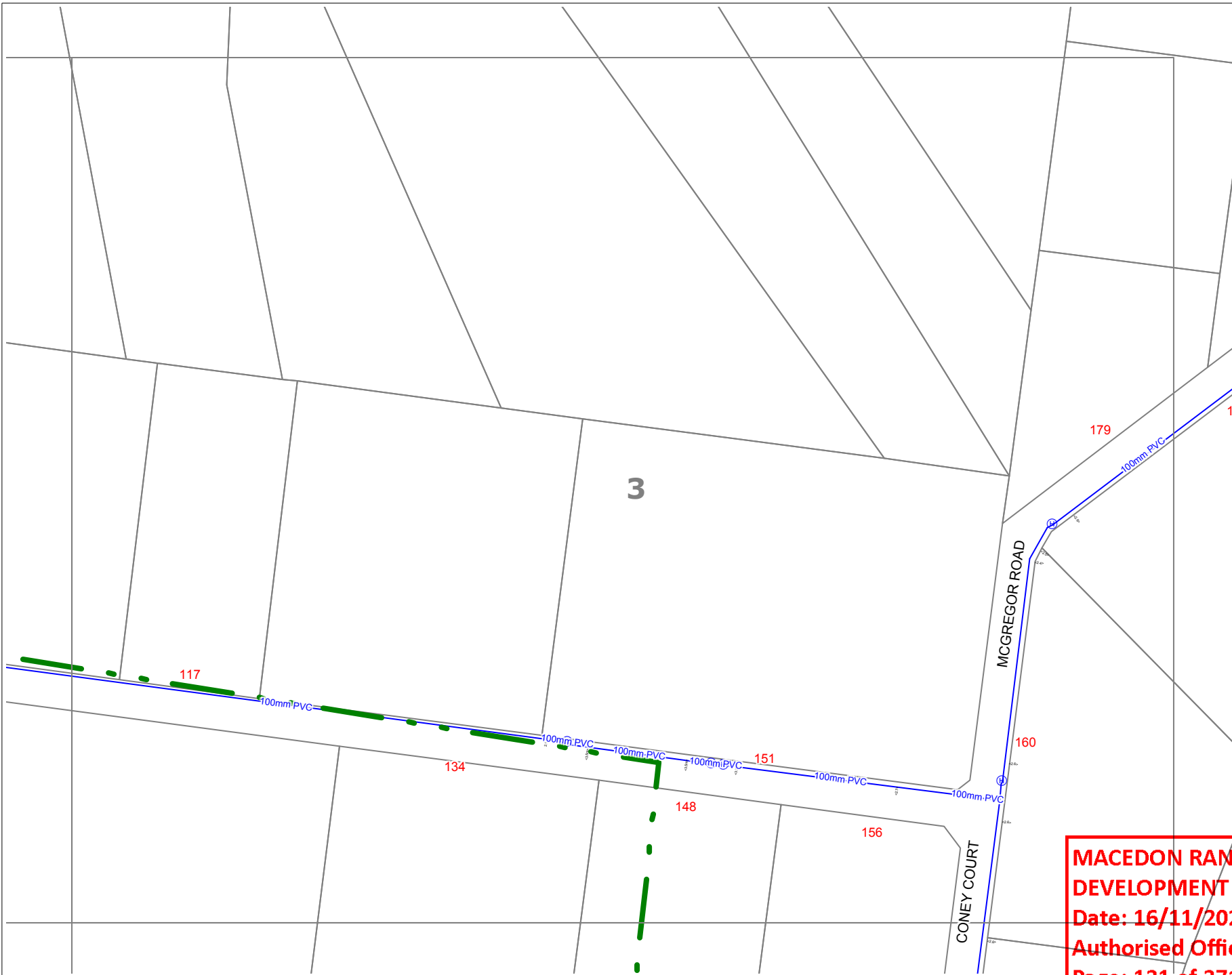
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DEVELOPMENT PLAN DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
Page: 131 of 371 SIGNED:**





**Date:**  
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Gisborne  
VIC, 3437

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- POTABLE WATER
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- ABANDONED MAIN

**Disclaimer:**

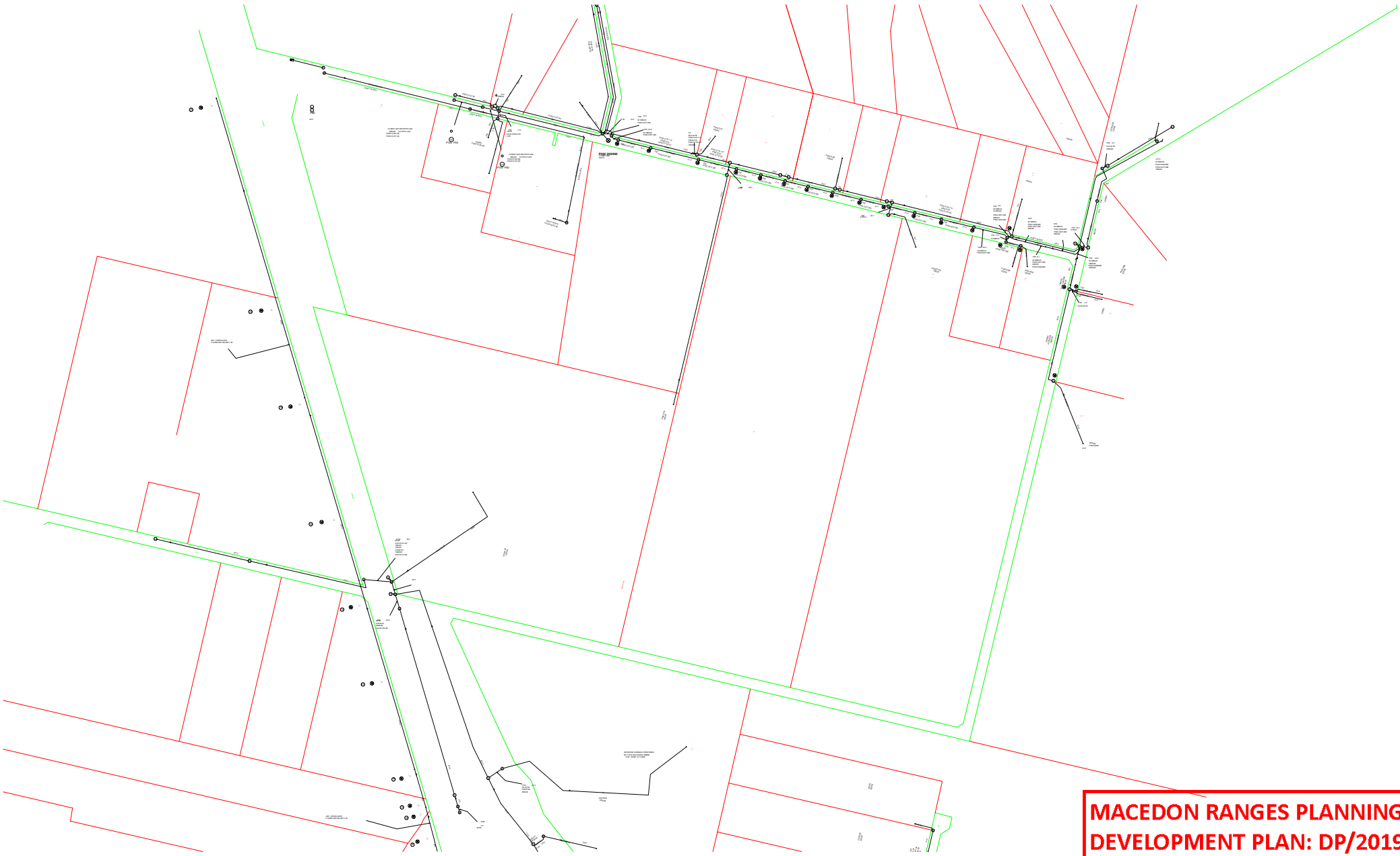
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**MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
Page: 133 of 371 SIGNED:** *Jack Wiltshire*



**128 BENNETT RD GISBORNE VIC 3437**  
Australia

Planned to be available from  
**Apr-Jun 2020\***


Note: Some premises may require more work before they are ready to connect.

 [Register for email alerts](#)

Planned technology  
**nbn™ Fixed Wireless (FW)\***

 [More address information](#)



 **Service available**



 **Other fibre provider**



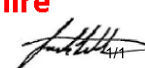
 **Build commenced**

#### Disclaimer

\*This date and technology is based on **nbn's** current deployment plans and is subject to change. Network rollout information is accurate as at 10/7/2019 and is updated weekly. Rollout areas and boundaries are subject to change as construction planning is finalised.

Services provided over the **nbn™** broadband access network will be replacing phone and internet services provided over most of the existing landline networks, including copper and the majority of HFC networks within the fixed line footprint. Services provided over existing fibre networks (including in-building, health and education networks) and some special and business services may not be affected. To find out if your services will be affected, please contact your current phone or internet provider. For more information, visit [www.nbnco.com.au/switchoff](http://www.nbnco.com.au/switchoff) or call 1800 687 626.

**MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
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Authorised Officer: Jack Wiltshire  
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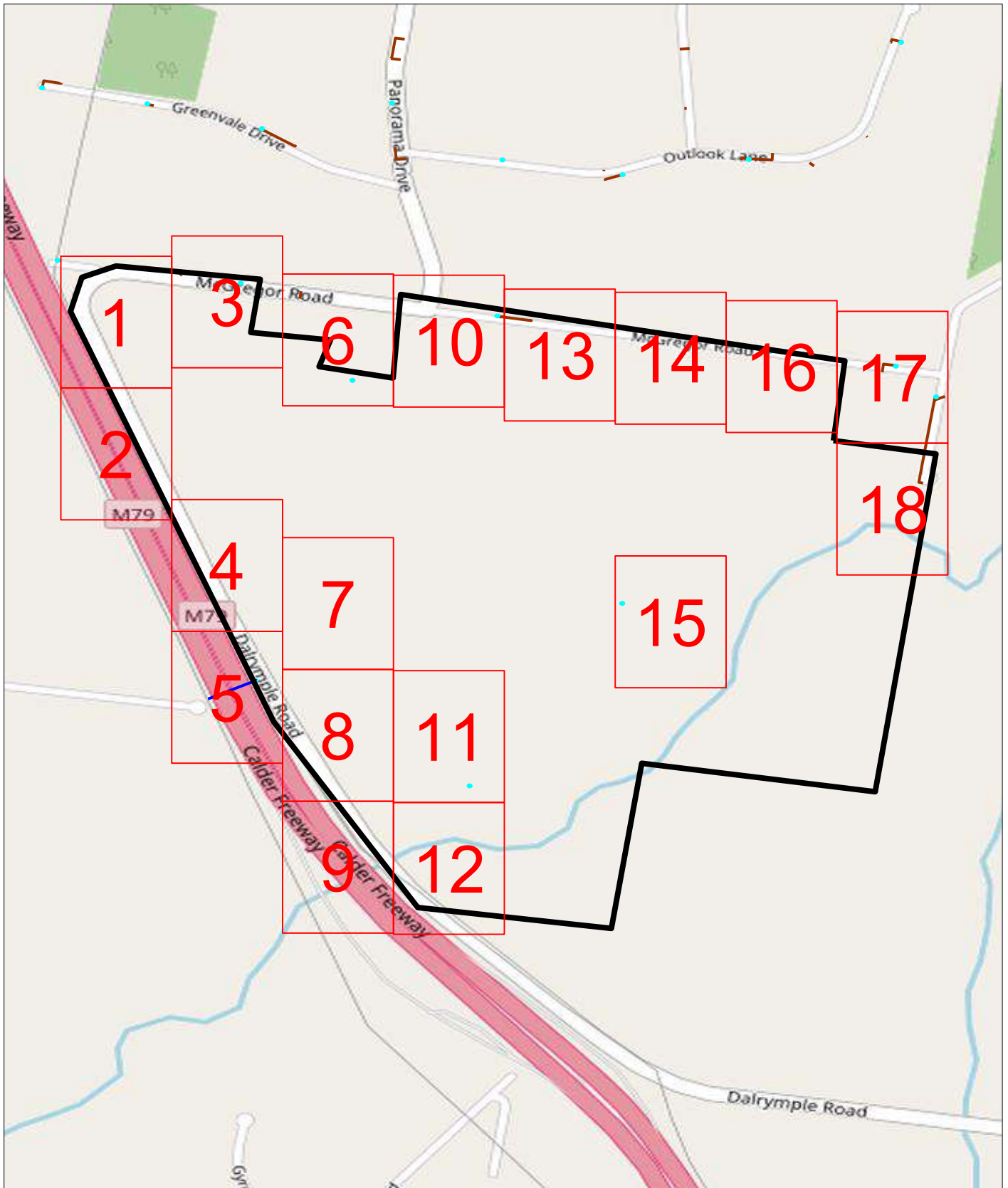


# Locality Map

## Sequence No: 84303250

Bennett Road & McGregor Road Gisborne

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

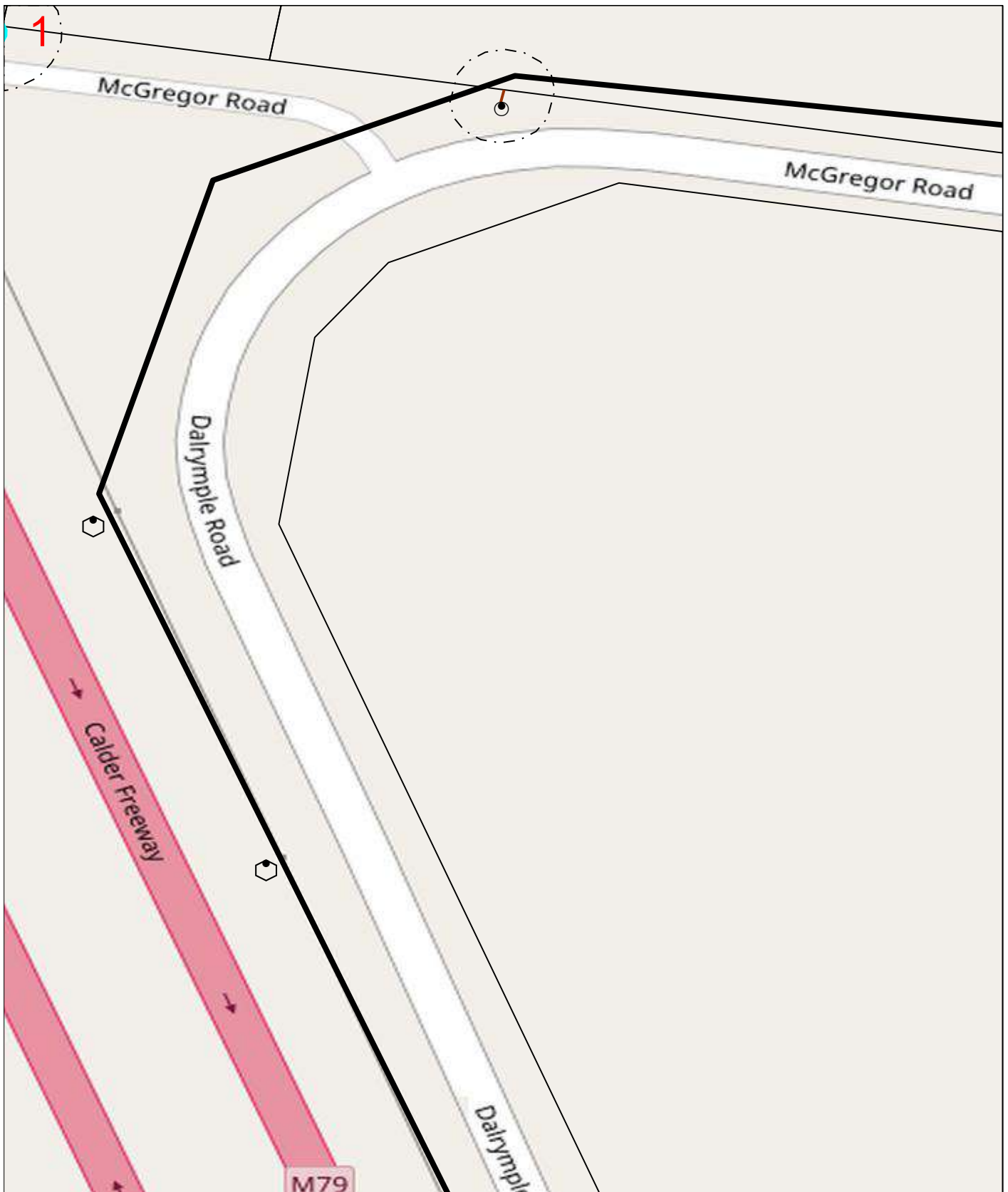
Imagery sourced from Open StreetMap

**MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022**

**Authorised Officer: Jack Wiltshire**

**Page: 135 of 371 SIGNED:**

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



#### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (LV)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

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Imagery sourced from Open StreetMap

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
**Page: 136 of 371 SIGNED:**



**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



#### LEGEND:

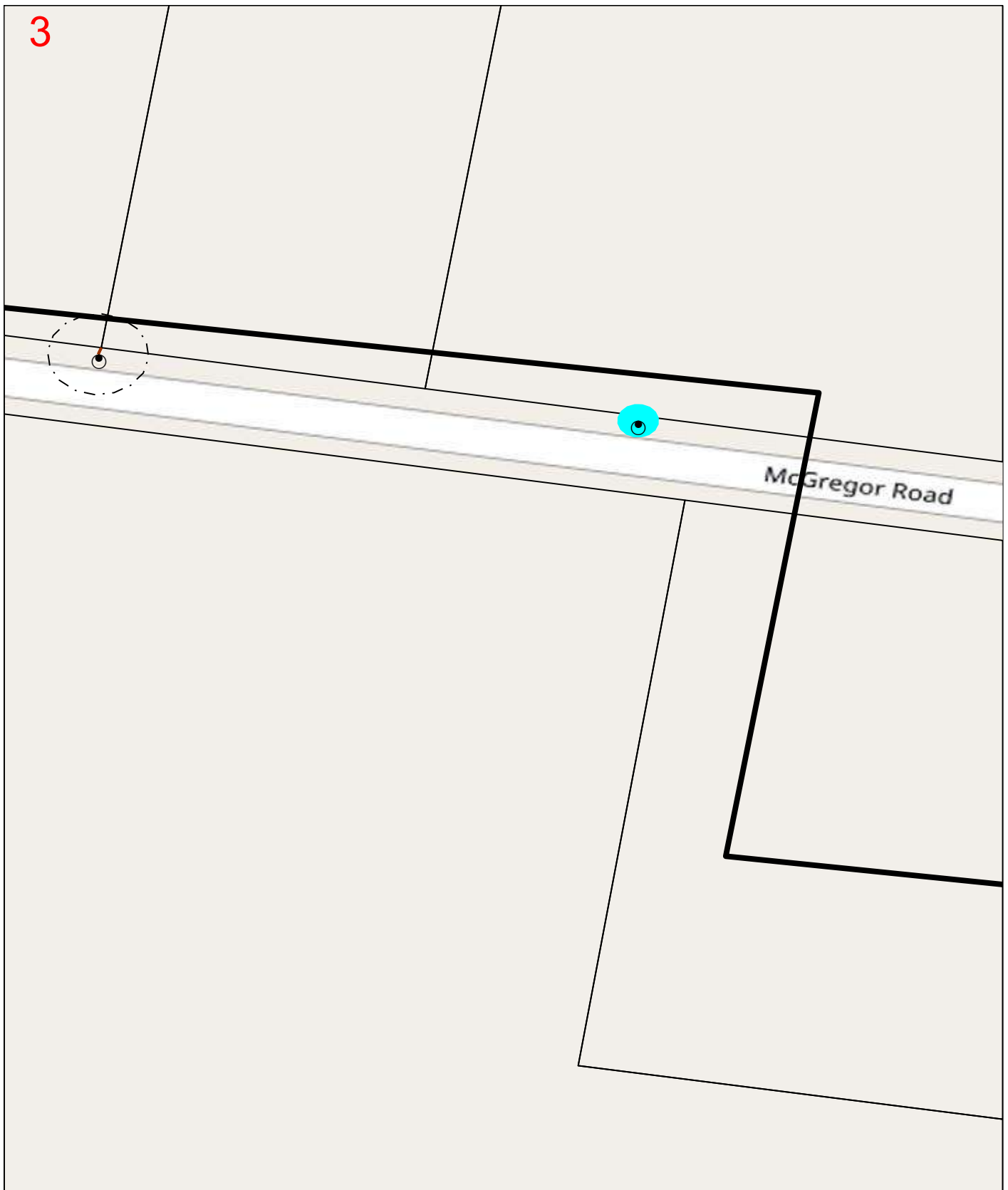
- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (LV)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

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Imagery sourced from Open StreetMap

MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 137 of 371 SIGNED:

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



#### LEGEND:

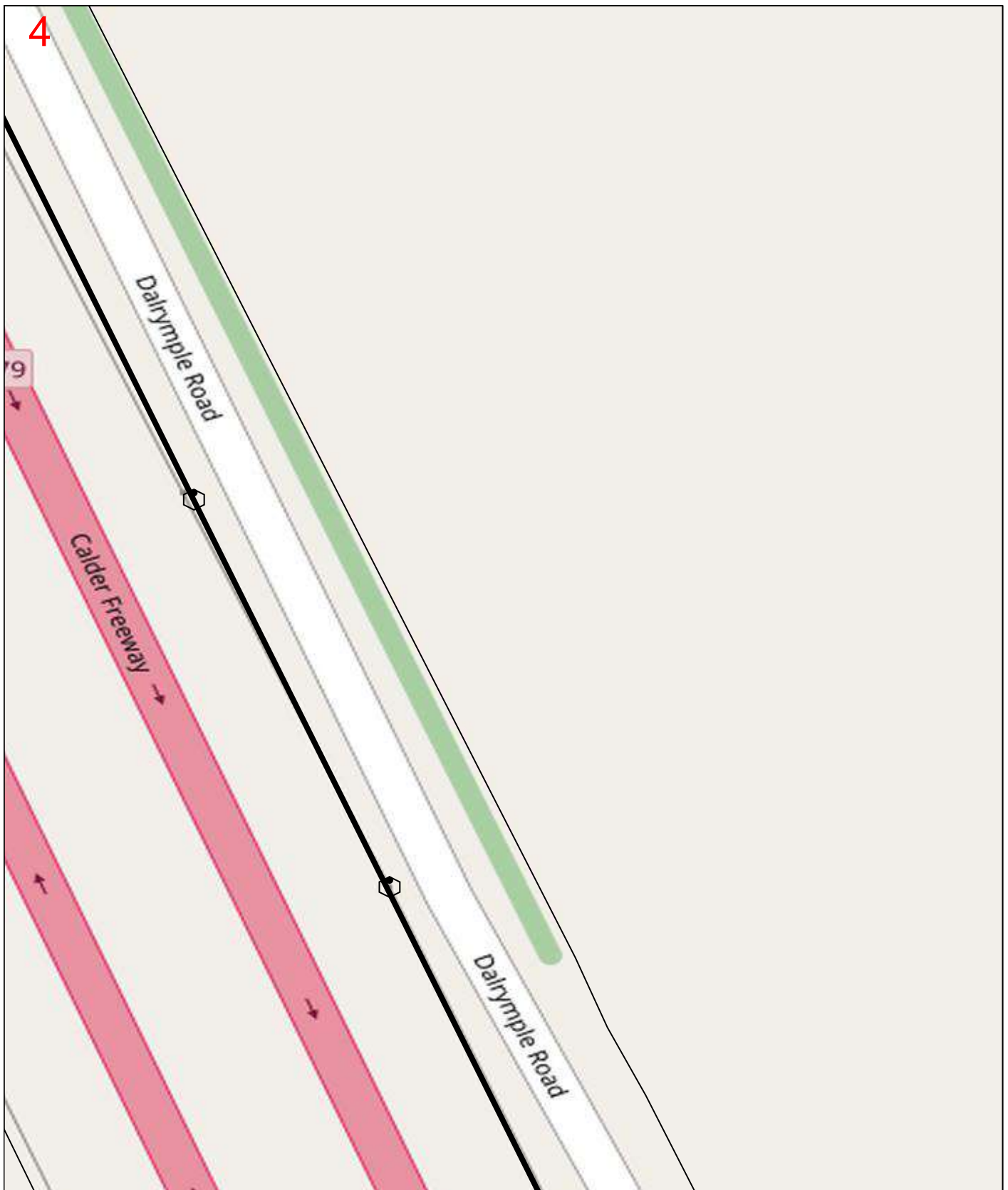
- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (L.V)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Pole (H.V)
- Property Boundary

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Imagery sourced from Open StreetMap

MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 138 of 371 SIGNED:

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



#### LEGEND:

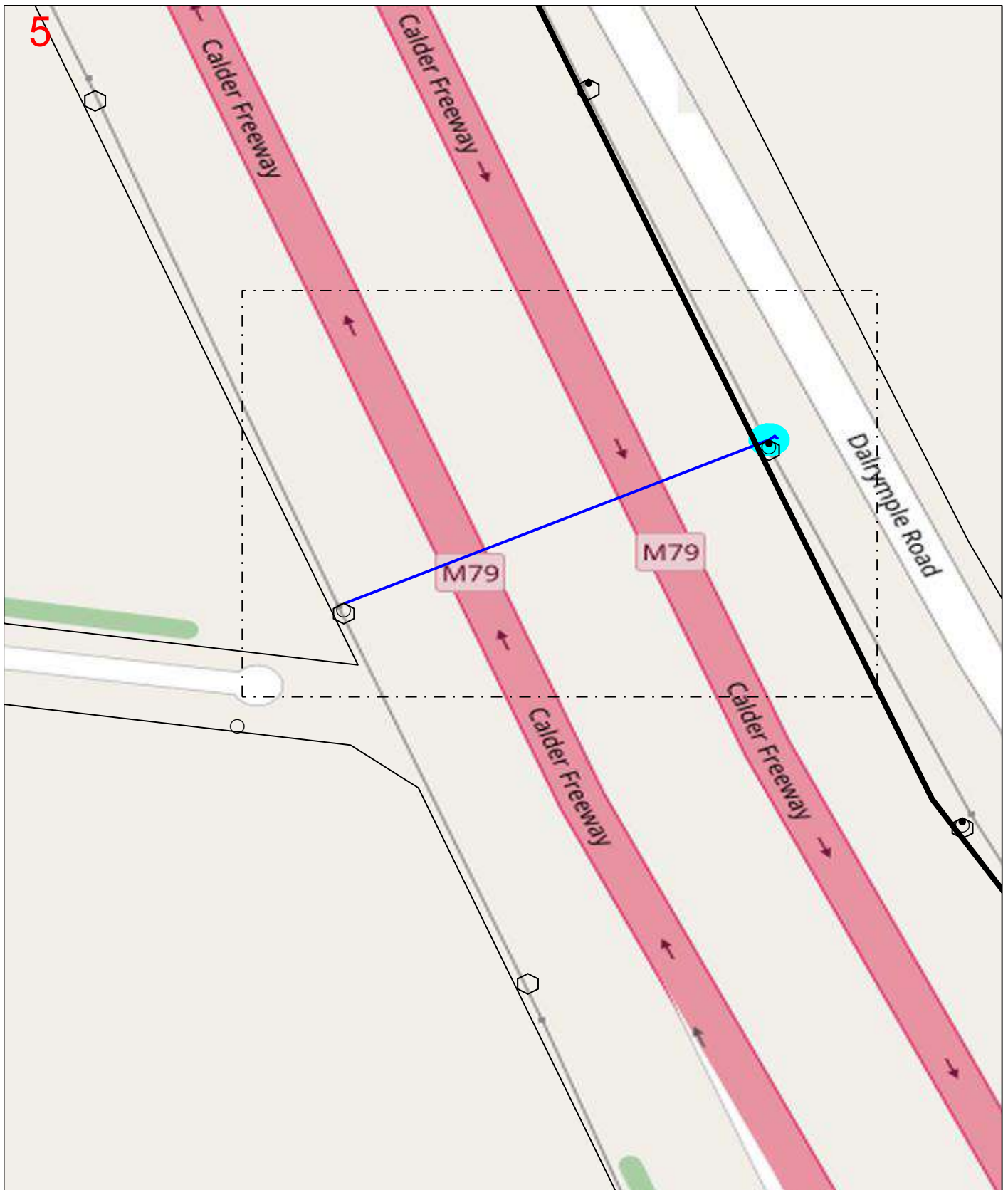
- DBYD Work Area
- SWER Substation
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- Communication Cable
- Pole (Subtransmission)
- Pole (L.V)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

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Imagery sourced from Open StreetMap

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
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**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



#### LEGEND:

- DBYD Work Area
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- Communication Cable
- Pole (Subtransmission)
- Pole (LV)
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- Distribution Substation
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- Earth Cable
- Property Boundary

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Imagery sourced from Open StreetMap

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
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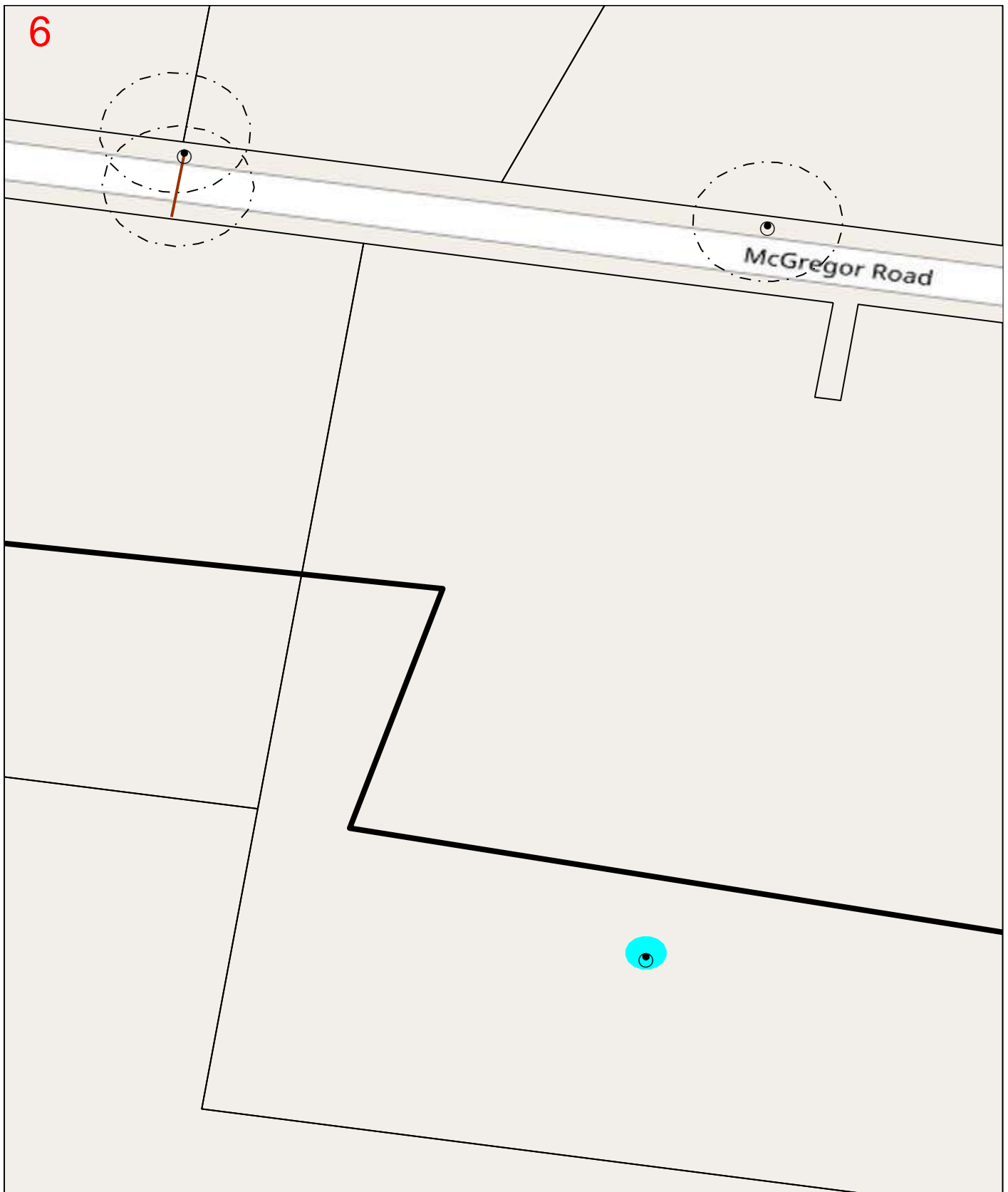


# Map 6

## Sequence No: 84303250

### Bennett Road & McGregor Road Gisborne

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



#### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (LV)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Imagery sourced from Open StreetMap

MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 141 of 371 SIGNED:



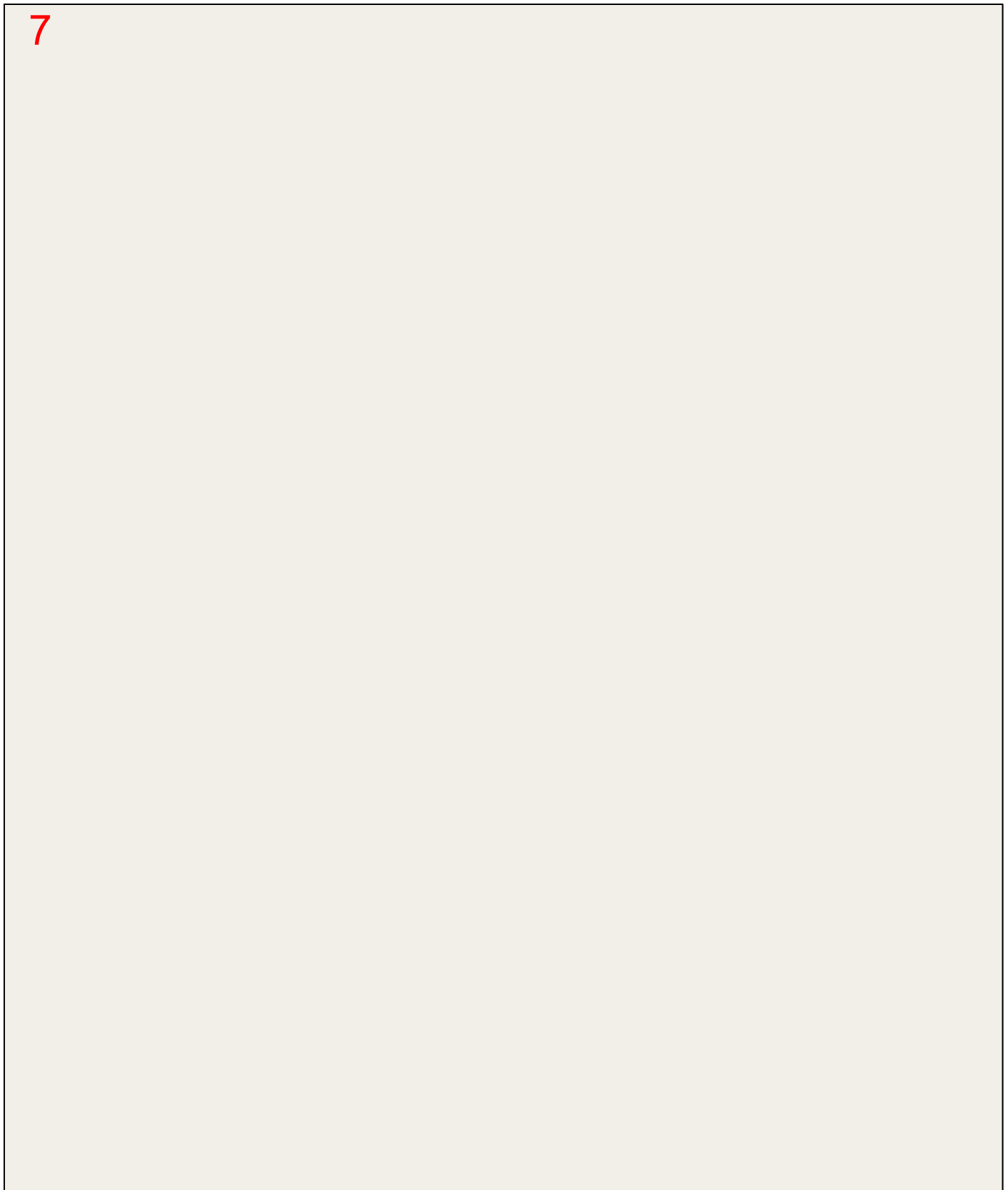
# Map 7

## Sequence No: 84303250

Bennett Road & McGregor Road Gisborne

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**

7



### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (LV)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Imagery sourced from Open StreetMap

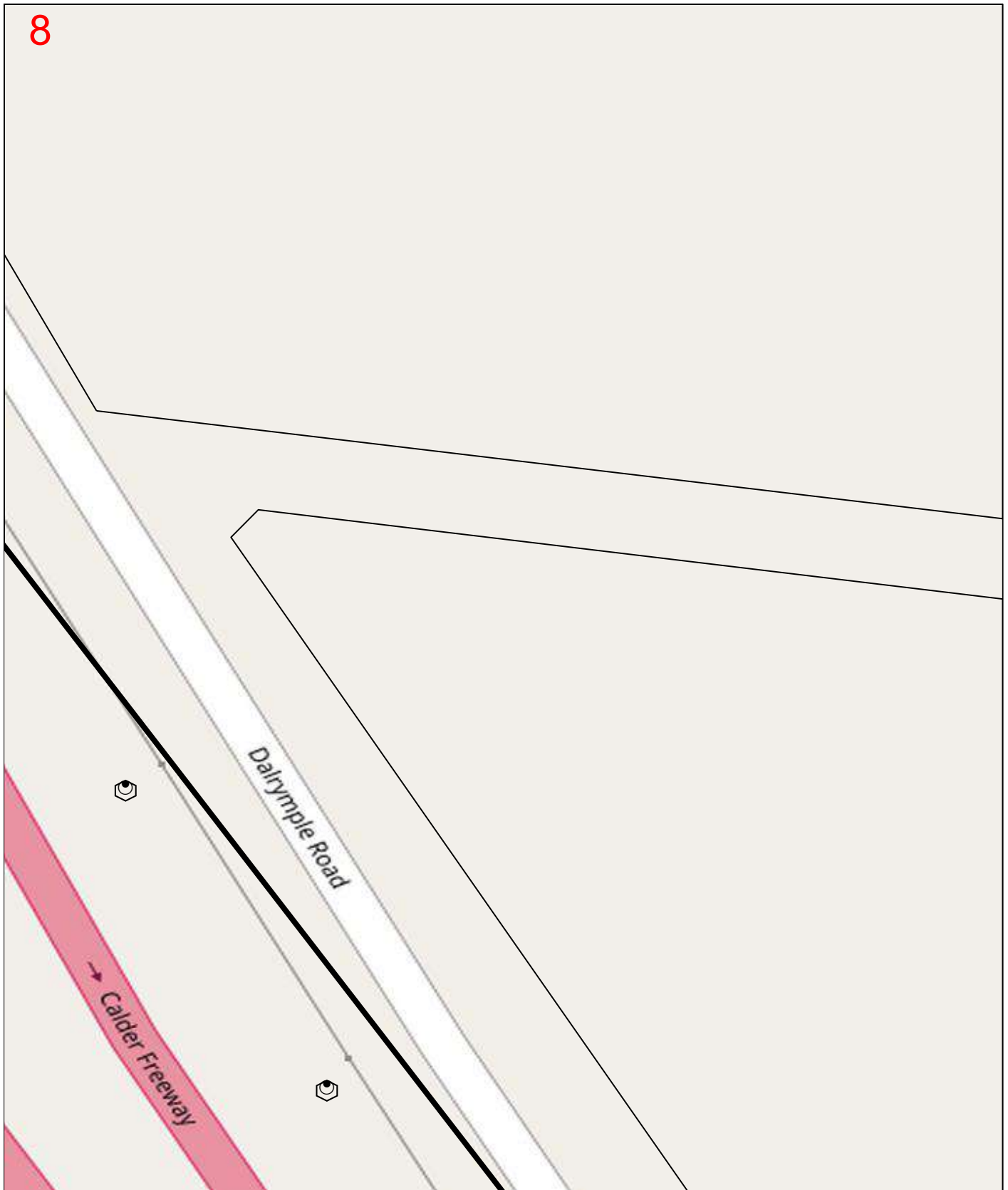
**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**

0 0.01km

**Authorised Officer: Jack Wiltshire**  
**Page: 142 of 371 SIGNED:**

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**

# 8



#### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (L.V)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

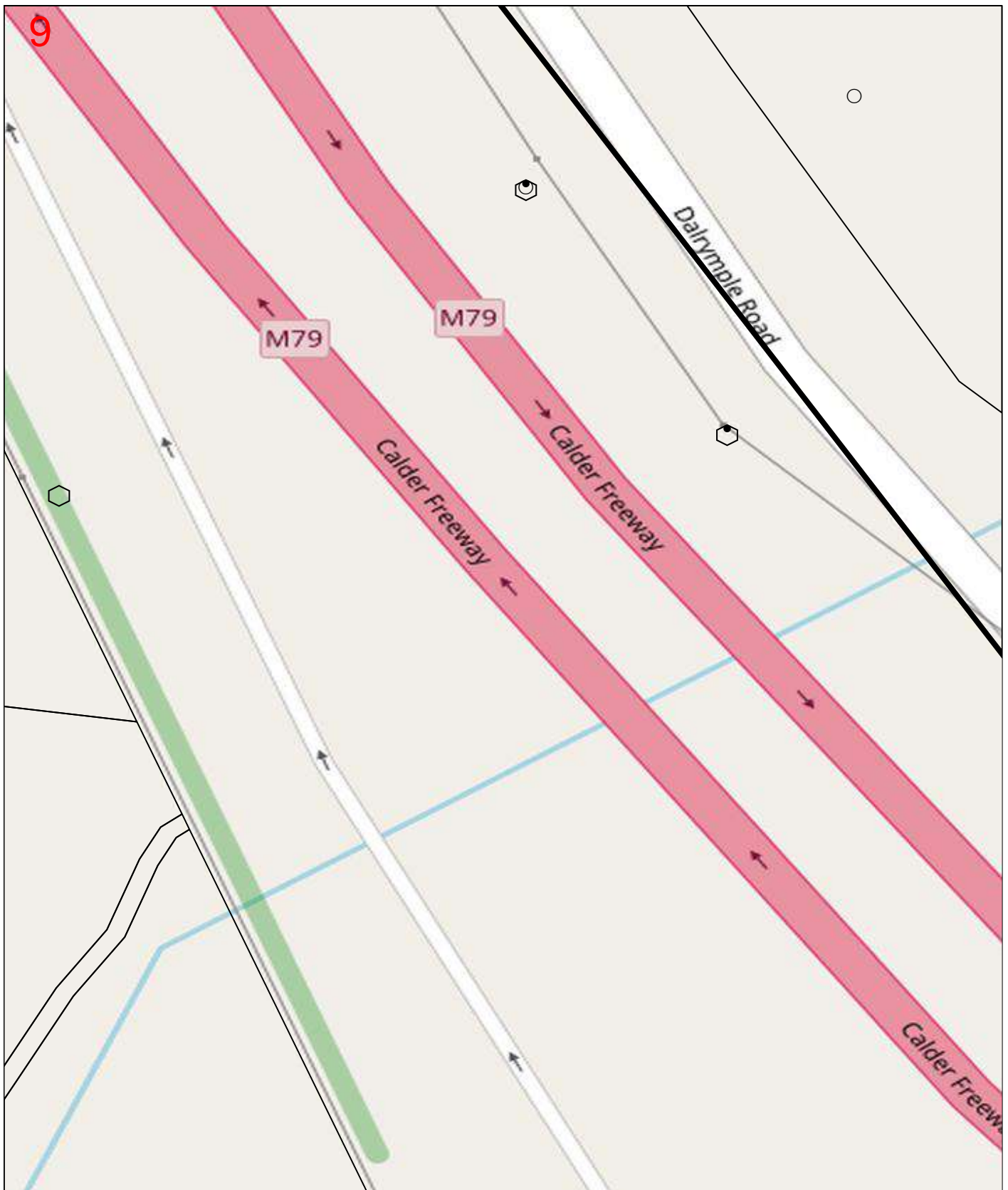
Imagery sourced from Open StreetMap

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**

0 0.01km

**Authorised Officer: Jack Wiltshire**  
**Page: 143 of 371 SIGNED:**

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



#### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (LV)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Imagery sourced from Open StreetMaps

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
**Page: 144 of 371 SIGNED:**



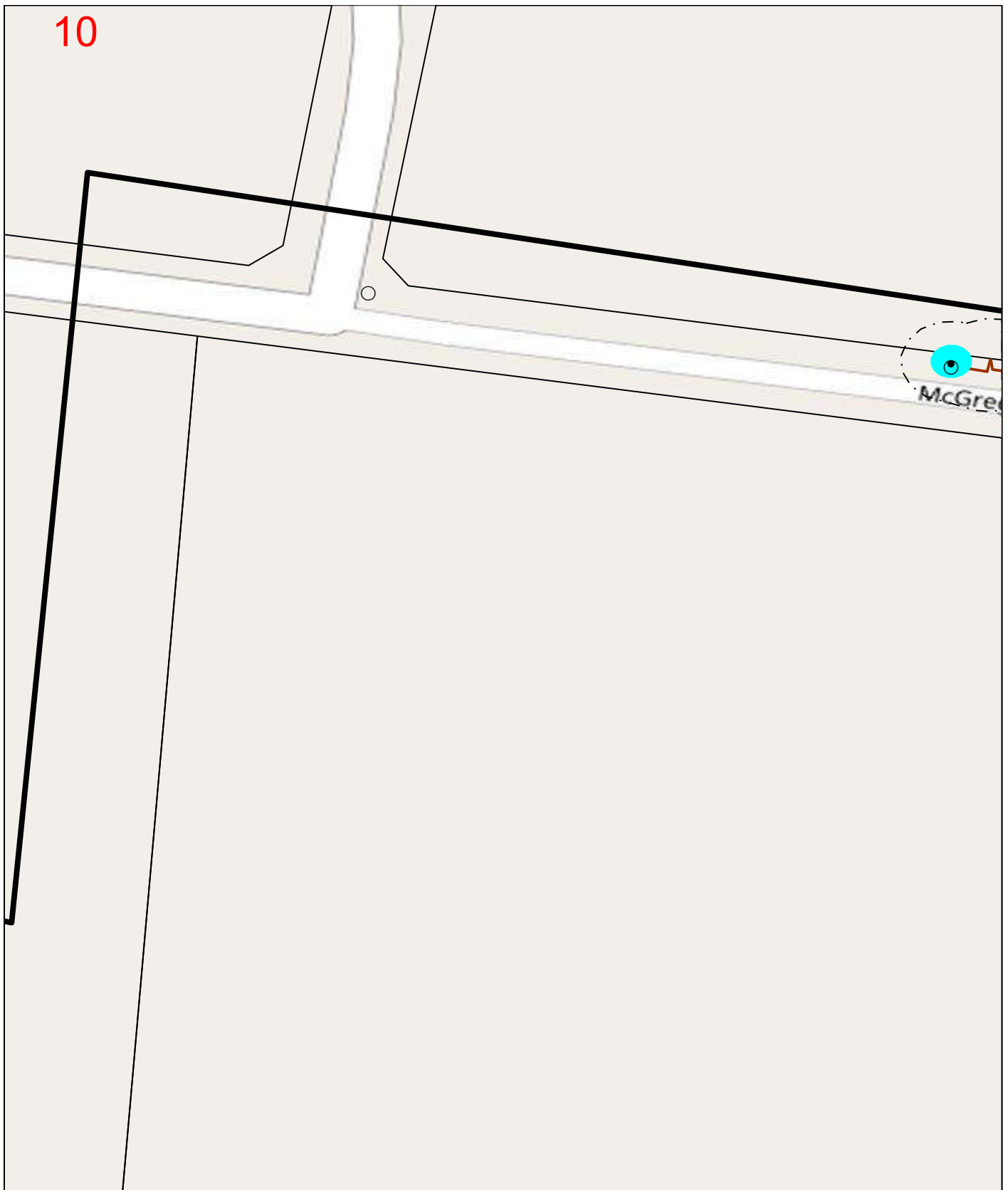


# Map 10

## Sequence No: 84303250

Bennett Road & McGregor Road Gisborne

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (LV)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Imagery sourced from Open StreetMap

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**

0 0.01km

**Authorised Officer: Jack Wiltshire**  
**Page: 145 of 371 SIGNED:**

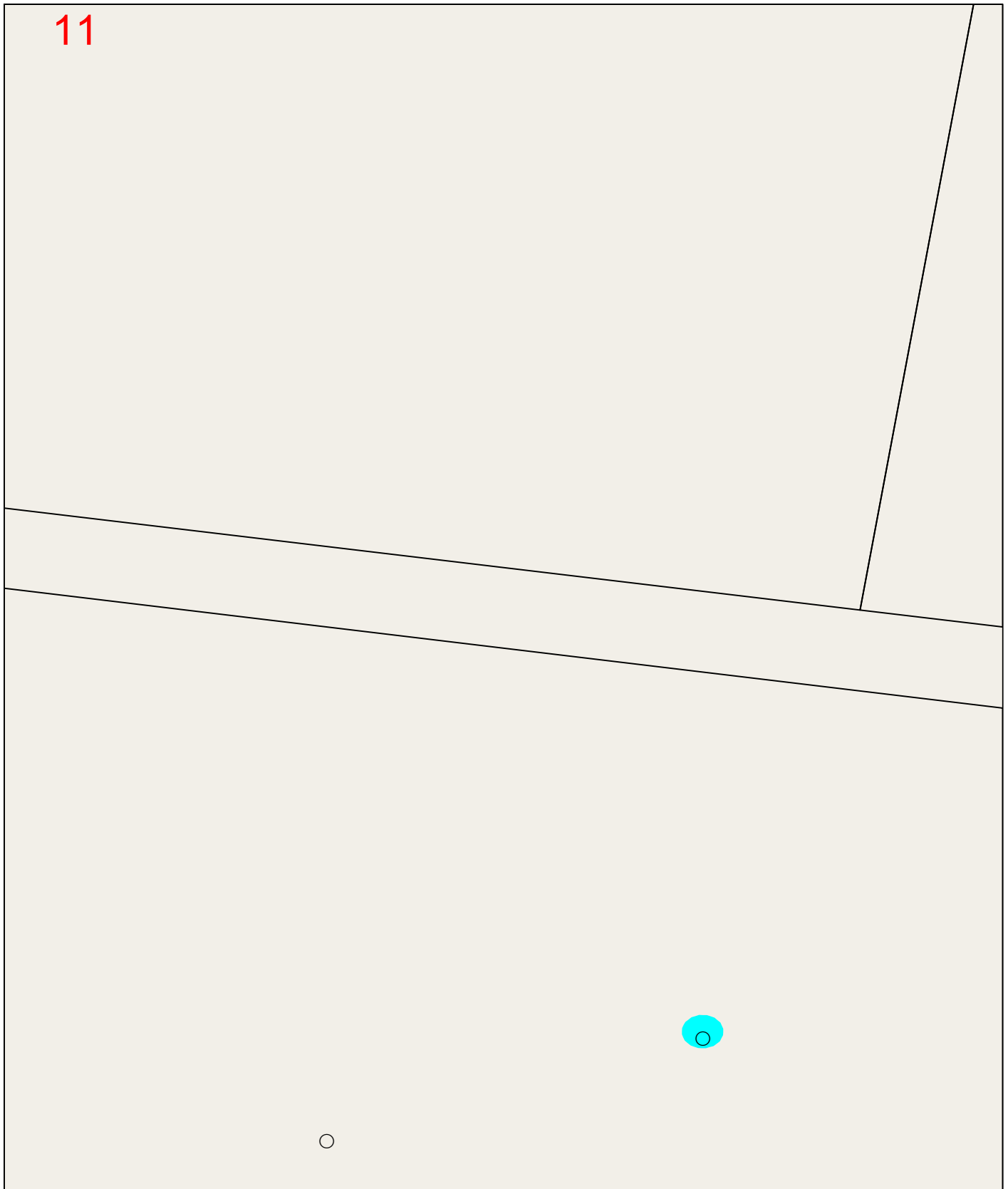


# Map 11

## Sequence No: 84303250

Bennett Road & McGregor Road Gisborne

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (LV)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Imagery sourced from Open StreetMap

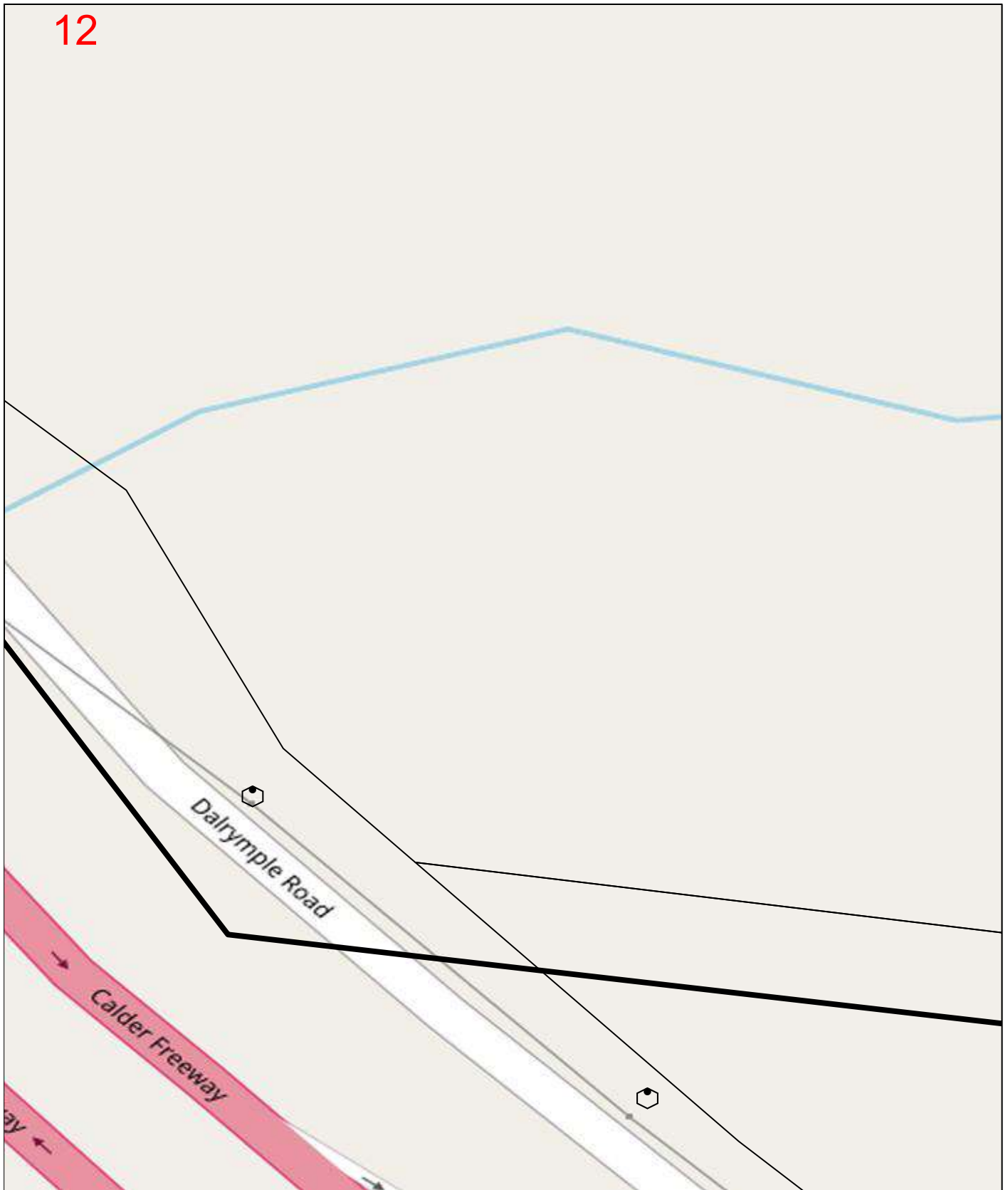
MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022

Authorised Officer: Jack Wiltshire

Page: 146 of 371 SIGNED:

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**

12



**LEGEND:**

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (L.V)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Imagery sourced from Open StreetMap

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
**Page: 147 of 371 SIGNED:**

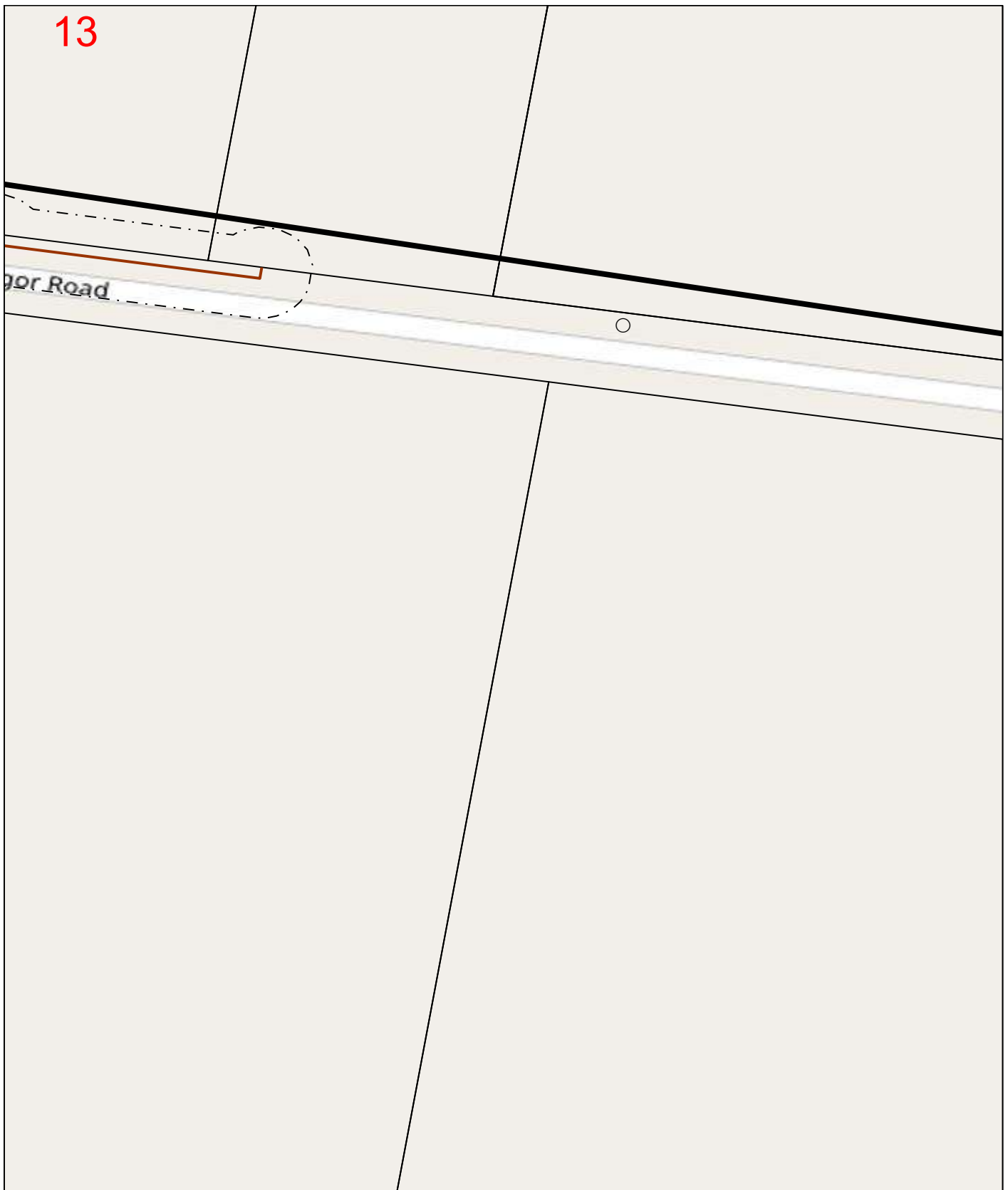


# Map 13

## Sequence No: 84303250

### Bennett Road & McGregor Road Gisborne

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



#### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (LV)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Imagery sourced from Open StreetMap

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**

0 0.01km

**Authorised Officer: Jack Wiltshire**  
**Page: 148 of 371 SIGNED:**

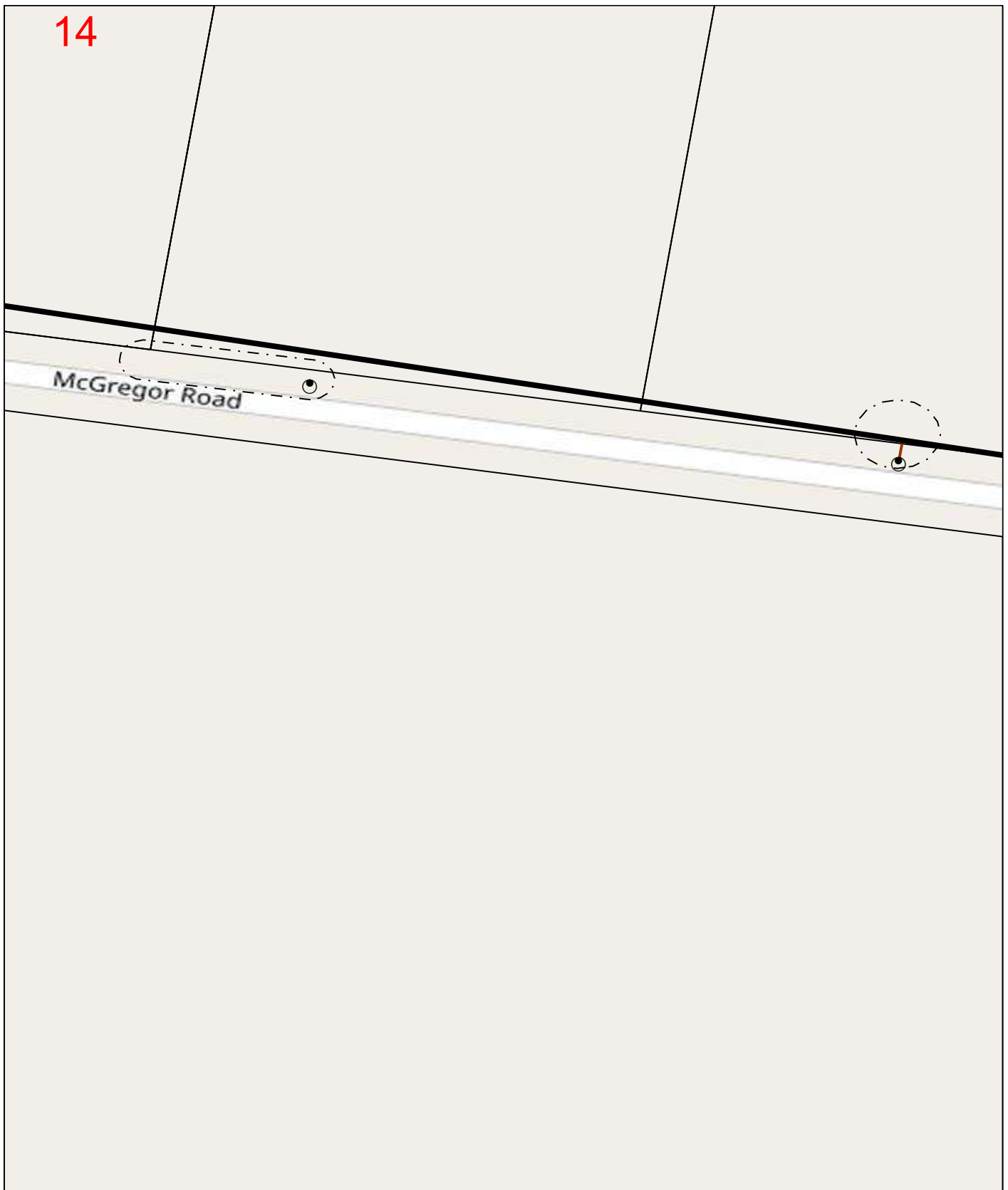


# Map 14

## Sequence No: 84303250

### Bennett Road & McGregor Road Gisborne

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



#### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (L.V)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Imagery sourced from Open StreetMaps

MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 149 of 371 SIGNED:

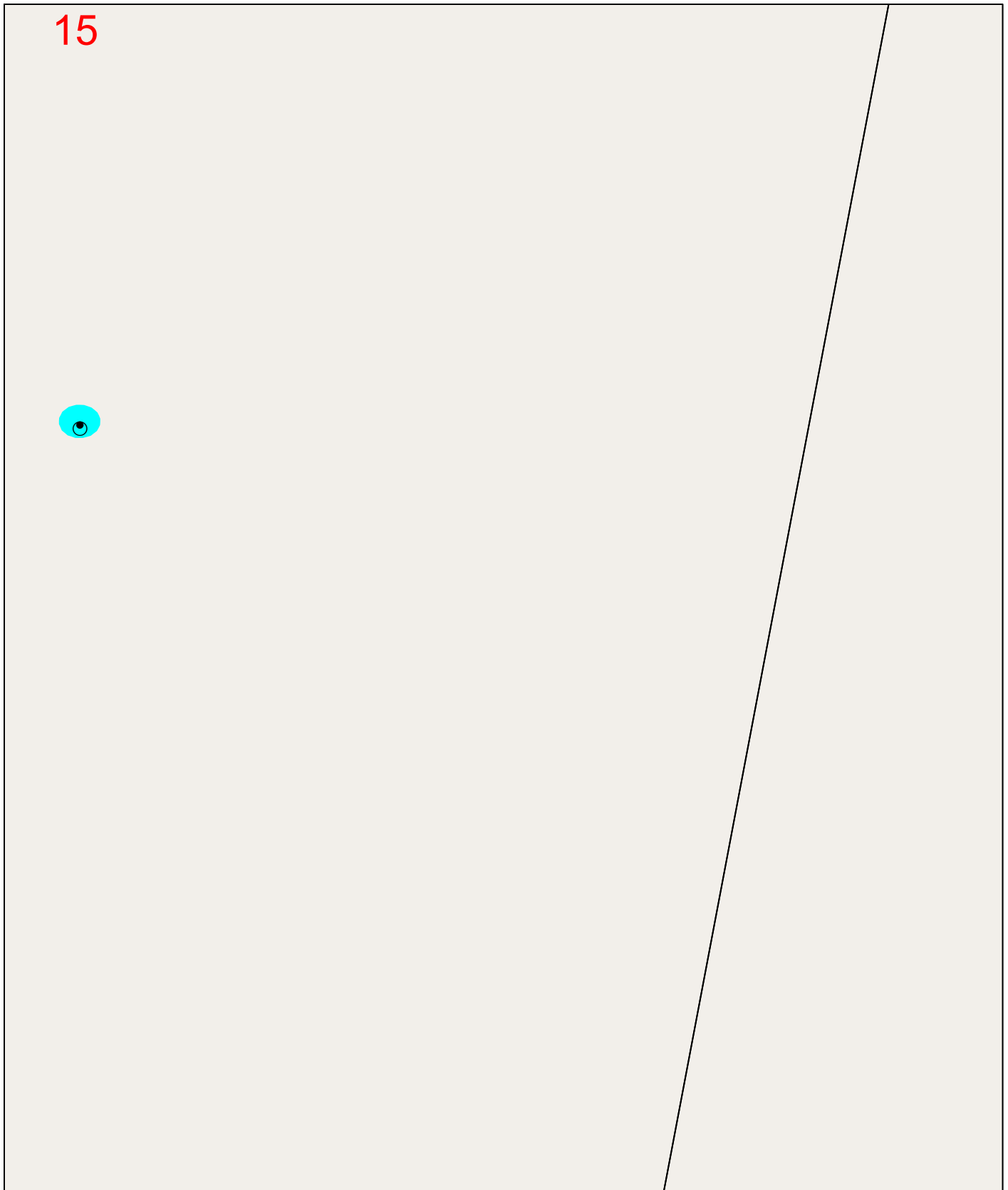


# Map 15

## Sequence No: 84303250

Bennett Road & McGregor Road Gisborne

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (LV)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Imagery sourced from Open StreetMap

MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 150 of 371 SIGNED:

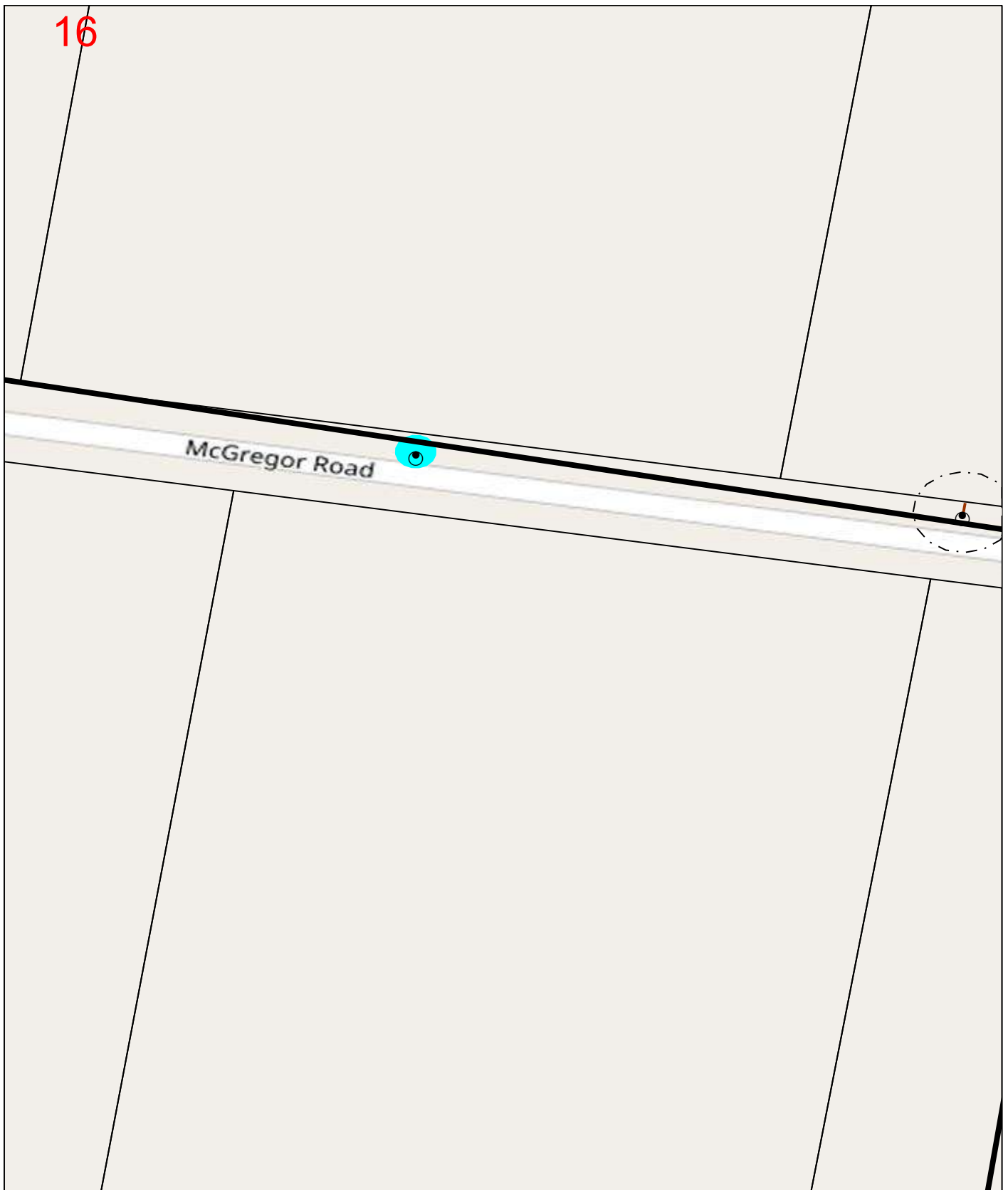


# Map 16

## Sequence No: 84303250

### Bennett Road & McGregor Road Gisborne

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



#### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (L.V)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Imagery sourced from Open StreetMap

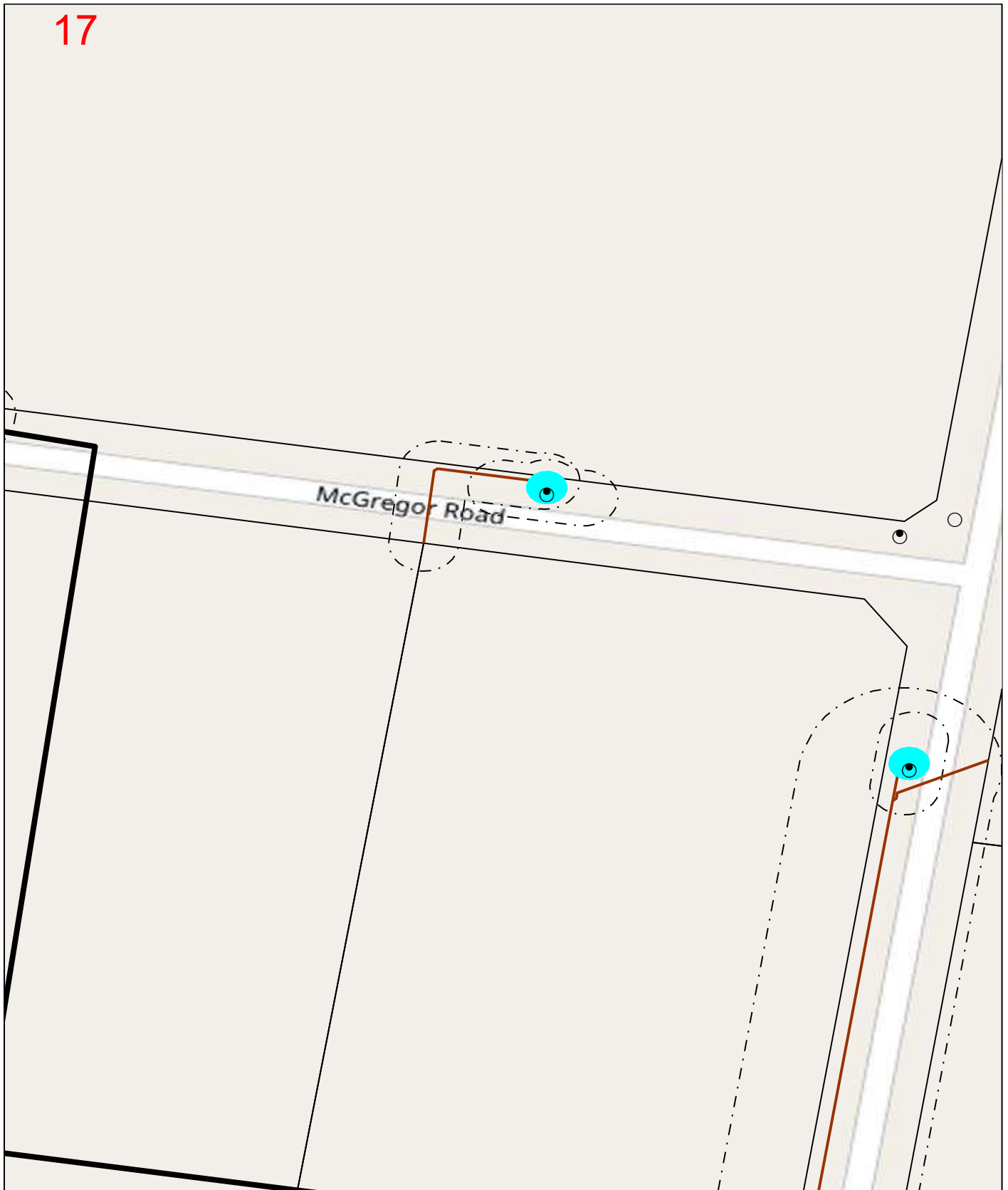
**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**

0 0.01km

**Authorised Officer: Jack Wiltshire**  
**Page: 151 of 371 SIGNED:**

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**

17



#### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Communication Cable
- Earth Cable
- Pole (Subtransmission)
- Pole (LV)
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Imagery sourced from Open StreetMap

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
**Page: 152 of 371 SIGNED:**





# Map 18

## Sequence No: 84303250

Bennett Road & McGregor Road Gisborne

**MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS**



### LEGEND:

- DBYD Work Area
- SWER Substation
- High Voltage Cable
- Communication Cable
- Pole (Subtransmission)
- Pole (LV)
- Zone Substation
- Distribution Substation
- Low Voltage Cable
- Earth Cable
- Property Boundary

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Imagery sourced from Open StreetMap

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**

0 0.01km

**Authorised Officer: Jack Wiltshire**  
**Page: 153 of 371 SIGNED:**

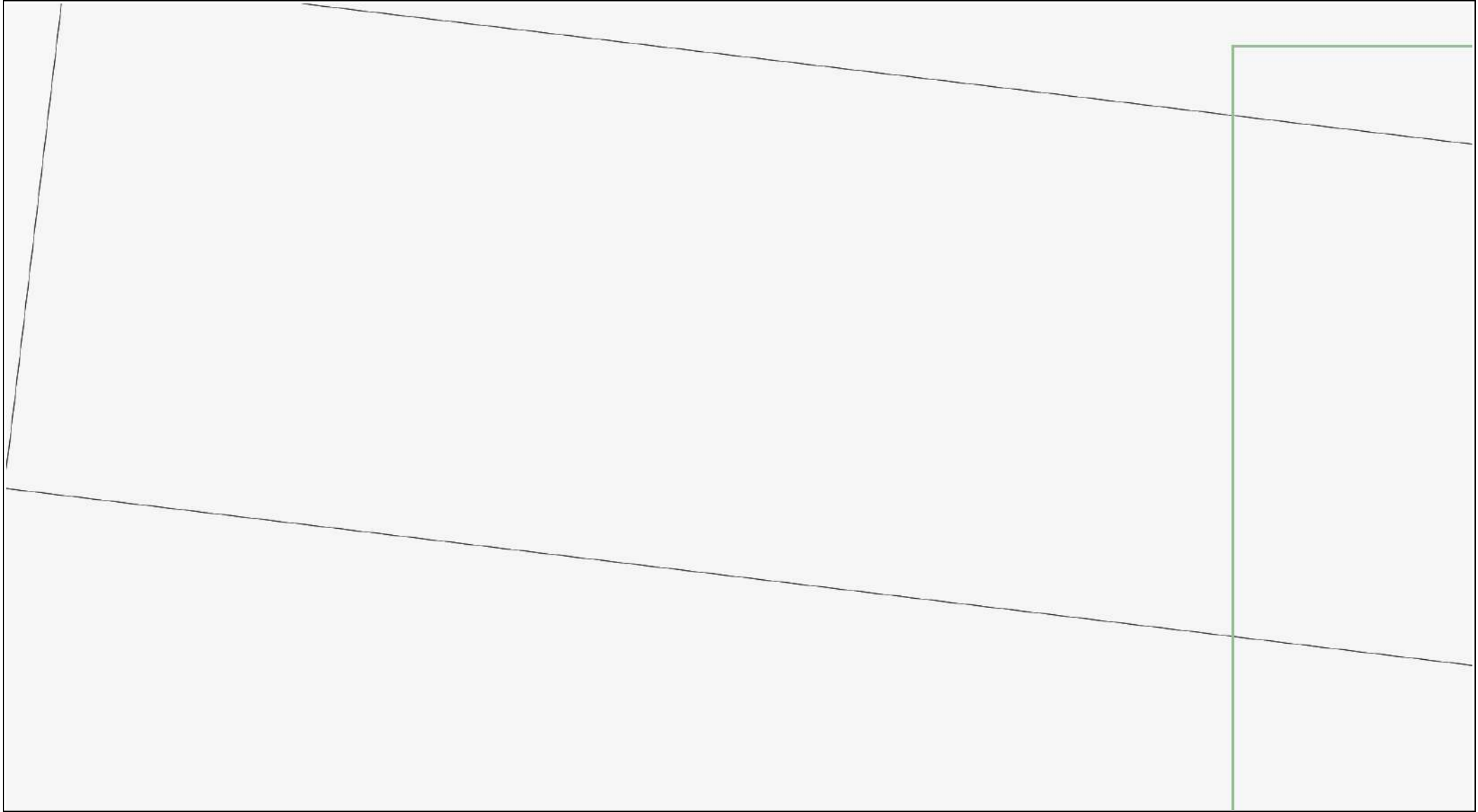


Legend			
LV Cable	Conduit	Drawing Boundary	LV / Lighting Pole
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station	LV / HV Pole
Subtransmission Cable	DBYD Search Area	Distribution Substation	HV Pole
Fibre Optic / Auxiliary Cable	Connection		LV / Subtrans. Pole
			LV / HV / Subtrans. Pole
			HV / Subtrans. Pole
			Subtrans. Pole

Issue Date: 24/05/2018  
 DBYD Seq. No: 71805162  
 DBYD Job No: 4218709  
 Scale: 1:1000  
 Over View

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
 Date: 16/11/2022  
 Authorised Officer: Jack Wilshire  
 Page: 154 of 371 SIGNED:

**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.



Legend		
LV Cable	Conduit	Drawing Boundary
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station
Subtransmission Cable	DBYD Search Area	Distribution Substation
Fibre Optic / Auxiliary Cable	Connection	LV / Lighting Pole
		LV / HV Pole
		HV Pole
		LV / Subtrans. Pole
		LV / HV / Subtrans. Pole
		HV / Subtrans. Pole
		Subtrans. Pole

Issue Date: 24/05/2018

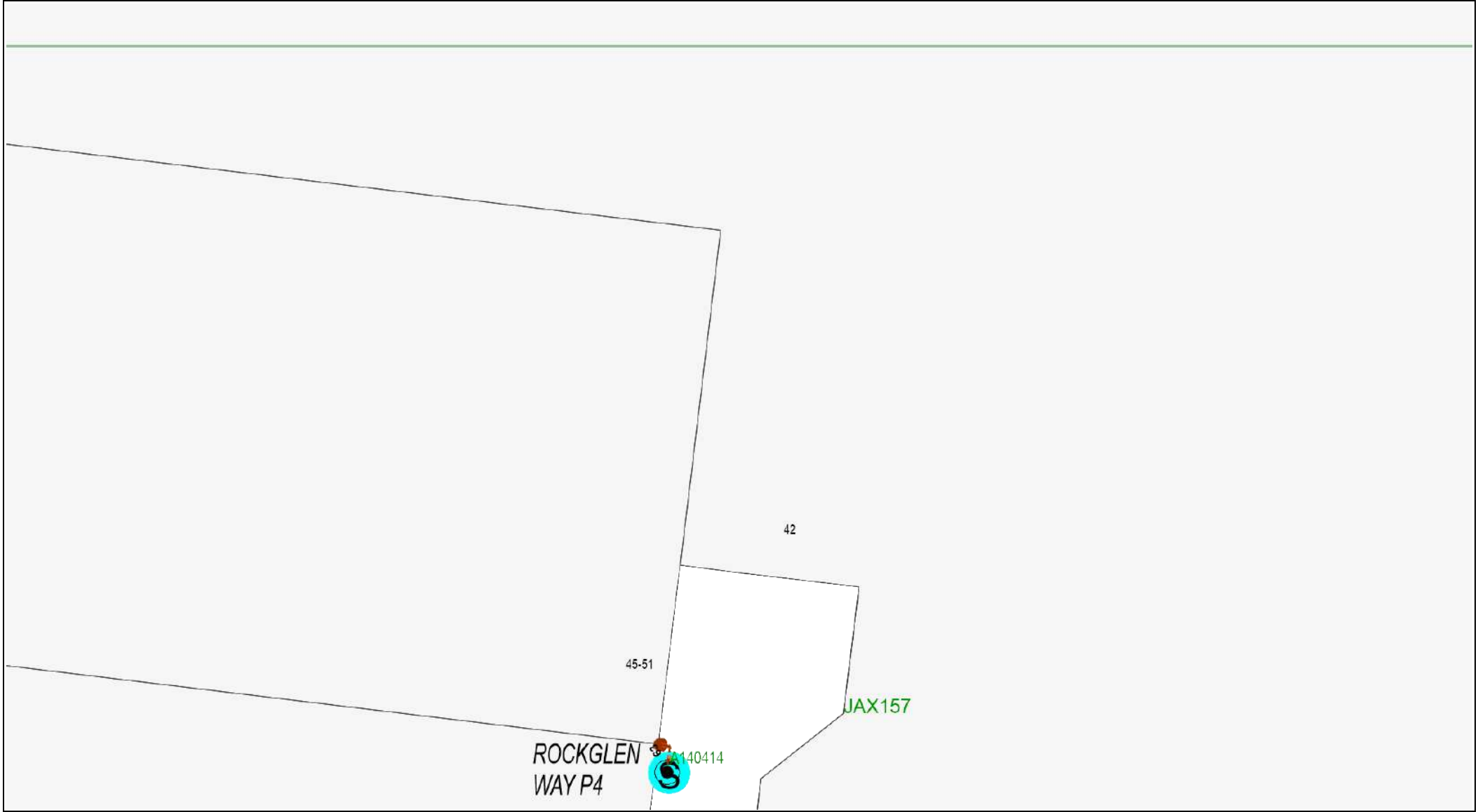
DBYD Seq. No: 71805162

DBYD Job No: 4218709

Scale: 1:1000

MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 155 of 371 SIGNED:

**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.

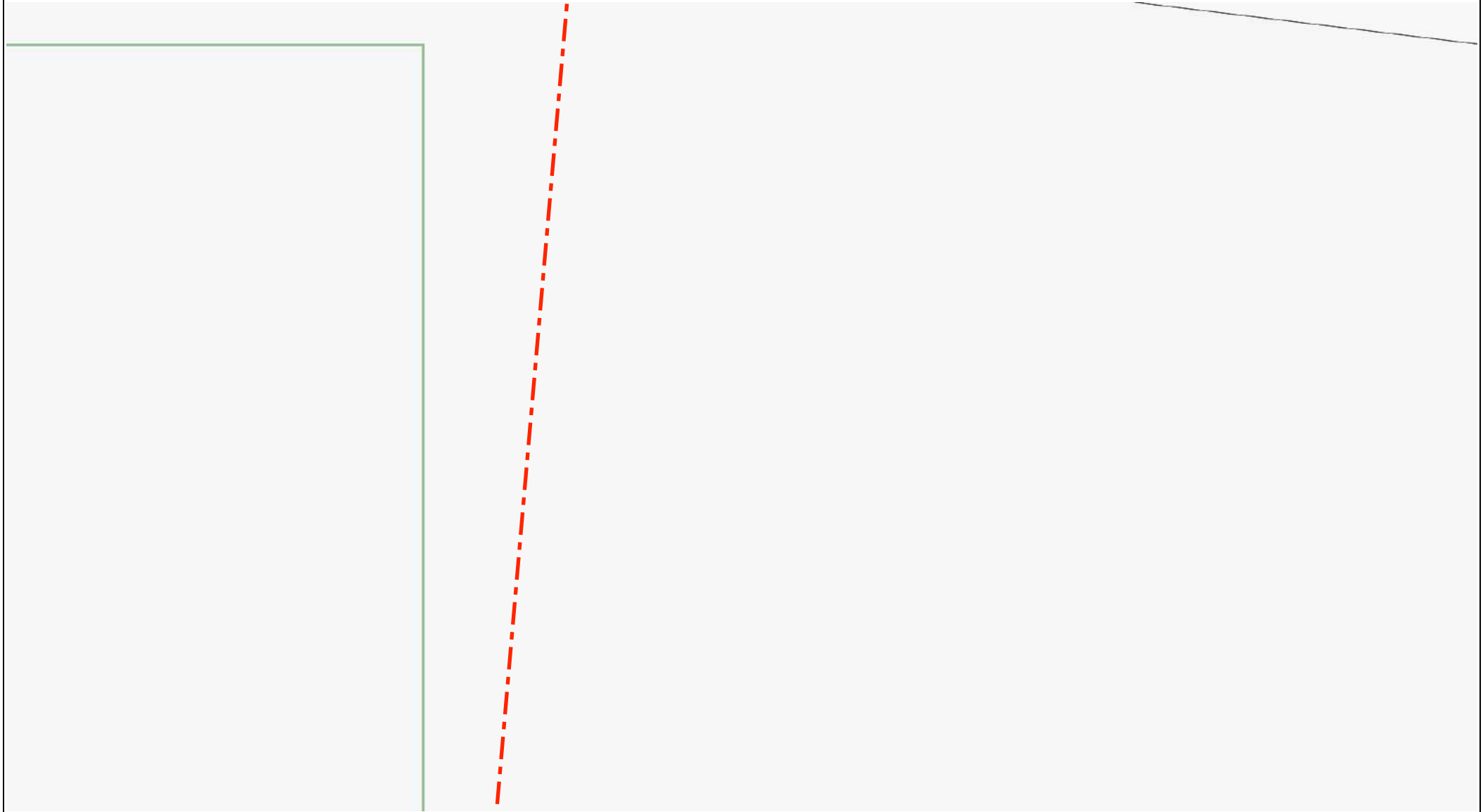


Legend			
LV Cable	Conduit	Drawing Boundary	LV / Lighting Pole
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station	LV / HV Pole
Subtransmission Cable	DBYD Search Area	Distribution Substation	HV Pole
Fibre Optic / Auxiliary Cable	Connection		LV / Subtrans. Pole
			LV / HV / Subtrans. Pole
			HV / Subtrans. Pole
			Subtrans. Pole

Issue Date: 24/05/2018  
 DBYD Seq. No: 71805162  
 DBYD Job No: 4218709  
 Scale: 1:1000  
 Title No: 2

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
 Date: 16/11/2022  
 Authorised Officer: Jack Wilshire  
 Page: 156 of 371 SIGNED:

**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.

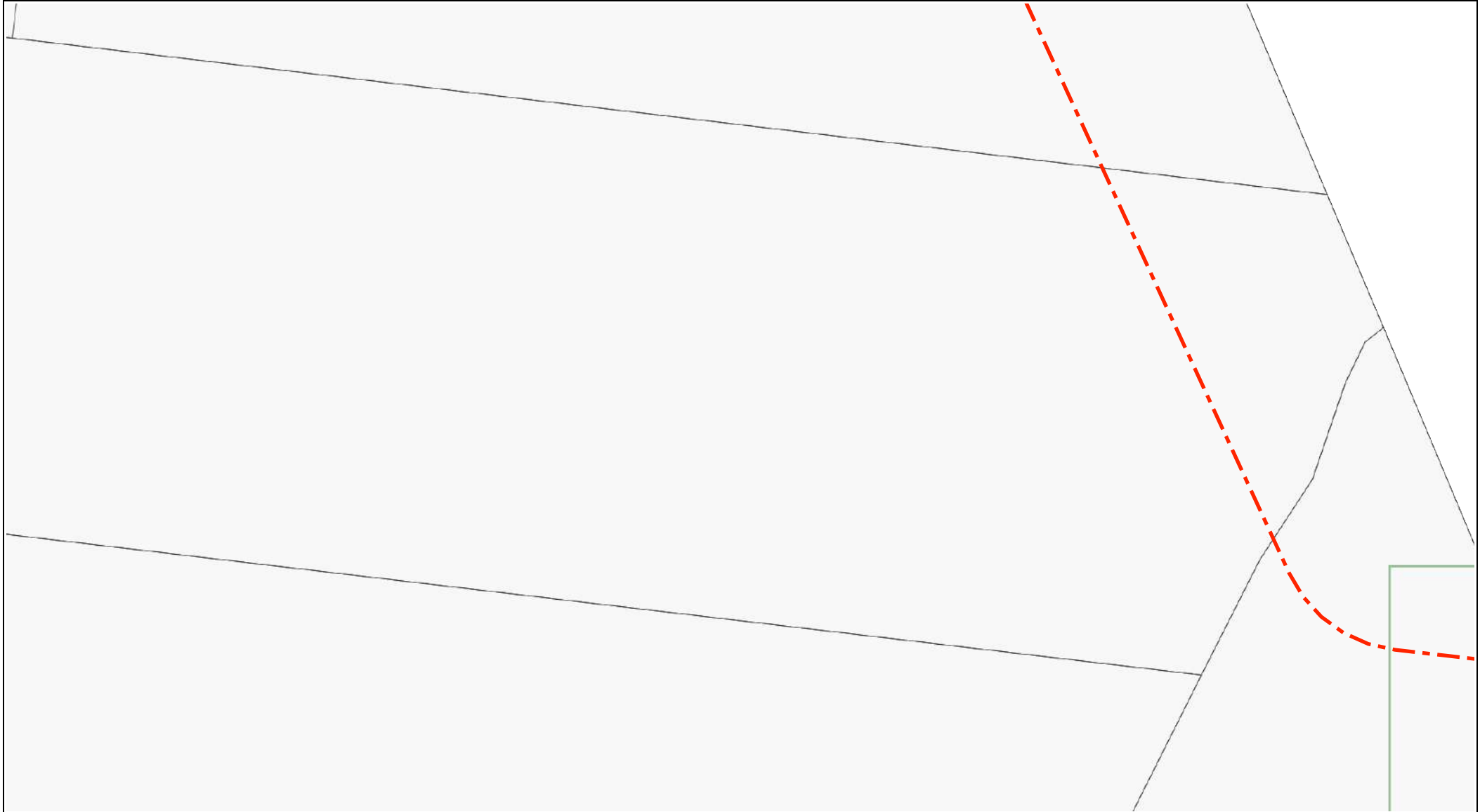


Legend		
LV Cable	Conduit	Drawing Boundary
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station
Subtransmission Cable	DBYD Search Area	Distribution Substation
Fibre Optic / Auxiliary Cable	Connection	LV / Lighting Pole
		LV / HV Pole
		HV Pole
		LV / Subtrans. Pole
		LV / HV / Subtrans. Pole
		HV / Subtrans. Pole
		Subtrans. Pole

Issue Date: 24/05/2018  
 DBYD Seq. No: 71805162  
 DBYD Job No: 4218709  
 Scale: 1:1000  
 Title No: 3

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 157 of 371 SIGNED:

**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.

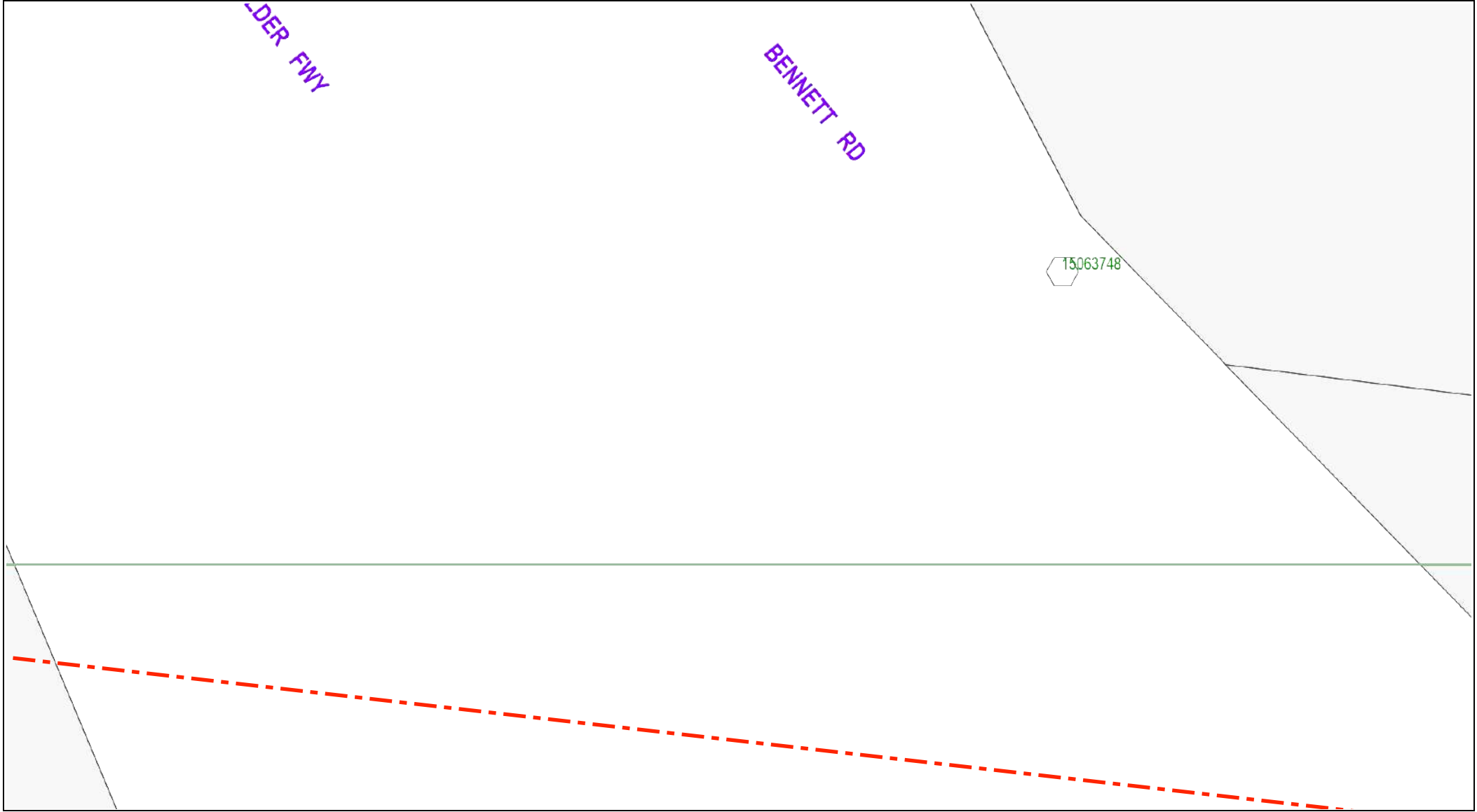


Legend		
LV Cable	Conduit	Drawing Boundary
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station
Subtransmission Cable	DBYD Search Area	Distribution Substation
Fibre Optic / Auxiliary Cable	Connection	LV / Lighting Pole
		LV / HV Pole
		HV Pole
		LV / Subtrans. Pole
		LV / HV / Subtrans. Pole
		HV / Subtrans. Pole
		Subtrans. Pole

Issue Date: 24/05/2018  
 DBYD Seq. No: 71805162  
 DBYD Job No: 4218709  
 Scale: 1:1000  
 Title No: 14218709

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
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**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.

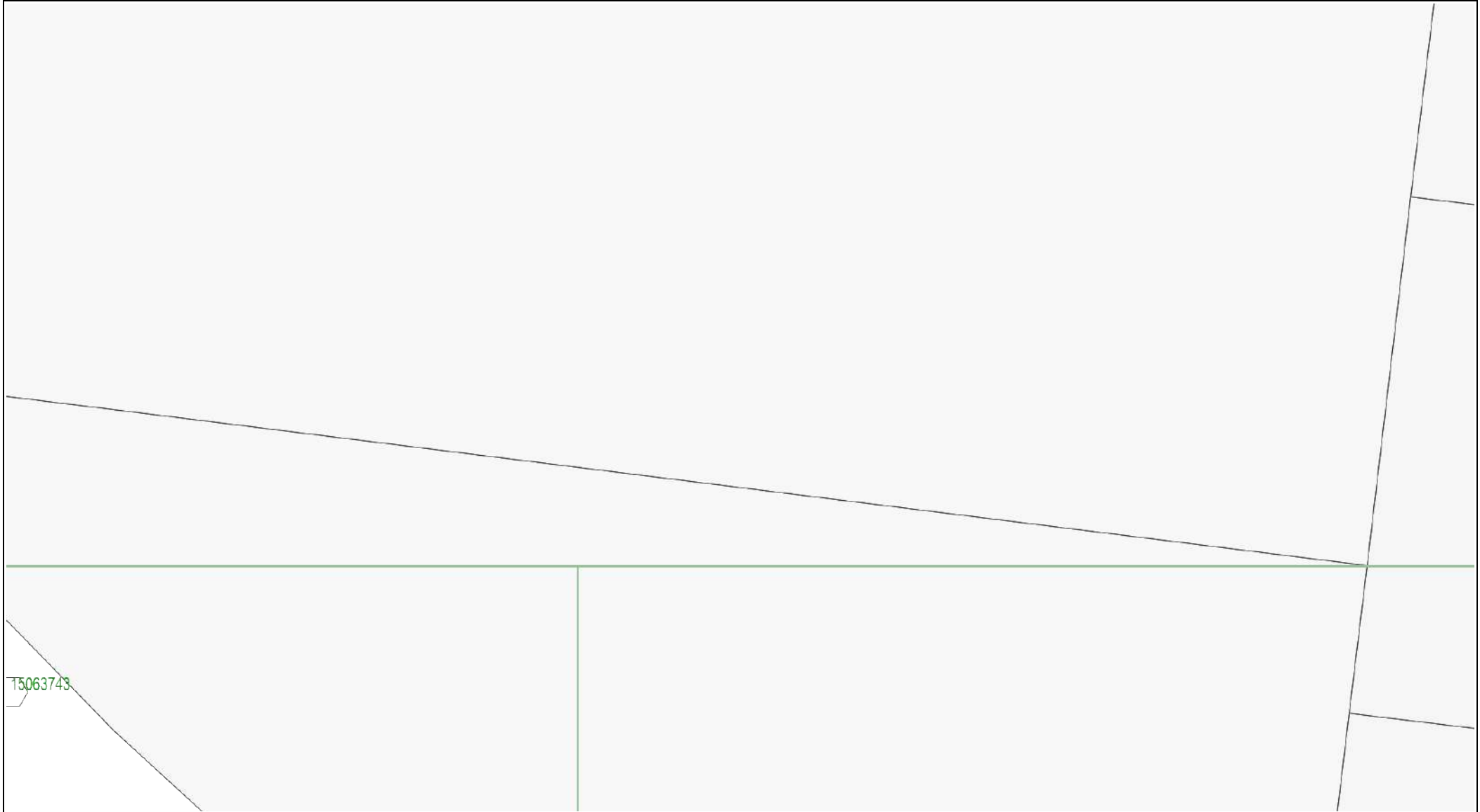


Legend		
LV Cable	Conduit	Drawing Boundary
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station
Subtransmission Cable	DBYD Search Area	Distribution Substation
Fibre Optic / Auxiliary Cable	Connection	LV / Lighting Pole
		LV / HV Pole
		HV Pole
		LV / Subtrans. Pole
		LV / HV / Subtrans. Pole
		HV / Subtrans. Pole
		Subtrans. Pole

Issue Date: 24/05/2018  
 DBYD Seq. No: 71805162  
 DBYD Job No: 4218709  
 Scale: 1:1000  
 Title No: 5

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 159 of 371 SIGNED:

**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.



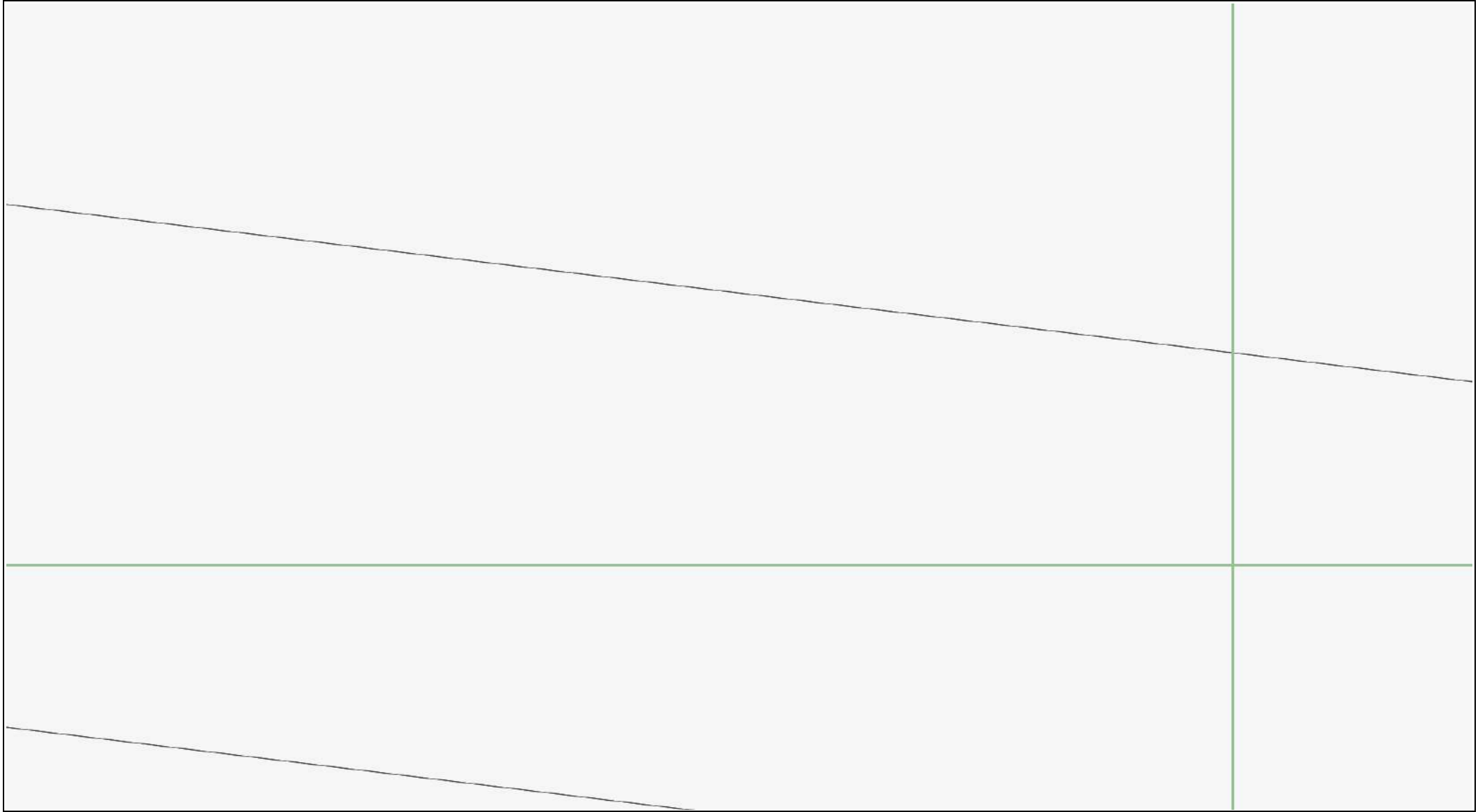
Legend		
LV Cable	Conduit	Drawing Boundary
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station
Subtransmission Cable	DBYD Search Area	Distribution Substation
Fibre Optic / Auxiliary Cable	Connection	
LV / Lighting Pole	LV / HV Pole	LV / Subtrans. Pole
HV Pole	LV / HV / Subtrans. Pole	HV / Subtrans. Pole
		Subtrans. Pole

Issue Date: 24/05/2018  
 DBYD Seq. No: 71805162  
 DBYD Job No: 4218709  
 Scale: 1:1000  
 Title No: 6

**MACEDON RANGES PLANNING SCHEME DEVELOPMENT PLAN: DP/2019/1**  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 160 of 371 SIGNED:

**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.





Legend		
LV Cable	Conduit	Drawing Boundary
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station
Subtransmission Cable	DBYD Search Area	Distribution Substation
Fibre Optic / Auxiliary Cable	Connection	LV / Lighting Pole
		LV / HV Pole
		HV Pole
		LV / Subtrans. Pole
		LV / HV / Subtrans. Pole
		HV / Subtrans. Pole
		Subtrans. Pole

Scale: 1:1000

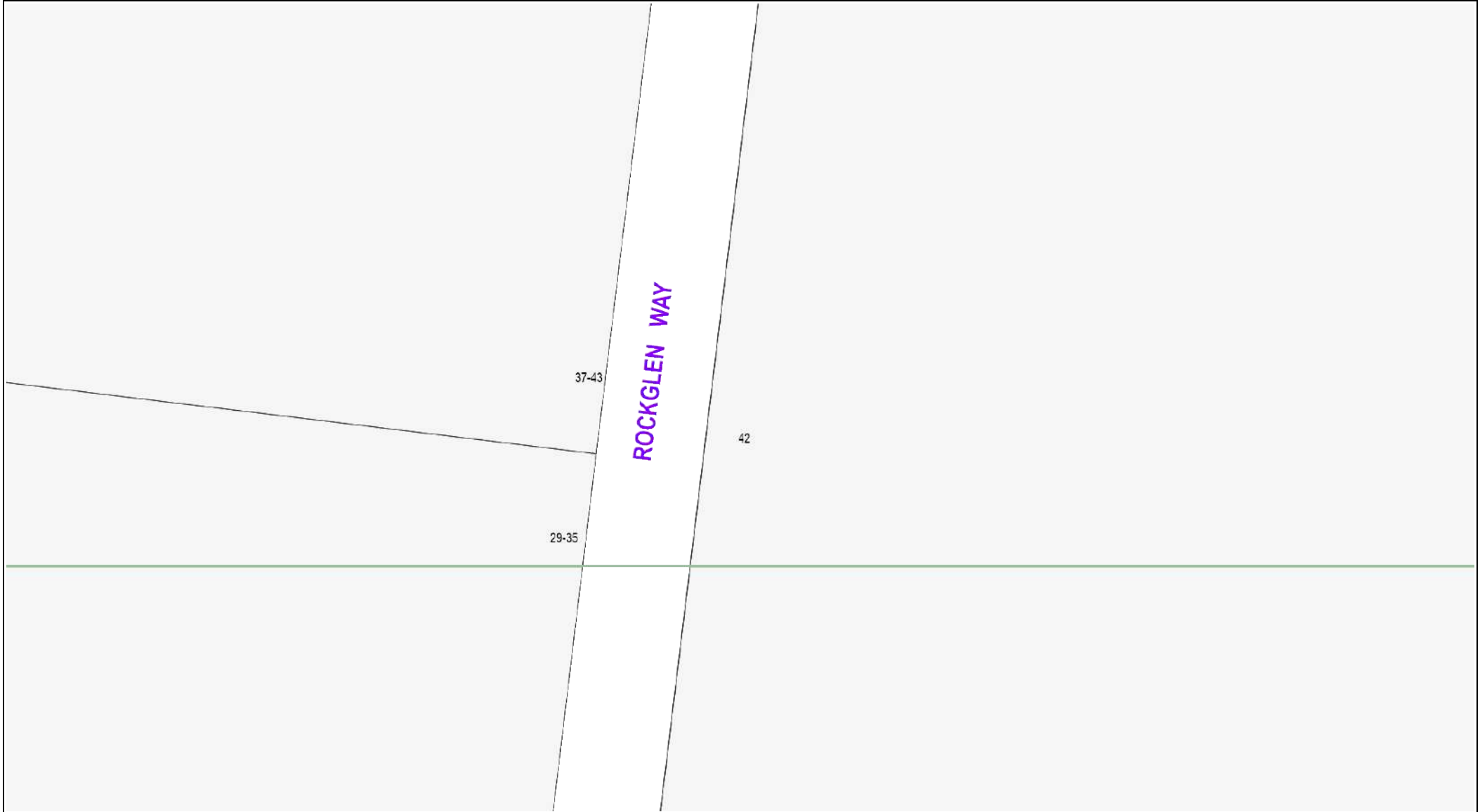
Issue Date: 24/05/2018

DBYD Seq. No: 71805162

DBYD Job No: 4218709

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
**Page: 161 of 371 SIGNED:**

**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.



Legend		
LV Cable	Conduit	Drawing Boundary
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station
Subtransmission Cable	DBYD Search Area	Distribution Substation
Fibre Optic / Auxiliary Cable	Connection	LV / Lighting Pole
		LV / HV Pole
		HV Pole
		LV / Subtrans. Pole
		LV / HV / Subtrans. Pole
		HV / Subtrans. Pole
		Subtrans. Pole

Issue Date: 24/05/2018

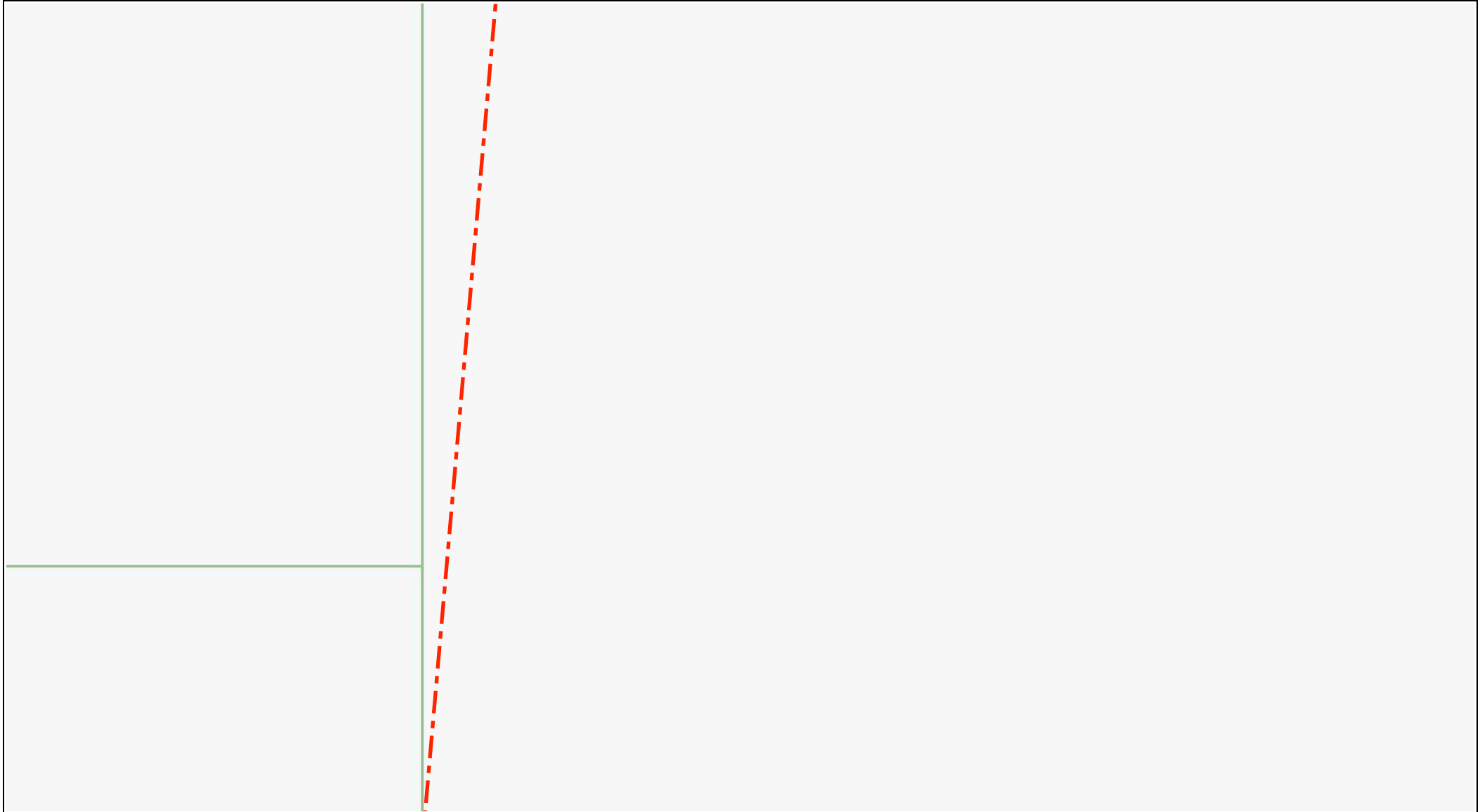
DBYD Seq. No: 71805162

DBYD Job No: 4218709

Scale: 1:1000

MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 162 of 371 SIGNED:

**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.

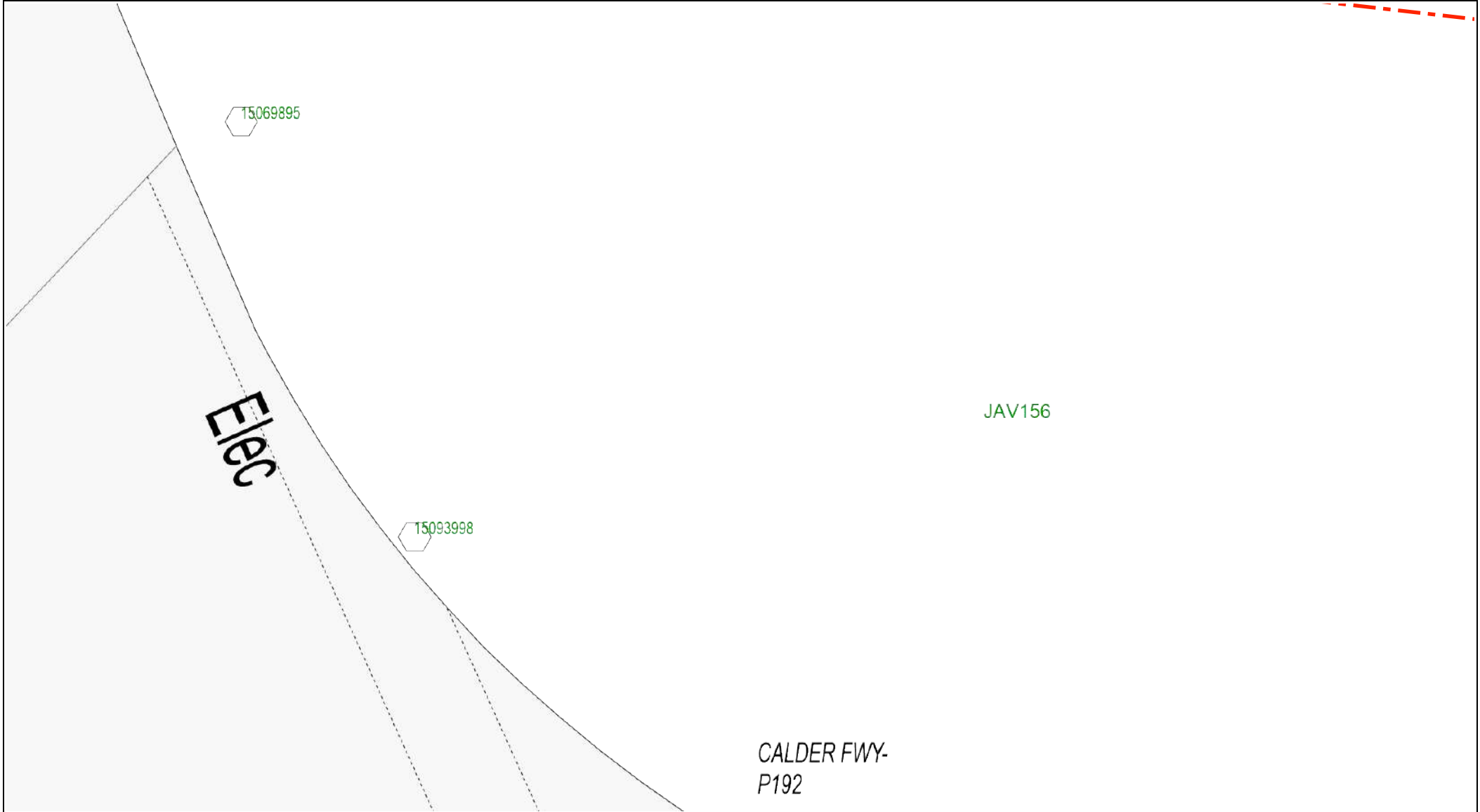


Legend		
LV Cable	Conduit	Drawing Boundary
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station
Subtransmission Cable	DBYD Search Area	Distribution Substation
Fibre Optic / Auxiliary Cable	Connection	LV / Lighting Pole
		LV / HV Pole
		HV Pole
		LV / Subtrans. Pole
		LV / HV / Subtrans. Pole
		HV / Subtrans. Pole
		Subtrans. Pole

Issue Date: 24/05/2018  
 DBYD Seq. No: 71805162  
 DBYD Job No: 4218709  
 Scale: 1:1000

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 163 of 371 SIGNED:

**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.



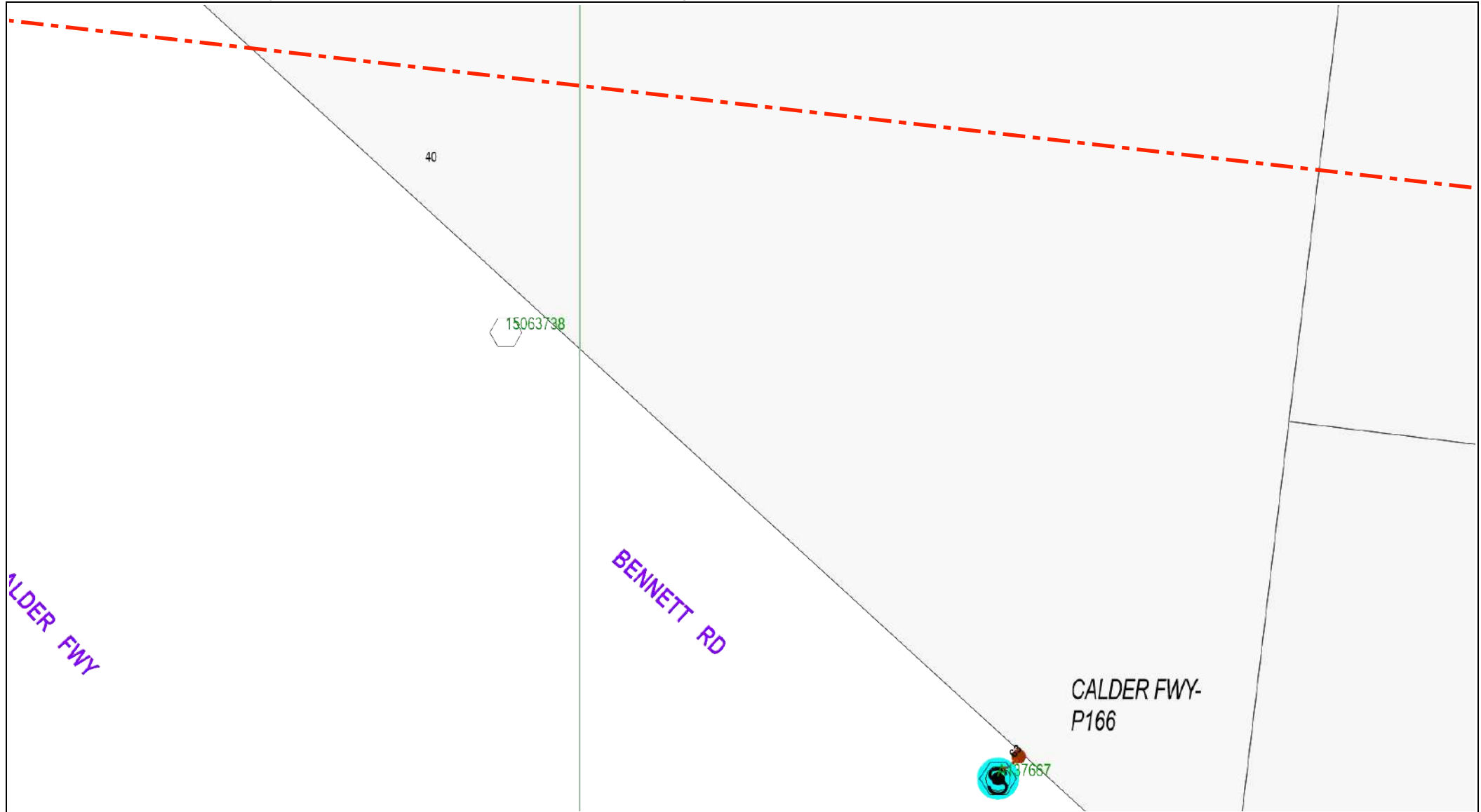
ABN 82 064 651 083

Legend		
LV Cable	Conduit	Drawing Boundary
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station
Subtransmission Cable	DBYD Search Area	Distribution Substation
Fibre Optic / Auxiliary Cable	Connection	LV / Lighting Pole
		LV / HV Pole
		HV Pole
		LV / Subtrans. Pole
		LV / HV / Subtrans. Pole
		HV / Subtrans. Pole
		Subtrans. Pole

Issue Date: 24/05/2018  
 DBYD Seq. No: 71805162  
 DBYD Job No: 4218709  
 Scale: 1:1000  
 Title No: 10

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 164 of 371 SIGNED:

**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.



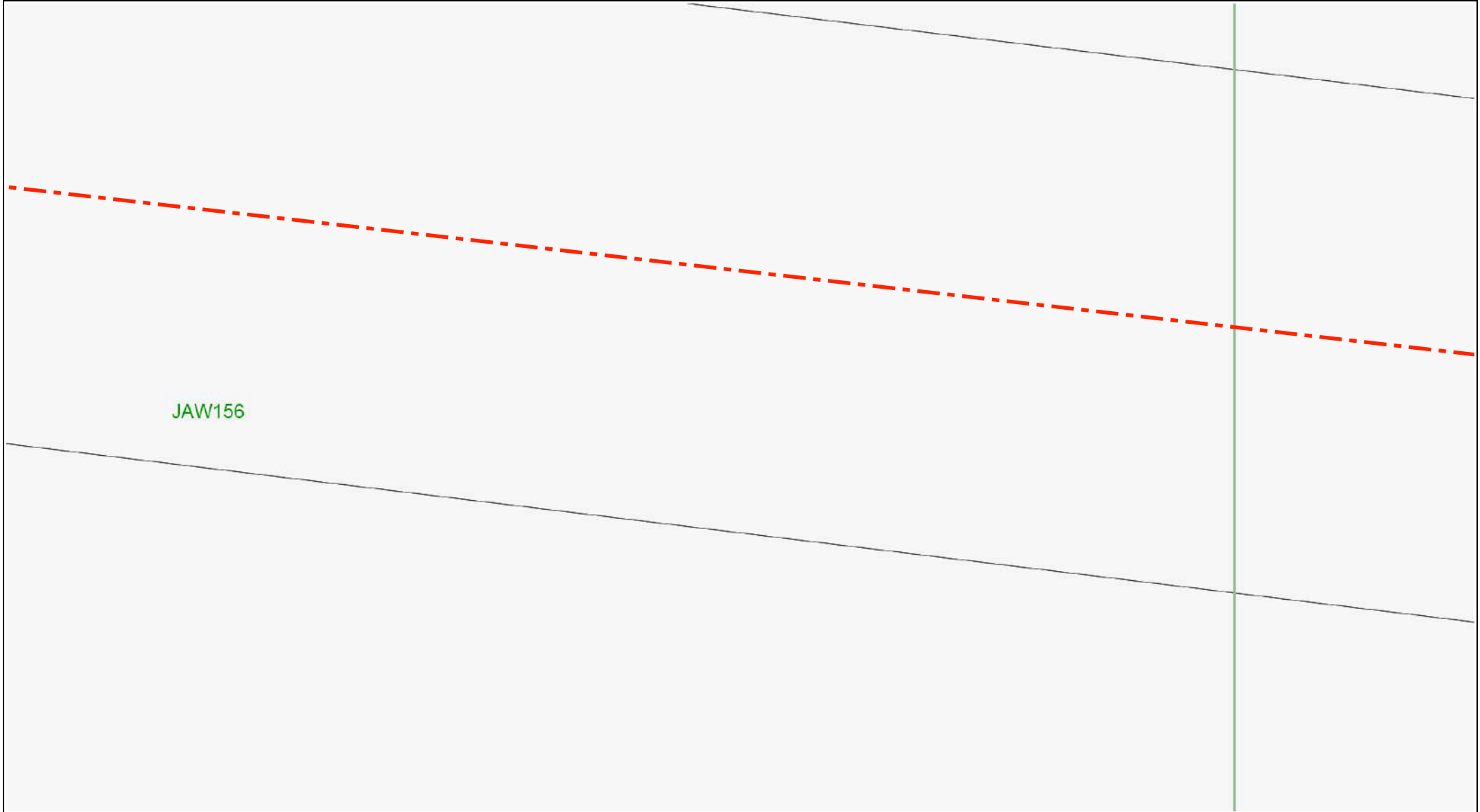
ABN 82 064 651 083

Legend		
LV Cable	Conduit	Drawing Boundary
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station
Subtransmission Cable	DBYD Search Area	Distribution Substation
Fibre Optic / Auxiliary Cable	Connection	LV / Lighting Pole
		LV / HV Pole
		HV Pole
		LV / Subtrans. Pole
		LV / HV / Subtrans. Pole
		HV / Subtrans. Pole
		Subtrans. Pole

Issue Date: 24/05/2018  
 DBYD Seq. No: 71805162  
 DBYD Job No: 4218709  
 Scale: 1:1000  
 Title No: 150637667

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 165 of 371 SIGNED:

**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.



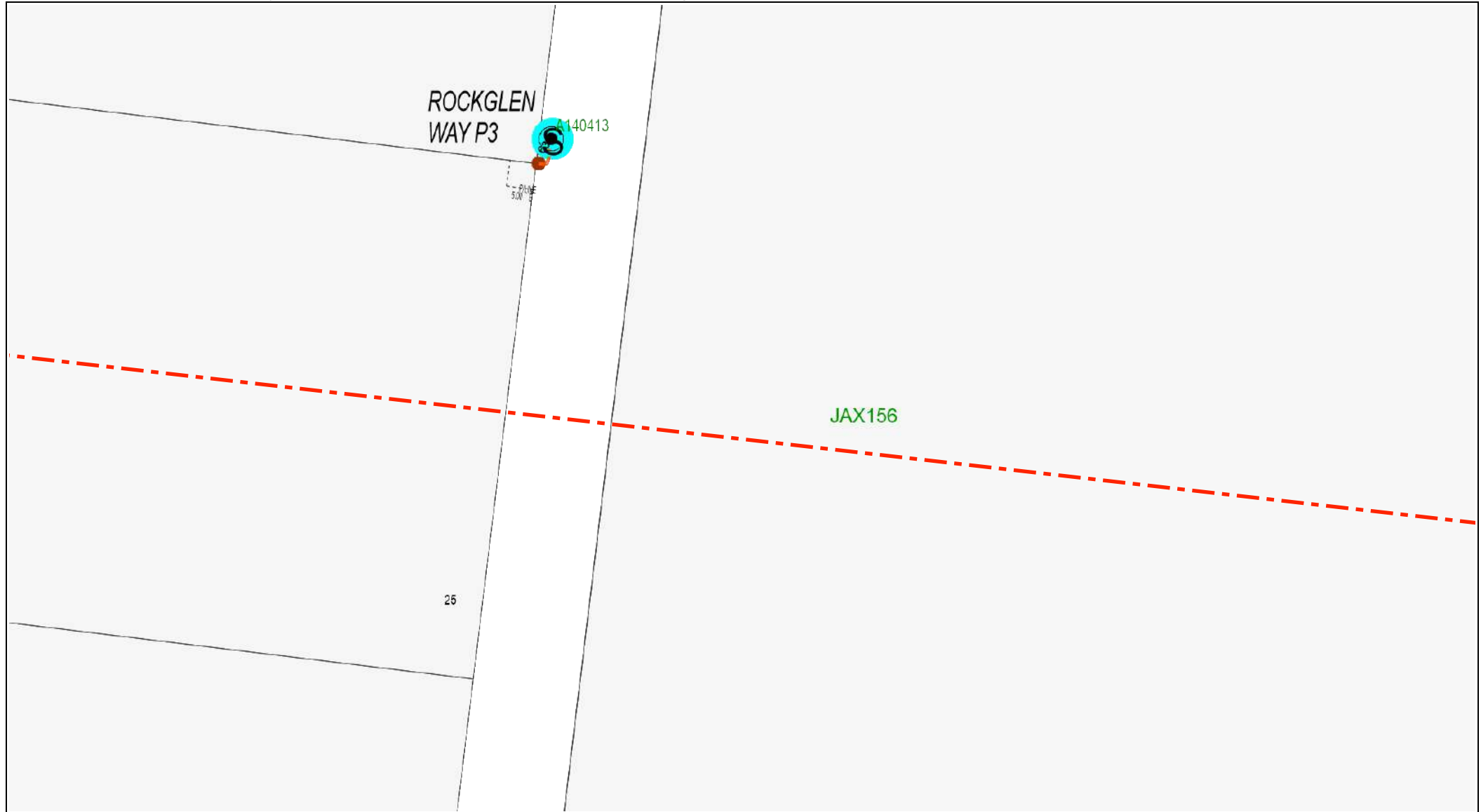
ABN 82 064 651 083

Legend		
LV Cable	Conduit	Drawing Boundary
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station
Subtransmission Cable	DBYD Search Area	Distribution Substation
Fibre Optic / Auxiliary Cable	Connection	LV / Lighting Pole
		LV / HV Pole
		HV Pole
		LV / Subtrans. Pole
		LV / HV / Subtrans. Pole
		HV / Subtrans. Pole
		Subtrans. Pole

Issue Date: 24/05/2018  
 DBYD Seq. No: 71805162  
 DBYD Job No: 4218709  
 Scale: 1:1000  
 Title No: 12

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
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**WARNING:** This is a representation of Jemena Electricity Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the Date of Issue.



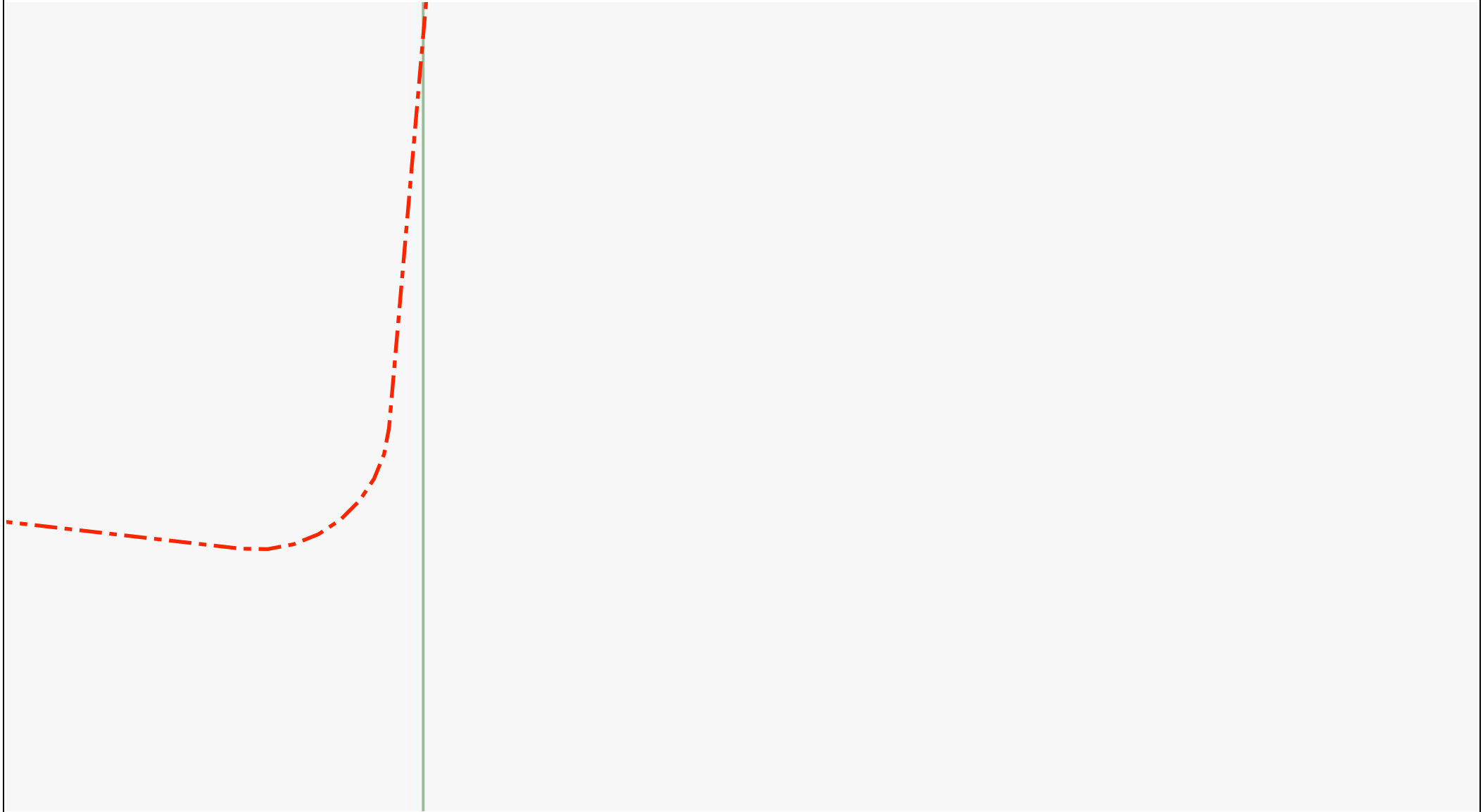
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Legend		
LV Cable	Conduit	Drawing Boundary
HV Cable	Asbestos Conduit	Zone Sub. / Terminal Station
Subtransmission Cable	DBYD Search Area	Distribution Substation
Fibre Optic / Auxiliary Cable	Connection	LV / Lighting Pole
		LV / HV Pole
		HV Pole
		LV / Subtrans. Pole
		LV / HV / Subtrans. Pole
		HV / Subtrans. Pole
		Subtrans. Pole

Issue Date: 24/05/2018  
 DBYD Seq. No: 71805162  
 DBYD Job No: 4218709  
 Scale: 1:1000  
 Title No: 13

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
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Legend			
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			Subtrans. Pole

Scale: 1:1000

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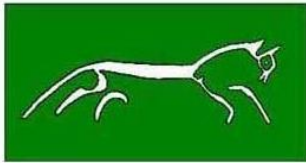
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 DEVELOPMENT PLAN: DP/2019/1  
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**Archaeo-Environments Pty Ltd**  
**heritage soils and landscape**

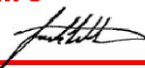
## **Bennett Road Development Plan** **Gisborne South**

### **LAND CAPABILITY & STORM WATER REVIEW**



**Land Capability Assessor**  
**Dr Chris Day**  
**Archaeo-Environments Pty Ltd**  
**ABN 89 119 932 437**

**Rev 5 December 4 2021**

**MACEDON RANGES PLANNING SCHEME**  
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**Date: 16/11/2022**  
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# LAND CAPABILITY AND STORM WATER REPORT

## Bennett Road Development Plan, Gisborne South

### ABOUT THE AUTHORS

**Dr Chris Day** DPhil, MIFA Director, Archaeo-Environments Ltd

Chris has over 35 years experience in geology, geomorphology, soils and heritage work which included 12 years in Bendigo and Benalla with DSE. This included management of catchment and salinity research teams and soil and soil permeability (recharge) mapping as a basis for Dryland Salinity Management Plans across the Avoca, Loddon, Campaspe and Goulburn Broken Catchments.

**Larry White** B Agr Sc., CPSS<sub>3</sub>, CPAg, CENVP

Larry has over 45 years of experience in land and soils management with preparation of land capability assessment and land management plans throughout Victoria since 1990.

Larry has held senior research positions with Victorian Land Protection and Department of Conservation as well as EPA and Golder Associates. Larry has prepared over 500 land capability and land management plans, VCAT hearings and consulting work with various Shires throughout Victoria

# 1 INTRODUCTION

A land capability and storm water review has been commissioned by various landowners for a Development Plan for 130ha at Bennett Road, Gisborne. The land is subject to Macedon Ranges Planning Scheme Development Plan Overlay 18 (DPO18) and also the Rural Living Zone Schedule 2 under the recent C110 Planning Scheme Amendment. A Development Plan is required and will provide an overview document for a future planning permit application.

The land is not within a Declared Water Supply Catchment. The aim of this report is to identify the various issues which will inform sub-division and a planning permit application to Macedon Ranges Shire Council.

## 1.1 SCOPE OF WORKS

The land capability and storm water review will include a summary of potential site issues relevant to local planning requirements as follows :

To demonstrate the capacity of infrastructure to service the proposed lot density of the development ; retain waste water on site; treat, retard and reduce stormwater; and reduce any impacts on soil and water downstream of the development

The scoping study is conservative, aimed at the protection of environmental and human health. It is not intended to support a particular proposal, but rather to describe the existing land parcels and suggest how adverse environmental impacts of the proposal may be minimised. Field work was conducted on March 24, 2018.

## 2.0 DATA SCOPE AND LIMITATIONS

The land planning assessment has been prepared by Dr. Chris Day (Archaeo-Environments Ltd) and Larry White (Paladin White Pty Ltd). Mapping and assessment has been conducted at a scale of 1 : 2500 and provides a guide and professional overview of site conditions. Terrain mapping, soil properties, climatic and botanical data are based on reconnaissance field-work and regional data sources for the purpose of reasonable and relevant estimates. As physical conditions, soils and local hydrology may vary over time, the overview assessment on which estimates are made in this report are limited to 18 months. This assessment is sufficient for a broad assessment within DPO18. The report should be used within the scope and scale of the brief and not for detailed design or property layout works or for any development beyond those of the brief. The scope of the Development Plans and more detailed assessment would occur at the time of development of the future lots. The report and recommendations therein are to be used to provide guidance toward - but do not guarantee – planning permission. It is not to be used, in full or in part, by any other party without written permission from the author.

### 3 LOCATION AND PROPERTY BACKGROUND

#### 3.1 LOCATION

The subject block is composed of 6 properties. The site occupies approximately 130ha in and around Bennett Rd Gisborne. Located within Macedon Ranges Planning Scheme Development Plan Overlay (DPO18) and Rural Living Zone Schedule 2 under the recent C110 Planning Scheme Amendment. Both the Zone and DPO refer to a minimum lot size of 2ha.

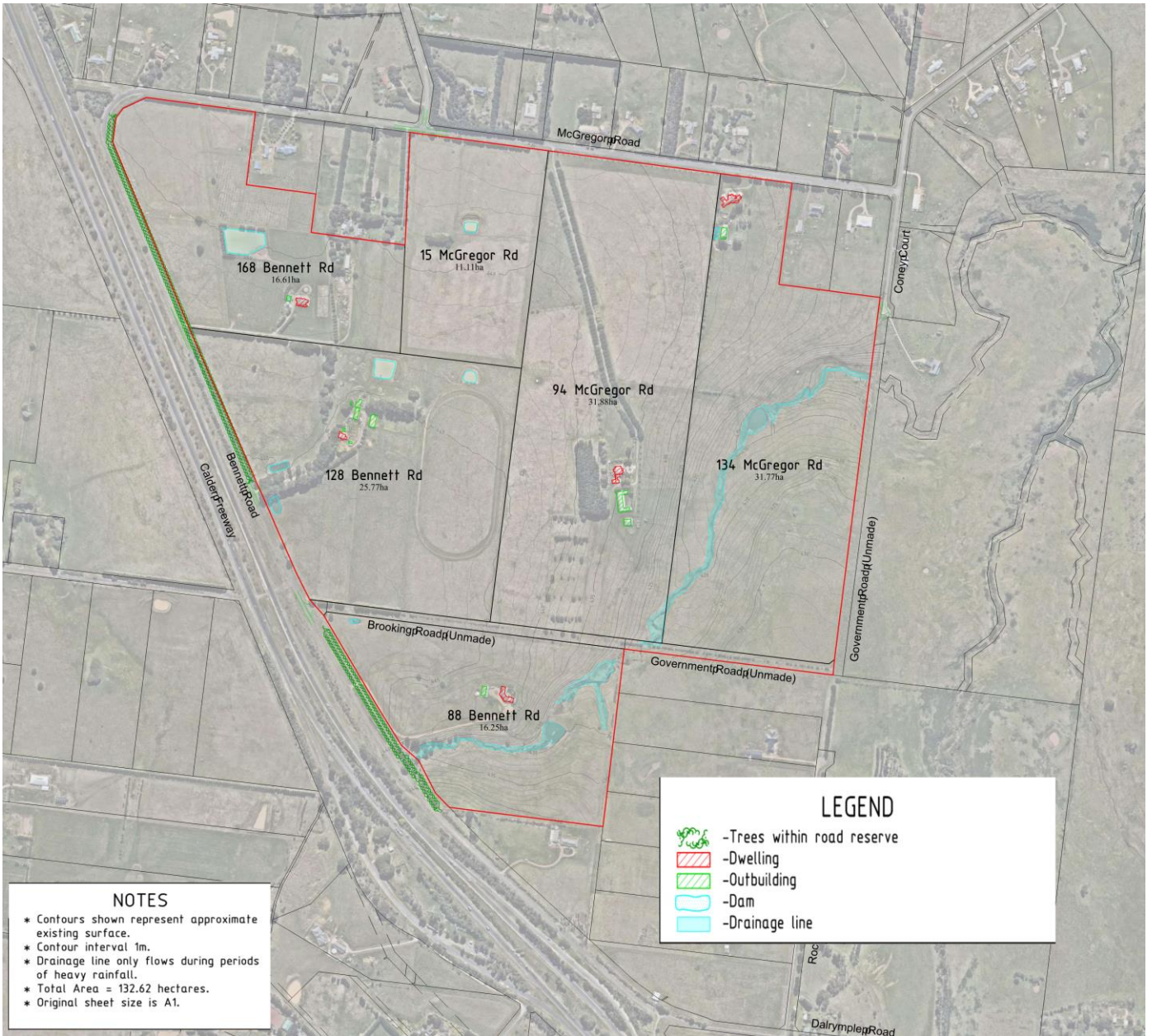


Fig 1 Location Map : Aerial view (courtesy : Terraco Ltd)

## 3.2 GENERAL SETTING/SITE CONDITION

The property is characterised by a broad and open volcanic plain which includes an incised waterway across the south-west. The block has been almost entirely cleared of native vegetation, with minor clumps of eucalypts (predominantly grey box) and tree plantations, with the main vegetation existing as exotic plantings as driveway avenues and some cypress windbreaks and boundary plantings. There are 10 dams which are for the most part across gentle drainage depressions. The property is fenced throughout with a range of horse property and lifestyle properties.

## 3.3 USE OF ADJOINING LAND

The subject property is bounded to the west by Bennett Road and the Calder Freeway to the west, McGregor Road to the north and Dalrymple Road to the south with developed blocks to the north and sloping terrain toward Jacksons Creek to the east.

## 3.4 FACILITIES/INFRASTRUCTURE

### 3.4.1 Mains Power

Mains power will be available to properties within the site.

### 3.4.2 Water

Reticulated potable water will be connected to the development area.

### 3.4.3 Bores and Dams

There are no bores onsite. There are 10 dams on the property. A series of stand-alone dams are situated across the open plain with two dams located across the waterway (Djirri Djirri Creek) to the east. These two dams will be removed under development plans. It is expected that other dams will be seasonal or have minimal volumes in the summer. At the time of inspection most of the dams were essentially dry.

### 3.4.4 Watertable depth

No groundwater bores were observed on the block. Registered bores are located within 200m of the site boundary to the north and south. Reference was made to the VVS (Visualising Victorias Groundwater) website which interpolates regional bore data. On this basis the watertable depth across the development area varies between 10 and 30m with watertable depth becoming shallower toward the north-west. Groundwater salinity varies between 1-3500mg/l and is classed as (b) level beneficial use. On the basis of the VVG website, watertable depth will not be at high risk from effluent disposal across the development area.

### 3.4.5 Climate

Average annual rainfall is in the order of 750-800mm. A one-in-ten year rain is ~750mm. Average estimated annual evapo-transpiration is in the order of ~1350mm. Evaporation may exceed rainfall for 8 months (September to April) in an "average" year and these dry months may be challenging for agricultural production. The district can experience significant variations in rainfall and temperature and can have very cool winters & warm to hot and windy summers (which can

have implications for vegetation establishment).

### 3.5 TOPOGRAPHY AND DRAINAGE

The land encompasses a gently undulating volcanic terrain which falls toward the north and north-east. Water flow and local drainage is predominantly toward an incised waterway (Djirri Djirri Creek) which extends across the south-east corner of the property. Otherwise drainage across the property is via very gentle drainage swales and undefined drainage depressions. There is rock outcrop along the edge of low escarpments above the main drainage line to the east as well as within a stoney rise in the south-east part of the block.

Land form and soil description is based on field inspection and reference to the report : A Study of the Land in the Catchments to the North of Melbourne (Jeffrey P J 1981) SCA. Fig 2 shows general landform and land units across the development area.

**Five main land units have been mapped across the development area.**

- LU 1 Open plain
- LU2 Gentle-moderate slopes
- LU3 Steep slopes
- LU4 Valley floor
- LU5 Stoney rise (o/c)

### 3.6 SOILS-LANDFORMS and WASTE WATER MANAGEMENT

Geology across the development area has been described in Section 3.5 as undulating volcanic terrain. The pattern of soils across this landscape reflects soil development across the large and predominant volcanic plain land unit with smaller soil units within valley edge and drainage features to the east of the property. Soils have been mapped for each land unit as follows :

#### LAND UNIT 1

Land Unit 1 is the predominant land type occupying the majority (73%) of the development area. Soils are typically deep volcanic silty clay (Plate 1) with soil profile described in Table 1 below

#### Soil profile

Yellow-grey sodic duplex soils, coarse structure clay loam

Moderate-low permeability – 5-10cm/day

Soil depth 1-1.5m deep.

Land Capability Rating Fair

Design loading rate (DLR) 2.5L/m<sup>2</sup>/day

Constraints : Localised area of flat-gentle slopes, poor drainage or floaters will require site by site investigation.

#### Summary (on-site WW disposal):

Soils across land unit 1 would present generally suitable conditions for effluent disposal with estimated waste water envelopes at 300-450m<sup>2</sup> in area for 3-5 bedroom dwellings. At individual 2ha block level some localised conditions may require lot by lot assessment and design subject to location of building envelopes etc..



Plate 1 Typical deep yellow-grey clay loam across land unit 1



Plate 2 View to south across land unit 1 and location of auger hole

## LAND UNIT 2

Land unit 2 occupies (16%) gentle-moderate slopes along Djirri Djirri Creek to the east of the development area. Soils are typically reddish-brown volcanic silty clay, stoney in part (Plate 1) with soil profile described :

### Soil profile

Reddish-brown duplex soils, coarse structure clay loam. Some basalt floaters within the profile.

Moderate-low permeability – 5-10cm/day

Soil depth 0.5-0.8m deep.

Land Capability Rating Fair

Design loading rate (DLR) 3L/m<sup>2</sup>/day

Constraints : Localised areas of shallow soils and stoney subsoils will require site by site investigation.

Summary (on site WW disposal) :

Soils across land unit 2 would present generally suitable conditions for effluent disposal with estimated waste water envelopes at 300-400m<sup>2</sup> in area for 3-5 bedroom dwellings. At individual 2ha block level some localised conditions may require lot by lot assessment.



Plate 3 View to south across mid-slope soil exposure



Plate 4 View to north-east across Land Unit 2

**LAND UNIT 3**

Land unit 3 occupies 2% of the development area, small areas of steep and stoney ground (2%) commonly along the edge of Djirri Djirri Creek across the eastern part of the development area. Soils are typically shallow reddish-brown clay loam with common basalt outcrop (Plate 1) with soil profile described :

Soil profile

Reddish-brown duplex soils, coarse structure clay loam. Common basalt floaters and outcrop within the profile.

Moderate permeability – 10-30cm/day

Soil depth 0.2 – 0.8m deep.



Land Capability Rating Very poor  
Design loading rate (DLR) 3L/m<sup>2</sup>/day  
Constraints : Common areas of bedrock outcrop and shallow stoney subsoils.

Summary (on site WW disposal):

Soils across land unit 3 would present poor conditions for effluent disposal with waste water disposal considered high risk in this area. These areas will be included within the drainage line reserve and will therefore be exempt from development.



Plate 5 View to south across Land unit 3 (to north of Djirri Djirri Creek).

#### **LAND UNIT 4**

Land unit 4 occupies 6% and includes Djirri Djirri Creek and surrounding low slopes to the eastern part of the development area. Soils are typically dark grey-black uniform clay soils of low permeability with soil profile described :

Soil profile

Dark grey-black clay soils with heavy clay subsoils.  
Low permeability – 1-10mm/day  
Soil depth 1.0 – 1.5m deep.  
Land Capability Rating Very poor  
Design loading rate (DLR) 2L/m<sup>2</sup>/day  
Constraints : Common areas of waterlogging and poor drainages.

Summary (on site WW disposal):

Soils across land unit 4 would present poor conditions for effluent disposal with estimated waste water envelopes at 450-550m<sup>2</sup> in area for 3-5 bedroom dwellings. Heavy clay soils and occasional waterlogging risk may require additional management measures. Much of Land Unit 4 lies within the drainage line reserve and will be exempt from development.

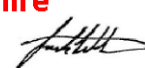
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Plate 6 Soil profile (Land Unit 4) showing deep clay subsoil.



Plate 7 View to south-east across land unit 4.

## LAND UNIT 5

Land unit 5 (5%) is located on a gentle hillcrest in the south-east part of the development area. Bedrock outcrop is high in this area with shallow stoney soils. Soils are typically dark grey-black uniform clay soils of low permeability with soil profile described :

### Soil profile

Dark grey-black clay soils with heavy clay subsoils.

Low permeability – 1-10mm/day

Soil depth 1.0 – 1.5m deep.

Land Capability Rating Very poor

Design loading rate (DLR) 2L/m<sup>2</sup>/day

Constraints : Common areas of waterlogging and poor drainage.

Summary (on site WW disposal):

Soils across land unit 5 would present poor conditions for effluent disposal with likely additional management design and estimated waste water envelopes at 450-550m<sup>2</sup> in area for 3-5 bedroom dwellings. Presence of bedrock outcrop would require careful design of WW envelope and additional excavation work or adoption of secondary treatment and subsurface irrigation for example. However the large size (2ha) of lots within Land unit 5 would be expected to include parts of Land unit 2 which provides suitable conditions for waste water disposal.



Plate 8 View to south across land unit 5 showing common bedrock outcrop

### 3.7 SETBACKS

A 60m waste water envelope setback from the (non-potable) waterway (Djirri Djirri Creek) across the eastern part of the development area is shown in Fig 2 and is in accord with Table 5 (EPA Septic Code 2016) with use of a primary system. As the development area is not part of a declared water supply catchment final setback requirements will be subject to advice from MRSC with possible referral to Western Water. The EPA Code (2016) also allows a 30m setback with use of a secondary system. A 30m setback is recommended around isolated dams should they be retained. The dams located along Djirri Djirri Creek will be decommissioned.

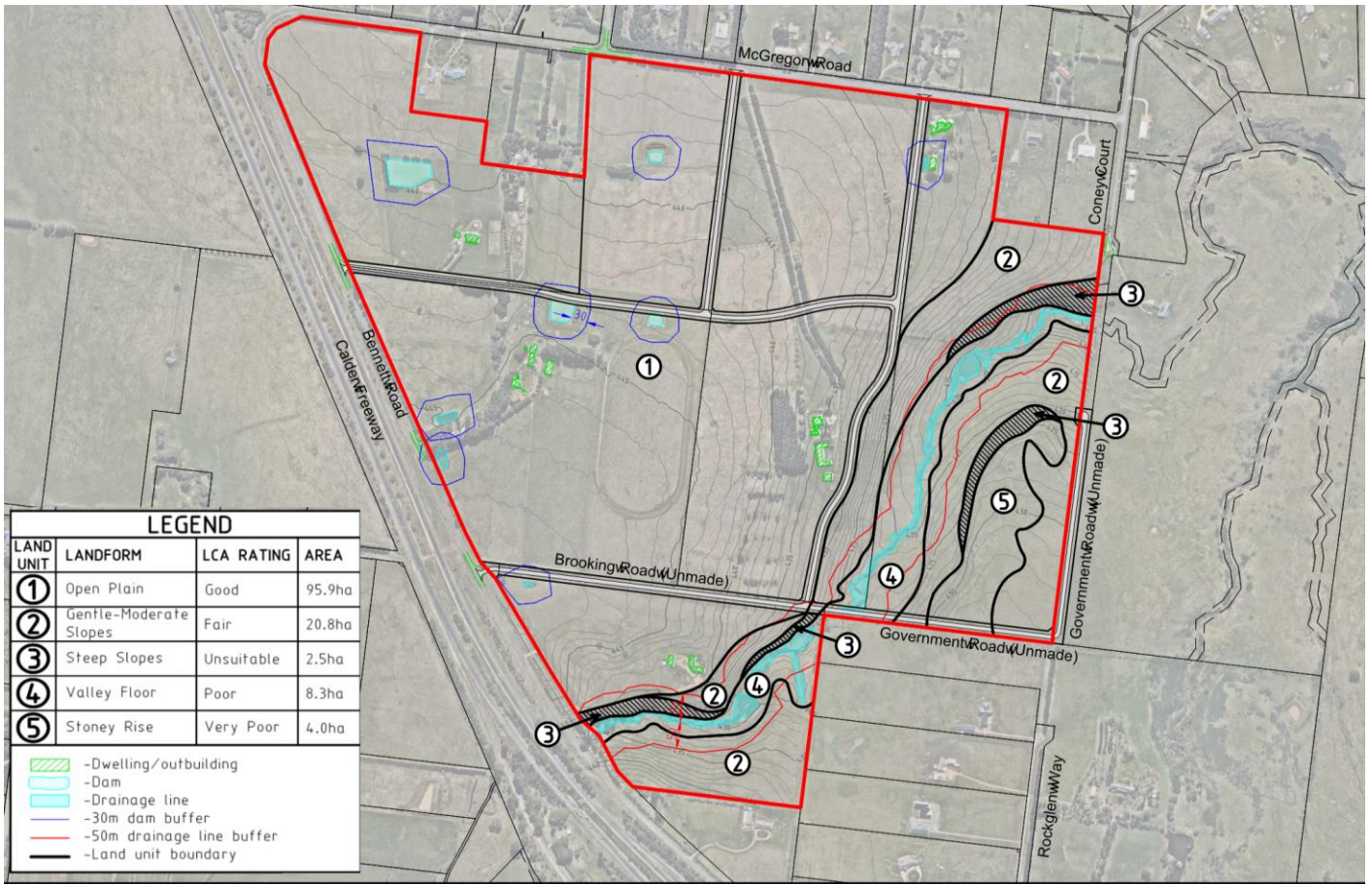


Fig 2 Land Unit Map (Courtesy Terraco Ltd)

#### 4.0 WASTE WATER MANAGEMENT – LAND CAPABILITY

A summary of soil and environmental properties across the subject property is described in Section 3 above. It is expected that there would be few constraints to wastewater disposal across the majority (73%) of the subject property. Djirri Djirri Creek and areas of rock outcrop to the east of the development area include some areas which will constrain waste water disposal. The concept plan specifies a maximum of 6 lots in this area and subject to detailed assessment under subdivision application. The EPA Septic Code (2016) recommends setbacks from waterways and features and this will include a 60m buffer of the waterway and 30m from various scattered dams in accord with Table 5 (EPA Septic Code 2016).

For each subdivision application for the land an effluent envelope or treatment area must be designated and shown on the proposed lots. The envelopes shall be at least 60 metres or greater from the watercourse top of bank, and created on the plan of subdivision as a restriction or as agreed with the Responsible Authority. EPA's Code of Practice – Onsite Wastewater Management determines septic field setbacks required from waterways, at 60 metres for a primary treatment system and 30 metres for a secondary treatment system.

#### 4.1 LAND CAPABILITY SUMMARY TABLE

Table 1 presents a summary of landform, soil and land capability values across the development area with suggested constraints and WW management for planned 2ha lot development. The summary of information is in general compliance with the EPA Septic Code and general MAV standards.

Table 1 Land capability summary

Land Unit	Landform	Area (ha)	Soil type	Slope %	Percolation (est) cm/day	LCA rating	On site WW comment (2ha lots)
1	Open Plain	73	Yellow-grey clay loam	0-2	5-10	Good	Few constraints. Subject to individual assessment.
2	Gentle-Mod plain	16	Reddish-brown silty clay (floaters)	7-10	10-20	Fair	Few constraints. Subject to individual assessment
3	Steep slopes	2	Reddish brown clay and common bedrock outcrop	12-25	20-50	Very poor	Highly constrained. No development likely
4	Valley floor	6	Dark grey-black heavy clay	1-3	0.5-1.0	Poor	Heavy soils and low permeability. Some waterlogging risk. Most of the area within 60m buffer.
5	Stoney rise	3	Shallow stoney soil and bedrock outcrop	2-4	20-50	Very Poor – additional WW management required.	Constrained by bedrock outcrop. Secondary treatment and additional excavation work necessary.

## 4.2 EXAMPLE OF SIZING OF WASTE WATER ENVELOPE (CASE STUDY)

While the sizing of waste water envelopes on individual lots is beyond the scope of this study, an indicative sizing of a WWE is summarised below. There are commonly two methods for assigning the size of WWEs which incorporate (i) design loading rates which use soil permeability and daily effluent volumes and (ii) a water-nitrogen balance.

An example of sizing of waste water envelopes across 2ha lots for Land Unit 1 which occupies the largest part of the development area uses an assumption of a 4 bedroom dwelling and 750 litres/day effluent volumes and adoption of a conventional trench septic system.

### 4.2.1 Waste water envelope – land application

#### (i) DESIGN LOADING RATE

The critical time for wastewater application will be during the winter period. Based upon the estimated household discharge for a 4BR house (up to 750L/day) and with an application rate (DLR) of 3.0L/m<sup>2</sup>/day (based on low-moderate percolation rates on deep volcanic sub-soils onto a series of raised, disposal areas (garden or treed), there would be a requirement for an area of 250m<sup>2</sup> to address the wastewater disposal needs for any new dwelling on this property. It is expected that this estimate of WWE area would be increased to 300m<sup>2</sup> to provide an additional buffer. It is expected that within Land Unit 1 that there would be ample room for design of a waste water field of these dimensions within the 2ha lots across the development area.

A conventional trench system of 120-150m would appear to be sufficient to carry the hydraulic load from the new dwelling. Layout design may vary, with 3 trenches (such as 40-50m long, 70cm wide and 60cm deep) with appropriate setbacks. Other configurations may suit, subject to individual site conditions, owner preference, site design and plumbing contractor advice.

#### (ii) WATER – NITROGEN BALANCE

A water-nitrogen balance using various rainfall, environmental and effluent volumes has been generated for proposed discharge from a 4 bedroom dwelling (Table 1 below)

As a general guide to sizing waste water envelopes within the 2ha lots the following water-nitrogen balance has incorporated various parameters (rainfall Macedon station, estimated discharge from a 4br home, evapotranspiration and nitrogen factors). The water-nitrogen balance incorporates rainfall and evapotranspiration data and various soil properties.

TABLE 2 Water – nitrogen balance assuming 4br dwelling on Land Unit 1.  
(Template supplied courtesy P Williams)

Paul Williams & Associates Pty Ltd

CD00002

**WATER/NITROGEN BALANCE (20/30/10): With no wet month storage.**

Rainfall Station: Macedon Forestry/ Evaporation Station: Malmesbury

Location: LAURISTON

Date: #####

Client: Chris Day

ITEM	UNIT	#	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Days in month:	D		31	28	31	30	31	30	31	31	30	31	30	31
Evaporation (Mean)	mm	A	205	176	124	75	47	27	27	43	66	105	126	152
Mean Rainfall	mm	B1	79	98	91	104	139	139	132	138	129	125	114	108
Effective rainfall	mm	B2	71	88	82	94	125	125	119	124	116	113	103	97
Peak seepage Loss <sup>1</sup>	mm	B3	171	154	171	165	171	165	171	171	165	171	165	171
Evapotranspiration(IXA)	mm	C1	92	79	56	34	21	12	12	19	30	47	57	68
Waste Loading(C1+B3-B2)	mm	C2	192	145	144	105	67	52	64	66	79	105	119	142
Net evaporation from lagoons (10(0.8A-B1x(lagoon area(ha))))	L	NL	0	0	0	0	0	0	0	0	0	0	0	0
Volume of Wastewater	L	E	23250	21000	23250	22500	23250	22500	23250	23250	22500	23250	22500	23250
Total Irrigation Water(E-NL)G	mm	F	66	60	66	64	66	64	66	66	64	66	64	66
Irrigation Area(E/C2)annual.	m <sup>2</sup>	G												
Surcharge	mm	H	-125	-85	-78	-41	0	12	3	1	-14	-39	-55	-75
Actual seepage loss	mm	J	45	69	93	124	170	177	173	171	151	132	110	95
Direct Crop Coefficient:		I	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Rainfall Retained:	90 %	K	1. Seepage loss (peak) equals deep seepage plus lateral flow: 5.4mm (<10% ksat)											
Lagoon Area:	0 ha	L	CROP FACTOR											
Wastewater(Irrigation):	750 L	M	0.7	0.7	0.7	0.6	0.5	0.45	0.4	0.45	0.55	0.65	0.7	0.7
Seepage Loss (Peak):	5.5 mm	N	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Irrig'n Area(No storage):	350 m <sup>2</sup>	P2	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Application Rate:	3.0 mm	Q	1	1	1	1	1	1	1	1	1	1	1	1
Nitrogen in Effluent:	30 mg/L	R	NITROGEN UPTAKE:											
Denitrification Rate:	20 %	S												
Plant Uptake:	220 kg/ha/yr	T												
Average daily seepage:	4.1 mm	U												
Annual N load:	6.57 kg/yr	V												
Area for N uptake:	299 m <sup>2</sup>	W												
Application Rate:	2.5 mm	X												
Irrig'n Area (adjusted for slope)	420 m <sup>2</sup>	Z												
Application Rate (Design):	1.8 mm	Z1												

Species:	Kg/ha.yr	pH	Species:	Kg/ha.yr	pH	Species:	Kg/ha.yr
Ryegrass	200	5.6-8.5	Bent grass	170	5.6-8.9	Grapes	200
Eucalyptus	90	5.6-8.9	Couch grass	280	6.1-6.9	Lemons	90
Lucerne	220	6.1-7.9	Clover	180	6.1-6.9	C cunn'a	220
Tall fescue	150-320	6.1-6.9	Buffalo (soft)	150-320	5.5-7.5	P radiata	150
Rye/clover	220		Sorghum	90	5.6-6.9	Poplars	115

1.2 x hydraulic area (10% to 20% slope)

Based on Water-Nitrogen Balance Calculations shown above which assume 600L/day waste water use and effective rainfall, evapotranspiration and soil seepage parameters, the irrigation area (no wet month storage) = 350m<sup>2</sup>

**NOMINATED WW APPLICATION AREA**

(i) According to DLR estimates cited above, the estimated irrigation area = 250m<sup>2</sup> upgraded to 300m<sup>2</sup>.

(ii) According to Water - Nitrogen Balance\* above the estimated irrigation area (no storage) = 350m<sup>2</sup>

\*This value is highly dependent on (conservative) soil percolation estimates and an overestimate of monthly rainfall.

Accounting for both methods of WWE approximation, the more conservative estimate from the Water Balance indicates the area required for land application (350m<sup>2</sup>).

#### 4.2.3 Conventional Waste Water System (example)

A conventional system is a passive system, which does not require connection to electricity. If carefully located, installed and routinely inspected there should be a low risk of failure or break down. A conventional system can also be used for intermittent occupancy patterns.

##### *Treatment*

- Treatment should be via a septic tank having an EPA Certificate of Approval and with fittings meeting Australian Standards AS1546.
- The tank should be inspected annually and pumped out every three years or earlier if required. Pump outs should be reported to Council.

##### *Disposal Field*

- Disposal field will be designed within the 2ha lot area according to various setback requirements and individual site design.
- The chosen disposal field should be planted out in the early stages of development to allow establishment of vegetation such as trees and shrubs.
- Beds could be built up with mulch to a depth of at least 100mm.
- Vegetation across the WWE will assist with water and nutrient uptake.

#### 4.2.4 General waste water management per 2ha lot

Local soils across Land Unit 1 are deep and relatively well-drained.

The WWE should be re-vegetated with shrubs and trees to enhance transpiration and maximize soil-water storage, particularly during winter months. .

To ensure the viability of the vegetation on a disposal field, it may occasionally be necessary for supplementary watering in very dry times.

The active disposal field should be restricted from access by vehicles, children, pets and visitors.

New owner/occupants should be made familiar with management and permit requirements

If there are plans for house extensions, the wastewater management program should be reviewed by Council.



## 5.0 SUMMARY

It is emphasised that the development area is not part of a declared water supply catchment. Given proposed 2ha lot size it is expected that building and waste water envelopes could be assigned to adequately managed waste water disposal. There may be localised constraints which would be identified at individual lot resolution. On this basis, waste water could be retained and treated on site.

Areas where land is steep, mainly within the 60m drainage line buffer, will not require WW service. Land Unit 4 and Land Unit 5 will be constrained by poor soils and rock outcrop with a lesser yield as indicated in the concept plan.

An example of sizing of waste water envelope and waste water management across Land Unit 1 is presented above.

For each subdivision application for the land an effluent envelope or treatment area must be designated and shown on the proposed lots. The envelopes shall be at least 60 metres or greater from the watercourse top of bank, and created on the plan of subdivision as a restriction or as agreed with the Responsible Authority. EPAs Code of Practice – Onsite Wastewater Management determines septic field setbacks required from waterways, at 60 metres for a primary treatment system and 30 metres for a secondary treatment system.

## 6.0 STORM-WATER ASSESSMENT AND RECOMMENDATIONS

### INTRODUCTION

The storm water assessment aims at identifying land constraints associated with the development area and to recommend management programs to address these constraints and thereby reduce the environmental impact of the proposed changed land use. Emphasis of the assessment is on internal management of storm water within the individual lots.

The emphasis is on soil-water management issues as follows :

- *Management of soil and water impacts so that the water quality of Jacksons Creek is not affected.*
- *The capacity of all drainage infrastructure to service the development.*
- *The methods for the treatment and retardation of all stormwater.*
- *The methods for sediment control*

### 6.1 DRAINAGE INFRASTRUCTURE and STORMWATER MANAGEMENT

The development property is not connected to sewer. A land capability assessment above has identified general land units within which waste water disposal is suitable or constrained. Within a minimum 2ha lot size, the proposed residential dwellings will be designed to harvest rainwater to water tanks. Engineering design plans will include retarding and management of runoff from driveways and paved surfaces. Rain water that is not

harvested from the dwelling and sheds as well as rain water from access roads etc shall be retarded on site to maintain flow at current conditions.

At an individual lot level, it is expected that rain water runoff from dwellings and shedding would be managed to reduce run-off and retain rain water on site. It is recommended that each block will be landscaped and planted to reduce/retard run-off.

## 6.2 STORM WATER MANAGEMENT RECOMMENDATIONS

The assessed environmental risk indicates that residential development on this land will need moderate management programs in place to address Storm water management on the property.

- A) Design of drainage areas : driveways, paved area to mitigate off-site drainage.
- B) Harvesting of rainwater from dwelling and sheds to large water tanks as well as retarding basins
- C) Construction of contour banks to mitigate run-off where necessary
- D) Establishment of tree/vegetation belts to minimise risk of overland flow.
- E) Sediment control

## 6.3 DRAINAGE DESIGN

The development will include approximately 50x 2ha blocks which will be large enough to incorporate storm water management measures for dwellings and garage/outbuildings with access driveway and internal paths.

### *Recommendations*

*Engineering design to manage/reduce run-off from driveways and paved areas. Potential design might include direction of excess runoff toward either a sump or area of tree planting aimed at reducing ponding / mitigating off-site runoff.*

## 6.4 STORM WATER AND HARVESTING RAINWATER

### *Recommendations*

*Stormwater will be harvested to large rainwater tanks. Overflow pipes will be directed toward treed areas or off-site drainage to avoid ponding.*

## 6.5 SOIL EROSION AND SEDIMENT MANAGEMENT

### ROADS and ACCESS

Access to the proposed dwellings will be via new driveways and upgraded access roads. It is expected that new access roads or driveways will need to be constructed and maintained to prevent erosion.

#### *Recommendations*

- *Drainage of new driveways should be designed to accommodate heavy and potentially erosive rainfall events. This would include effective grading and use of concrete and gravel batters designed to avoid gullyng during storm events.*
- *Track runoff should be very carefully controlled, with well formed and maintained drainage structures (eg table drains, under road drainage etc*
- *Erosion management measures would include establishment of vegetation or geotextile along the exposed edges of the driveway.*
- *It is a general recommendation that future plans for access road throughout the block recognize soil erosion risk and implement measures to avoid soil exposure.*
- *During short-term construction works for any dwelling, impacts on shallow soils should be minimized.*

## 6.6 SOIL EROSION/SEDIMENT CONTROL MANAGEMENT

Local volcanic soils have an organic topsoil which can be susceptible to erosion when exposed. Local areas of poor drainage within each lot could be drained/vegetated to avoid ponding. Overall erosion risk is however low across the development area block. Soils are of low-moderate erosion risk following construction of the new driveway and other earthworks allied with development of the new dwelling.

## ***Recommendations***

- *During house, shed and infrastructure works, minimize soil exposure and potential soil erosion during wet periods by staged works and use of gravel cover where necessary.*
- *Establishment of contour tree planting to minimize overland flow*
- *Construction of a dam in suitable part of the property could be used to harvest stormwater and site drainage.*
- *Construction and maintenance of any access roads should be designed for optimal drainage with stone/gravel cover to reduce erosion risk.*
- *Maintain vegetative cover over undeveloped parts of the property - avoid areas of exposed soil.*
- *Minimize “off-track” use of vehicles (including motor bikes) on the property.*
- *Sediment from driveways and exposed areas should be minimize by the above soil management measures. Construction of a sediment/sump (subject to engineering design) could be constructed to retard sediment on-site for potential redistribution.*

Fig 3 presents a conceptual land management plan for management and mitigation of storm water, sediment and erosion control across a typical residential property.

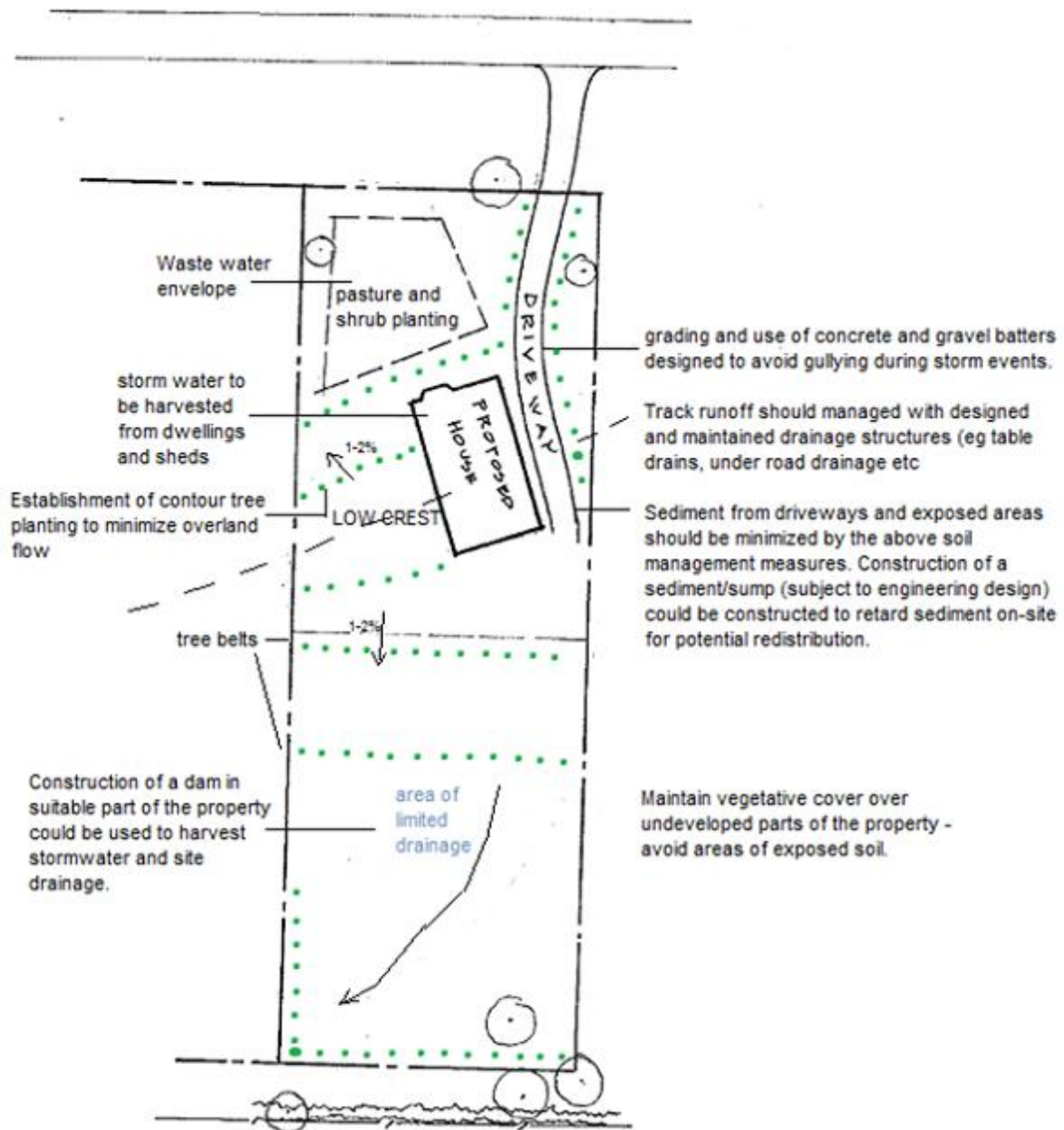


Fig 3 Storm water management map of typical 2ha lot within development area showing location of proposed dwelling (BE) and waste water envelope WWE with general land and storm water management recommendations.

## APPENDIX A LIMITATIONS

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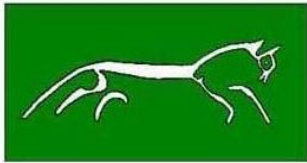
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**Archaeo-Environments Pty Ltd**  
heritage soils and landscape

## **Sustainability Report**

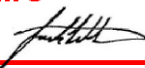
### **Bennett Road Development Plan**

### **Gisborne South**



**Land Capability Assessor**  
**Dr Chris Day**  
**Archaeo-Environments Pty Ltd**  
**ABN 89 119 932 437**

**Rev 5 Dec 4 2021**

**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
**Page: 191 of 371 SIGNED:** 

# LAND CAPABILITY AND STORM WATER REPORT

## Bennett Road Development Plan, Gisborne South

### ABOUT THE AUTHOR

**Dr Chris Day** DPhil, MIFA Director, Archaeo-Environments Ltd

Chris has over 35 years experience in geology, geomorphology, soils and heritage work which included 12 years in Bendigo and Benalla with DSE. This included management of catchment and salinity research teams and soil and soil permeability (recharge) mapping as a basis for Dryland Salinity Management Plans across the Avoca, Loddon, Campaspe and Goulburn Broken Catchments.



# 1 INTRODUCTION

A sustainability report has been commissioned by several landowners for input to a Development Plan for a 130ha property at Bennett Road, Gisborne (the study area). The land is subject to Macedon Ranges Planning Scheme Development Plan Overlay 18 (DPO18) and also the Rural Living Zone Schedule 2 under the recent C110 Planning Scheme Amendment. A Development Plan is required for the entire 130ha (estimated 50 lots) and will provide an overview document for future planning permit applications.

The proposed development will provide for lots consistent with the Panorama Dr estate to the north, which appears to function well in terms of “sustainability” / environmental considerations. The aim of this report is to identify sustainability issues which will enhance subdivision and planning permit applications to Macedon Ranges Shire Council.

## 1.1 SCOPE OF WORKS

The sustainability report will include a summary of potential site issues relevant to DPO18 :

A sustainability plan will identify environmental assets and initiatives to be implemented as part of development activities on the site including but not limited to : how the principles of water sensitive design are to be achieved in subdivision and development activities and how flora/fauna/biodiversity/revegetation may be integrated into the overall development plan.

The sustainability study is conservative, aimed at the protection of environmental and human health. It is not intended to support a particular proposal, but rather to describe the existing land parcels and suggest how adverse environmental impacts of the proposal may be minimised. Field work was conducted on March 24, 2018.

## 2.0 DATA SCOPE AND LIMITATIONS

The land planning assessment has been prepared by Dr. Chris Day (Archaeo-Environments Ltd) Assessment has been conducted at a scale of 1 : 2500 and provides a guide and professional overview of site conditions. Terrain mapping, soil properties, climatic and botanical data are based on reconnaissance field-work and regional data sources for the purpose of reasonable and relevant estimates. As physical conditions, soils and local hydrology may vary over time, the overview assessment on which estimates are made in this report should be reassessed if natural conditions change. This assessment is sufficient for a broad assessment within DPO18. The report should be used within the scope and scale of the brief and not for detailed design or property layout works or for any development beyond those of the brief. The report and recommendations therein are to be used to provide guidance toward - but do not guarantee – planning permission. It is not to be used, in full or in part, by any other party without written permission from the author.

### 3 LOCATION AND PROPERTY BACKGROUND

#### 3.1 LOCATION

The study area is composed of 6 properties and 6 individual landowners. The site occupies approximately 130ha in and around Bennett Rd Gisborne. Located within Macedon Ranges Planning Scheme Development Plan Overlay (DPO18) and Rural Living Zone Schedule 2 under the recent C110 Planning Scheme Amendment. Both the Zone and DPO refer to a minimum lot size of 2ha.

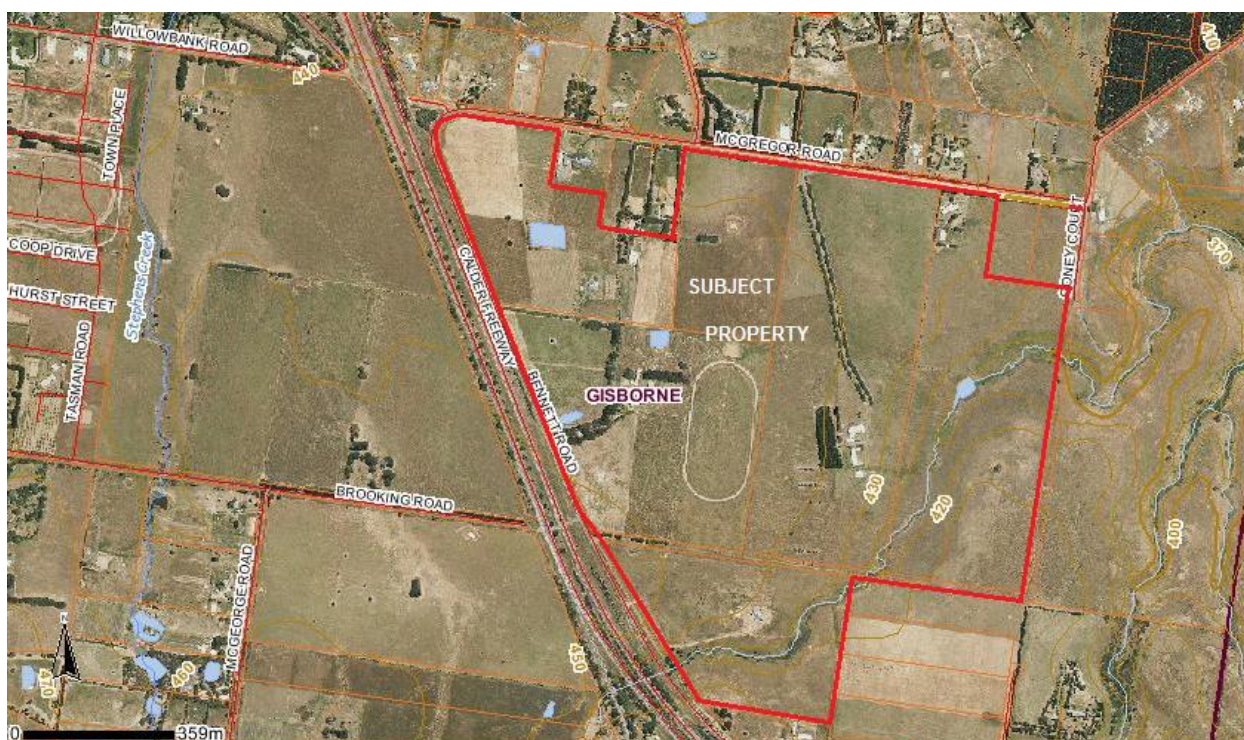


Fig 1 Location Map : Aerial view

#### 3.2 GENERAL SETTING/SITE CONDITION

The study area is characterised by a broad and open volcanic plain which includes an incised waterway across the south-west. The area has been almost entirely cleared of native vegetation, with minor clumps of eucalypts (predominantly grey box) and tree plantations, with the main vegetation existing as exotic plantings as driveway avenues and some cypress windbreaks and boundary plantings. There are 10 dams which are for the most part across gentle drainage depressions. The study area is fenced throughout with a range of grazing property and lifestyle properties.

### 3.3 USE OF ADJOINING LAND

The study area is bounded to the west by Bennett Road with the Calder Freeway to the west, McGregor Road to the north and Dalrymple Road to the south with developed blocks to the north and sloping terrain toward Jacksons Creek to the east.

### 3.4 CLIMATE

Average annual rainfall is in the order of 750-800mm. A one-in-ten year rain is ~750mm. Average estimated annual evapo-transpiration is in the order of ~1350mm. Evaporation may exceed rainfall for 8 months (September to April) in an “average” year and these dry months may be challenging for agricultural production. The district can experience significant variations in rainfall and temperature and can have very cool winters & warm to hot and windy summers (which can have implications for vegetation establishment).

### 3.5 TOPOGRAPHY AND DRAINAGE

The land encompasses a gently undulating volcanic terrain which falls toward the north and north-east. Water flow and local drainage is predominantly toward a defined waterway (Djirri Djirri Creek) which extends across the south-west corner of the property. Otherwise drainage across the property is via very gentle drainage swales and undefined drainage depressions. There is rock outcrop along the edge of low escarpments above the main drainage line to the east as well as within a stoney rise in the south-east part of the block.

Land form and soil description is based on field inspection and reference to the report : A Study of the Land in the Catchments to the North of Melbourne (Jeffrey P J 1981) SCA. Fig 2 shows general landform and land units across the development area.

**Five main land units have been mapped across the development area.**

- LU 1 Open plain
- LU2 Gentle-moderate slopes
- LU3 Steep slopes
- LU4 Valley floor
- LU5 Stoney rise (o/c)

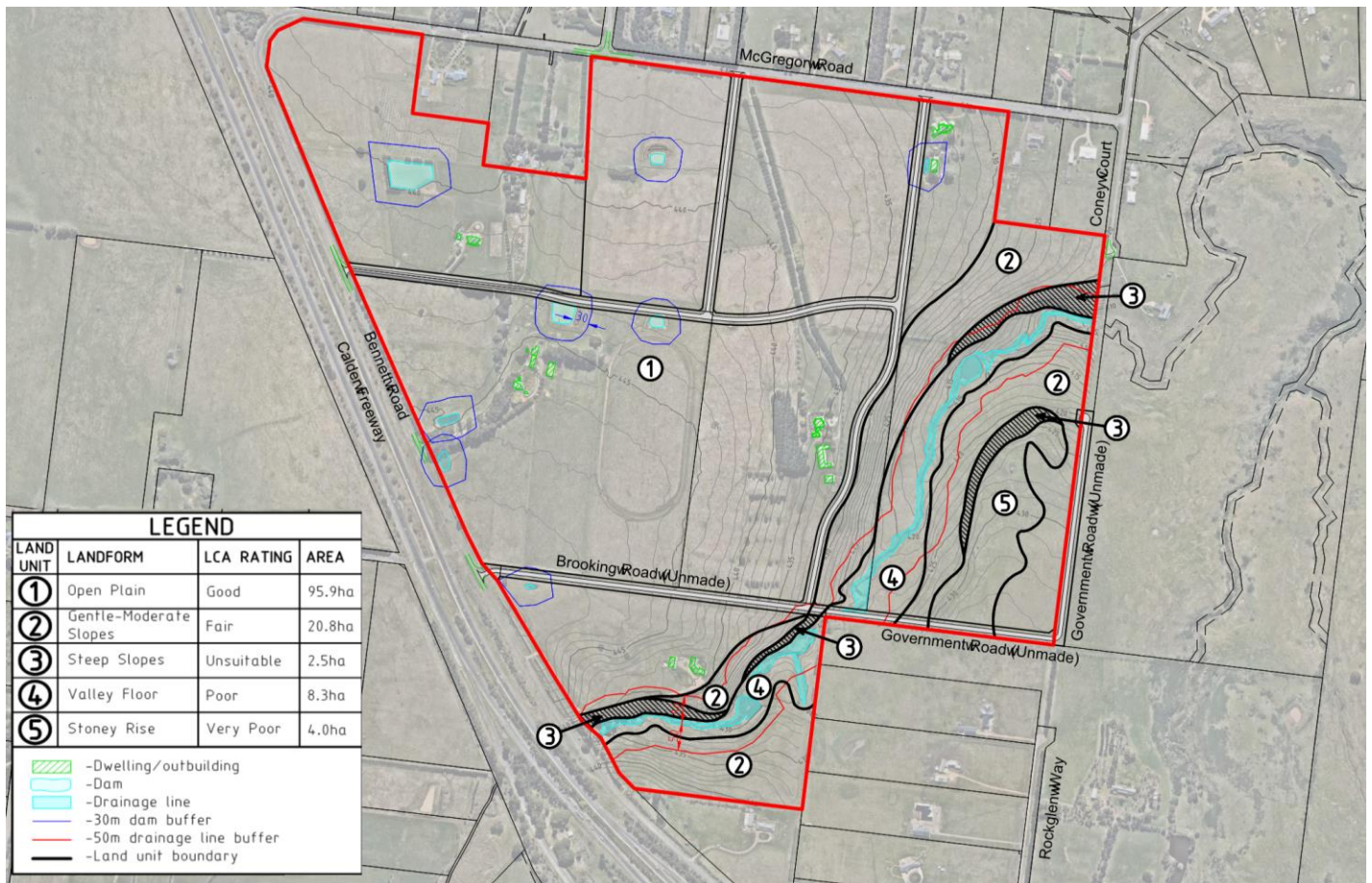


Fig 2 Land Unit Map (Courtesy Terraco Ltd)

Table 1 presents a summary of soil and landform values across the study area as background for the sustainability assessment.

Table 1 Land capability summary

Land Unit	Landform	Area (ha)	Soil type	Slope %
1	Open Plain	73	Yellow-grey clay loam	0-2
2	Gentle-Mod plain	16	Reddish-brown silty clay (floaters)	7-10
3	Steep slopes	2	Reddish brown clay and common bedrock outcrop	12-25
4	Valley floor	6	Dark grey-black heavy clay	1-3
5	Stoney rise	3	Shallow stoney soil and bedrock outcrop	2-4

## 4.0 ENVIRONMENTAL ASSETS (input included from Ecology and Heritage Partners)

### 4.1 FLORA AND FAUNA

Native vegetation in the study area is representative of four Environmental Vegetation Classes (EVCs) characteristic of the Victorian Volcanic Plains: Plains Grassland Heavier-soils (EVC 132\_61), Plains Sedgy Wetland (EVC 647), Tall Marsh (EVC 821) and Stony Knoll Shrubland (EVC 649). The presence of these EVCs is generally consistent with the modelled pre-1750s native vegetation mapping (DELWP 2017b).

The remainder of the study area comprises introduced and planted vegetation, present as stands of non-Victorian eucalypt species, pasture and Victorian Eucalypts. Targeted surveys have indicated that there are no Matted Flax-lily (May – August), Swamp Everlasting (November – March) and Swamp Fireweed (November – March) on the land.



Plate 1 View to north toward example of introduced vegetation/windbelt within the study area.

Despite current land uses the study area contains patches of native vegetation, scattered trees and some introduced vegetation that is of value to fauna. There are patches of Plains Grassland and remnant riparian vegetation along the creek line. Targeted surveys by Ecology and Heritage Partners have indicated no presence of Golden Sun Moth or Growling Grass Frog across the study area.

## 4.2 FLORA AND FAUNA MANAGEMENT and INTEGRATION

The primary protection of environmental assets will include protection of native vegetation up to a minimum of 30 metres either side of the Djirri Djirri Creek line which will be retained and stock excluded. Dwellings will be set back from the drainage line buffer by at least 20 metres. Trees within the road reserve, including revegetation, will be retained where possible (Appendix 1)

There are potential remnants of native vegetation and fauna which have been addressed in the environmental report (Ecology and Heritage Partners). Targeted surveys of flora and fauna species were undertaken and no remnant species were recorded. It is understood that the creek line and immediate surrounds – which will be preserved via a minimum of 30m buffer from stock – will be the corridor within which significant environmental assets will be preserved and managed. These will be appropriately assessed at the planning permit stage.

As described above, trees will be retained within road reserves where possible and removal or lopping of native trees will require a planning permit.

A program of revegetation of Djirri Djirri Creek will provide habitat, erosion and flood mitigation as well as an area of passive recreation (Plate 2). In addition the wider Development Area will retain original vegetation where possible and establish a program of buffer/corridor planting, road reserve and habitat planting (Fig 3) with the aim of retaining existing assets and improving shelter, screening, microclimate, fauna habitat and general amenity.



Plate 2 View to south across Djirri Djirri Creek planned for revegetation

The study area is located within the Macedon Ranges municipality and is zoned Rural Living Zone 2 (RLZ2). Development Plan Overlay (DPO18) applies to the land proposed for subdivision.

A Planning Permit from Macedon Ranges Council will be required to remove, destroy or lop any native vegetation on site. A Planning Permit will be assessed in accordance with the 'The Guidelines for the removal, destruction or lopping of native vegetation' (Guidelines) and Clause 52.17 of the Whittlesea Planning Scheme.

Any persons engaged to remove, salvage, hold or relocate native fauna during construction must hold a current Management Authorisation under the *Wildlife Act 1975*, issued by DELWP.

Weeds listed as noxious under the *Catchment and Land Protection Act 1994* (CaLP Act) (Artichoke Thistle, Fennel, Paterson's Curse, African Box-thorn, Blackberry, Chilean Needle-grass and Serrated Tussock) were recorded during the assessment. Weeds should be managed in accordance with the Act.

## 4.3 WATER

### 4.3.1 STORM WATER AND WATER SENSITIVE DESIGN

While domestic water use will be via reticulated supply from Western Water, supply will be enhanced by harvesting of rainwater via rainwater tanks. Otherwise storm water retention dams can harvest run-off from hard surfaces, roads etc.

Rainwater shall be retarded on site to maintain flow at current conditions. Maintaining a vegetative cover will be part of management recommendations to avoid erosion and soil loss. The existing dams and additional dams will retain water supply on site.

The primary focus of water management is within the individual lots in the form of water sensitive design as follows :

- Promotion of water conservation fittings within domestic and gardens as well as public space and infrastructure.
- Revegetation programs within any public areas and along road reserves to improve habitat, shade biodiversity and soil stability.
- The study area is not connected to sewer. There is also ample capacity for management of waste water

At an individual lot level, it is expected that rain water runoff from dwellings and shedding would be managed to reduce run-off and retain rain water on site. It is recommended that each block will be landscaped and planted to reduce/retard run-off off-site.

### 4.3.2 WATER MANAGEMENT RECOMMENDATIONS

Water management across the study area might include :

- A) Design of drainage areas : driveways, paved area to mitigate off-site drainage.
- B) Harvesting of rainwater from dwelling and sheds to large water tanks as well as retarding basins
- C) Construction of contour banks to mitigate run-off where necessary
- D) Establishment of tree/vegetation belts to minimise risk of overland flow.
- E) Sediment control

#### ***Recommendation***

*Engineering design to manage/reduce run-off from driveways and paved areas. Potential design might include direction of excess runoff toward either a sump or area of tree planting aimed at reducing ponding / mitigating off-site runoff.*

#### ***Recommendation***

*Stormwater will be harvested to rainwater tanks and overflow pipes will be directed toward treed areas or off-site drainage to avoid ponding.*



#### 4.4 SOIL EROSION/SEDIMENT CONTROL MANAGEMENT

Local volcanic soils have an organic topsoil which can be susceptible to erosion when exposed. Local areas of poor drainage within each lot could be drained/vegetated to avoid ponding. Overall erosion risk is however low across the study area.

Soils are of low-moderate erosion risk following construction of the new driveway and other earthworks allied with development of new dwellings. To the south-east of the Djirri Djirri Creek where there is a stony rise a detailed site assessment at the time of subdivision shall inform lot yield and lot configuration.

##### *Recommendations*

- *During house, shed and infrastructure works, minimize soil exposure and potential soil erosion during wet periods by staged works and use of gravel cover where necessary.*
- *Establishment of contour tree planting to minimize overland flow*
- *Construction of a dam in suitable part of the property could be used to harvest stormwater and site drainage.*
- *Construction and maintenance of any access roads should be designed for optimal drainage with stone/gravel cover to reduce erosion risk.*
- *Maintain vegetative cover over undeveloped parts of the property - avoid areas of exposed soil.*

Fig 3 below presents a storm water management map of typical 2ha lot.

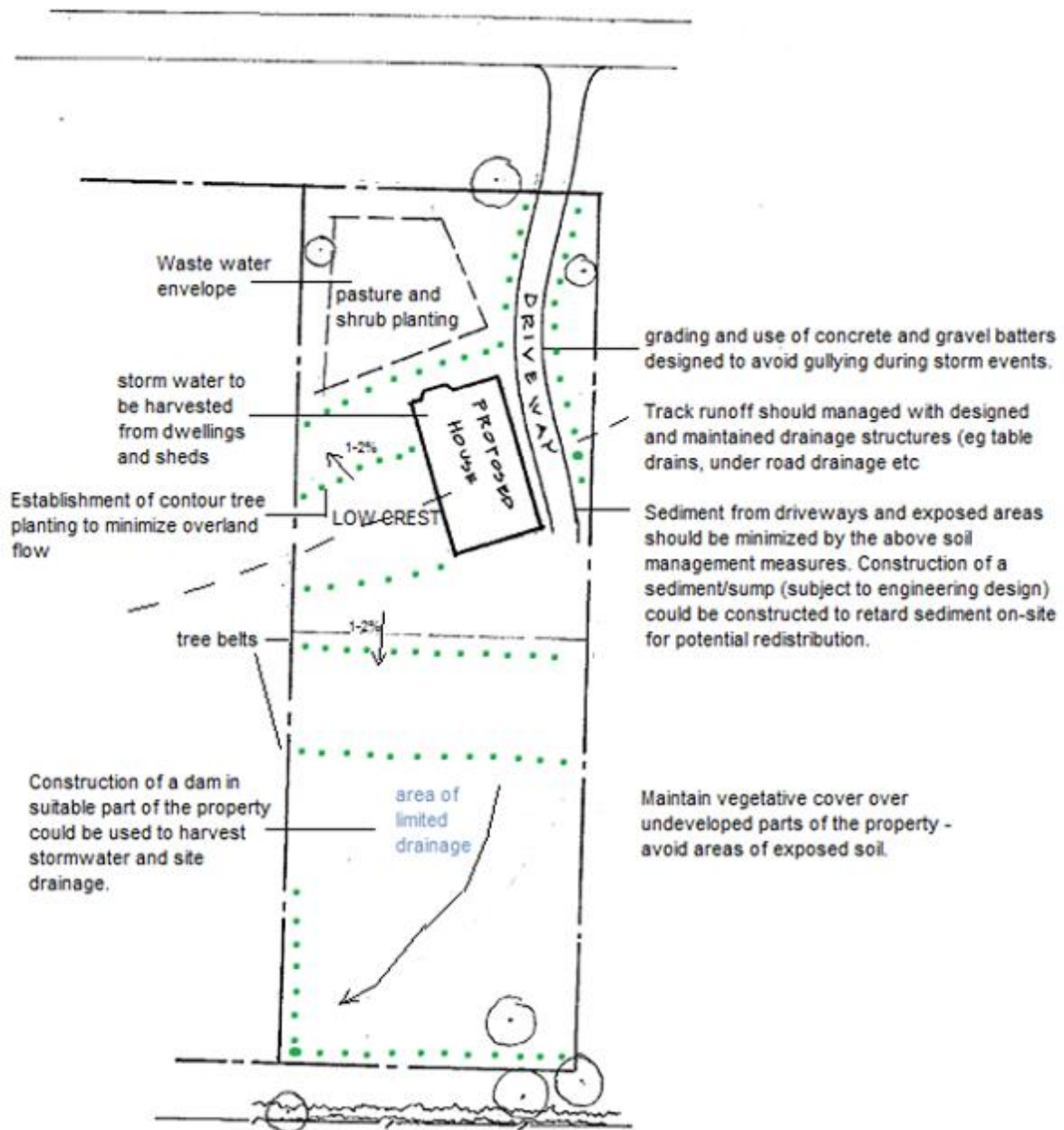


Fig 3 Storm water management map of typical 2ha lot within the study area showing location of proposed dwelling (BE) and waste water envelope WWE with general land and storm water management recommendations.

#### 4.4 STOCK MANAGEMENT

It is expected that some properties will have limited stock such as horses or sheep at a rural “domestic scale”. It is expected that this could be successfully undertaken as is the case in the 2 lot subdivision at the Panorama Drive Estate to the north.

Fig 4 below presents the concept landscape plan which shows current and planned vegetation planting / habitat corridors.



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## Traffic Management and Impact Plan

### Proposed Development Plan

at

**88-168 Bennett Road and 15 & 94-134 McGregor Road,  
Gisborne**

October, 2021  
G24605R-01F


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**MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022  
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## Traffic Management and Impact Plan

### Proposed Development Plan

at

**88-168 Bennett Road and 94-134 McGregor Road, Gisborne**

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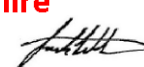
Issue No.	Type	Date	Prepared By	Approved By
A	Draft	28/06/2019	A. Mian	N. Woolcock/T. Togany
B	Final	02/07/2019	A. Mian	N. Woolcock/T. Togany
C	Amended Draft	12/02/2020	D. Robertson	N. Woolcock
D	Amended Final	14/02/2020	D. Robertson	N. Woolcock
E	Amended Final	31/07/2020	N. Woolcock	A. Mian
F	Amended Final	12/10/2021	N. Woolcock	A. Mian

#### Our Reference: G24605R-01F

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**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
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<p><b>MACEDON RANGES PLANNING SCHEME</b>  <b>DEVELOPMENT PLAN: DP/2019/1</b>  <b>Date: 16/11/2022</b>  <b>Authorised Officer: Jack Wiltshire</b>  <b>Page: 207 of 371 SIGNED:</b></p> 
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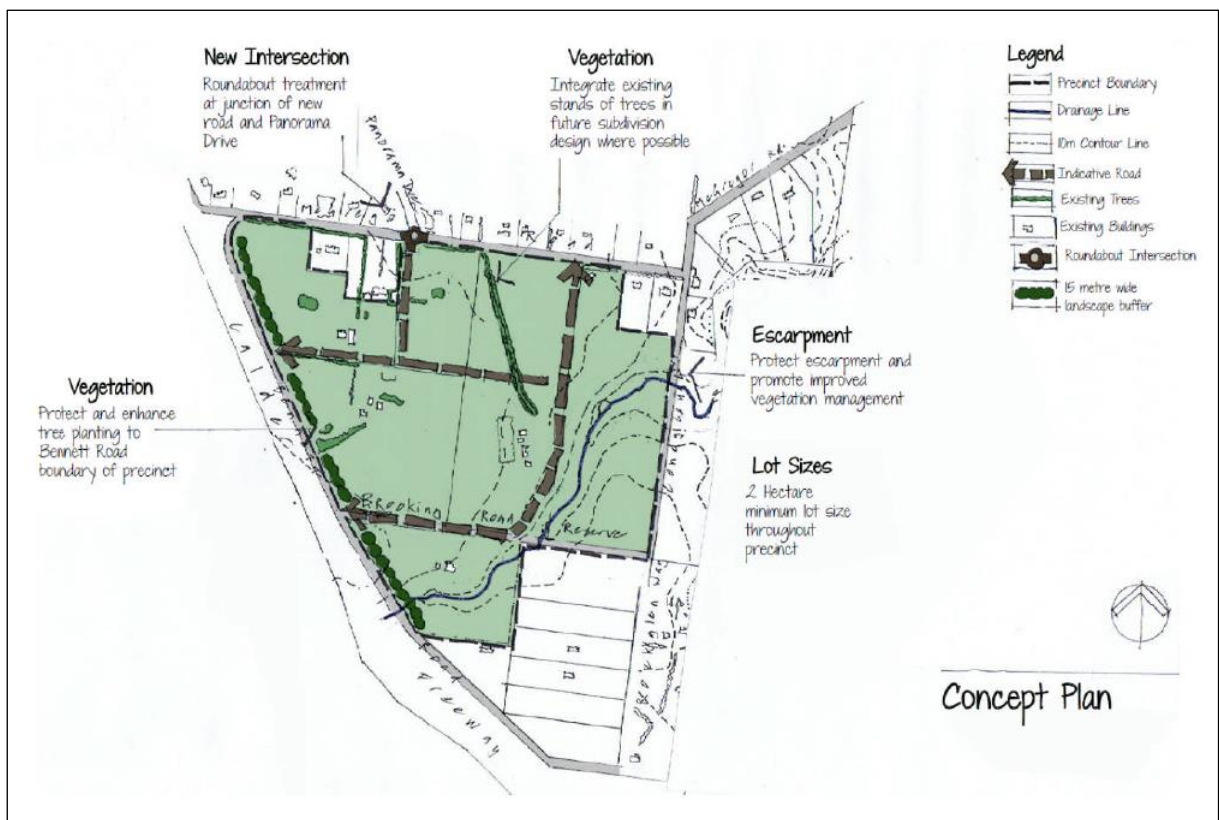
## 1 Introduction

Traffix Group has been engaged to prepare a Traffic Management and Impact Plan for the proposed Development Plan at 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne.

This report responds to the access and traffic aspects of the requirements under Schedule 18 to the Development Plan Overlay (DPO18) of the Macedon Ranges Planning Scheme, i.e. the preparation of a Traffic Management and Impact Plan.

## 2 DPO18 Bennett Road, Gisborne, Rural Living Area

DPO18 of the Macedon Ranges Planning Scheme requires a Development Plan to be prepared that is generally in accordance with the concept plan under Sub-Clause 5.0 (Map 1) of the DPO. This concept plan is reproduced at Figure 1.



**Figure 1: Development Plan Concept**





## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne

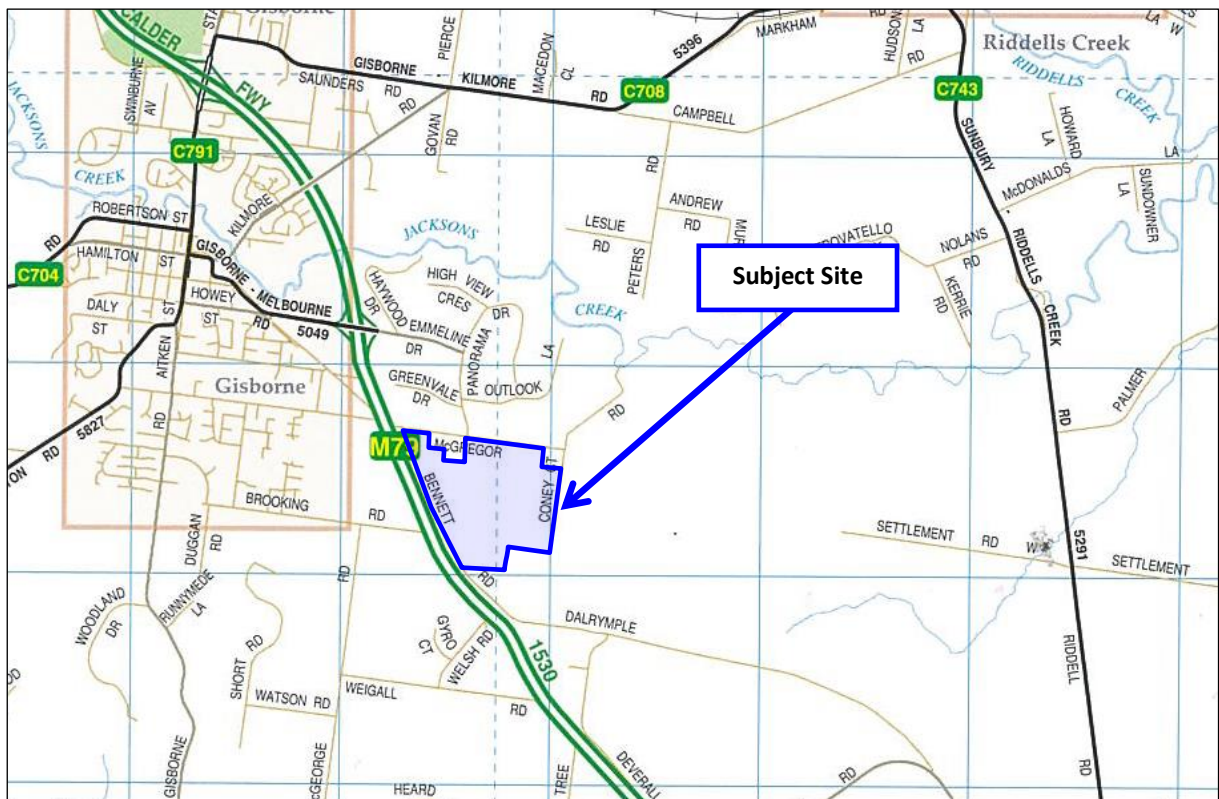
DPO18 requires that any proposed development plan must include, amongst other plans, a Traffic Management and Impact Plan which includes:

- A well defined, appropriately designed, convenient and safe internal road, cycling and pedestrian network.
- Appropriate access points and circulation areas for vehicles, cyclists and pedestrians on the existing and future road network.
- Upgrade works necessary to accommodate traffic generated by the development and to mitigate the impact of the development on the surrounding area.
- East-west and north-south road connections, including the construction of the Brooking Road extension, all with a minimum width of 20 metres.
- Roundabout intersection treatment at the Panorama Drive intersection.

## 3 Existing Conditions

### 3.1 Subject Site

The subject site is bound by Bennett Road to the west, McGregor Road and abutting land to the north, Coney Court, an unmade road and abutting land to the east and an unmade road and abutting land to the south. A locality plan and an aerial photograph of the site are presented at Figure 2 and Figure 3 respectively.



Source: RACV VicRoads Country Street Directory

Figure 2: Locality Plan

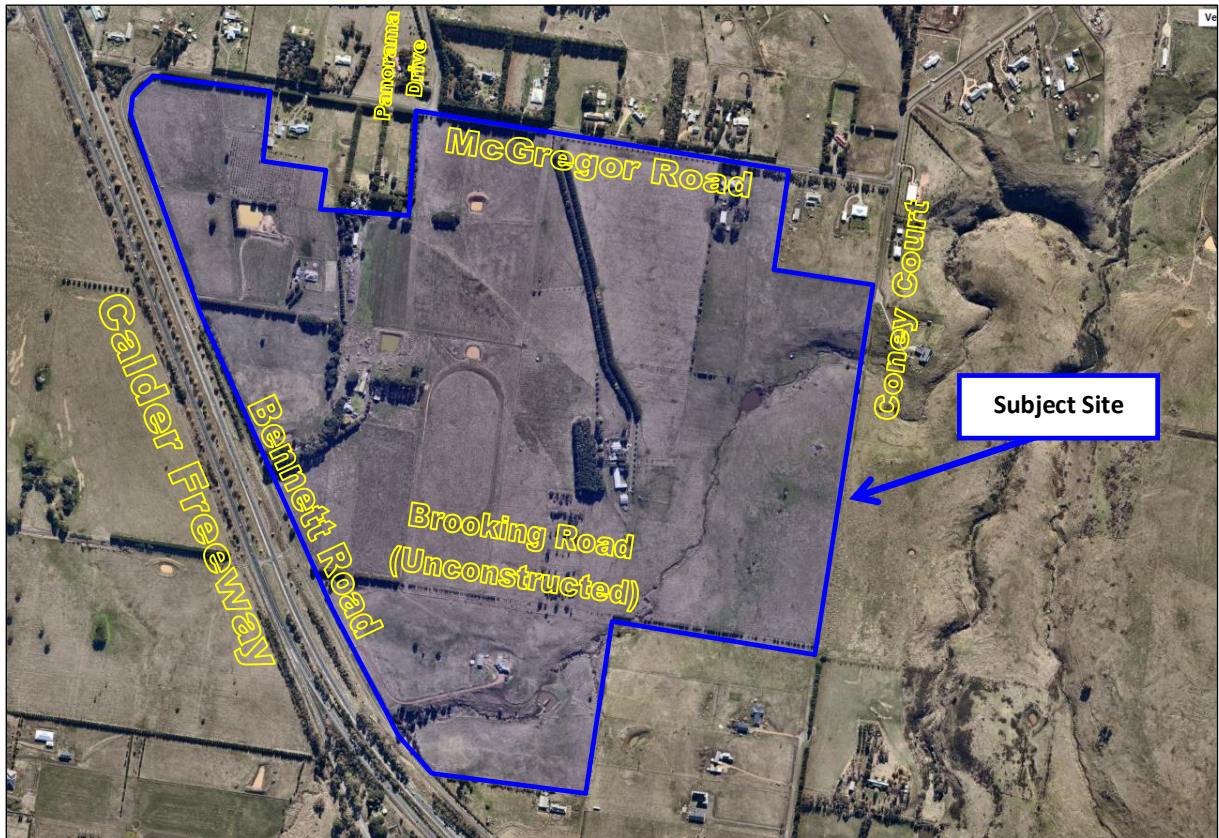


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*Jack Wiltshire*

## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne



Source: Nearmap.com

**Figure 3: Aerial Photograph**

Specifically, the subject site comprises various properties located in Gisborne, as follows:

- 88, 128 and 168 Bennett Road;
- 94 and 134 McGregor Road; and
- A parcel known as Lot 1 TP886104 (understood to be 15 McGregor Road).

Vehicle access for the site to/from the Gisborne township to the northwest is available via Panorama Drive and Emmeline Drive. Access to/from areas to the north of the site and Melbourne city to the southeast is available via Calder Freeway, which can also be accessed via the Panorama Drive/Emmeline Drive route, and approximately 3.5km from the south via local roads to the Coangault Road/Mundy Road freeway interchange.

The site has good access to central Sunbury to the southeast via two primary route options as follows:

- Via Dalrymple Road (to the southeast) which connects with Bennett Road directly; and
- Via Calder Freeway (via access ramps to the northwest).

Both existing route options are estimated to take approximately the same time to travel.

It is noted that no formal pedestrian or cyclist provisions, i.e. footpaths, on-road bicycle lanes or off-road bicycle paths, are constructed in the area surrounding the site, consistent with the rural nature of the area.

The site is irregular in shape and has a total site area of approximately 132 ha.



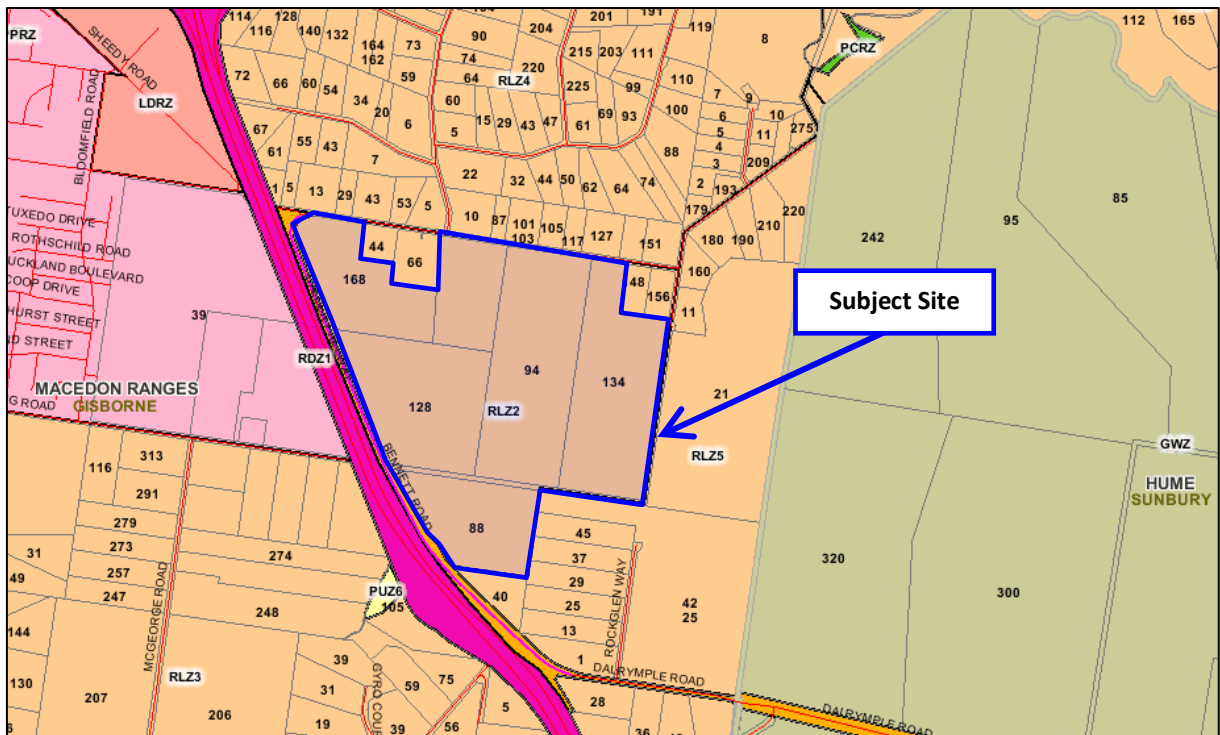
## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne

Each property/lot is largely free of structures, with the majority of properties currently accommodating a single residential dwelling and associated structures, except for the land parcel known as Lot 1 TP886104 which does not currently have a dwelling on it.

Formal vehicle access is provided to each property via McGregor Road or Bennett Road, except for Lot 1 TP886104 which does not currently have formal vehicle access.

The subject site is located within a Rural Living Zone - Schedule 2 (RLZ2), as shown in Figure 4.



Zones Legend		
ACZ - Activity Centre	IN1Z - Industrial 1	R1Z - General Residential
B1Z - Commercial 1	IN2Z - Industrial 2	R2Z - General Residential 2
B2Z - Commercial 1	IN3Z - Industrial 3	R3Z - General Residential
B3Z - Commercial 2	LDRZ - Low Density Residential	RAZ - Rural Activity
B4Z - Commercial 2	MUZ - Mixed Use	RCZ - Rural Conservation
B5Z - Commercial 1	NRZ - Neighbourhood Residential	RDZ1 - Road - Category 1
C1Z - Commercial 1	PCRZ - Public Conservation & Resource	RDZ2 - Road - Category 2
C2Z - Commercial 2	PDZ - Priority Development	RGZ - Residential Growth
CA - Commonwealth Land	PPRZ - Public Park & Recreation	RLZ - Rural Living
CCZ - Capital City	PUZ1 - Public Use - Service & Utility	RUZ - Rural
CDZ - Comprehensive Development	PUZ2 - Public Use - Education	SUZ - Special Use
DZ - Dockland	PUZ3 - Public Use - Health Community	TZ - Township
ERZ - Environmental Rural	PUZ4 - Public Use - Transport	UFZ - Urban Floodway
FZ - Farming	PUZ5 - Public Use - Cemetery/Crematorium	UGZ - Urban Growth
GRZ - General Residential	PUZ6 - Public Use - Local Government	
GWAZ - Green Wedge A	PUZ7 - Public Use - Other Public Use	
GWZ - Green Wedge	PZ - Port	-- Urban Growth Boundary

Source: Planning Scheme Maps Online <http://services.land.vic.gov.au>

Figure 4: Land Use Zoning Map

Land use in the immediate vicinity of the site is predominantly rural residential. A green wedge zone is located to the east of the site.



### 3.2 Road Network

#### 3.2.1 Existing Roads

**Bennett Road** is in the Road Zone - Category 2 (RDZ2) and is under the control of Council. Bennett Road is generally aligned in a northwest-southeast orientation between McGregor Road in the northwest (where it continues in an east-west orientation as McGregor Road) and Dalrymple Road in the southwest (where it continues in an east-west orientation as Dalrymple Road). Bennett Road is a sealed road and has a carriageway width of approximately 6.35m, which accommodates a single lane of traffic in each direction.

The default rural speed limit of 100km/h applies to Bennett Road.

Calder Freeway abuts the southwestern side of Bennett Road. One emergency vehicle connection is provided to Calder Freeway near the middle of the site's Bennett Road frontage. No public vehicle access is permitted at this connection.

Bennett Road is shown in Figure 5 and Figure 6.



**Figure 5: Bennett Road (View North)**



**Figure 6: Bennett Road (View South)**

**McGregor Road** in the vicinity of the subject land is generally aligned in an east-west orientation between Bennett Road in the west and Coney Court in the east. McGregor Road is a sealed road and has a carriageway width of approximately 7.0m, which accommodates a single lane of traffic in each direction.

A speed limit of 100km/h applies to McGregor Road.

McGregor Road, west of its intersection with Panorama Drive, is shown in Figure 7 and Figure 8.





**Figure 7: McGregor Road (View East)**



**Figure 8: McGregor Road (View West)**

**Coney Court** is a cul-de-sac road which extends to the south from McGregor Road. Coney Court is a sealed road and has a carriageway width of approximately 3.9m. Coney Court has grass verges on either side of the carriageway which are used by vehicles to facilitate passing other vehicles.

Coney Court, near its court bowl termination, is shown in Figure 9 and Figure 10.

At the time of writing this report, permit application PLN/2018/541 has been lodged for a ten-lot subdivision of 21 Coney Court. The application proposes an access link with Rockglen Way to the south of the subject land.



**Figure 9: Coney Road (View North)**



**Figure 10: Coney Road (View South)**

**Panorama Drive** is generally aligned in a north-south 'loop' between McGregor Road and Outlook Lane. Panorama Drive is a sealed road and has a carriageway width of approximately 5.5m, which accommodates a single lane of traffic in each direction.

Mitchel Shire Council has advised that Panorama Drive is subject to a speed limit of 80km/h.

The Panorama Drive/McGregor Road intersection is an unsignalised T-intersection that operates under standard give-way conditions, with priority afforded to motorists along McGregor Road.



## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne

No designated turn lanes are provided on any of the legs of the Panorama Drive/McGregor Road intersection.

Panorama Drive, at its intersection with McGregor Road, is shown in Figure 11 and Figure 12.



Figure 11: Panorama Drive (View North)



Figure 12: Panorama Drive (View South)

The road reserve of **Brooking Road** within the subject land is generally aligned in an east-west direction along the northern boundary of 88 Bennett Road and has an existing connection with Bennett Road. It is currently unconstructed within the site, i.e. no public access is currently provided.

### 3.2.2 Existing Traffic Conditions

Traffix Group has undertaken the following traffic counts:

- Automatic tube counts from Thursday 24 May, 2018 to Wednesday 30 May, 2018 along McGregor Road between:
  - Panorama Drive and Bennett Road, and
  - Panorama Drive and Coney Court.
- Turning movement counts on Wednesday 23 May, 2018 from 4:30pm to 6:30pm and Thursday 24 May, 2018 from 7:00am to 9:00am at the Panorama Drive/McGregor Road intersection.

A summary of the tube count results is presented in Table 1.



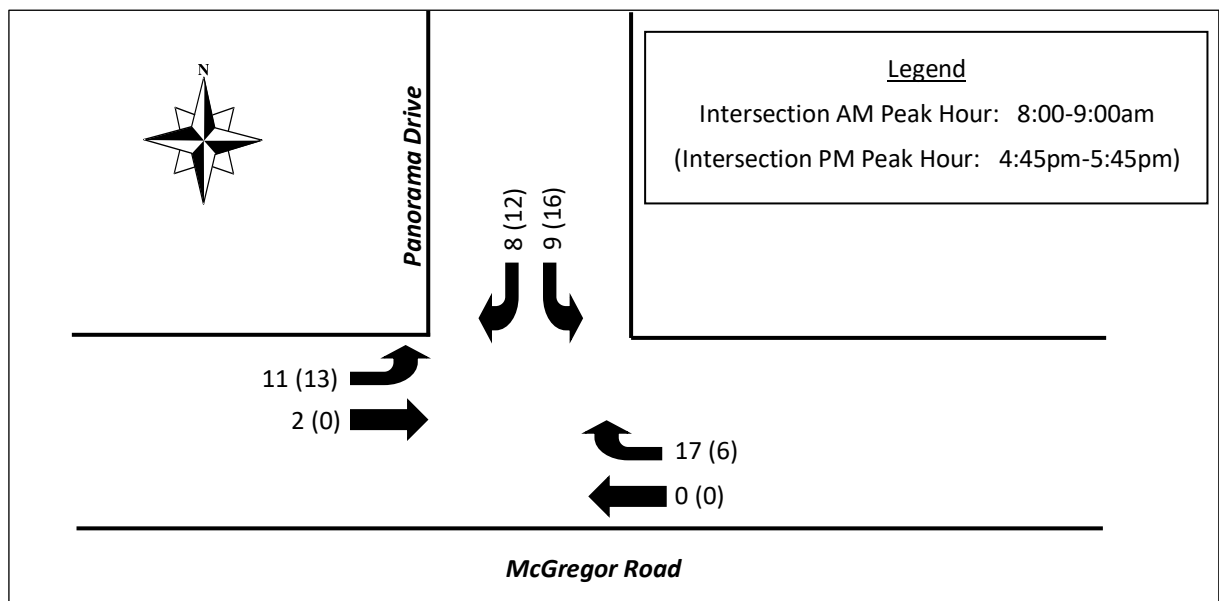
## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne

**Table 1: Traffic Count Summary**

Direction	Weekday Daily Average	AM Peak Hour	PM Peak Hour
<b>McGregor Road between Panorama Drive and Bennett Road (May, 2018)</b>			
Eastbound	153 vpd	18 vph 8:00am-9:00am	22 vph 4:00pm-5:00pm
Westbound	142 vpd	18 vph 10:00am-11:00am	17 vph 3:00pm-4:00pm
Two-Way	294 vpd	32 vph 8:00am-9:00am	36 vph 4:00pm-5:00pm
<b>McGregor Road between Panorama Drive and Coney Court (May, 2018)</b>			
Eastbound	115 vpd	15 vph 10:00am-11:00am	21 vph 5:00pm-6:00pm
Westbound	114 vpd	22 vph 8:00am-9:00am	16 vph 2:00pm-3:00pm
Two-Way	229 vpd	32 vph 8:00am-9:00am	31 vph 5:00pm-6:00pm

The results of the turning movement counts are shown in Figure 13.



**Figure 13: Peak Hour Traffic Counts Summary - Panorama Drive/McGregor Road**

Full output of the tube counts and turning movement counts are attached at Appendix A and Appendix B respectively.



### 3.3 Public Transport

The site is not currently serviced by public transport services, which is consistent with the relatively low density of residential dwellings in the vicinity of the site. However, private school buses operate in the vicinity of the site, with an informal bus pick up/drop off location at the Panorama Drive/McGregor Road intersection.

The nearest public transport service (Bus Route 473) is located approximately 2.9km northwest of the site at Howey Street, closer to the centre of the Gisborne township.

## 4 Proposed Development Plan

The proposed Development Plan for the 'Bennett Road Precinct' is attached at Appendix C and includes the following key features:

- Approximately 50 future allotments provided within the subject site with a minimum lot area of 2 hectares (ha), in accordance with the requirements of DPO18;
- Four unsignalised T-intersections with the existing external road network, comprising two connections with Bennett Road and two connections with McGregor Road; and
- Vehicle access for the future allotments to be provided as follows:
  - Direct access via a number of new roads within the future subdivision, including via:
    - The formal construction of the existing Brooking Road road reserve, consistent with the DPO18 requirements; and
    - A currently unconstructed Government road along the southern boundary of 94 and 134 McGregor Road and part of the eastern boundary of 134 McGregor Road; and
  - Direct access for the future allotments that are to abut Bennett Road and McGregor Road, consistent with current access arrangements for existing allotments abutting these roads.

## 5 Panorama Drive/McGregor Road Intersection

As shown in Figure 1, Map 1 of DPO18 shows an indicative north-south aligned road on the west boundary of the property that abuts east boundaries of 66 McGregor Road and 168 Bennett Road, intersecting with McGregor Road opposite Panorama Drive. Map 1 of DPO18 also shows a roundabout at the Panorama Drive/McGregor Road intersection.

The proposed Development Plan shows this indicative north-south aligned road along the east boundary of the property that abuts the west boundary of 94 McGregor Road, approximately 270m east of the location shown in Map 1 of DPO18.

DPO18 requires that the Development Plan be prepared for the whole area covered by the overlay, and that the Development Plan "must be generally in accordance" with the concept plan contained in the overlay (ie Map 1 of DPO18).





## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne

The DPO concept plan shows a north-south aligned road connecting McGregor Road to an internal east-west aligned road, which in turn connects to Bennett Road to the west and another internal road to the east. The fact that the road intersects McGregor Road at a crossroad is the reason for a roundabout being shown in the DPO concept plan. The proposed Development Plan retains this north-south aligned road, albeit moved to the east. The provision of this north-south aligned road is generally in accordance with the DPO concept plan.

The proposed alignment of this north-south road removes the need for a roundabout at the McGregor Road/Panorama Drive intersection on capacity grounds given that a standard T-intersection has the capacity to accommodate the relatively low volume of traffic that will use this intersection as discussed in greater detail at Section 6.2 of this report. In turn, the proposed alignment removes the inherent land acquisition issues that would otherwise be associated with the provision of the roundabout (ie on the northeast and northwest corners of this intersection).

The location of this north-south road allows the orderly development of land covered by the proposed Development Plan.

On this basis, it is considered that the road network contained in the proposed Development Plan is generally in accordance with the concept plan contained in DPO18.

## 6 Traffic Considerations

### 6.1 Traffic Generation and Distribution

The RTA Guide to Traffic Generating Developments (2002) (RTA Guide) sets out traffic generation rates based on survey data collected in New South Wales for a range of land uses. This guide is used by VicRoads and is generally regarded as the standard for metropolitan development characteristics.

The RTA Guide sets out the following rates for standard residential dwellings:

- *daily vehicle trips = 9.0 per dwelling*
- *weekday peak hour vehicle trips = 0.85 per dwelling*

However, the RTA Guide states that ... *“The Australian Model Code for Residential Development (AMCORD) assumes a daily vehicle generation rate of 10.0 per dwelling, with 10% of that taking place in the commuter peak period. The use of these figures provides some allowance for later dual occupancy development.”*

Conservatively adopting a rate of 10 vehicle trip-ends (vte) per day per lot, in the order of 500 vte per day would be generated by the future residential subdivision, including 50 vte during each of the AM and PM commuter peak hours<sup>1</sup>. This results in approximately in the order of one vehicle generated every 1.2 minutes, noting that the traffic generated would be less than this given that the site already generates traffic.

<sup>1</sup> Previous experience with residential subdivisions indicates that an upper limit of approximately 8% of daily trips are generated in each commuter peak hour in outer metropolitan areas such as this.



## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne

It is anticipated that the primary destinations for traffic generated by the site would include the Gisborne township, central Sunbury and Melbourne city, including other metropolitan suburbs.

The Gisborne township is located to the northwest of the site, and central Sunbury and Melbourne city are located to the southeast. Melbourne city (and other metropolitan suburbs) and central Sunbury are accessed via Calder Freeway to the northwest of the site, with central Sunbury also having an alternate route to/from the site via Bennett Road to the southeast. Access is also available to/from Calder Freeway at the Couangalt Road/Mundy Road freeway interchange via local roads to the south.

For the purposes of a conservative assessment, it is assumed that all traffic generated by the site will be distributed to/from the Gisborne township and Calder Freeway (which provides access with Sunbury central, Melbourne city and other metropolitan suburbs), i.e. to/from Panorama Drive to the north of the site. It is likely that some motorists intending to travel to/from central Sunbury may choose to instead travel via Bennett Road's southeast extension.

## 6.2 Traffic Impacts

A number of lots within the proposed Development Plan will take direct vehicle access off McGregor Road or Bennett Road. The remaining lots will utilise the internal road network to access the external road network at four locations.

### Brooking Road/Bennett Road

A basic right turn (BAR) treatment is proposed at this location, given the intersection provides access to the proposed subdivision.

### Rockglen Way/Dalrymple Road

It is not proposed to upgrade this intersection as part of the proposed Development Plan for the subject land. The volume of traffic generated by the existing and approved subdivisions that take access off Rockglen Way (understood to be in the order of 15 lots) will already require this intersection to be upgraded to a BAR. This is a matter to be addressed, if required, under the separate proposal which is the one that proposes to connect to Rockglen Way (not this Development Plan). The additional traffic likely to use this intersection from the land covered by the proposed Development Plan will be low and will replace a proportion of the traffic from the subdivisions abutting Rockglen Way that is redirected to the north as a result of the extension of Rockglen Way to the subject land. Hence, any additional traffic from the land subject to the proposed Development Plan will not trigger a requirement for a higher order intersection than is already required as a result of the subdivision of land abutting Rockglen Way.

### New Roads Intersecting with Bennett Road and McGregor Road

Basic right turn (BAR) treatments are proposed at these locations, given the intersections provides access to the proposed subdivision.

### Bennett Road/Brooking Road

The location of this intersection is fixed and is consistent with the concept plan in the overlay. Access is appropriately considered as part of any planning permit application. At that time, it would be appropriate to also consider the speed limit on Bennett Road in the vicinity of the area covered by the



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## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne

development plan. It is currently 100 km/h. With the proposed subdivision there will be an increase in the number of properties taking access off Bennett Road and a reduced speed limit of 80 km/h would be more appropriate. A reduced speed limit will assist in enabling appropriate sight distances to be provided at the Bennett Road/Brooking Road intersection.

### Brooking Road/Proposed North-South Orientated Road

A new road is proposed to run to the north of Brooking Road (which will be constructed as part of the Development Plan). The associated intersection will be located a minimum of approximately 80m to the west of the crossing of the Djiri Djiri Creek and future detailed design of the intersection and creek crossing should have consideration for associated sight distances which would be based on the relevant future speed limit of the relevant section of Brooking Road.

It is also noted that the southern end of the future north-south road that is to run through 94 McGregor Road is identified to connect with Brooking Road further to the west than what is identified in the DPO in order to maximise sight distance. Furthermore, no access/driveways will be provided to individual allotments in the vicinity of any critical changes in the vertical alignment of Brooking Road as a result of the creek crossing.

### Panorama Drive/Emmeline Drive

This intersection operates as a standard T-intersection, with priority given to Panorama Drive traffic. From Figure 13, it is evident that Panorama Drive at McGregor Road carries the following traffic:

- AM peak hour:
  - Northbound: 28 vph
  - Southbound: 17 vph
  - Two way: 45 vph
- PM peak hour:
  - Northbound: 19 vph
  - Southbound: 28 vph
  - Two way: 47 vph

This intersection also serves 81 low density residential lots to the north, south and east of the intersection, estimated to approach and depart the intersection as shown in Figure 14.



Figure 14: Panorama Drive/Emmeline Drive



## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne

Existing traffic volumes through the Panorama Drive/Emmeline Drive intersection have been estimated as follows:

- All northbound traffic on Panorama Drive at McGregor Road turns left into Emmeline Drive.
- All southbound traffic on Panorama Drive at McGregor Road turns right from Emmeline Drive.
- All traffic from properties south of a line extending east from Emmeline Drive (42 lots) travels from the south to the west and from the west to the south through the Panorama Drive/Emmeline intersection.
- All traffic from properties north of a line extending east from Emmeline Drive (41 lots) travels from the north to the west and from the west to the north through the Panorama Drive/Emmeline intersection.
- Traffic from these 83 properties is conservatively predicted to be generated at a rate of 1 vte/hour in both peak hours, split as follows:
  - AM peak hour: In: 0.2 Out: 0.8
  - PM peak hour: In: 0.6 Out: 0.4

Application of these assumptions produces the predicted existing traffic volumes through the Panorama Drive/Emmeline Drive intersection shown in Figure 15.

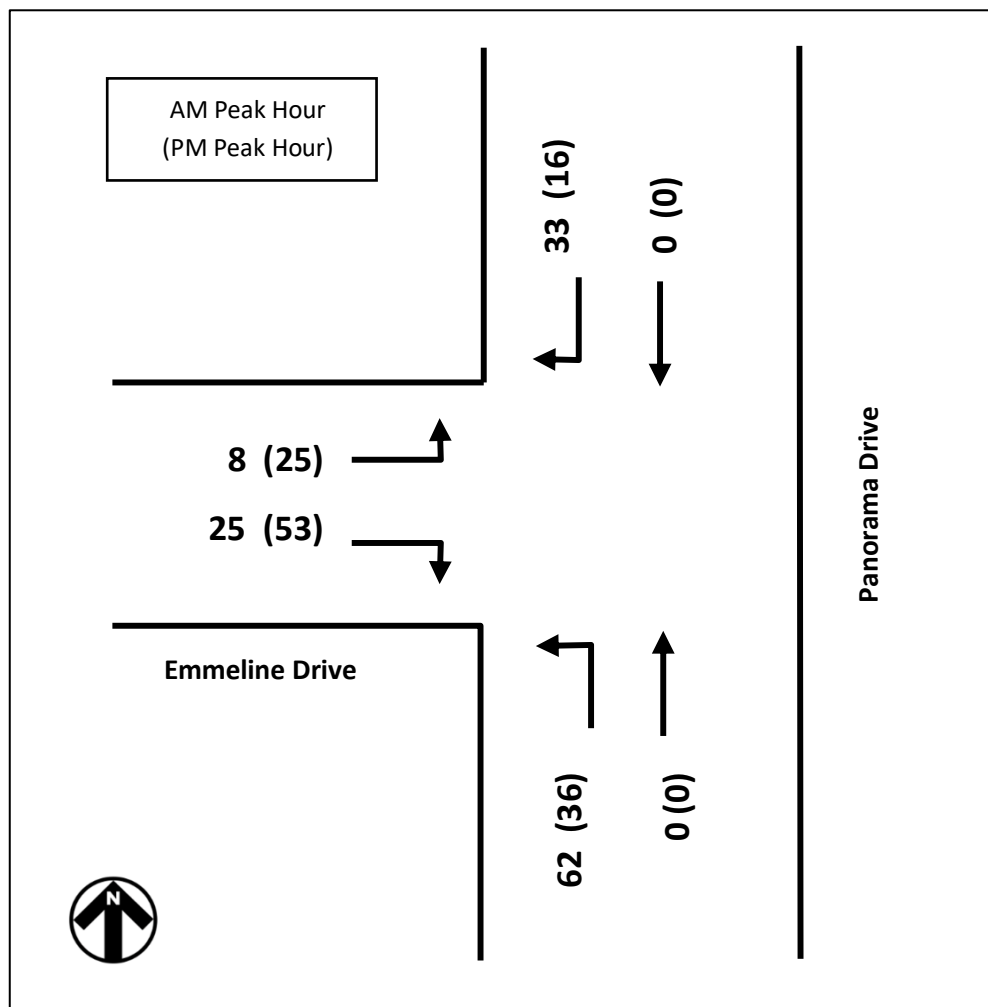


Figure 15: Panorama Drive/Emmeline Drive Existing Traffic Volumes

If all the traffic anticipated to be generated by the proposed Development Plan travelled through the Panorama Drive/Emmeline Drive intersection, this would add an additional 50 vph in both peak hours.



Development Plan travelled through the  
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## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne

This T-intersection has the capacity to readily accommodate this additional traffic without the need for modification. Priority should remain with Panorama Drive traffic.

### Panorama Drive/McGregor Road

Traffic generated by the proposed Development Plan is anticipated to travel via the Panorama Drive/McGregor Road intersection. As mentioned above, this conservatively equates to in the order of one vehicle being generated every 1.2 minutes at this intersection.

When combined with existing traffic at the existing Panorama Drive/McGregor Road intersection, i.e. up to 47 vehicle movements during each commuter peak hour from Figure 13, this results in approximately in the order of 97 vehicle movements during each commuter peak hour. The T-intersection at the Panorama Drive/McGregor Road intersection has the capacity to readily accommodate the additional traffic without the need for modification as detailed following.

For the purposes of an intersection analyses we have assumed the following:

- 1 vte/hour in both the AM and PM peak hours for each of the 50 lots within the Development Plan, split as follows:
  - AM peak hour: In: 0.2 Out: 0.8
  - PM peak hour: In: 0.6 Out: 0.4
- Based on the location of the proposed lots the number of movements associated with the Development Plan that would be generated to/from the east and west along McGregor Road to its intersection with Panorama Drive is as follows:
  - To/From the East: 35 lots
  - To/From the West: 15 lots

Based on the above, and when considering the existing traffic that was observed at the intersection during our associated traffic counts, the post development traffic at the intersection is estimated to be as presented in Figure 16 (note that this is conservatively based on a former potential yield of 55 lots on the subject site).

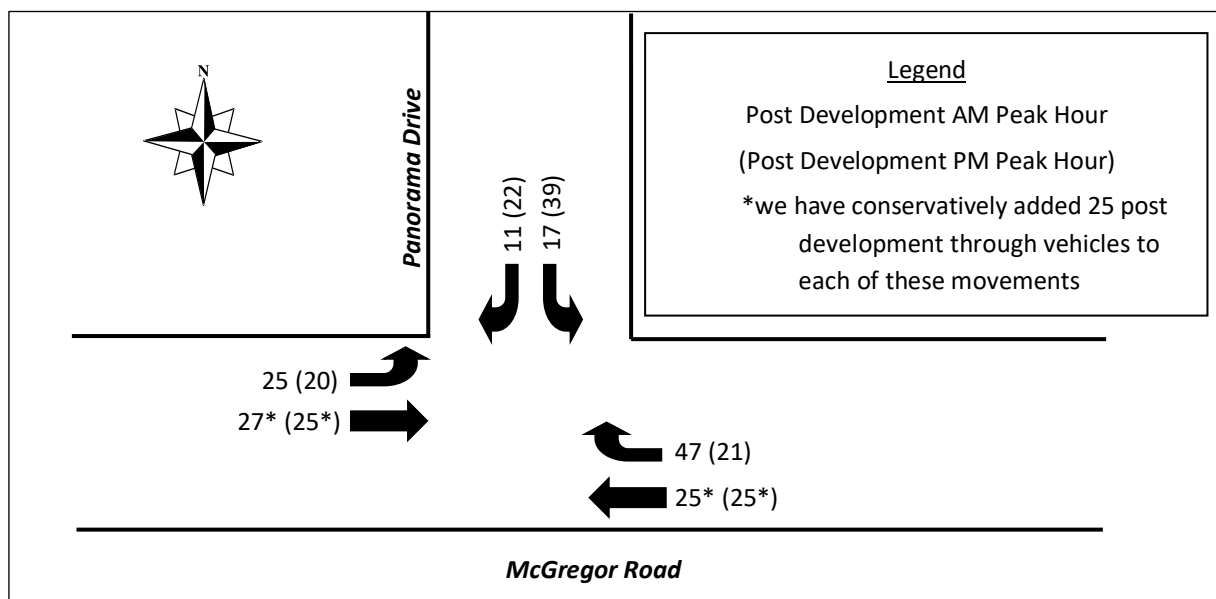


Figure 16: Post Development Peak Hour Traffic Volume Estimate  
(Panorama Drive/McGregor Road)



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## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne

We have undertaken analysis of the post development conditions at the Panorama Drive/McGregor Road intersection using SIDRA Intersection 8 adopting all SIDRA default values including the conservative critical-gap and follow-up headway values.

Full output of the associated post development operating conditions at the intersection are attached at Appendix D which clearly show that the intersection will continue to function with abundant spare capacity even under the existing geometry with very low Degree of Saturation, Queues and Delays expected in both the AM and PM peak hours.

Accordingly, we are satisfied that it would be appropriate for nothing more than a BAR treatment to be provided at the Panorama Drive/McGregor Road intersection.

### Safe Road Access to Lots

#### At Bend in Bennett Road and McGregor Road

This bend has a signed advisory speed of 50 km/h. The proposed Development Plan includes indicative lots. The lot on the bend in Bennett Road and McGregor Road has its eastern boundary 80m east of the bend in the property line on Bennett Road and has its southern boundary 80m south of the bend in the property line on McGregor Road. Both these bends in the property boundary are adjacent to the point where the bend in the road commences. Accordingly, there is adequate sight distances on both roads for vehicle access to be provided in the vicinity of either of the corner lots' property boundaries, given the speed of traffic exiting the bend in the road. It is noted that sight distances to the east along McGregor Road and to the south along Bennett Road are adequate.

#### At 88 Bennett Road

Access to 88 Bennett Road is appropriately considered as part of any planning permit application. At that stage, a range of options could be explored to ensure appropriate access is provided to this parcel of land. Sight lines at this location are affected by the horizontal and vertical geometry of Bennett Road. They are also affected by the speed limit along Bennett Road and vegetation largely within the road reserve. These can be appropriately addressed at planning permit or detailed design stage, with removal of exotic vegetation and an 80 km/h speed limit recommended.

### Conclusion

Based on the preceding, we are of the opinion that there will be no unreasonable detrimental impacts to the surrounding road network as a result of a future subdivision at the subject site and that no external traffic-related works, other than at intersections of new internal roads with Bennett Road and McGregor Road, are required.



## 7 Other Traffic Matters

### 7.1 Internal Road Cross Sections

The DPO18 specifies that “*East-west and north-south road connections*”, including Brooking Road should be constructed with a “*minimum width of 20 metres*”. All road reservations within the proposed Development Plan are identified as being a minimum of 20m wide. Accordingly, the relevant requirement under DPO18 with regards to the minimum road reservation width for internal roads is met.

Council’s *Engineering Requirements for Infrastructure Construction* policy document details the engineering requirements associated with infrastructure construction resulting from development within the Shire. Based on this document, it is apparent that Council considers the new roads to be “*rural type*”. Council’s engineers have advised that the following, in part, will be required:

- Carriageway width: 6.6m
- Shoulders: 0.5m both sides
- Swale drains on both sides
- 20m wide road reserve

All internal roads within the proposed Development Plan will be constructed in accordance with these requirements.

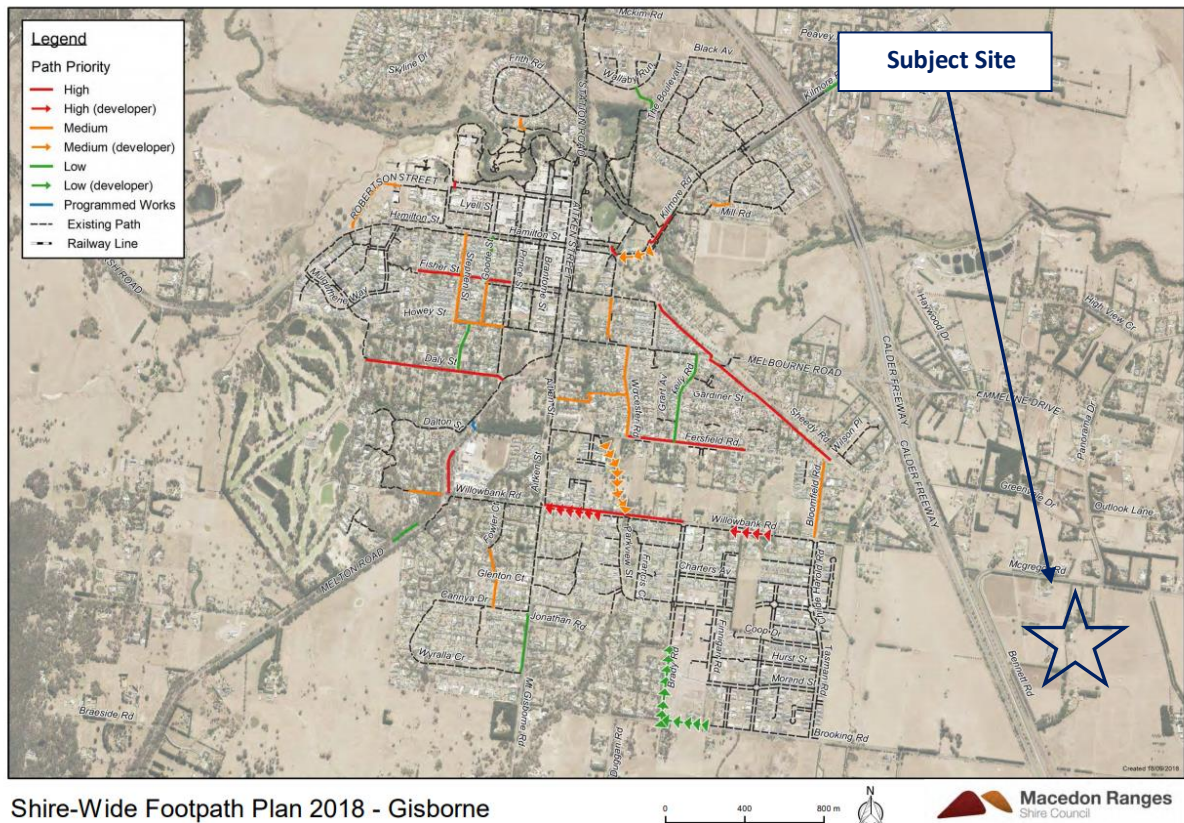
Council’s *Shire Wide Footpath Plan* has prioritised the promotion of health and wellbeing and improvement of the built environment through the upgrade of walking and cycling infrastructure within the municipality”. The footpath plan is in effect a 15 to 20 year plan to retrofit footpaths within the municipality.

The Shire-wide footpath plan for Gisborne is shown in Figure 17.



## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne



**Figure 17: Shire-Wide Footpath Plan for Gisborne**

The Development Plan subdivision concept plan allows for rural condition pedestrian and bike access. In particular, a 'rural pedestrian path/bike track' is proposed on the central east-west road, central north-south road and part of the north-south connection to Brooking Road, and there will also be a path along the waterway as shown in the Development Plan.

Bicycle movements can also be accommodated along the carriageway of all roads within the proposed development in a shared fashion that is consistent with typical practice.

## 7.2 Access for Service and Emergency Vehicles

All road carriageway widths will adequately facilitate relevant service and emergency vehicles and are consistent with the typical CFA requirements.

CFA and maintenance access is to be provided along the entire Djirri Djirri Creek Reserve.





## Traffic Management and Impact Plan

Proposed Development Plan: 88-168 Bennett Road and 15 & 94-134 McGregor Road, Gisborne

### 7.3 Pedestrian and Cycling Access

As shown in the Development Plan, a 'rural pedestrian path/bike track' is proposed on the central east-west road, central north-south road and part of the north-south connection to Brooking Road.

A path will also be provided along the waterway as also shown in the Development Plan.

Cyclists will also be able to utilise the proposed internal and abutting road carriageways in a shared fashion consistent with typical practice on access streets within a rural residential subdivision.

### 7.4 Public Transport Considerations

Consistent with existing dwellings in the area surrounding the site, future allotments within the subject site will not have access to public transport services in close proximity. However, it is noted that public transport services could be extended to the subject site to service the overall area if ultimately deemed necessary.

### 7.5 Street Lights

Street lighting is to be provided at the four intersections with the site at Bennett and McGregor Roads as identified in the Development Plan.

### 7.6 Gradients

The southern end of the north-south road has been located further west than identified in the DPO so as to avoid the slope and ensure that sight lines are maximised at its intersection with Brooking Road. Terraco, the civil engineering consultant undertaking assessments in association with the site, will have regard to the existing levels on the associated feature survey plan to ensure that a suitable gradient is provided at the Brooking Road culvert crossing.

The gradient of the road reservation through the land at 94 McGregor Road towards the escarpment is not particularly steep at 1 in 19.4. It is noted that the associated Development Plan cross-section as prepared by Terraco states that '*The alignment shown has been chosen to maximise the buffer from road reserve to the existing house and sheds on 94 McGregor Road, whilst maintaining a safe and practical road location above the top of escarpment. Alignment shown is indicative only and is to be detailed in engineering design*'. Significantly, the 1 in 4.6 grade is outside of the road reservation and is further offset by a flatter 1 in 8.8 grade and the Development Plan acknowledges the same. The alignment will be detailed at subdivision stage when it is most suitable.



## 8 Conclusions

Having undertaken a detailed traffic engineering assessment of the proposed Bennett Road Precinct Development Plan at 88-168 Bennett Road and 94-134 McGregor Road in Gisborne, we are of the opinion that:

- a) The proposed road network is generally in accordance with Sub-Clause 5.0 (Map 1) of Schedule 18 to the Development Plan Overlay (DPO18) of the Macedon Ranges Planning Scheme;
- b) No external traffic-related works, other than at intersections of new internal roads with Bennett Road and McGregor Road and the introduction of a BAR treatment at the existing Panorama Drive/McGregor Road intersection, are required as a result of a future subdivision at the subject site;
- c) Street lighting will be provided at the four site intersections with Bennett and McGregor Roads;
- d) The proposed internal road reservations and intersections are in accordance with DPO18 and will provide safe connection and permeability for pedestrians, cyclists and motor vehicles, in a fashion that is typically better than existing arrangements in the surrounding area;
- e) An appropriate court bowl treatment capable of facilitating relevant service and emergency vehicles should be provided for the proposed dead-end road;
- f) There will be no unreasonable detrimental impacts to the surrounding road network as a result of a future subdivision at the subject land; and
- g) This Traffic Management and Impact Plan adequately addresses all associated requests of DPO18 of the Macedon Ranges Planning Scheme.



# Appendix A Tube Counts



**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
**Page: 227 of 371 SIGNED:** 



Traffic Data Collection Services

Traffix Survey Pty Ltd  
ABN 57 120 461 510

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Suite 8, 431 Burke Road  
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Contact  
Telephone 03 9822 2888  
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survey@traffixgroup.com.au  
www.traffixgroup.com.au

**McGregor Road, Gisborne**  
**Between**  
**Panorama Drive & Bennett Road**

Prepared for  
Traffix Group Pty Ltd

May 2018

Reference: 38971891

**MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
Page: 228 of 371 SIGNED:**

# TRAFFIC COUNT SUMMARY



## McGregor Road, Gisborne At: west of Panorama Dr Between Panorama Drive & Bennett Road

<b>CUSTOMER:</b>	Traffix Group Pty Ltd	<b>MAP REF:</b>	678 K11
<b>TYPE COUNT:</b>	7 days, Speed Vol Class	<b>ACTUAL DURATION:</b>	9 days
<b>DATE START:</b>	24/05/18	<b>DATE FINISH:</b>	30/05/18
<b>TIME START:</b>	0000	<b>TIME FINISH:</b>	2300
<b>DIRECTION-1:</b>	Eastbound	<b>DIRECTION-2:</b>	Westbound
<b>COUNTER NO:</b>		<b>SPEED LIMIT:</b>	80
<b>CLASSES:</b>	1 - 12	<b>SPEEDS:</b>	All

ALL VEHICLES	Eastbound	Westbound	COMBINED
24 Hour Week Day Average	153	142	294
24 Hour 7 Day Average	141	134	275
A.M. Peak Hour Volume	18	18	32
A.M. Peak Hour	0800-0859	1000-1059	0800-0859
P.M. Peak Hour Volume	22	17	36
P.M. Hour	1600-1659	1500-1559	1600-1659

COMMERCIAL VEHICLE	Eastbound	Westbound	COMBINED
Total Volume	86	138	224
%	8.7%	14.7%	11.6%

SPEEDS	Eastbound % Vol.	Westbound % Vol.	COMBINED % Vol.
>119km/h	0.0	0.0	0.0
>109km/h	0.0	0.0	0.0
>99km/h	0.0	0.1	0.1
>89km/h	0.6	0.7	0.7
>79km/h	4.0	4.2	4.1
>69km/h	24.9	14.5	19.8
>59km/h	64.5	47.3	56.1
>49km/h	91.5	82.4	87.1
>39km/h	97.5	95.6	96.6
>29km/h	98.8	98.3	98.5
>19km/h	99.9	99.3	99.6
85%ile	72.2	68.8	70.8
Mean	62.7		

Notes

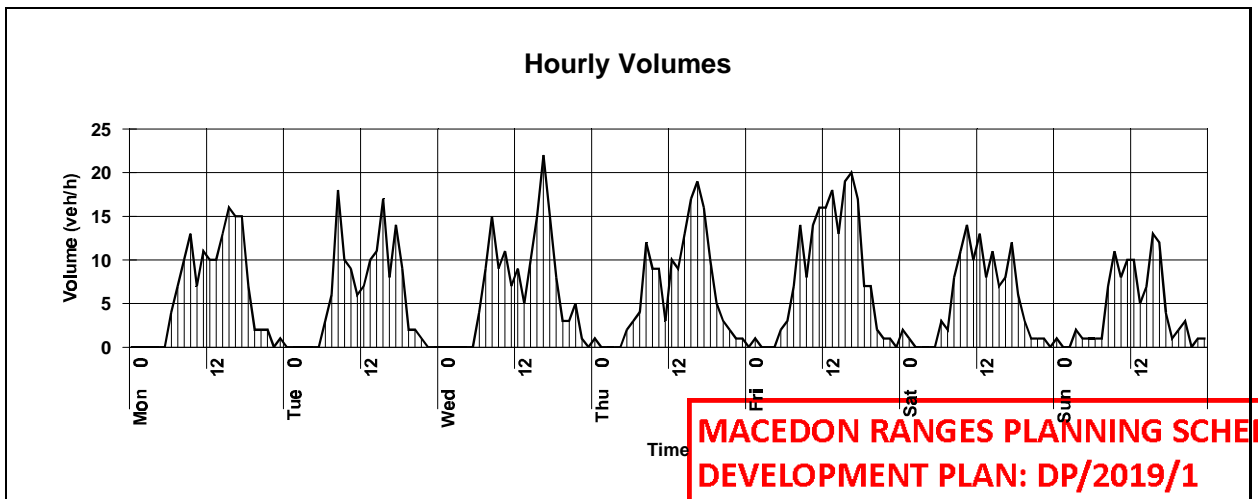
**MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
Page: 229 of 371 SIGNED:**

# Traffix Survey Traffic Count Traffic Volume Analysis



**Site No:** 3897189  
**Site location:** McGregor Road, Gisborne  
**Between :** Panorama Drive & Bennett Road  
**Direction :** Eastbound  
**Time range:** 0000 24/05/18 to 2300 30/05/18  
**Filters:** Class: 1-12, Speeds: All

Date	28/05/18	29/05/18	30/05/18	24/05/18	25/05/18	26/05/18	27/05/18	AVERAGES	
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	WEEKDAY	ALL DAYS
<b>Period</b>									
0000-0059	0	0	0	1	0	2	1	0	1
0100-0159	0	0	0	0	1	1	0	0	0
0200-0259	0	0	0	0	0	0	0	0	0
0300-0359	0	0	0	0	0	0	2	0	0
0400-0459	0	0	0	0	0	0	1	0	0
0500-0559	0	0	0	2	2	0	1	1	1
0600-0659	4	3	4	3	3	3	1	3	3
0700-0759	7	6	9	4	7	2	1	7	5
0800-0859	10	<b>18</b>	<b>15</b>	<b>12</b>	14	8	7	14	12
0900-0959	<b>13</b>	10	9	9	8	11	<b>11</b>	10	10
1000-1059	7	9	11	9	14	<b>14</b>	8	10	10
1100-1159	11	6	7	3	<b>16</b>	10	10	9	9
1200-1259	10	7	9	10	16	<b>13</b>	10	10	11
1300-1359	10	10	5	9	18	8	5	10	9
1400-1459	13	11	10	13	13	11	7	12	11
1500-1559	<b>16</b>	<b>17</b>	15	17	19	7	<b>13</b>	17	15
1600-1659	15	8	<b>22</b>	<b>19</b>	<b>20</b>	8	12	17	15
1700-1759	15	14	15	16	17	12	4	15	13
1800-1859	7	9	8	10	7	6	1	8	7
1900-1959	2	2	3	5	7	3	2	4	3
2000-2059	2	2	3	3	2	1	3	2	2
2100-2159	2	1	5	2	1	1	0	2	2
2200-2259	0	0	1	1	1	1	1	1	1
2300-2359	1	0	0	1	0	0	1	0	0
<b>TOTALS</b>									
12Hr 7-19	134	125	135	131	<b>169</b>	110	89	139	128
24Hr 0-24	145	133	151	149	<b>186</b>	122	102	153	141
24/12 Fact	1.08	1.06	1.12	1.14	1.10	1.11	1.15	1.10	1.11
AM HR	0900-0959	<b>0800-0859</b>	0800-0859	0800-0859	1100-1159	1000-1059	0900-0959		
PEAK	13	<b>18</b>	15	12	16	14	11		
PM HR	1500-1559	1500-1559	<b>1600-1659</b>	1600-1659	1600-1659	1200-1259	1500-1559		
PEAK	16	17	<b>22</b>	19	20	13	13		



MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 230 of 371 SIGNED:

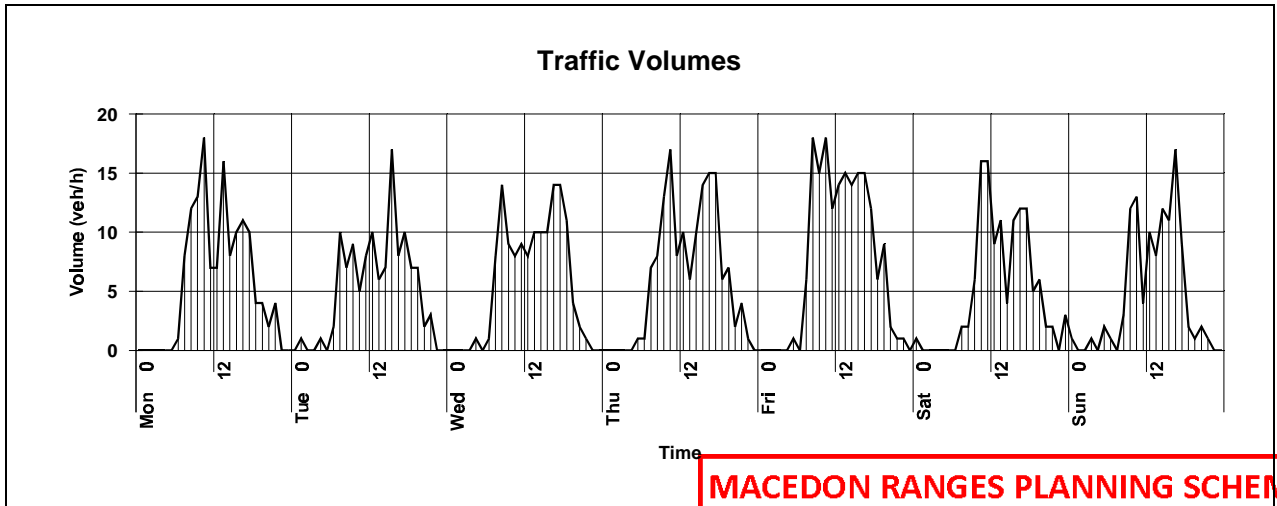
# Traffix Survey Traffic Count

## Traffic Volume Analysis



**Site No:** 3897189  
**Site location:** McGregor Road, Gisborne  
**Between :** Panorama Drive & Bennett Road  
**Direction :** Westbound  
**Time range:** 0000 24/05/18 to 2300 30/05/18  
**Filters:** Class: 1-12, Speeds: All

Date	28/05/18	29/05/18	30/05/18	24/05/18	25/05/18	26/05/18	27/05/18	AVERAGES	
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	WEEKDAY	ALL DAYS
<b>Period</b>									
0000-0059	0	0	0	0	0	1	1	0	0
0100-0159	0	1	0	0	0	0	0	0	0
0200-0259	0	0	0	0	0	0	0	0	0
0300-0359	0	0	0	0	0	0	1	0	0
0400-0459	0	1	1	0	0	0	0	0	0
0500-0559	0	0	0	1	1	0	2	0	1
0600-0659	1	2	1	1	0	0	1	1	1
0700-0759	8	10	8	7	6	2	0	8	6
0800-0859	12	7	14	8	18	2	3	12	9
0900-0959	13	9	9	13	15	6	12	12	11
1000-1059	18	5	8	17	18	16	13	13	14
1100-1159	7	8	9	8	12	16	4	9	9
1200-1259	7	10	8	10	14	9	10	10	10
1300-1359	16	6	10	6	15	11	8	11	10
1400-1459	8	7	10	10	14	4	12	10	9
1500-1559	10	17	10	14	15	11	11	13	13
1600-1659	11	8	14	15	15	12	17	13	13
1700-1759	10	10	14	15	12	12	9	12	12
1800-1859	4	7	11	6	6	5	2	7	6
1900-1959	4	7	4	7	9	6	1	6	5
2000-2059	2	2	2	2	2	2	2	2	2
2100-2159	4	3	1	4	1	2	1	3	2
2200-2259	0	0	0	1	1	0	0	0	0
2300-2359	0	0	0	0	0	3	0	0	0
<b>TOTALS</b>									
12Hr 7-19	124	104	125	129	160	106	101	128	121
24Hr 0-24	135	120	134	145	174	120	110	142	134
24/12 Fact	1.09	1.15	1.07	1.12	1.09	1.13	1.09	1.10	1.10
<b>AM HR</b>	1000-1059	0700-0759	0800-0859	1000-1059	0800-0859	1000-1059	1000-1059		
<b>PEAK</b>	18	10	14	17	18	16	13		
<b>PM HR</b>	1300-1359	1500-1559	1600-1659	1600-1659	1300-1359	1600-1659	1600-1659		
<b>PEAK</b>	16	17	14	15	15	12	17		



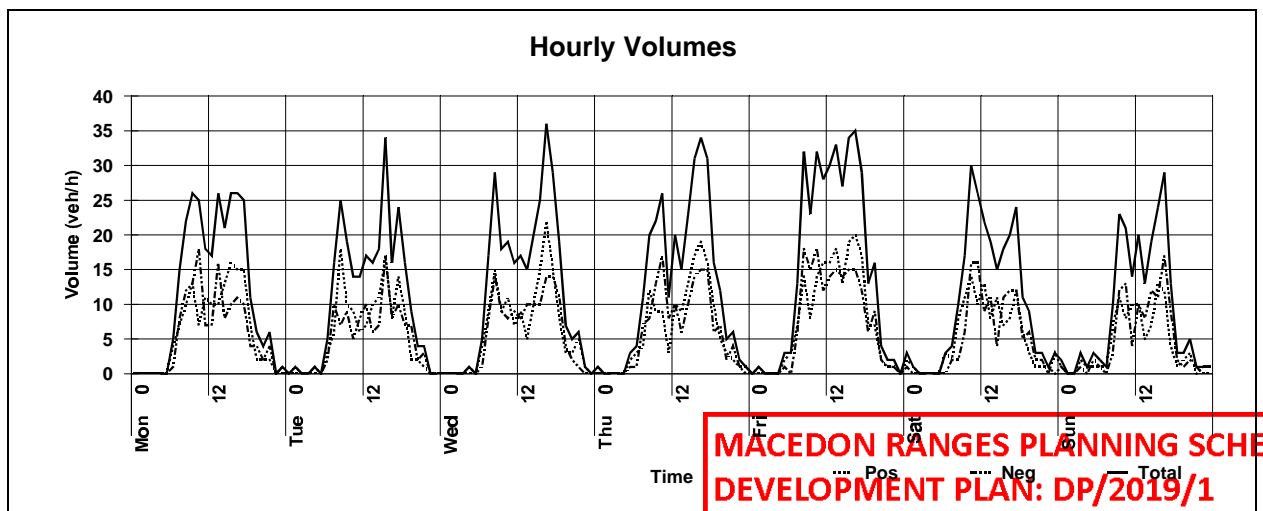
**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
**Page: 231 of 371 SIGNED:**

## Traffix Survey Traffic Count Traffic Volume Analysis



**Site No:** 3897189  
**Site location:** McGregor Road, Gisborne  
**Between :** Panorama Drive & Bennett Road  
**Direction :** Eastbound & Westbound  
**Time range:** 0000 24/05/18 to 2300 30/05/18  
**Filters:** Class: 1-12, Speeds: All

Date	28/05/18	29/05/18	30/05/18	24/05/18	25/05/18	26/05/18	27/05/18	AVERAGES	
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	WEEKDAY	ALL DAYS
<b>Period</b>									
0000-0059	0	0	0	1	0	3	2	0	1
0100-0159	0	1	0	0	1	1	0	0	0
0200-0259	0	0	0	0	0	0	0	0	0
0300-0359	0	0	0	0	0	0	3	0	0
0400-0459	0	1	1	0	0	0	1	0	0
0500-0559	0	0	0	3	3	0	3	1	1
0600-0659	5	5	5	4	3	3	2	4	4
0700-0759	15	16	17	11	13	4	1	14	11
0800-0859	22	<b>25</b>	<b>29</b>	20	<b>32</b>	10	10	26	21
0900-0959	<b>26</b>	19	18	22	23	17	<b>23</b>	22	21
1000-1059	25	14	19	<b>26</b>	32	<b>30</b>	21	23	24
1100-1159	18	14	16	11	28	26	14	17	18
1200-1259	17	17	17	20	30	22	20	20	20
1300-1359	<b>26</b>	16	15	15	33	19	13	21	20
1400-1459	21	18	20	23	27	15	19	22	20
1500-1559	26	<b>34</b>	25	31	34	18	24	30	27
1600-1659	26	16	<b>36</b>	<b>34</b>	<b>35</b>	20	<b>29</b>	29	28
1700-1759	25	24	29	31	29	<b>24</b>	13	28	25
1800-1859	11	16	19	16	13	11	3	15	13
1900-1959	6	9	7	12	16	9	3	10	9
2000-2059	4	4	5	5	4	3	5	4	4
2100-2159	6	4	6	6	2	3	1	5	4
2200-2259	0	0	1	2	2	1	1	1	1
2300-2359	1	0	0	1	0	3	1	0	1
<b>TOTALS</b>									
12Hr 7-19	258	229	260	260	<b>329</b>	216	190	267	249
24Hr 0-24	280	253	285	294	<b>360</b>	242	212	294	275
24/12 Fact	1.09	1.10	1.10	1.13	1.09	1.12	1.12	1.10	1.11
<b>AM HR</b>	0900-0959	0800-0859	0800-0859	1000-1059	<b>0800-0859</b>	1000-1059	0900-0959		
<b>PEAK</b>	26	25	29	26	<b>32</b>	30	23		
<b>PM HR</b>	1300-1359	1500-1559	<b>1600-1659</b>	1600-1659	1600-1659	1700-1759	1600-1659		
<b>PEAK</b>	26	34	<b>36</b>	34	35	24	29		



**MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
**Page: 232 of 371 SIGNED:**





Traffic Data Collection Services

Traffix Survey Pty Ltd  
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Telephone 03 9822 2888  
Facsimile 03 9822 7444  
survey@traffixgroup.com.au  
www.traffixgroup.com.au

**McGregor Road, Gisborne**  
**Between**  
**Panorama Drive & Coney Court**

Prepared for  
Traffix Group Pty Ltd

May 2018

Reference: 38971901

**MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
Page: 233 of 371 SIGNED:**

# TRAFFIC COUNT SUMMARY



## McGregor Road, Gisborne At: east of Panorama Dr Between Panorama Drive & Coney Court

**CUSTOMER:** Traffix Group Pty Ltd  
**TYPE COUNT:** 7 days, Speed Vol Class  
**DATE START:** 24/05/18  
**TIME START:** 0000  
**DIRECTION-1:** Eastbound  
**COUNTER NO:**  
**CLASSES:** 1 - 12

**MAP REF:** 678 K11  
**ACTUAL DURATION:** 9 days  
**DATE FINISH:** 30/05/18  
**TIME FINISH:** 2300  
**DIRECTION-2:** Westbound  
**SPEED LIMIT:** 80  
**SPEEDS:** All

ALL VEHICLES	Eastbound	Westbound	COMBINED
24 Hour Week Day Average	115	114	229
24 Hour 7 Day Average	110	109	219
A.M. Peak Hour Volume	15	22	32
A.M. Peak Hour	1000-1059	0800-0859	0800-0859
P.M. Peak Hour Volume	21	16	31
P.M. Hour	1700-1759	1400-1459	1700-1759

COMMERCIAL VEHICLE	Eastbound	Westbound	COMBINED
Total Volume	126	109	235
%	16.3%	14.3%	15.3%

SPEEDS	Eastbound % Vol.	Westbound % Vol.	COMBINED % Vol.
>119km/h	0.0	0.0	0.0
>109km/h	0.0	0.0	0.0
>99km/h	0.1	0.0	0.1
>89km/h	0.9	0.8	0.8
>79km/h	5.2	7.6	6.4
>69km/h	20.9	33.9	27.4
>59km/h	54.0	66.1	60.0
>49km/h	83.5	81.5	82.5
>39km/h	96.4	91.9	94.1
>29km/h	98.4	98.6	98.5
>19km/h	99.6	99.9	99.7
85%ile	72.0	75.3	73.9
Mean	60.3	60.4	60.4

Notes

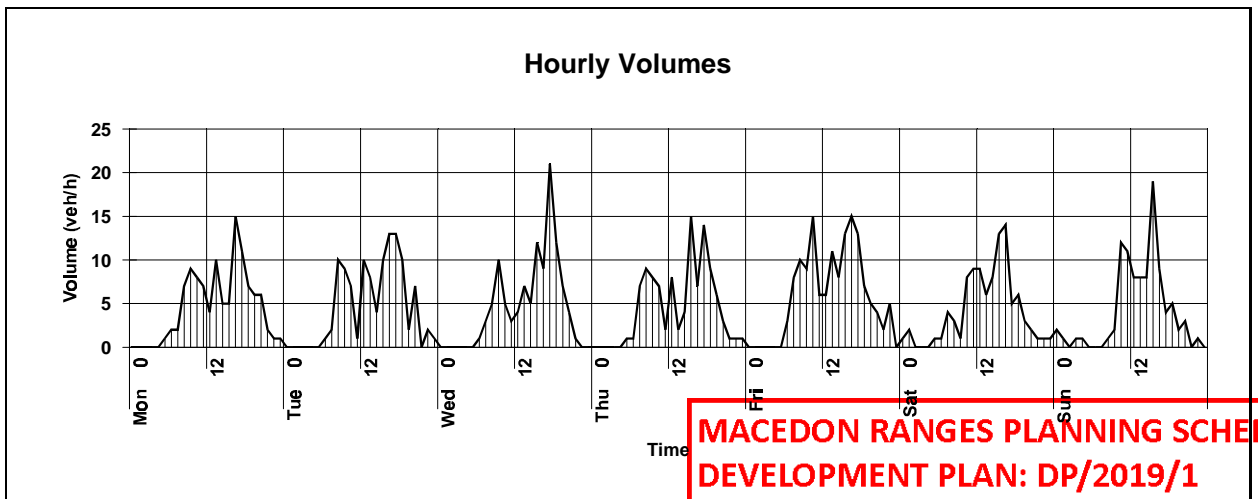
**MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 234 of 371 SIGNED:**

# Traffix Survey Traffic Count Traffic Volume Analysis



**Site No:** 3897190  
**Site location:** McGregor Road, Gisborne  
**Between :** Panorama Drive & Coney Court  
**Direction :** Eastbound  
**Time range:** 0000 24/05/18 to 2300 30/05/18  
**Filters:** Class: 1-12, Speeds: All

Date	28/05/18	29/05/18	30/05/18	24/05/18	25/05/18	26/05/18	27/05/18	AVERAGES	
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	WEEKDAY	ALL DAYS
<b>Period</b>									
0000-0059	0	0	0	0	0	1	2	0	0
0100-0159	0	0	0	0	0	2	1	0	0
0200-0259	0	0	0	0	0	0	0	0	0
0300-0359	0	0	0	0	0	0	1	0	0
0400-0459	0	0	0	0	0	0	1	0	0
0500-0559	1	0	0	1	0	1	0	0	0
0600-0659	2	1	1	1	3	1	0	2	1
0700-0759	2	2	3	7	8	4	0	4	4
0800-0859	7	10	5	9	10	3	1	8	6
0900-0959	9	9	10	8	9	1	2	9	7
1000-1059	8	7	5	7	15	8	12	8	9
1100-1159	7	1	3	2	6	9	11	4	6
1200-1259	4	10	4	8	6	9	8	6	7
1300-1359	10	8	7	2	11	6	8	8	7
1400-1459	5	4	5	4	8	8	8	5	6
1500-1559	5	10	12	15	13	13	19	11	12
1600-1659	15	13	9	7	15	14	9	12	12
1700-1759	11	13	21	14	13	5	4	14	12
1800-1859	7	10	12	9	7	6	5	9	8
1900-1959	6	2	7	6	5	3	2	5	4
2000-2059	6	7	4	3	4	2	3	5	4
2100-2159	2	0	1	1	2	1	0	1	1
2200-2259	1	2	0	1	5	1	1	2	2
2300-2359	1	1	0	1	0	1	0	1	1
<b>TOTALS</b>									
12Hr 7-19	90	97	96	92	121	86	87	99	96
24Hr 0-24	109	110	109	106	140	99	98	115	110
24/12 Fact	1.21	1.13	1.14	1.15	1.16	1.15	1.13	1.16	1.15
<b>AM HR</b>	0900-0959	0800-0859	0900-0959	0800-0859	1000-1059	1100-1159	1000-1059		
<b>PEAK</b>	9	10	10	9	15	9	12		
<b>PM HR</b>	1600-1659	1600-1659	1700-1759	1500-1559	1600-1659	1600-1659	1500-1559		
<b>PEAK</b>	15	13	21	15	15	14	19		



**MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1  
 Date: 16/11/2022  
 Authorised Officer: Jack Wiltshire  
 Page: 235 of 371 SIGNED:**

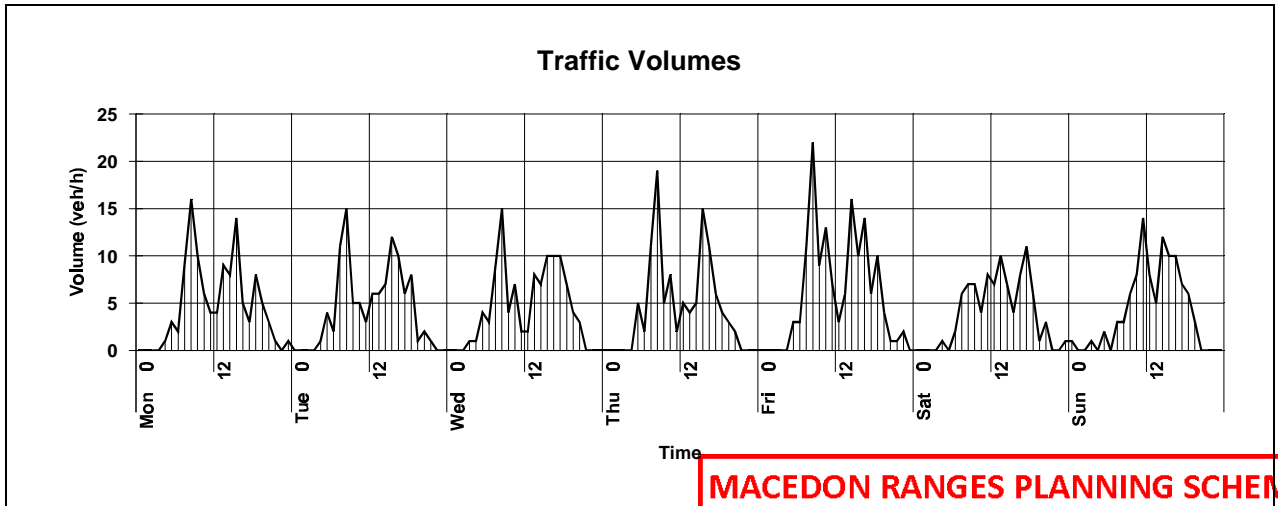
# Traffix Survey Traffic Count

## Traffic Volume Analysis



**Site No:** 3897190  
**Site location:** McGregor Road, Gisborne  
**Between :** Panorama Drive & Coney Court  
**Direction :** Westbound  
**Time range:** 0000 24/05/18 to 2300 30/05/18  
**Filters:** Class: 1-12, Speeds: All

Date	28/05/18	29/05/18	30/05/18	24/05/18	25/05/18	26/05/18	27/05/18	AVERAGES	
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	WEEKDAY	ALL DAYS
<b>Period</b>									
0000-0059	0	0	0	0	0	0	1	0	0
0100-0159	0	0	0	0	0	0	0	0	0
0200-0259	0	0	0	0	0	0	0	0	0
0300-0359	0	0	1	0	0	0	1	0	0
0400-0459	1	1	1	0	0	1	0	1	1
0500-0559	3	4	4	5	3	0	2	4	3
0600-0659	2	2	3	2	3	2	0	2	2
0700-0759	9	11	9	11	11	6	3	10	9
0800-0859	16	15	15	19	22	7	3	17	14
0900-0959	10	5	4	5	9	7	6	7	7
1000-1059	6	5	7	8	13	4	8	8	7
1100-1159	4	3	2	2	7	8	14	4	6
1200-1259	4	6	2	5	3	7	8	4	5
1300-1359	9	6	8	4	6	10	5	7	7
1400-1459	8	7	7	5	16	7	12	9	9
1500-1559	14	12	10	15	10	4	10	12	11
1600-1659	5	10	10	11	14	8	10	10	10
1700-1759	3	6	10	6	6	11	7	6	7
1800-1859	8	8	7	4	10	6	6	7	7
1900-1959	5	1	4	3	4	1	3	3	3
2000-2059	3	2	3	2	1	3	0	2	2
2100-2159	1	1	0	0	1	0	0	1	0
2200-2259	0	0	0	0	2	0	0	0	0
2300-2359	1	0	0	0	0	1	0	0	0
<b>TOTALS</b>									
12Hr 7-19	96	94	91	95	127	85	92	101	97
24Hr 0-24	112	105	107	107	141	93	99	114	109
24/12 Fact	1.17	1.12	1.18	1.13	1.11	1.09	1.08	1.14	1.12
<b>AM HR</b>	0800-0859	0800-0859	0800-0859	0800-0859	0800-0859	1100-1159	1100-1159		
<b>PEAK</b>	16	15	15	19	22	8	14		
<b>PM HR</b>	1500-1559	1500-1559	1500-1559	1500-1559	1400-1459	1700-1759	1400-1459		
<b>PEAK</b>	14	12	10	15	16	11	12		



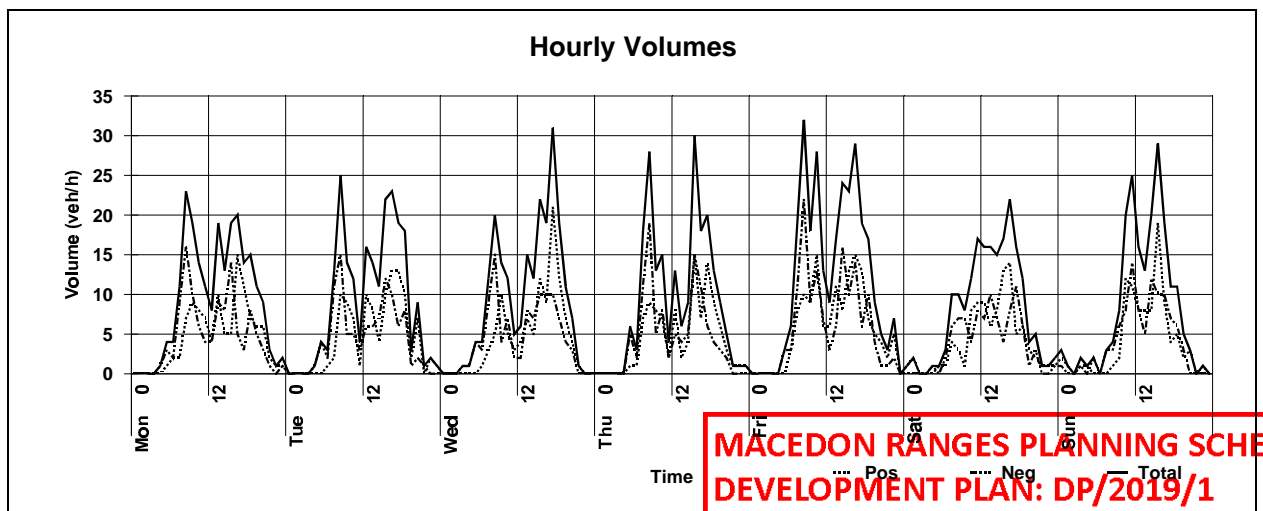
**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
**Page: 236 of 371 SIGNED:**

## Traffix Survey Traffic Count Traffic Volume Analysis



**Site No:** 3897190  
**Site location:** McGregor Road, Gisborne  
**Between :** Panorama Drive & Coney Court  
**Direction :** Eastbound & Westbound  
**Time range:** 0000 24/05/18 to 2300 30/05/18  
**Filters:** Class: 1-12, Speeds: All

Date	28/05/18	29/05/18	30/05/18	24/05/18	25/05/18	26/05/18	27/05/18	AVERAGES	
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	WEEKDAY	ALL DAYS
<b>Period</b>									
0000-0059	0	0	0	0	0	1	3	0	1
0100-0159	0	0	0	0	0	2	1	0	0
0200-0259	0	0	0	0	0	0	0	0	0
0300-0359	0	0	1	0	0	0	2	0	0
0400-0459	1	1	1	0	0	1	1	1	1
0500-0559	4	4	4	6	3	1	2	4	3
0600-0659	4	3	4	3	6	3	0	4	3
0700-0759	11	13	12	18	19	10	3	15	12
0800-0859	<b>23</b>	<b>25</b>	<b>20</b>	<b>28</b>	<b>32</b>	10	4	26	20
0900-0959	19	14	14	13	18	8	8	16	13
1000-1059	14	12	12	15	28	12	20	16	16
1100-1159	11	4	5	4	13	<b>17</b>	<b>25</b>	7	11
1200-1259	8	16	6	13	9	16	16	10	12
1300-1359	19	14	15	6	17	16	13	14	14
1400-1459	13	11	12	9	24	15	20	14	15
1500-1559	19	22	22	<b>30</b>	23	17	<b>29</b>	23	23
1600-1659	<b>20</b>	<b>23</b>	19	18	<b>29</b>	<b>22</b>	19	22	21
1700-1759	14	19	<b>31</b>	20	19	16	11	21	19
1800-1859	15	18	19	13	17	12	11	16	15
1900-1959	11	3	11	9	9	4	5	9	7
2000-2059	9	9	7	5	5	5	3	7	6
2100-2159	3	1	1	1	3	1	0	2	1
2200-2259	1	2	0	1	7	1	1	2	2
2300-2359	2	1	0	1	0	2	0	1	1
<b>TOTALS</b>									
12Hr 7-19	186	191	187	187	<b>248</b>	171	179	200	193
24Hr 0-24	221	215	216	213	<b>281</b>	192	197	229	219
24/12 Fact	1.19	1.13	1.16	1.14	1.13	1.12	1.10	1.15	1.14
<b>AM HR</b>	0800-0859	0800-0859	0800-0859	0800-0859	<b>0800-0859</b>	1100-1159	1100-1159		
<b>PEAK</b>	23	25	20	28	<b>32</b>	17	25		
<b>PM HR</b>	1600-1659	1600-1659	<b>1700-1759</b>	1500-1559	1600-1659	1600-1659	1500-1559		
<b>PEAK</b>	20	23	<b>31</b>	30	29	22	29		



**MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
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# Appendix B

## Turning Movement Counts



**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
**Page: 238 of 371 SIGNED:** 

23/05/2018	Panorama Drive (North Approach)		McGregor Road (East Approach)		McGregor Road (West Approach)		Total Movements	Hourly Volume
	Left	Right	Right	Through	Through	Left		
16:30	0	0	2	0	0	5	7	44
<b>16:45</b>	5	4	2	0	0	3	14	<b>47</b>
<b>17:00</b>	3	2	1	0	0	5	11	43
<b>17:15</b>	3	3	2	0	0	4	12	38
<b>17:30</b>	5	3	1	0	0	1	10	32
17:45	2	2	3	0	1	2	10	
18:00	2	2	1	0	0	1	6	
18:15	1	2	1	0	0	2	6	
Peak Hour Volumes	16	12	6	0	0	13	47	

4.45-5.45pm (Peak Hour)

24/05/2018	Panorama Drive (North Approach)		McGregor Road (East Approach)		McGregor Road (West Approach)		Total Movements	Hourly Volume
	Left	Right	Right	Through	Through	Left		
7:00	1	2	1	0	0	1	5	26
7:15	1	1	3	0	0	0	5	28
7:30	2	1	1	1	0	2	7	34
7:45	1	3	4	1	0	0	9	46
<b>8:00</b>	1	2	2	0	1	1	7	<b>47</b>
<b>8:15</b>	4	2	3	0	0	2	11	
<b>8:30</b>	2	2	8	0	1	6	19	
<b>8:45</b>	2	2	4	0	0	2	10	
Peak Hour Volumes	9	8	17	0	2	11	47	

8-9am (Peak Hour)

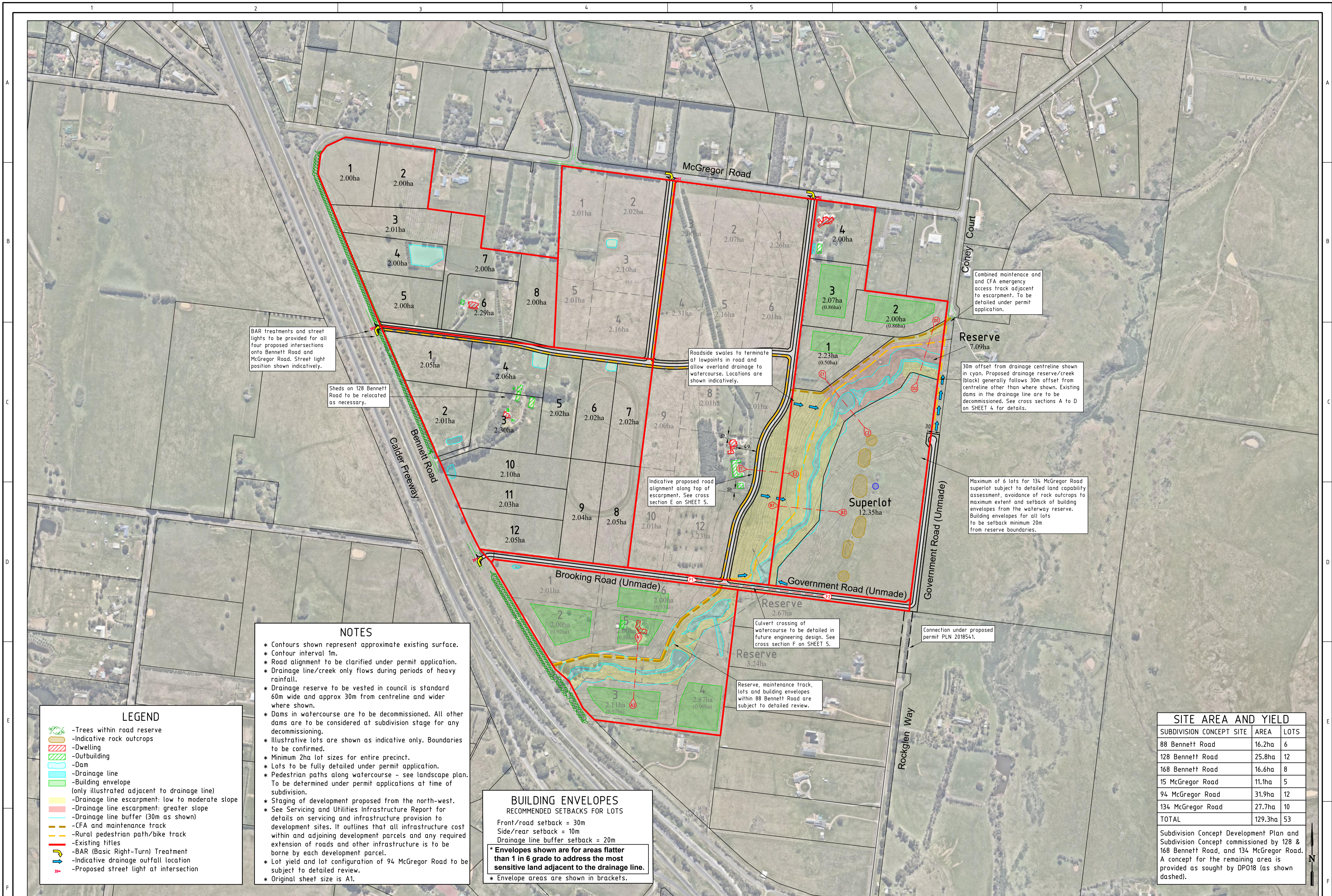
Appendix C  
Proposed Development Plan



**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
**Page: 240 of 371 SIGNED:** 







BAR treatments and street lights to be provided for all four proposed intersections onto Bennett Road and McGregor Road. Street light position shown indicatively.

Sheds on 128 Bennett Road to be relocated as necessary.

Roadside swales to terminate at lowpoints in road and allow overland drainage to watercourse. Locations are shown indicatively.

Combined maintenance and CFA emergency access track adjacent to escarpment. To be detailed under permit application.

30m offset from drainage centreline shown in cyan. Proposed drainage reserve/creek (black) generally follows 30m offset from centreline other than where shown. Existing dams in the drainage line are to be decommissioned. See cross sections A to D on SHEET 4 for details.

Maximum of 6 lots for 134 McGregor Road superlot subject to detailed land capability assessment, avoidance of rock outcrops to maximum extent and setback of building envelopes from the waterway reserve. Building envelopes for all lots to be setback minimum 20m from reserve boundaries.

Indicative proposed road alignment along top of escarpment. See cross section E on SHEET 5.

Culvert crossing of watercourse to be detailed in future engineering design. See cross section F on SHEET 5.

Connection under proposed permit PLN 2018541.

Reserve, maintenance track, lots and building envelopes within 88 Bennett Road are subject to detailed review.

**NOTES**

- \* Contours shown represent approximate existing surface.
- \* Contour interval 1m.
- \* Road alignment to be clarified under permit application.
- \* Drainage line/creek only flows during periods of heavy rainfall.
- \* Drainage reserve to be vested in council is standard 60m wide and approx 30m from centreline and wider where shown.
- \* Dams in watercourse are to be decommissioned. All other dams are to be considered at subdivision stage for any decommissioning.
- \* Illustrative lots are shown as indicative only. Boundaries to be confirmed.
- \* Minimum 2ha lot sizes for entire precinct.
- \* Lots to be fully detailed under permit application.
- \* Pedestrian paths along watercourse - see landscape plan. To be determined under permit applications at time of subdivision.
- \* Staging of development proposed from the north-west.
- \* See Servicing and Utilities Infrastructure Report for details on servicing and infrastructure provision to development sites. It outlines that all infrastructure cost within and adjoining development parcels and any required extension of roads and other infrastructure is to be borne by each development parcel.
- \* Lot yield and lot configuration of 94 McGregor Road to be subject to detailed review.
- \* Original sheet size is A1.

**BUILDING ENVELOPES**  
RECOMMENDED SETBACKS FOR LOTS

Front/road setback = 30m  
Side/rear setback = 10m  
Drainage line buffer setback = 20m  
**\* Envelopes shown are for areas flatter than 1 in 6 grade to address the most sensitive land adjacent to the drainage line.**  
\* Envelope areas are shown in brackets.

**LEGEND**

- Trees within road reserve
- Indicative rock outcrops
- Dwelling
- Outbuilding
- Dam
- Drainage line
- Building envelope (only illustrated adjacent to drainage line)
- Drainage line escarpment: low to moderate slope
- Drainage line escarpment: greater slope
- Drainage line buffer (30m as shown)
- CFA and maintenance track
- Rural pedestrian path/bike track
- Existing titles
- BAR (Basic Right-Turn) Treatment
- Indicative drainage outfall location
- Proposed street light at intersection

**SITE AREA AND YIELD**

SUBDIVISION CONCEPT SITE	AREA	LOTS
88 Bennett Road	16.2ha	6
128 Bennett Road	25.8ha	12
168 Bennett Road	16.6ha	8
15 McGregor Road	11.1ha	5
94 McGregor Road	31.9ha	12
134 McGregor Road	27.7ha	10
<b>TOTAL</b>	<b>129.3ha</b>	<b>53</b>

Subdivision Concept Development Plan and Subdivision Concept Development Plan by 128 & 168 Bennett Road, and 134 McGregor Road. A concept for the remaining area is provided as sought by DP018 (as shown dashed).

**Bennett Road Development Plan: Subdivision Concept Plan with Aerial**

Ver	Revision Description	Date	Checked	Approved
23	Minor Amendments	22/09/2021	Drafted	
22	Addressed Council Feedback	25/06/2021	J.Sens	
21	Minor Amendments	29/07/2020	P.Bove	
20	Addressed Council Feedback	21/07/2020		
19	Amended Notations	21/07/2020		
18	Amended Notations and Layout	13/12/2019		
17	Amended Drainage Line Details	25/10/2019		

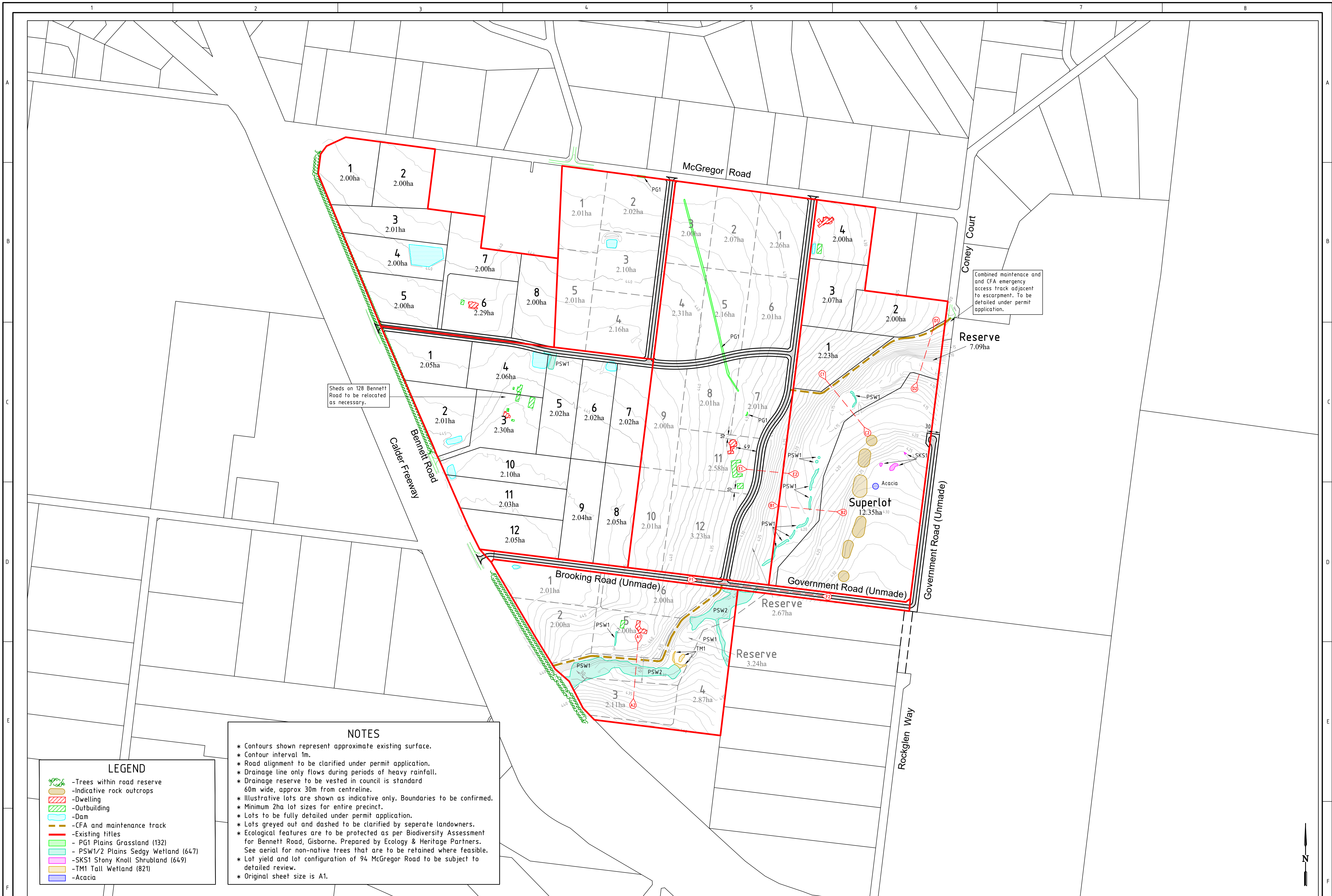
Notes/Legend

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Web: www.terraco.com.au

Scale (m) 1:14,000  
All lengths are in metres and all levels are to Australian Height Datum (Original Sheet Size is A1)  
Drawing file: 17085 Concept V23.dwg  
LTO Ref: -  
Council Ref: -  
Date: 16/11/2021  
Version: 23  
Sheet: 2 of 6

Macedon Ranges Shire Council - Gisborne  
Bennett Road Precinct  
**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/L**  
Date: 16/11/2021  
Authorised Officer: Jack Wiltshire  
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Sheds on 128 Bennett Road to be relocated as necessary.

Combined maintenance and CFA emergency access track adjacent to escarpment. To be detailed under permit application.

**NOTES**

- \* Contours shown represent approximate existing surface.
- \* Contour interval 1m.
- \* Road alignment to be clarified under permit application.
- \* Drainage line only flows during periods of heavy rainfall.
- \* Drainage reserve to be vested in council is standard 60m wide, approx 30m from centreline.
- \* Illustrative lots are shown as indicative only. Boundaries to be confirmed.
- \* Minimum 2ha lot sizes for entire precinct.
- \* Lots to be fully detailed under permit application.
- \* Lots greyed out and dashed to be clarified by separate landowners.
- \* Ecological features are to be protected as per Biodiversity Assessment for Bennett Road, Gisborne. Prepared by Ecology & Heritage Partners. See aerial for non-native trees that are to be retained where feasible.
- \* Lot yield and lot configuration of 94 McGregor Road to be subject to detailed review.
- \* Original sheet size is A1.

**LEGEND**

- Trees within road reserve
- Indicative rock outcrops
- Dwelling
- Outbuilding
- Dam
- CFA and maintenance track
- Existing titles
- PG1 Plains Grassland (132)
- PSW1/2 Plains Sedgy Wetland (647)
- SKS1 Stony Knoll Shrubland (649)
- TM1 Tall Wetland (821)
- Acacia

**Bennett Road Development Plan: Subdivision Concept Plan with Ecological Features**

Ver	Revision Description	Date	Checked	Checked
23	Minor Amendments	22/09/2021	Drafted	
22	Addressed Council Feedback	25/06/2021	J.Sens	P.Bowe
21	Minor Amendments	29/07/2020	Sep 2021	Sep 2021
20	Addressed Council Feedback	21/07/2020		
19	Amended Notations	21/02/2020		
18	Amended Notations and Layout	13/12/2019		
17	Amended Drainage Line Details	25/10/2019		

Notes/Legend

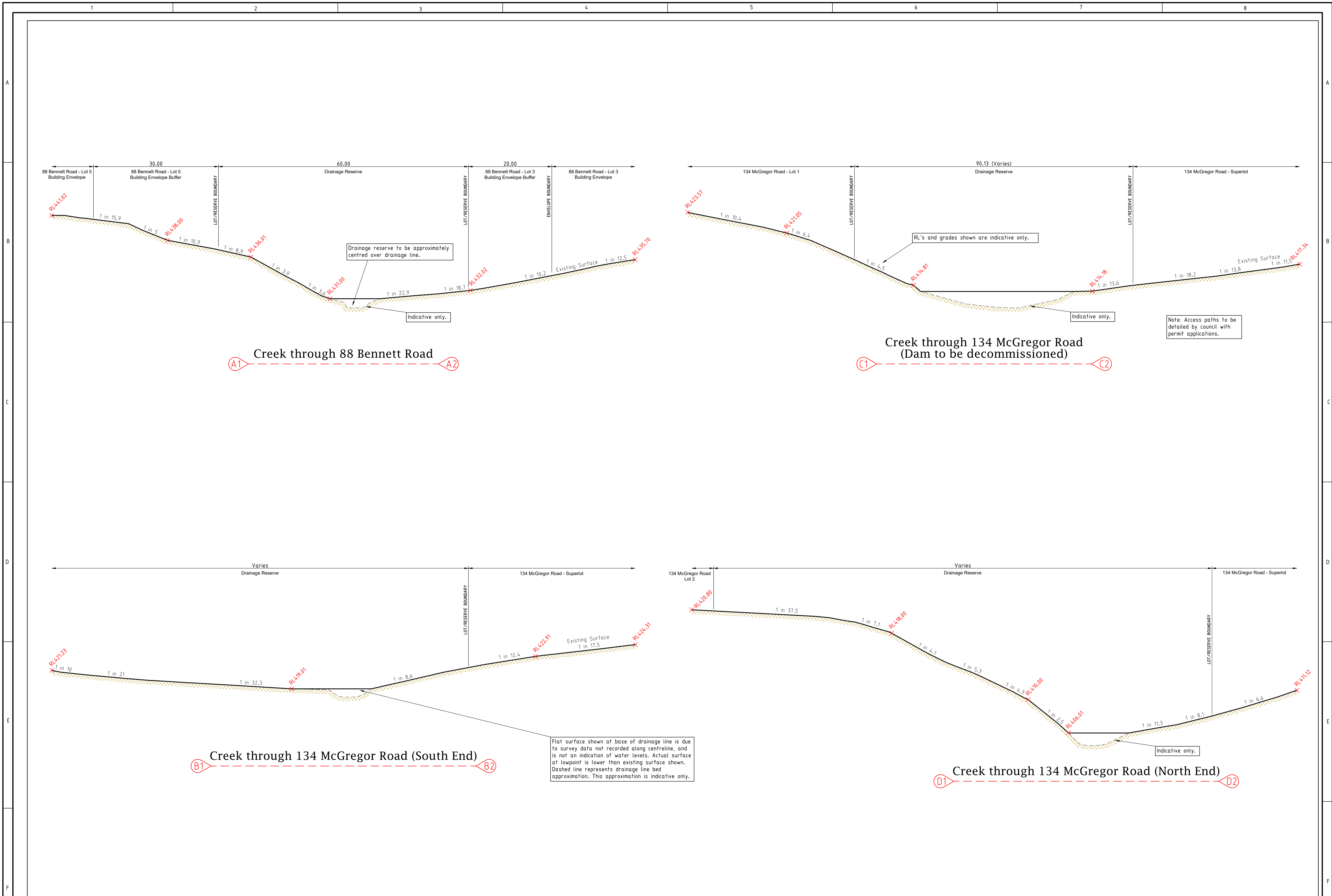
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Scale (m) 1:14,000  
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LTO Ref: -  
Council Ref: -

Macedon Ranges Shire Council - Gisborne  
Bennett Road Precinct  
**DEVELOPMENT PLAN: DP/2019/L**  
Date: 16/11/2021  
Version: 23  
Sheet: 3 of 6  
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Bennett Road Development Plan: Drainage Line Cross Sections

Ver	Revision Description	Date	Checked	Checked Date
23	Minor Amendments	22/09/2021	Drafted	J.Sens Sep 2021
22	Addressed Council Feedback	25/06/2021	Checked	P.Bowe Sep 2021
21	Minor Amendments	29/07/2020		
20	Addressed Council Feedback	21/07/2020		
19	Amended Notations	21/02/2020	Approved	
18	Amended Notations and Layout	13/12/2019		
17	Amended Drainage Line Details	25/10/2019		

Notes/Legend	

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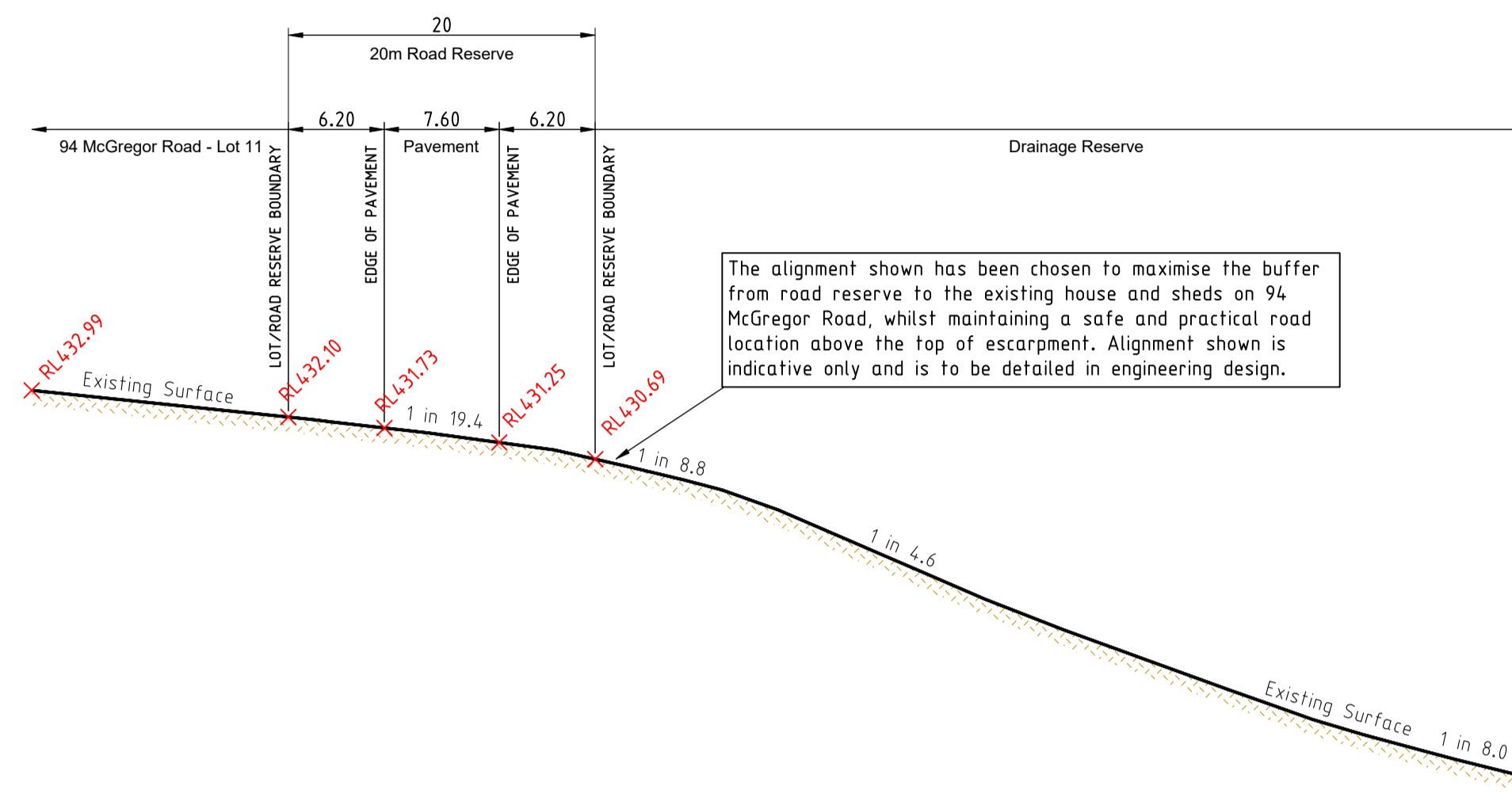
Terraco P/L  
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East Brisbane, Qld 4155  
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www.terraco.com.au

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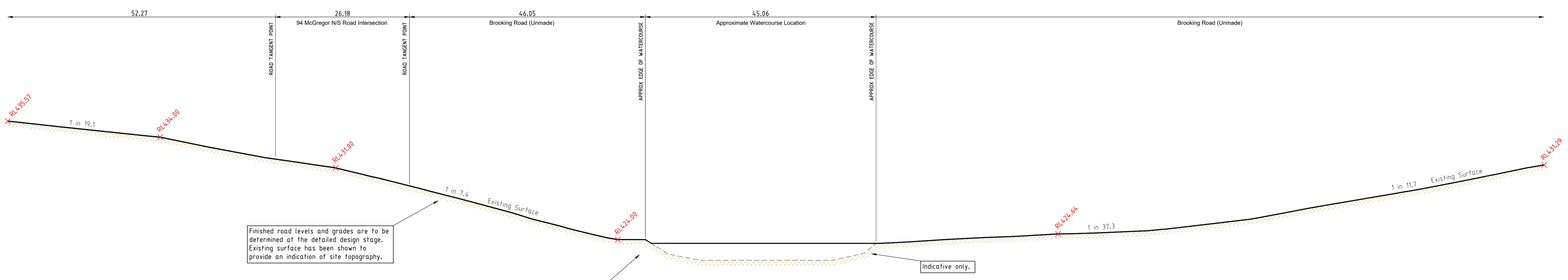
All lengths are in metres  
and all levels are to Australian Height Datum  
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Macedon Ranges Shire Council - Gisborne  
Bennett Road Precinct  
Macedon Ranges Planning Scheme  
DEVELOPMENT PLAN: DP/2019/L  
Date: 16/11/2021 Version: 23 Sheet: 4 of 6  
Authorised Officer: Jack Wilshire  
Page: 244 of 371 SIGNED: [Signature]

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**Road Alignment in 94 McGregor Road Cross Section**



**Culvert Crossing of Watercourse Longitudinal Section**

Finished road levels and grades are to be determined at the detailed design stage. Existing surface has been shown to provide an indication of site topography.

Flat surface shown at base of drainage line is due to survey data not recorded along centreline, and is not an indication of water levels. Actual surface at lowpoint is lower than existing surface shown. Dashed line represents drainage line bed approximation. This approximation is indicative only.

The alignment shown has been chosen to maximise the buffer from road reserve to the existing house and sheds on 94 McGregor Road, whilst maintaining a safe and practical road location above the top of escarpment. Alignment shown is indicative only and is to be detailed in engineering design.

RL's and grades shown are indicative only.

**Bennett Road Development Plan: Road Sections**

Ver	Revision Description	Date	Checked	Checked Date
23	Minor Amendments	22/09/2021	Drafted	
22	Addressed Council Feedback	25/06/2021	J.Sent	25/06/2021
21	Minor Amendments	29/07/2020	P.Bowe	29/07/2020
20	Addressed Council Feedback	21/07/2020	Approved	
19	Amended Notations	21/02/2020		
18	Amended Notations and Layout	13/12/2019		
17	Amended Drainage Line Details	25/10/2019		

Notes/Legend	

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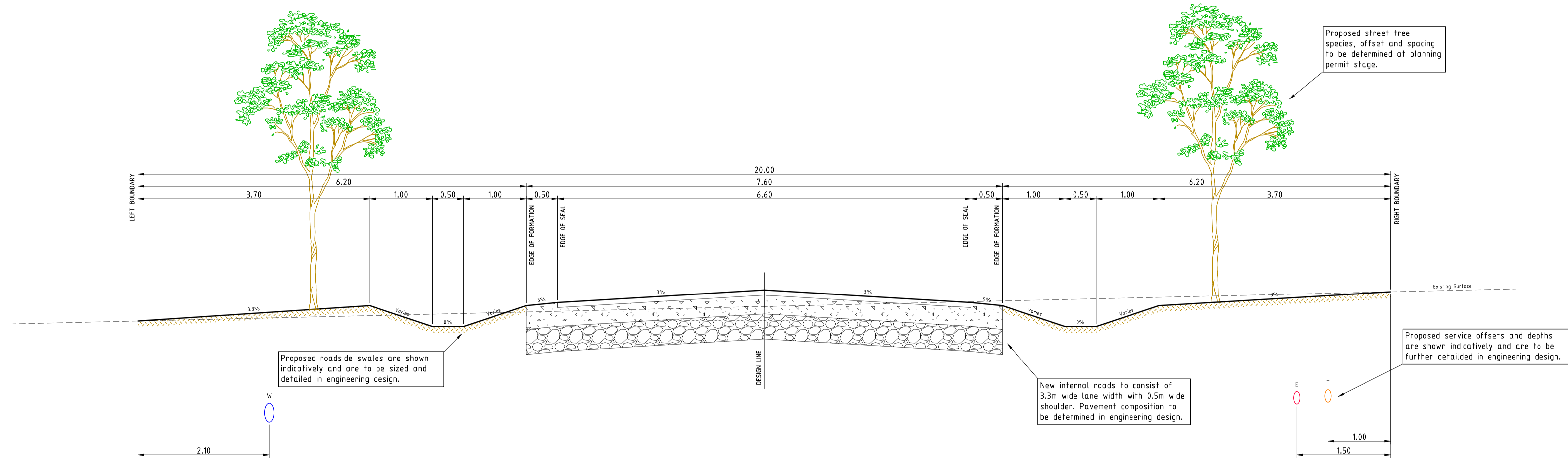
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and all levels are to Australian Height Datum  
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Drawing file: 17085\_Concept\_V23.dwg  
LTO Ref: -  
Council Ref: -

Macedon Ranges Shire Council - Gisborne

Bennett Road Precinct  
DEVELOPMENT RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/L  
Date: 16/11/2021  
Version: 23  
Sheet: 5 of 6  
Authorised Officer: Jack Wilshire



Typical Cross Section - Internal Roads

Bennett Road Development Plan: Typical Road Cross Sections

Ver	Revision Description	Date	Checked	Checked
23	Minor Amendments	22/09/2021	Drafted	J.Sens
22	Addressed Council Feedback	25/06/2021	Checked	P.Bowe
21	Minor Amendments	29/07/2020	Sep 2021	Sep 2021
20	Addressed Council Feedback	21/07/2020	Approved	
19	Amended Notations	21/02/2020		
18	Amended Notations and Layout	13/12/2019		
17	Amended Drainage Line Details	25/10/2019		

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Macedon Ranges Shire Council - Gisborne  
Bennett Road Precinct  
**MACEDON RANGES PLANNING SCHEME**  
DEVELOPMENT PLAN: DP/2019/L  
Date: 16/11/2021  
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Sheet: 6 of 6  
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Appendix D  
Post Development SIDRA Summary  
Panorama Drive/McGregor Road

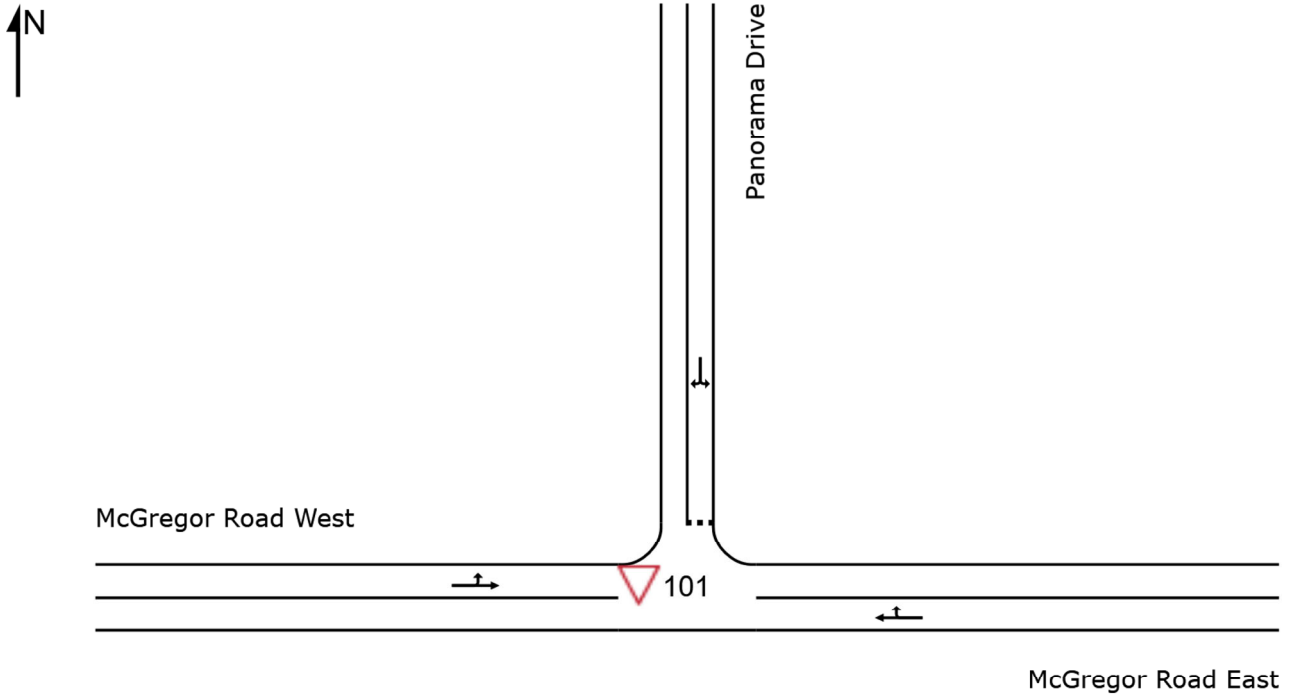


**MACEDON RANGES PLANNING SCHEME**  
**DEVELOPMENT PLAN: DP/2019/1**  
**Date: 16/11/2022**  
**Authorised Officer: Jack Wiltshire**  
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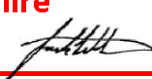
# SITE LAYOUT

▽ Site: 101 [Panorama Drive/McGregor Road AM Peak]

Post Development AM Peak  
Site Category: (None)  
Giveaway / Yield (Two-Way)



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Project: Not Saved

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DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022  
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Page: 248 of 371 SIGNED:** 



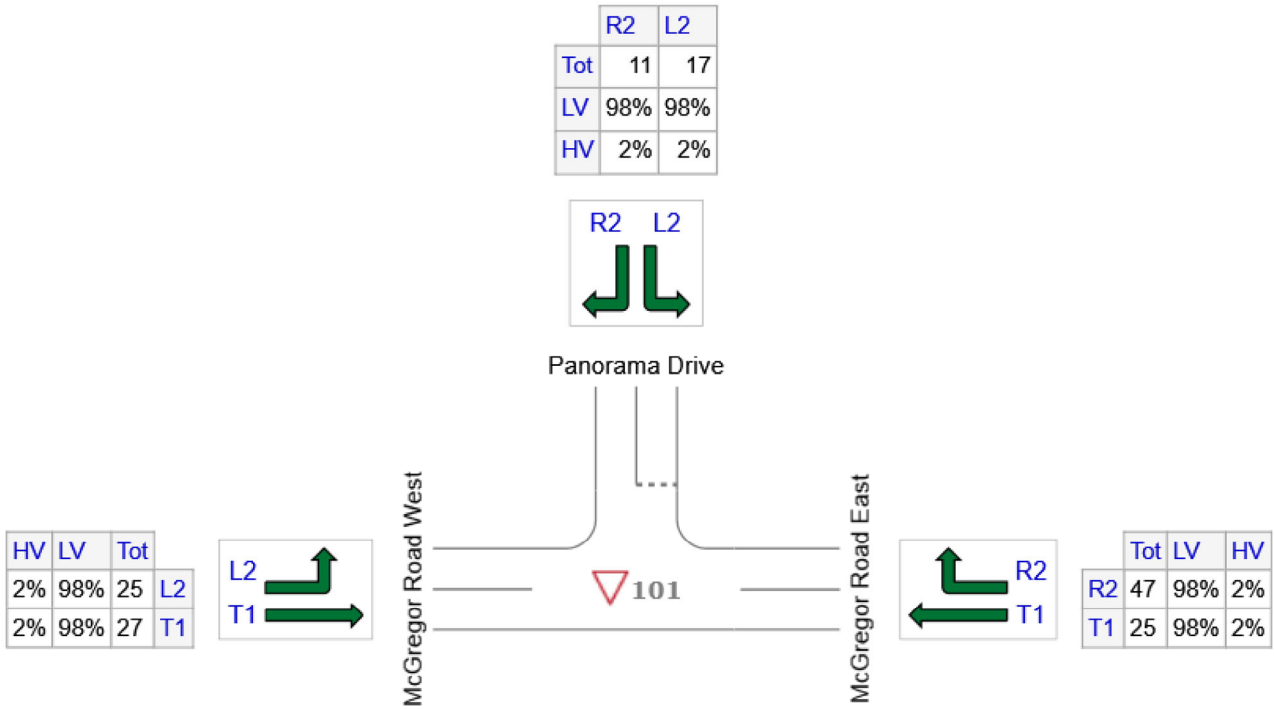
# INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

▽ Site: 101 [Panorama Drive/McGregor Road AM Peak]

Post Development AM Peak  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

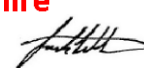
Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
E: McGregor Road East	72	71	1
N: Panorama Drive	28	27	1
W: McGregor Road West	52	51	1
Total	152	149	3

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 Date: 16/11/2022  
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 Page: 249 of 371 SIGNED:**



# MOVEMENT SUMMARY

Site: 101 [Panorama Drive/McGregor Road AM Peak]

Post Development AM Peak  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: McGregor Road East												
5	T1	26	2.0	0.043	0.1	LOS A	0.2	1.4	0.14	0.41	0.14	87.1
6	R2	49	2.0	0.043	7.6	LOS A	0.2	1.4	0.14	0.41	0.14	77.1
Approach		76	2.0	0.043	5.0	NA	0.2	1.4	0.14	0.41	0.14	80.3
North: Panorama Drive												
7	L2	18	2.0	0.021	7.1	LOS A	0.1	0.5	0.09	0.61	0.09	64.5
9	R2	12	2.0	0.021	7.0	LOS A	0.1	0.5	0.09	0.61	0.09	63.9
Approach		29	2.0	0.021	7.0	LOS A	0.1	0.5	0.09	0.61	0.09	64.2
West: McGregor Road West												
10	L2	26	2.0	0.029	7.9	LOS A	0.0	0.0	0.00	0.33	0.00	80.3
11	T1	28	2.0	0.029	0.0	LOS A	0.0	0.0	0.00	0.33	0.00	90.6
Approach		55	2.0	0.029	3.8	NA	0.0	0.0	0.00	0.33	0.00	85.3
All Vehicles		160	2.0	0.043	5.0	NA	0.2	1.4	0.08	0.42	0.08	78.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

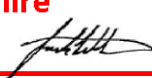
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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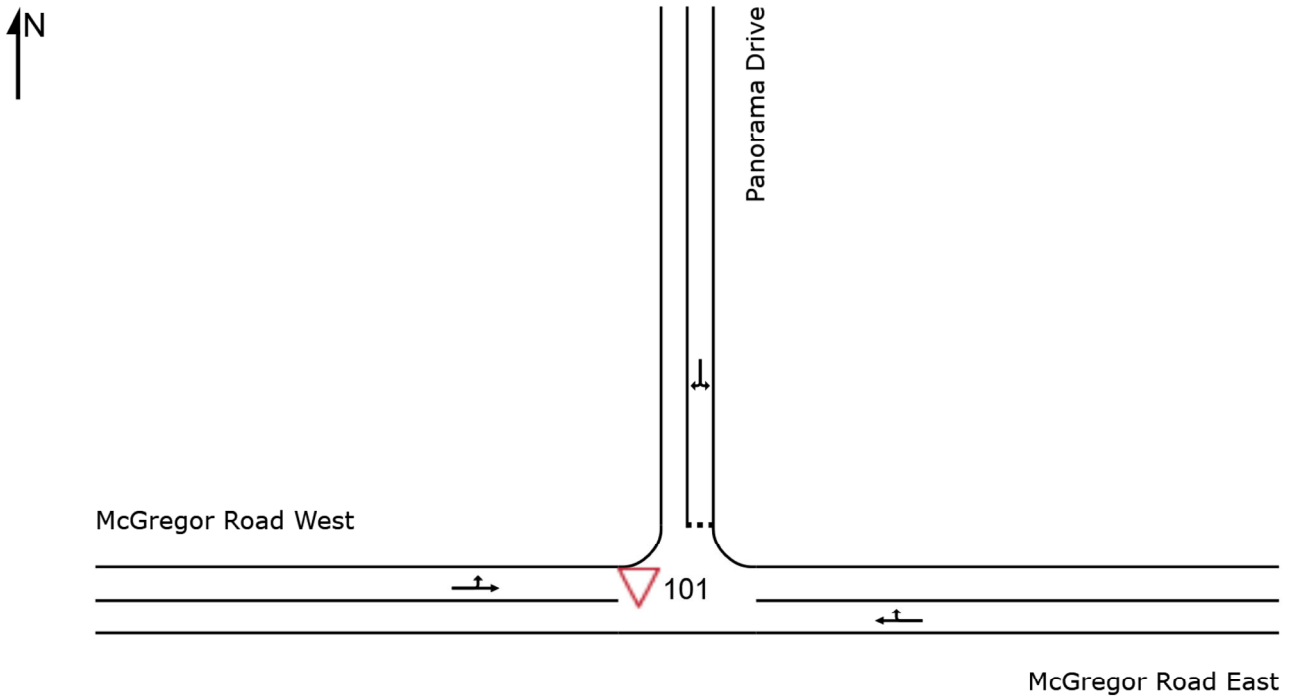
**MACEDON RANGES PLANNING SCHEME  
 DEVELOPMENT PLAN: DP/2019/1  
 Date: 16/11/2022  
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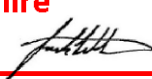
# SITE LAYOUT

▽ Site: 101 [Panorama Drive/McGregor Road PM Peak]

Post Development PM Peak  
Site Category: (None)  
Giveaway / Yield (Two-Way)



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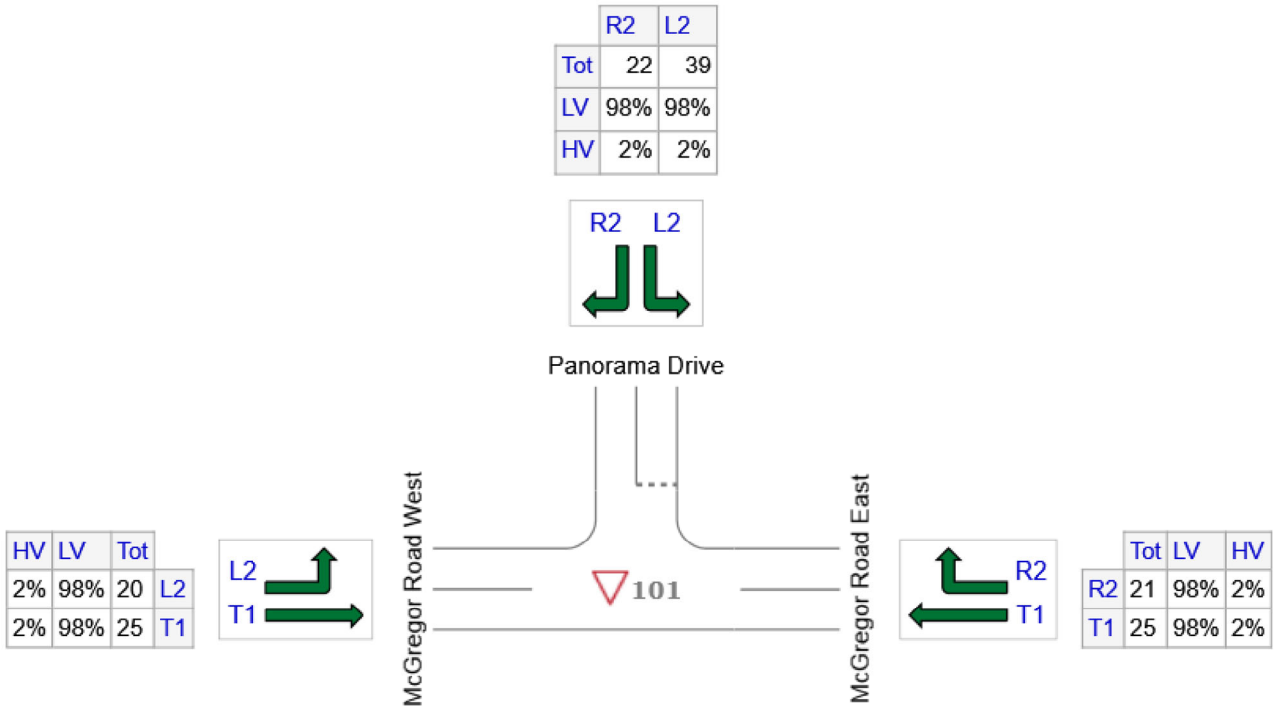
# INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

▽ Site: 101 [Panorama Drive/McGregor Road PM Peak]

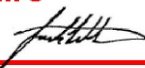
Post Development PM Peak  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
E: McGregor Road East	46	45	1
N: Panorama Drive	61	60	1
W: McGregor Road West	45	44	1
Total	152	149	3

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# MOVEMENT SUMMARY

Site: 101 [Panorama Drive/McGregor Road PM Peak]

Post Development PM Peak  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: McGregor Road East												
5	T1	26	2.0	0.027	0.1	LOS A	0.1	0.8	0.11	0.29	0.11	90.4
6	R2	22	2.0	0.027	7.6	LOS A	0.1	0.8	0.11	0.29	0.11	79.7
Approach		48	2.0	0.027	3.5	NA	0.1	0.8	0.11	0.29	0.11	85.2
North: Panorama Drive												
7	L2	41	2.0	0.045	7.1	LOS A	0.2	1.2	0.09	0.61	0.09	64.4
9	R2	23	2.0	0.045	6.9	LOS A	0.2	1.2	0.09	0.61	0.09	63.9
Approach		64	2.0	0.045	7.0	LOS A	0.2	1.2	0.09	0.61	0.09	64.2
West: McGregor Road West												
10	L2	21	2.0	0.025	7.9	LOS A	0.0	0.0	0.00	0.30	0.00	80.8
11	T1	26	2.0	0.025	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	91.3
Approach		47	2.0	0.025	3.5	NA	0.0	0.0	0.00	0.30	0.00	86.3
All Vehicles		160	2.0	0.045	4.9	NA	0.2	1.2	0.07	0.42	0.07	75.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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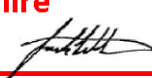
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

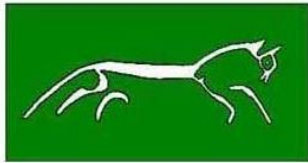
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**Archaeo-Environments Pty Ltd**  
**heritage soils and landscape**

ABN 89 119 932 437

## **HERITAGE AND ARCHAEOLOGICAL ASSESSMENT (Aboriginal and European)**

**BENNETT ROAD DEVELOPMENT PLAN  
GISBORNE SOUTH**

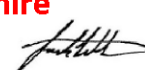


**Heritage Assessor**  
**Dr Chris Day**  
**Archaeo-Environments Pty Ltd**  
**ABN 89 119 932 437**

Rev4 5 August 2021

Prepared for Client  
G2 Urban Planning  
670 Mt Alexander Road  
Moonee Ponds VIC 3039 AUSTRALIA

**MACEDON RANGES PLANNING SCHEME  
DEVELOPMENT PLAN: DP/2019/1  
Date: 16/11/2022  
Authorised Officer: Jack Wiltshire  
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## INTRODUCTION

Archaeo-Environments Ltd (AE Ltd) were engaged by several landowners under the Bennett Road Development Plan (BRDP) to prepare a heritage and archaeological assessment for proposed future subdivision and development at Bennett Road, Gisborne South (the subject property). It is understood that the land is subject to Macedon Ranges Planning Scheme Development Plan Overlay 18 (DPO18) and also the Rural Living Zone Schedule 2 under the recent C110 Planning Scheme Amendment. A Development Plan is required for the property and will provide an overview document for a future planning permit application. We understand the subject property occupies an area of approx. 130ha to the south-east of Gisborne township (Fig 1 and 2).

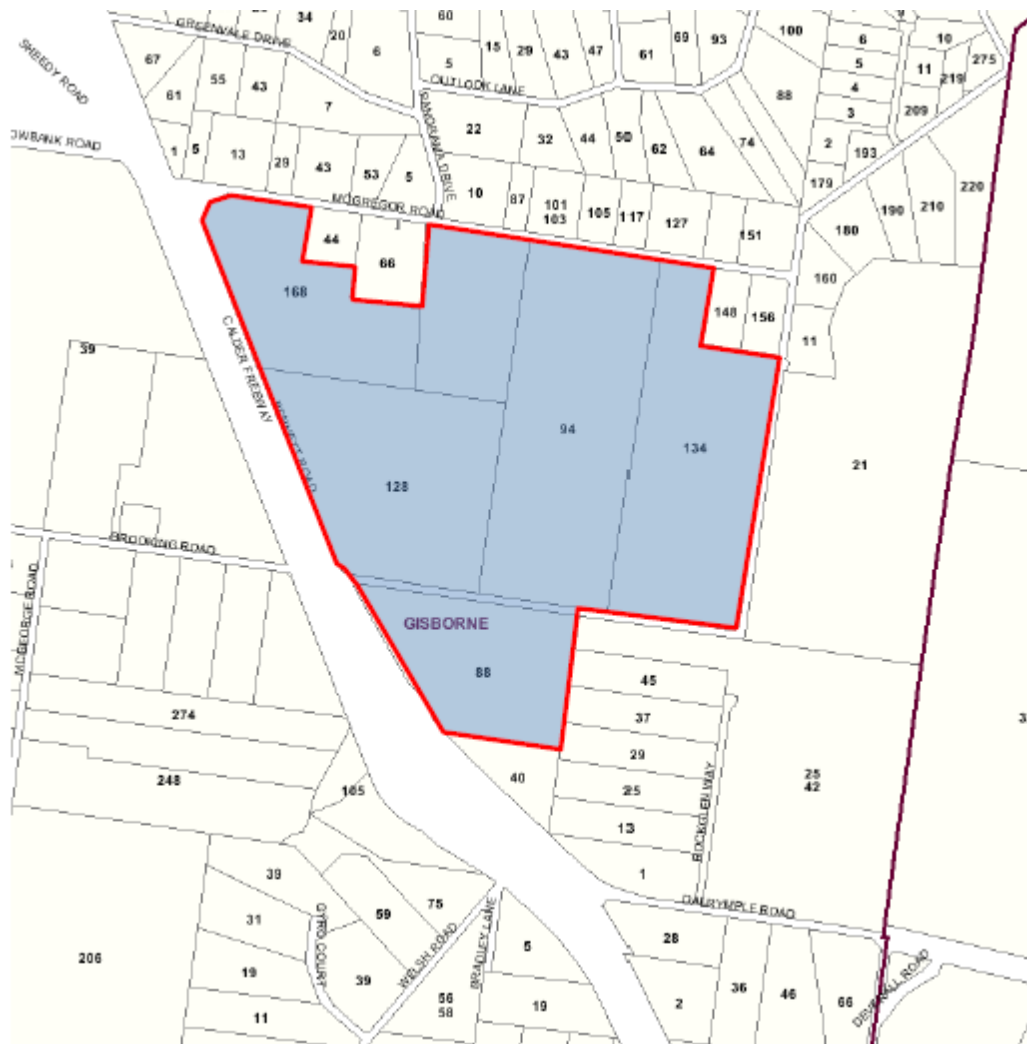


Fig 1 Location of the development area at Bennett Road, Gisborne South.

The heritage and archaeological assessment is undertaken as an overview document for a future Planning Permit Application to the Macedon Ranges Shire. The purpose of the assessment is to determine future requirements, notably protection of European heritage and/or a Cultural Heritage Management Plan (CHMP) is mandatory in accordance with the requirements of the *Victorian Heritage Act (2007)* or the *Aboriginal Heritage Act 2006* and the *Aboriginal Heritage Regulations 2007* (hereafter referred to as 'the Act' and 'the Regulations'). The BRDP area is within the boundary of the Wurundjeri Tribe Land Council and Compensation Registered Aboriginal Party (RAP) area.

The assessment consists of :

- \* a summary of obligations under the *Aboriginal Heritage Act 2006* and the *Aboriginal Heritage Regulations 2018* and a definition and assessment guidelines for significant ground disturbance (SGD).
- \* An assessment of geological, archaeological and historic information, including :
  - a search of the Aboriginal heritage mapping via Government sources to identify whether any Aboriginal places or sites have been recorded on or near the subject property;
- \* An assessment of the Victorian Heritage Register and Victorian Heritage Inventory
  - a review of historical and current aerial photographs to determine the level of prior ground disturbance and landscape modification that has occurred within the subject property, and;
  - a site inspection to observe potential heritage features, ground conditions and in particular evidence of ground disturbance.
- \* a summary of the recommendations of the above, notably whether an Aboriginal CHMP is mandatory for the planned development.



Fig 2 Aerial map of the subject property at Bennett Road, Gisborne South.

## 1.0 STATUTORY OVERVIEW AND REQUIREMENTS

A review of the Aboriginal Heritage Act and Regulations provides a statutory framework for the purpose of determining whether a CHMP is mandatory for the BRDP.

### 1.1 Regulations

It is noted that a review of the Aboriginal Heritage Regulations effective May 23 1, 2018 produced some amendments relevant to CHMPs and compliance. Those amendments included the following :

- A removal of a mandatory CHMP for small lot sub-divisions (<1100m<sup>2</sup>) in most situations.
- A process for amendment of CHMPs
- An increase of fees and penalties for non-compliance
- Introduction of a Preliminary Aboriginal Heritage Test (PAHT) to determine whether a CHMP is mandatory. A PAHT is a tool in the form of a heritage assessment, prepared in standard format and evaluated by Aboriginal Victoria (AV). The purpose of the PAHT is not to replace a heritage due diligence assessment, but to provide Councils/sponsors with a formal process via Aboriginal



Victoria (AV) for whether a CHMP was mandatory or not. Discussion with AV confirmed that a PAHT was not to be used automatically if a Council or sponsor is otherwise equipped to make a CHMP decision according to their statutory decision-making role. In the case of the current development a PAHT was deemed not necessary.

## 1.2 Is a CHMP mandatory at Bennett Road Gisborne South?

Under the AHR (2007), a CHMP is required if a development is considered to be a **high impact activity** and is located within an area of **cultural heritage sensitivity**.

### 1.2.1 Is the activity a high impact activity ?

#### **A High Impact Activity**

It is our opinion that future subdivision and development of the subject property could be interpreted to be a high impact activity according to Section 46 (AHR 2007) Subdivision of land

#### *46 Subdivision of land*

(1) *The subdivision of land into three or more lots is a high impact activity if –*

(a) *The planning scheme that applies to the activity area in which the land to be subdivided is located provides that at least three of the lots may be used for a dwelling or may be used for a dwelling subject to the grant of a permit: and*

(b) *The area of each of at least three of the lots is less than 8ha*

***It is emphasised that the current assessment and Development Plan is not part of any permit or statutory authorization and therefore a CHMP is not triggered at this stage.***

### 1.2.2 Does the activity lie within an area of cultural heritage sensitivity (CHS) ?

Regulation 26 Areas of Cultural Heritage Sensitivity : Waterways states:

- (1) Subject to sub regulation (2), a waterway or land within 200 metres of a waterway is an area of cultural heritage sensitivity
- (2) If part of a waterway or part of the land within 200m of a waterway has been subject to significant ground disturbance, that part is not an area of cultural heritage sensitivity.

The subject property lies within Djirri Djirri Creek – a tributary of Jacksons Creek and mapped area of CHS – which extends across the south-west part of the property (Figure 3 and Plate 1).



Fig 3 Map showing location of Djirri Djirri Creek and 200m buffer (area of cultural heritage sensitivity).as well as surrounding artefact scatters located during recent CHMP surveys



Plate 1 View to south along Djirri Djirri Creek within the eastern part of the development area.

### 1.2.3 Is the development exempt from a CHMP on the basis of significant ground disturbance ?

Under Regulation 22 (3), the proposed activity would not require a CHMP if the 'area of cultural sensitivity' has been subject to prior 'significant ground disturbance'. Significant ground disturbance is defined in the Regulations as follows:

'Disturbance of –

(a) the topsoil or surface rock layer of the ground, or

(b) waterway by machinery in the course of digging, dredging, or deep ripping, but does not include ploughing other than deep ripping'.

### 1.2.4 Assessing Significant Ground Disturbance

Aboriginal Victoria (AV) has produced a Practice Note for Significant Ground Disturbance Practice Note which is available on their website and which supports a staged approach as follows :

#### Level 1 – Common knowledge

The fact that land has been subject to significant ground disturbance may be common knowledge. Very little or no additional information should be required from the responsible authority. For example, common knowledge about the redevelopment of a petrol station with extensive underground storage tanks.

#### Level 2 – Publicly available records

If the existence of significant ground disturbance is not common knowledge, a responsible authority may be able to provide assistance from its own records about prior development and use of land, or advise the applicant about other publicly available records, including aerial photographs.

These documents may allow a reasonable inference to be made that the land has been subject to significant ground disturbance. In such event, no further inquiries or information would be needed by the responsible authority. The particular records and facts relied upon should be noted by the responsible authority as a matter of record. For example, a former quarry site subsequently filled, but where the public records show the area of past excavation.

#### Level 3 – Further information

If 'common knowledge' or 'publicly available records' do not provide sufficient information about the occurrence of significant ground disturbance, the applicant may need to present further evidence either voluntarily or following a formal request from the responsible authority. Further evidence could consist of land use history documents, old maps or photographs of the land or statements by former landowners or occupiers. Statements should be provided by statutory declaration or similar means; for example, the construction of a former dam on a farm.

#### Level 4 – Expert advice or opinion

If these levels of inquiry do not provide sufficient evidence of significant ground disturbance (or as an alternative to level 3), the applicant may submit or be asked to submit a professional report with expert advice or opinion from a person with appropriate skills and experience. Depending on the circumstances, this may involve a site inspection and/or a review of primary documents. If there is sufficient uncertainty some preliminary sub-surface excavation or geotechnical investigation may be warranted.

## 2.0 ASSESSMENT

The BRDP area lies within an area of CHS, however an assessment is necessary to determine whether the area of CHS has been subject to significant ground disturbance. For this purpose we undertook a review of historical information, historic maps and aerial photographs to identify evidence of landscape modification and ground disturbance. A site visit was also undertaken to document site condition and evidence of ground disturbance. The various levels of evidence for significant ground disturbance above are addressed in turn below.

## 2.1 Historical setting

Accounts and maps of settlement and historic pastoral use would constitute Level 1 (common knowledge) and Level 2 (publicly available information) evidence for significant ground disturbance. On this basis it appears unlikely that Djirri Djirri Creek - the area of CHS - has been subject to SGD.

## 2.2 Review of Aerial Photography

An aerial image from 2019 shows Djirri Djirri Creek - the area of cultural heritage sensitivity which overlaps with the BRDP area (Fig 4). There does not appear to be evidence of significant ground disturbance from aerial imagery.



Fig 4 Aerial photo (2019) showing the course of Djirri Djirri Creek and surrounds across the eastern part of the BRDP area.

## 2.3 Site Inspection

A site inspection of the subject property was conducted by Dr Chris Day (AE Ltd Cultural Heritage Advisor) on the 17<sup>th</sup> May 2018. The purpose of the inspection was to observe site conditions, notably evidence of past land use and ground disturbance. No Aboriginal artefacts or sites were identified during the inspection.

The Djirri Djirri Creek and surrounds within the development area features a gentle valley with areas of bedrock outcrop. Apart from implied original tree clearance and presence of several dams, the subject area did not show evidence of disturbance in the form of significant earthworks or deep ripping. Evidence from

a site inspection would constitute Level 4 (Expert advice/opinion and site inspection) evidence for significant ground disturbance.

### **3.0 ABORIGINAL CULTURAL HERITAGE POTENTIAL**

A review of ACHRIS, the registry of Aboriginal cultural heritage held by Aboriginal Victoria indicates that several CHMP studies have been prepared in the area surrounding the development area in the past 18 months. These include CHMP 15832 approved in Nov 2019 west of the Calder Freeway and a CHMP to the immediate east which is currently in progress. Aboriginal cultural heritage in the form of stone artefact scatters have been recorded during these surveys (Fig 3) and indicate that the development area would have potential for Aboriginal heritage.

### **4.0 SUMMARY AND CONCLUSIONS**

#### **Level 1 Common Knowledge**

A review of regional land use history indicates that the subject property was part of early 19C agricultural development. The area of CHS (Djirri Djirri Creek) extends across the eastern part of the development area and – apart from several dams – is not expected to have been subject to disturbance which might be common knowledge.

#### **Level 2 Publicly Available Records and Level 3 Additional information**

In addition to published maps and reports about 19C farming activity, there is insufficient local evidence to imply significant ground disturbance across the area of CHS. The landscape shown in Plate 1 shows that the area surrounding Djirri Djirri Creek has been dammed in some areas but is for the most part under pastoral use without evidence of SGD.

#### **Level 4 Expert Opinion/Site Inspection & subsurface investigation**

Site inspection of Djirri Djirri Creek and surrounds indicated presence of several dams but overall negligible evidence of SGD.

### **5.0 FUTURE MANAGEMENT**

The Djirri Djirri Creek is the area of highest Aboriginal cultural heritage potential within the Development area. Regional predictive models have established that Aboriginal sites generally have a focus on waterways with lesser frequency > 200m from these features. Djirri Djirri Creek will not be subject to residential development.

The 2ha lot size under the current Development Plan will mitigate against high risk of impact to Aboriginal cultural heritage, certainly compared with smaller lot subdivision. In other words the relatively small development footprint (dwelling, outbuildings, driveway etc) will allow for a large proportion of the lot to remain undisturbed. The large lot sizes when compared to a standard intensive residential subdivision such as to the west side of the Calder Freeway allow considerable capacity for potential sensitive sites to be avoided.

The upgrade of the Development Area as a landscape resource will require compliance with the Aboriginal Heritage Act (2006) and Aboriginal Heritage Regulations (2018) and will include preparation of a Cultural Heritage Management Plan (CHMP) - desktop and field assessment of Aboriginal archaeological potential - across required development parcels.

As a guide to future works, the Djirri Djirri Creek is an area of mapped Aboriginal Cultural Heritage sensitivity and under current legislation, a Cultural Heritage Management Plan (CHMP) will be mandatory for lots at 88 Bennett Road and 94 and 134 McGregor Road. It is expected that any CHMP would follow standard practice in accord with AHR (2018) and include a desktop review, field walkover and test pit excavation work where necessary. Fieldwork would be focused on areas of identified Aboriginal cultural heritage potential and likely areas of impact. The results of the CHMP(s) will inform future management of any identified Aboriginal sites and might include areas of set aside or managed open space.

Preliminary discussion with the local Registered Aboriginal Party (Wurundjeri and Woi Wurrung Cultural Heritage Aboriginal Corporation) in July 2021 advised of the Development Plan and future subdivision, Liaison with the RAP group will be included as part of any future CHMP process.

The future subdivision lot development of the area is directed away from the area of prime potential sensitivity, being the waterway with areas away from the water way having lesser potential for artefact presence. An aim will be to retain the current form of this area, with low impact paths and additional scattered vegetation. A detailed assessment will not be required for those parts of the reserve that are not altered. Assessment will be require around reinstated dams.

A CHMP will be undertaken for the affected areas prior to subdivision permit applications being formalised.

## 6.0 EUROPEAN HERITAGE ASSESSMENT

An inspection of the Victorian Heritage Register or Victorian Heritage Inventory indicated that there are no registered heritage sites or features within the BRDP. A preliminary field survey (17 May 2018) did not observe features of potential European heritage value. On this basis the potential for European heritage potential across the BRDP is expected to be low.

## 7.0 RECOMMENDATIONS

1. It is our opinion that there is no evidence of significant ground disturbance within the areas of CHS (Djirri Djirri Creek) which overlaps with the eastern part of the BRDP area – according to level 1, 2, 3 and 4 criteria of AV guidelines (Section 1.2.4). On this basis and with reference to Reg 26 (2) of the AHR (2018) (1) *If part of a waterway or part of the land within 200m of a waterway has been subject to significant ground disturbance, that part is not an area of cultural heritage sensitivity.* It is our opinion that an Aboriginal Cultural Heritage Management Plan will be mandatory for the proposed activity.

2 It is our opinion – on the basis of a review of recent CHMP studies from the surrounding region – that the Djirri Djirri Creek area would have some potential for Aboriginal Cultural Heritage.

3 A CHMP is not mandatory under the Development Plan process as this stage does not propose development itself. A CHMP will be mandatory under a permit application for subdivision which is a CHMP trigger according to AHR (2018) (discussed in Section 1.2.1).

4. Aboriginal cultural heritage is provided with blanket protection in Victoria under the Aboriginal Heritage Act 2006. If any Aboriginal artefacts or sites are found during development works or at any other time, excavation must cease immediately and the local RAP (WLCCHC) should be notified for advice before work can re-commence.

5. There are no registered European heritage sites or features within the BRDP. A preliminary field survey (17 May 2018) did not observe features of potential European heritage value. The Victorian Heritage Act

(2007) provides protection for sites of heritage value and a process of management or consent should sites or features be found during development works.

Author

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Registered Heritage Advisor (Victoria).  
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## PROFILE

**Dr Chris Day Director, Archaeo-Environments Ltd**

**MIFA**

**Honorary Research Associate (Latrobe University)**

**Cultural Heritage Advisor (Victoria)**

## PROFESSIONAL HISTORY

**2014 – present Director, Archaeo-Environments Pty Ltd** - a heritage soils and landscape consultancy. Chris brings to the position over 30 years of experience in archaeology, geo-archaeological research and natural resource management.

**2007 - 2014 Principal Archaeologist, Golder Associates** – Management of a cultural heritage team at Golder Associates which included Aboriginal and European heritage work throughout Australia and management of large-scale EIA cultural and heritage impact assessments throughout Hong Kong, S Pacific and SE Asia.

Chris has prepared over 70 Aboriginal Cultural Heritage Management Plans, impact assessments and due diligence surveys in Australia including indigenous heritage consultation and survey work on both brown and greenfield sites throughout Victoria. Chris has also supervised indigenous heritage surveys and impact assessments on large energy projects in South Australia and Victoria and a heritage management plan for Hyde Park, WA. In addition Chris has overseas cultural heritage experience (field survey and community consultation) of large EIA projects in Hong Kong as well as mine feasibility assessments in Tibet, Philippines, Fiji and PNG.

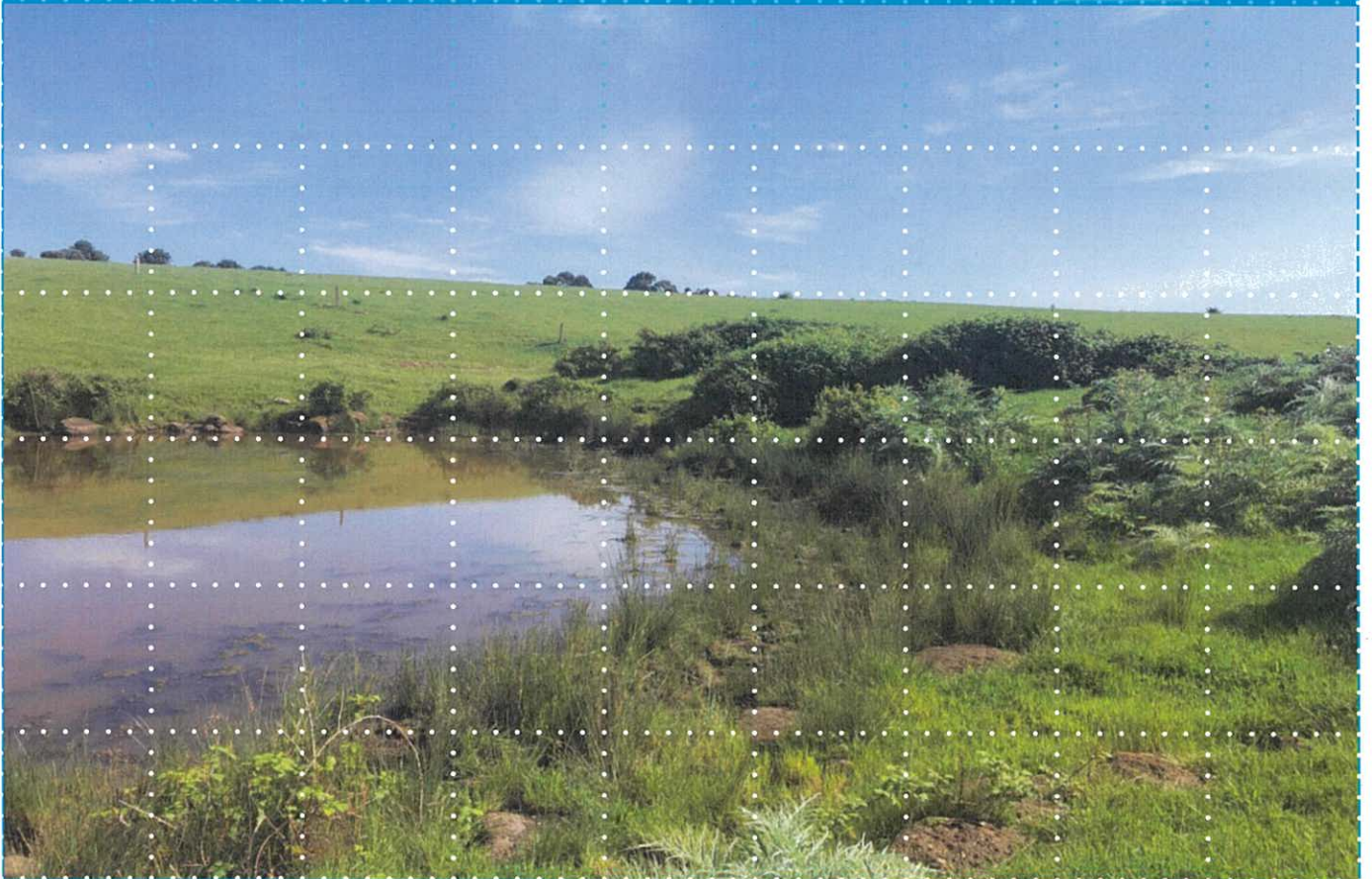
Final Report

# Vegetation Management Plan for Bennett Road Development Plan, Gisborne, Victoria

Prepared for

**G2 Urban Planning**

February 2021



Ecology and Heritage Partners Pty Ltd



## DOCUMENT CONTROL

<b>Assessment</b>	Vegetation Management Plan
<b>Address</b>	Bennett Road Development Plan, Gisborne, Victoria
<b>Project number</b>	14226
<b>Project Manager</b>	Emma Keith (Botanist)
<b>Report author</b>	Emma Keith (Botanist)
<b>Report reviewer</b>	Aaron Organ (Director / Principal Ecologist)
<b>File name</b>	14226_Vegetation Management Plan_Bennett Road DP_Final_11022021
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<b>Bioregion</b>	Victorian Volcanic Plain
<b>CMA</b>	Port Phillip and Western Port
<b>Council</b>	Macedon Ranges Shire Council

## VERSION CONTROL

Report versions	Comments	Comments updated by	Date submitted
Draft			04/02/2021
Final	Damian Loughnan	EK	11/02/2021

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## 1 INTRODUCTION

---

### 1.1 Background

Ecology and Heritage Partners Pty Ltd was engaged by G2 Urban Planning to prepare a Vegetation Management Plan (VMP) for the waterway reserve within the land proposed for the Bennett Road Development Plan, Gisborne, Victoria.

The VMP has been prepared in response to Point 5 of the Request for Further Information (RFI) from Melbourne Water, dated 18 November 2019. Point 5 states:

*'Vegetation Management Plan – even in concept form must be submitted to Melbourne Water for approval, outlining vegetation and weed control works within the waterway reserve'.*

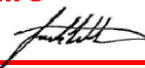
Ecology and Heritage Partners Pty Ltd previously completed a Biodiversity Assessment of the study area in July 2019 (Ecology and Heritage Partners 2019). This investigation sought to identify flora and fauna values within the study area and any potential legislative and policy requirements associated with the development.

### 1.2 Vegetation Management Plan Objectives

The Vegetation Management Plan has been prepared for the waterway reserve that flows from the south-west to the north-east of the study area. This plan details:

- The native vegetation to be retained and protected within the waterway reserve;
- Information relating to mitigation, monitoring and control methods to be implemented to achieve ecologically appropriate on-going management of pest species within the waterway reserve; and,
- Measures to minimise the spread of noxious weeds from the waterway reserve to the rest of the study area.

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## 2 EXISTING CONDITIONS

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### 2.1 Vegetation Condition

Previous and current assessments of native vegetation within the study area provide a snapshot of the existing conditions prior to the commencement of the proposed construction within the development area. All remnant native vegetation patches were previously assessed and described as part of the Biodiversity Assessment (Ecology and Heritage Partners Pty Ltd 2019) and have since been confirmed as part of the targeted spring flora surveys conducted by Ecology and Heritage Partners in November and December 2020, during an optimal surveying period for flora species.

The study area contains vegetation ranging from highly modified areas dominated by exotic vegetation (i.e. pasture grasses and invasive species) in poor condition, to relatively intact wetlands in moderate condition. The majority of the study area comprises pasture grasses, land used for agricultural purposes, planted windrows and ornamental plantings. However, the waterway that flows from the south-western corner to the north-eastern corner of the study area contains scattered Eucalypts in the southern extent, and patches of Plains Sedgy Wetland (EVC 647) of varying quality and Tall Marsh (EVC 821) throughout the creekline. There is also a linear patch of Plains Grassland Heavier-soils (EVC 132\_61) within the northern extent of the study area, and several small patches of Stony Knoll Shrubland (EVC 649) within the eastern extent (Figure 2).

#### 2.1.1 Native Vegetation within the Waterway Reserve

##### Plains Sedgy Wetland

The creek that runs through the southern and eastern extent of the study area contains native vegetation with the highest diversity and condition. Plains Sedgy Wetland is patchy along the creek alignment and ranges from moderate to low condition (Plate 1). Species such as Common Tussock-grass *Poa labillardierei*, Tall Rush *Juncus procerus*, Tall Sedge *Carex appressa* and Common Spike-sedge *Eleocharis acuta* were common throughout the patches of Plains Sedgy Wetland.

Grassy, herbaceous and woody weeds species were common throughout the creekline and within the patches of Plains Sedgy Wetland (Plate 2). Species such as Spiny Rush *Juncus acutus*, Toowoomba Canary-grass *Phalaris aquatica*, Cape Weed *Arctotheca calendula*, Ribwort *Plantago lanceolata*, Blackberry *Rubus fruticosus* spp. agg. and Gorse *Ulex europaeus* were common throughout the creekline (Plate 2).



**Plate 1.** Small patch of poor-quality Plains Sedgy Wetland along the creekline (Ecology and Heritage Partners Pty Ltd 02/11/2020).



**Plate 2.** Woody weeds, including Blackberry, are common along the creekline (Ecology and Heritage Partners Pty Ltd 02/11/2020).

### Tall Marsh

One patch of Tall Marsh is present along the edges of a dam within the southern extent of the study area. Sedges densely populate the inflow drain to the dam, and emergent vegetation is present in the centre and around the edges (Plate 3, Plate 4). Species present include Common Reed *Phragmites Australia*, Common Spike-sedge and Narrow-leaf Cumbungi *Typha domingensis*.



**Plate 3.** Patch of Tall Marsh around the dam in the southern extent of the study area (Ecology and Heritage Partners Pty Ltd 05/11/2020).



**Plate 4.** Patch of Tall Marsh around the dam in the southern extent of the study area (Ecology and Heritage Partners Pty Ltd 05/11/2020).

### Introduced and Planted Vegetation

Areas not supporting native vegetation within the creekline had a high coverage (>90%) of exotic and invasive species, including 12 species listed as noxious under the *Catchment and Land Protection Act 1994* (CaLP Act), four of which are also listed as Weeds of National Significance (WoNS); Blackberry *Rubus fruticosus* spp. agg., Gorse *Ulex europaeus*, Serrated Tussock *Nassella trichotoma* and Broom *Genista* spp (Plate 5; Plate 6; Plate 7). Many exotic grass species present have been direct-seeded for use as pasture. Disturbed areas along the creekline also had a high coverage of environmental weeds such as Toowoomba Canary-grass, Perennial Rye-

grass *Lolium perenne* and Yorkshire Fog *Holcus lanatus*. Exotic and invasive species recorded along the creekline are given below in Table 1.

Planted vegetation within and around the creekline consists of exotic and non-indigenous tree species, most commonly Radiata Pine *Pinus radiata* and Sugar Gum *Eucalyptus cladocalys* (Plate 8).



**Plate 5.** Large infestations of Gorse along the creekline (Ecology and Heritage Partners Pty Ltd 05/11/2020).



**Plate 6.** Exotic grass species are common along the creekline (Ecology and Heritage Partners Pty Ltd 05/11/2020).



**Plate 7.** Common weeds within the creekline, including Blackberry, Artichoke Thistle and Briar Rose (Ecology and Heritage Partners Pty Ltd 05/11/2020).



**Plate 8.** Planted Sugar Gum along the creekline (Ecology and Heritage Partners Pty Ltd 02/11/2020).

**Table 1.** Exotic and invasive species recorded along the creekline during the assessment

Scientific Name	Common Name	Status
<i>Agapanthus spp.</i>	Agapanthus	-
<i>Arctotheca calendula</i>	Cape weed	-
<i>Avena sativa</i>	Oat	-
<i>Betula pendula</i>	Silver Birch	-
<i>Brassica spp.</i>	Turnip	-
<i>Cirsium vulgare</i>	Spear Thistle	C
<i>Crataegus monogyna</i>	Hawthorn	C
<i>Cynara cardunculus subsp. flavescens</i>	Artichoke Thistle	C
<i>Dactylis glomerata</i>	Cocksfoot	-
<i>Echium plantagineum</i>	Paterson's Curse	C
<i>Galenia pubescens var. pubescens</i>	Galenia	-
<i>Genista spp.</i>	Broom	*C
<i>Holcus lanatus</i>	Yorkshire Fog	-
<i>Hypochaeris spp.</i>	Cat's Ear	-
<i>Juncus acutus subsp. acutus</i>	Spiny Rush	C
<i>Lolium perenne</i>	Perennial Rye-grass	-
<i>Malus pumila</i>	Apple	-
<i>Nassella trichotoma</i>	Serrated Tussock	*C
<i>Oxalis pes-caprae</i>	Soursob	R
<i>Paspalum dasypleurum</i>	Paspalum	-
<i>Phalaris aquatica</i>	Toowoomba Canary-grass	-
<i>Pinus radiata</i>	Radiata Pine	-
<i>Plantago lanceolata</i>	Ribwort	-
<i>Rosa rubiginosa</i>	Briar Rose	C
<i>Rubus fruticosus spp. agg.</i>	Blackberry	*C
<i>Rumex crispus</i>	Curled Dock	-
<i>Silybum marianum</i>	Variiegated Thistle	C
<i>Sonchus oleraceus</i>	Common Sow-thistle	-
<i>Trifolium repens var. repens</i>	White Clover	-
<i>Ulex europaeus</i>	Gorse	*C

## 2.3 Fauna Habitat

Native and planted vegetation within the creekline is likely to provide habitat such as nesting/roosting areas, and protective habitat for mobile fauna species such as small birds and mammals. The creekline provides habitat for common frog species, and potentially for the nationally significant Growling Grass Frog *Litoria raniformis*.

### 3 VEGETATION MANAGEMENT PLAN

#### 3.1 Summary of Management Priorities and Definitions

An overview of management issues and control priorities for the study area is provided below (Table 2). Priorities have been based on the following criteria:

##### 3.1.1 Control Priority

**High priority:** Issue poses a high level of threat to ecological values and needs to be addressed immediately and on a frequent basis.

**Medium priority:** Issue has a high to moderate threat level and needs to be addressed in the short-term or on a regular basis.

**Low priority:** Issue has a medium to low threat level, or low likelihood of occurrence, and needs to be addressed on an irregular basis.

Table 2. Summary of management issues within the site

Management Issue	Comments	Control Priority
Weeds (noxious and environmental)	<ul style="list-style-type: none"> <li>Adverse impacts on native flora and fauna habitat</li> <li>Impacts to ecosystem services</li> </ul>	High
Stock	<ul style="list-style-type: none"> <li>Impacts to native vegetation from overgrazing and pugging</li> <li>Soil degradation</li> </ul>	High
Degradation of native vegetation	<ul style="list-style-type: none"> <li>Loss of native vegetation extent</li> <li>Impacts to ecosystem services</li> <li>Increase of exotic weeds</li> <li>Impacts to native fauna</li> </ul>	High
Pest animals (rabbits, foxes, feral cats, domestic pets)	<ul style="list-style-type: none"> <li>Predation on native wildlife</li> <li>Impacts on soil and vegetation health</li> </ul>	Moderate

#### 3.2 Overview of Key Threats

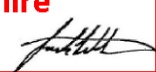
Several potential threatening ecological processes and management issues exist along the creekline, with details on the nature and extent of these are outlined below.

Management priorities (control priority and threat level) should be actively reviewed on an annual basis to allow for resources to be focussed towards management issues, which may arise throughout the duration of the construction phase of the development, and to reflect the success or otherwise of management works previously undertaken.

##### 3.2.1 Weeds

Several noxious and environmental weeds were recorded within the study area during the site assessment. In general, the creekline is in a degraded condition, with key factors such as historical land use (agriculture) facilitating weed invasion within the study area.

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Weeds often out-compete and exclude native vegetation, leading to the deterioration in fauna habitats and ecological value. Declared noxious weeds in Victoria are plants proclaimed under the *Catchment and Land Protection Act 1994* (CaLP Act) because they cause environmental or economic harm or have the potential to cause such harm (DPI 2008).

It should be noted that all land managers/persons are required under the CaLP Act to prevent the growth and spread of a Regionally Controlled weed (C) for which they are responsible. Land managers that do not control Regionally Controlled weeds may be issued with a Land Management Notice or Directions notice that requires specific control work to be undertaken. Failure to comply with the conditions of a Notice may result in court action and fines or the issuing of an infringement notice and fine (DPI 2008).

There are no legal requirements to eradicate or control Restricted Weeds (R) growing on land; however, Restricted Weeds cannot be traded, transported or knowingly spread in Victoria. Sections 70, 70A and 71 of the CaLP Act for all declared noxious weeds, irrespective of category or region, prohibits the:

- Transport of a noxious weed or its propagules within Victoria; and
- Deposition on land of a noxious weed or its seeds (DPI 2008).

**Threat Level:**

- **High** – Rapidly spreading species with the potential for high ecological impacts.
- **Moderate** – Moderately spreading species with the potential for high ecological impacts.
- **Low** – Slow spreading species with the potential for high ecological impacts.

**Infestation level:**

- **High** – Weed infestation over large areas across the site.
- **Moderate** – Weed infestation over moderate areas on the site.
- **Low** – Localised weed infestation within the site.


### 3.2.2 Pest Animals

Pest animals listed under the CaLP Act are likely to occur within the study area, with one species (European Rabbit) recorded with the study area during the assessment. European Rabbit is the most notable pest species within the surrounds (i.e. within 10 kilometres of the study area) and is considered the most appropriate focus for pest control efforts. Impacts associated with domestic cats and foxes are also likely to become an issue once development is established on site.

### 3.2.3 Native Vegetation

Without active management, areas supporting native vegetation values may be degraded over time. The main management issue for protecting retained native vegetation is weed control. Unless weed levels are low, exotic species will need to be controlled. The risk of ongoing weed invasion can be reduced by minimising disturbance in areas of retained native vegetation. Factors which promote weeds infestations include native vegetation clearance, vehicle traffic, other soil disturbance, and storage of materials and dumping of waste materials.

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### 3.3 Management Actions

The following management actions and performance measures are detailed below to protect and enhance the creekline and to ensure the long-term functionality of the site in the future.

It should be noted that all management issues relating to the construction phase of the development are not addressed in this report and should be addressed in a Construction Environmental Management Plan prepared by the relevant contractor. Land along the creek will be managed under this report which will be triggered by a subdivision planning permit condition.

#### 3.3.1 Weed Control

Annual, ongoing weed control is one of the primary management requirements along the creekline. The objective of weed control is to reduce weed populations to manageable levels. As with all weed control operations, it is important to establish native vegetative cover as soon as practicable within disturbed areas to prevent establishment of exotic species. It is also important that only an experienced contractor undertakes weed control works within areas of higher quality native vegetation. Licensed weed control contractors should make appropriate decisions on which technique to use based on individual situations. Contractors will also need to be aware of the potential for new outbreaks of weed species not recorded in this assessment and implement appropriate weed control techniques as necessary.

A list of priority weeds that require control within the creekline (Figure 3) and their current level of threat are listed in Table 3.

Areas comprising patches of native vegetation are under continual pressure from weed emergence from seed storage within the soil and weed invasion from adjoining areas (edge effects). Several management techniques are recommended to control weeds, including physical removal, brush cutting and herbicide application. In most cases, herbicide will only be applied to weeds by using the spot-spraying technique, to prevent death or damage to non-target species. Weed control works should seek to eliminate all declared noxious weeds and woody weeds recorded along the creekline and at a minimum reduce the cover and abundance of all other weed species. A summary of weed management techniques for priority weeds and woody weeds is provided in Table 3. Various weed control techniques are outlined in Appendix 1.

#### Actions

- Undertake weed control works prior to the weeds flowering and setting seed or spreading;
- Eliminate all listed noxious weeds, WONS and other woody weeds;
- Undertake weed control with sensitivity to indigenous species also present, particularly indigenous grass species;
- Where appropriate, promote persistence and expansion of indigenous species populations; and,
- Monitor for the occurrence of new weeds or the further spread of current weeds.

#### Performance Indicators

Key performance indicators for weed management include:

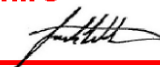
- Meeting the requirements of the CaLP Act in relation to control of listed noxious weeds within the study area;

- No new significant weed invasions occur in the study area;
- Control (<5% cover) High threat weeds and woody weeds;
- Reduce cover of Moderate threat weeds to <10%; and,
- No increase in the cover of Low threat weeds within the study area.

Table 3. Priority weeds recorded within the study area and recommended control

Scientific Name	Common Name	Weed Classification	Current Threat Level	Extent of Infestation	Control Priority	Timing	Control Method
<i>Cirsium vulgare</i>	Spear Thistle	R Herbaceous	Low	Low	Low	Spring/Summer	SS/HP
<i>Crataegus monogyna</i>	Hawthorn	C Woody	High	High	High	Spring/Summer	MR/CP
<i>Cynara cardunculus</i> subsp. <i>flavescens</i>	Artichoke Thistle	C Herbaceous	High	High	High	Spring/Summer	SS/HP
<i>Echium plantagineum</i>	Paterson's Curse	C Herbaceous	Low	Low	Low	All year	SS/HP
<i>Genista</i> sp.	Broom	C Woody	Low	Low	Low	Spring/Summer	MR/CP
<i>Nassella trichotoma</i>	Serrated Tussock	C Herbaceous	High	Low	Moderate	Winter/Spring/Summer	SS/HP
<i>Rosa rubiginosa</i>	Briar Rose	C Woody	Low	Low	Moderate	Spring/Summer/Autumn	MR/CP
<i>Rubus fruticosus</i> spp. agg.	Blackberry	C Woody	High	High	High	Spring/Summer/Autumn	MR/CP
<i>Spiraea marianum</i>	Variiegated Thistle	C Herbaceous	Low	Low	Low	Spring/Summer	SS/HP
<i>Ulex europaeus</i>	Goose	C Woody	Moderate	Moderate	Moderate	All year	MR/CP

Note: Weed Classification = Noxious weed classification within the Port Phillip & Westport CMA under the CaLP Act, C = Regionally controlled weed, R = Restricted Weed. SS = Spot Spray. HP = Hand Pull. MR = Mechanical Removal. CP = Cut and Paint

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### 3.3.2 Pest Animal Management

All domestic animals such as cats and dogs should be fed in an inside area to ensure that the food is not scavenged by pest animals.

Several pest animals listed under the CaLP Act are likely to occur within the study area. The removal of pest animal harbours (such as hard rubbish, stockpiles of building materials and woody weed infestations) is a very important aspect of pest animal control. The management procedures detailed below should be incorporated into the management strategy for the site. Table 4 provides an evaluation of management measures commonly adopted to control European Rabbits in Victoria.

**Table 4.** Feasibility assessment of European Rabbit control methods

Method	Feasibility
Warren fumigation	<b>Low</b> – The site inspection identified very little evidence of warrens across the site, with rabbits likely to be harbouring in woody weeds, debris and the cover provided by indigenous trees and shrubs. In the event that significant warren networks become established, this method is considered suitable for control.
Long netting and night netting	<b>High</b> – Night netting is an effective method, particularly in situations where rabbits are leaving bushland harbour to feed in areas of open space.
Warren ripping	<b>Low</b> – As above. In order to avoid impacts on native vegetation communities, ripping would be constrained to areas of exotic grassland and other non-native vegetation.
Baiting (Pindone)	<b>Low</b> – Although an antidote exists for domestic pets which have ingested Pindone (Vitamin K1), the risks associated with the poisoning of domestic and native animals is considered unreasonable. Additionally, consultation with qualified pest controllers indicated that Pindone poisoning may not be successful, as rabbits are unlikely to feed on introduced bait if an abundance of existing food sources are present.

#### Timing of Rabbit control

European Rabbits commence breeding in autumn and continue until vegetation dries off, which generally occurs in early summer. Rabbit mortality is particularly high during summer months due to disease, lack of food and water, and high temperatures. Late summer and early autumn is therefore the best time to control rabbits as populations are naturally low.

#### Preferred control methods

The ongoing replacement of woody weeds (particularly Pittosporum) with indigenous plantings is considered the primary method of reducing rabbit populations. It is recommended that weeded areas are revegetated as soon as practically possible to reduce rabbits from establishing warrens within the clearings.

The feasibility assessment of control measures summarised in Table 4 indicate that night netting is the most appropriate method for actively controlling rabbits. This method avoids the use of poisons and is effective in situations where few warrens exist or where they are in areas of dense vegetation. Depending on the level of infestation, the removal of woody weeds may be enough to maintain sustainable rabbit levels in the long-term (assuming ongoing monitoring for warren establishment).

#### General Pest Animal Management Actions

- Continually monitor for the presence of pest animal fauna; and
- Where appropriate, undertake preferred control methods as summarised above.

#### General Pest Animal Performance Indicators

Key performance indicators for pest animal management include:

- Meeting the requirements of the CaLP Act in relation to the control of listed pest animals within the study area;
- Presence of pest fauna does not increase above baseline levels of occurrence;
- Achieving control of key fauna species within the study area within the specified management timeframe; and
- No new significant pest fauna invasions occur in the study area.

### 3.4 Timeframes and Priorities

The VMP should be activated at the civil construction phase for the development. This will be addressed by a planning permit condition on subdivision permits for adjoining land. This will ensure that there will be appropriate vegetation management along the water course. The timing of the management actions outlined within this report is key to the successful management of the vegetation within the site into the future.

At this time, the project is still in the project planning, however all land managers/persons are required under the CaLP Act to prevent the growth and spread of a Regionally Controlled weed (C) for which they are responsible. Therefore, weed control responsibilities are triggered at the time on property acquisition. The VMP is to be implemented immediately by the developer in vegetated areas yet to be developed on the site.

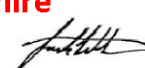
All technical on-ground works (i.e. pest animal and weed control) will require the input or services of suitably qualified and experienced contractors.

Management priorities should be undertaken in accordance with the definition and timings provided in Table 3, Management priorities (control priority and threat level) should be actively reviewed every year to allow for resources to be focussed towards management issues that may arise throughout the duration of the construction phase of the development and to reflect the success or otherwise of management works previously undertaken.

### 3.5 Monitoring

Monitoring of weed infestations and pest animal populations is required to evaluate the success of management actions and to allow for any modifications. The frequency of weed monitoring may need to vary to allow for seasonal variations and periods of active weed growth. Similarly, pest animal monitoring should be undertaken at a time of year when target species are most active.

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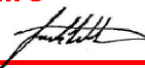
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## FIGURES

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**Legend**

-  Study Area
-  Railway
-  Freeway
-  Major Road
-  Collector Road
-  Minor Road
-  Proposed Road
-  Walking Track
-  Minor Watercourse
-  Permanent Waterbody
-  Land Subject to Inundation
-  Parks and Reserves
-  Crown Land
-  Localities

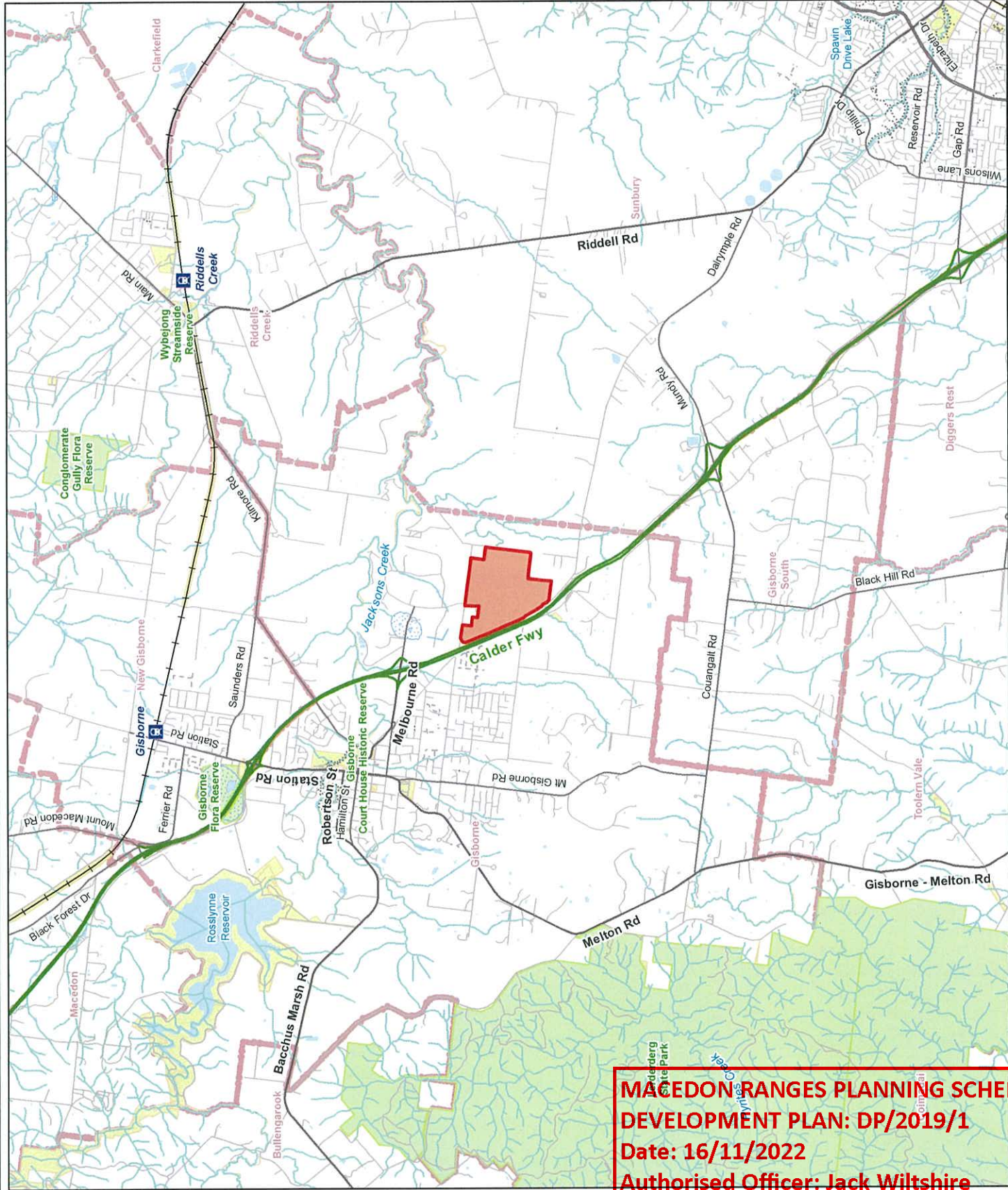


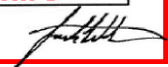
**Figure 1**  
**Location of the study area**  
**Vegetation Management Plan,**  
**Bennett Road Development**  
**Plan, Gisborne**









Vegetation Data. The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

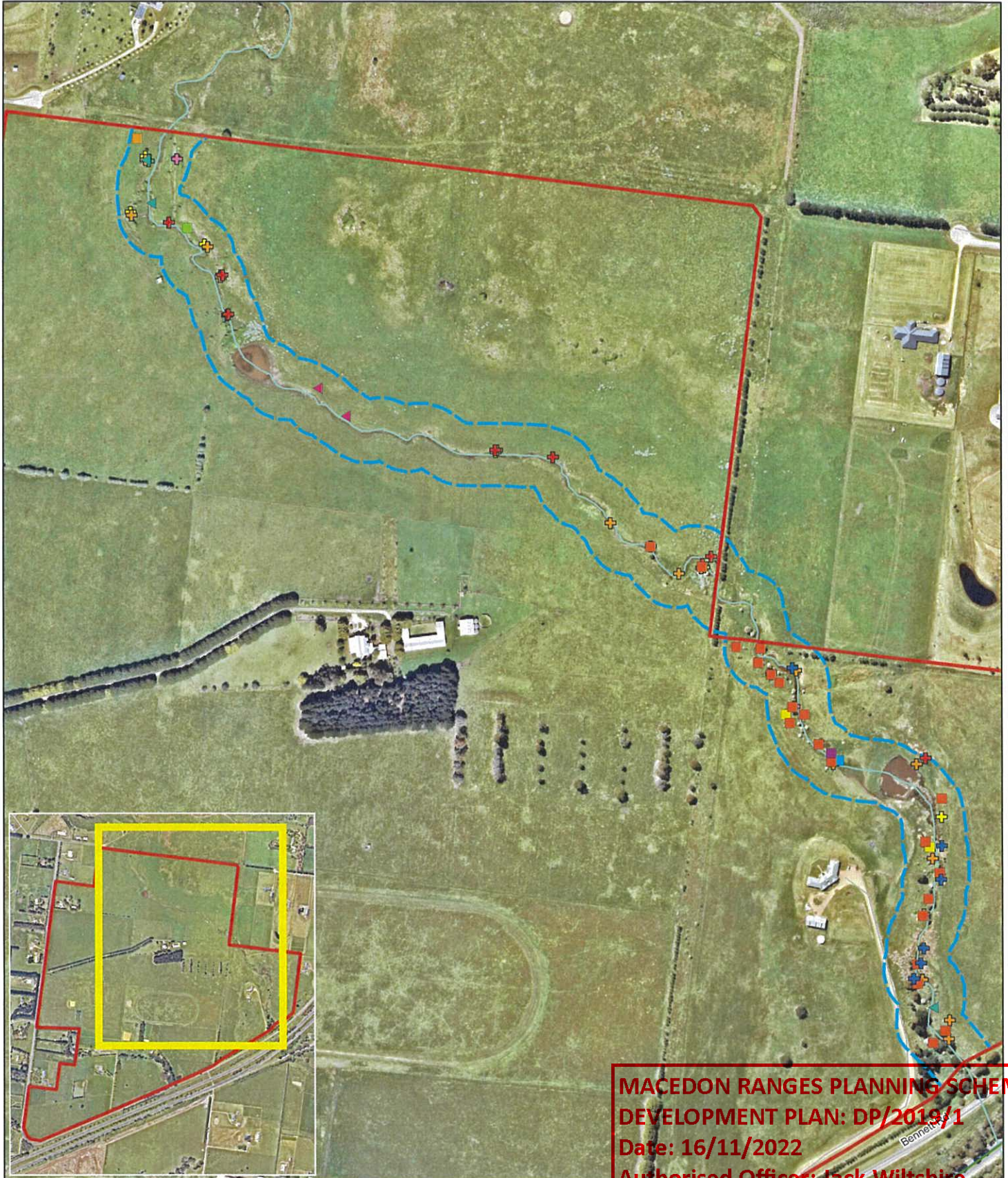
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**Legend**

-  Study Area
-  30m creek buffer
- Weeds**
-  Apple Tree
-  Artichoke Thistle
-  Blackberry
-  Briar Rose
-  Broom
-  Gorse
-  Hawthorn
-  Patersons Curse
-  Serrated Tussock
-  Slender Thistle
-  Soursob
-  Sow Thistle
-  Spear Thistle
-  Variegated Thistle



**Figure 2**  
**Vegetation Management Plan**  
**Bennett Road Development Plan, Gisborne**



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Aerial source: Nearmap 2020

## APPENDIX 1 WEED CONTROL MEASURES

Weed control measures identified in Table 2 are described in detail below. Weed control measures (including type of herbicide) should follow the guidance of an experienced contractor for the control of the weed species identified above.

### Spot spraying

The application of herbicides is an effective and efficient control technique for a range of woody, herbaceous and grass weeds. The correct use and application of herbicides can provide targeted control of a range of species; however it must be stressed all use of herbicides must be used in accordance with the manufacturer's specifications and occupational health and safety policies.

Application methods for herbicides include spot spraying with a knapsack for small or sensitive areas, or for targeted species. Dabbing of species with foam tipped application device, with the herbicide applied from an attached bottle, should be used in sensitive areas or in areas where weed control is targeted to a small number of plants, especially bulbs or tuberous plants.

Timing of intervals, plant age and growth seasons, plant stress levels and climatic factors all need to be considered when develop methodologies for the application of herbicides to ensure successful outcomes. Problems exist with ongoing unsuccessful herbicide treatments, which may result in weeds developing herbicide resistance, or the build-up of chemicals in the soil. Surrounding plants' susceptibility to herbicides and ongoing uses of the treated areas should also be considered when choosing the right herbicide to be used in a weed control program, as some herbicides are residual and may persist within the soil for varying durations.

### Drill and Fill

Drill and fill, also known as direct injection, is a method where the selected herbicide (usually Glyphosate) is injected through a device into a hole that has been made into the targeted plant (i.e. woody species). The hole is usually made through the use of a drill but sometimes a tomahawk or saw may be used to put small nicks into the targeted plant. It is essential that the hole or nick must always be lower than the first branch containing foliage (i.e. ideally, the lowest possible point on the plant) and also the herbicide is applied into the hole as quick as possible. The general rule of thumb is that the herbicide must be applied within 30 seconds. Holes are scattered around the main trunk at 50 millimetre intervals, depending on the diameter of the trunk and also branches or angle of the trunk. It is essential that a complete ring around the trunk of the plant be made of this herbicide filled holes to ensure plant death, as large gaps may allow sections of the target tree to survive. Generally, the holes or nicks do not need to be deeper than 20 millimetres but do need to be deep enough to penetrate the outer cambium layer of the tree. This allows the phloem to carry the herbicide into the roots, which will kill the plant over several weeks, depending on conditions.

The benefits of this method include: the retention of standing material for habitat, no costs for the removal of the plant from the site; no dragging of material across sensitive areas; and, speed, as the method is fast to execute (i.e. drill and fill and move on).

The drawbacks of this method are that if it is not executed correctly, trees may re-grow, particularly as accessing the base of the trunk of spiny plants such as Hawthorn and African Box-thorn can be difficult.

However, if the application is successful, dead standing vegetation can become a fire hazard and look aesthetically displeasing to the community.

#### **Cut and Paint**

The cut and paint method of control requires the cutting of the target species at the very base, under any foliage, and the immediate application of herbicide (usually a glyphosate, dependent on the target species). The application can be done through a 'dabber' bottle or paint brush. Care should be undertaken during application, to avoid splash of herbicide causing non-target damage. Once cut down, the biomass of the target species may sometimes be left on the ground, but usually requires removal. This is particularly necessary if it bears fertile seeds or has the potential to re-shoot from contact with moist ground (i.e. *Salix* sp.) or covers native vegetation.

Many herbicides are available that are very effective in the control of woody weed species. Typically, these herbicides are applied to the stem, trunk or roots of the target plant by 'drill and fill', 'cut and paint' or 'frilling' methods of application. These herbicides can be more effective than manual removal alone, as the chance of the plant re-sprouting is significantly reduced.

#### **Manual Removal/Hand pulling**

Some weed species are resilient against other methods of eradication, such as herbicides, and should be targeted by manual removal. Infestations of species such as African Box-thorn, Fennel, Serrated Tussock and Toowoomba Canary-grass should be combated by manual removal techniques.

Additionally, manual removal is a crucial technique when used in conjunction with herbicides for the control of both woody and herbaceous weed species. This combination of weed eradication is advised for almost all weed species.



Final Report

# Existing Conditions Report 128 – 168 Bennett Road, Gisborne

Prepared for

**G2 Urban Planning**

November 2021



Ecology and Heritage Partners Pty Ltd

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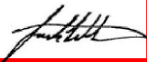
**MACEDON RANGES PLANNING SCHEME**

**DEVELOPMENT PLAN: DP/2019/1**

**Date: 16/11/2022**

**Authorised Officer: Jack Wiltshire**

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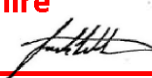
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## Document Control

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<b>Project manager</b>	Andrea Fullagar (Zoologist)
<b>Report reviewer</b>	Aaron Organ (Director – Principal Ecologist)
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<b>Mapping</b>	Julian Yuan (GIS Coordinator) and Monique Elsley (GIS Coordinator)
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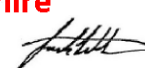
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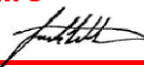




**Table 1.** Development Plan Overlay (DPO18) requirements.

Requirement	Summary of response
Identification of any existing native or significant vegetation on the site	<p>Native vegetation adjacent to the creek line will be retained and stock excluded. Native vegetation in the study area is representative of four EVCs characteristic of the Victorian Volcanic Plains: Plains Grassland Heavier-soils (EVC 132_61), Plains Sedgy Wetland (EVC 647), Tall Marsh (EVC 821) and Stony Knoll Shrubland (EVC 649). The presence of these EVCs is generally consistent with the modelled pre-1750s native vegetation mapping (DELWP 2017b).</p> <p>The remainder of the study area comprises introduced and planted vegetation, present as stands of non-Victorian eucalypt species, pasture and Victorian Eucalypts. (Section 3.1).</p> <p>At the time of the planning permit application (Clause 52.17), targeted surveys are recommended for Matted Flax-lily (May – August), Swamp Everlasting (November – March) and Swamp Fireweed (November – March) adjacent to the creek line/drainage line.</p>
Identification of any significant fauna and associated habitat	<p>Despite current land uses, the study area contains patches of native vegetation, scattered trees and some introduced vegetation that is of value to fauna. Patches of Plains Grassland and remnant riparian vegetation along the creek line may provide potential habitat for significant species.</p> <p>At the time of the planning permit application (Clause 52.17), targeted surveys are recommended for Golden Sun Moth across the whole study area during the summer flying season (late November – early January) (DEWHA 2009).</p> <p>Targeted surveys are recommended for Growling Grass Frog along the creek line during the species’ breeding season (November – March) (DEWHA 2009).</p>
Identification of the relevant legislative requirements for flora and fauna	<p>The <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) establishes a Commonwealth process for the assessment of proposed actions likely to have a significant impact on any matters of National Environment Significance (NES).</p> <p>The study area is located within the Macedon Ranges municipality and is zoned Rural Living Zone 2 (RLZ2). Development Plan Overlay (DPO18) applies to the land proposed for subdivision.</p> <p>A Planning Permit from Macedon Ranges Council will be required to remove, destroy or lop any native vegetation on site. A Planning Permit will be assessed in accordance with the ‘The Guidelines for the removal, destruction or lopping of native vegetation’ (Guidelines) and Clause 52.17 of the Whittlesea Planning Scheme.</p> <p>Any persons engaged to remove, salvage, hold or relocate native fauna during construction must hold a current Management Authorisation under the <i>Wildlife Act 1975</i>, issued by DELWP.</p> <p>Weeds listed as noxious under the <i>Catchment and Land Protection Act 1994</i> (CaLP Act) (Artichoke Thistle, Fennel, Paterson’s Curse, African Box-thorn, Blackberry, Chilean Needle-grass and Serrated Tussock) were recorded during the assessment. Weeds should be managed in accordance with the Act.</p> <p>See Section 4 for further detail on how legislative requirements will be met.</p>
Identification of existing vegetation to be retained as per DPO18 requirements	<p>Native vegetation up to 30 metres either side of the creek line (or drainage line) will be retained and stock excluded. Dwellings will be set back from drainage line by at least 20 metres. Trees within the road reserve, including revegetation, will be retained where possible (Appendix 1)</p>

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## 1 INTRODUCTION

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### 1.1 Background

Ecology and Heritage Partners Pty Ltd conducted and produced an Existing Conditions Report in February 2020, at the Bennett Road Precinct, to satisfy the requirements for a Development Plan Overlay – Schedule 18 (DPO18) according to the Macedon Ranges Planning Scheme.

Following the assessment detailed in the 2020 report, Ecology and Heritage Partners Pty Ltd undertook targeted surveys for significant flora and fauna species that had potential to occur in the study area based on the availability of suitable habitat (Ecology and Heritage Partners Pty Ltd 2021). The surveys indicated that there were no Matted Flax-lily, Swamp Everlasting, Swamp Fireweed, Growling Grass Frog or Golden Sun Moth in the Development Plan area.

This November 2021 version of the Existing Conditions Report, updates the discussion about significant flora, fauna and ecological communities, references the results of the targeted surveys, which are documented in (Ecology and Heritage Partners Pty Ltd 2021), and references a 2021 Development Plan.

### 1.2 Objectives

The objective of this assessment is to support the submission of a Development Plan, according to DPO18, which outlines the overall requirements for the proposed subdivision of 50 Lots (two hectares per Lot) to proceed.

The existing conditions assessment involved identifying the extent and type of remnant native vegetation present within the study area in accordance with Victoria's *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017). It also determined the likely presence of significant flora and fauna species and/or ecological communities protected under Commonwealth and State legislation and policy.

This report presents the results of the existing conditions report and discusses the potential ecological and legislative implications associated with the proposed subdivision. The report also provides recommendations to address or reduce impacts and, where necessary, highlights components that require further investigation.

### 1.3 Study Area

The study area is at the Bennett Road Precinct, located approximately six kilometres south of Gisborne and approximately 53 kilometres north-west of Melbourne's CBD (Figure 1). The site covers approximately 130 hectares and is bound by McGregor Road to the north, private property to the south, Coney Court to the east and the Calder Freeway to the west.

The study area is mostly undulating cleared agricultural land with introduced grasses, planted windrows of trees and some patches of native vegetation to the south of the study area trees. Patches of native vegetation, characteristic of Plains Sedgy Wetland and Tall Marsh Ecological Vegetation Classes (EVCs) are present along the creek line (Figures 2b, 2c). Patches of native vegetation (characteristic of Stony Knoll shrubland EVC) occurs in the south-east of the study area, but this has been grazed by livestock and the patches are highly degraded (Figure 2b). One continuous patch of native vegetation (characteristic of Plains Grassland EVC) is present adjacent to a driveway planted with windrow trees, in the south of the study area (Figure 2a).

According to the Department of Environment, Land, Water and Planning (DELWP) Native Vegetation Information Management (NVIM) Tool (DELWP 2018a), the study area occurs within the Victorian Volcanic Plain bioregion. It is located within the jurisdiction of the Port Philip and Westernport Catchment Management Authority (CMA) and the Macedon Ranges Shire municipality.

## 1.4 The Development Plan and Subdivision Concept Plan

The Development Plan prepared by Terraco Pty Ltd (2021) outlines the overall site characteristics and proposed road network to facilitate the consideration of a future subdivision application for 2-hectare residential allotments (Appendix 1.1; Appendix 1.2).

The Development Plan addresses the DPO18 requirement (Section 3.0) to identify measures for the preservation of remnant vegetation along drainage lines from the creek line to protect and manage waterway corridors. The Subdivision Concept Plan (2021) details the proposed subdivision including building envelopes within the study area.

While currently not incorporated into the Macedon Ranges Planning Scheme, the Biodiversity Strategy (2018) recommends the following urban biodiversity actions and local planning policies:

- Seek opportunities to transfer waterways and buffer areas to public ownership;
- Promote the use of native street trees in new subdivisions, and;
- Emphasise the importance of remnant native vegetation and their role in maintaining connected habitat for native flora and fauna.

## 2 METHODS

---

### 2.1 Desktop Assessment

Relevant literature, online-resources and numerous databases were reviewed to provide an assessment of flora and fauna values associated with the study area. The following information sources were reviewed:

- The Commonwealth Department of **the Environment and Energy (DoEE)** Protected Matters Search Tool (PMST) for matters of National Environmental Significance (NES) protected under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (DoEE 2019) (Not updated as apart from those species already searched for during targeted surveys, no additional matters are considered relevant);
- The Native Vegetation Information Management (NVIM) Tool (DELWP 2019b) for modelled biodiversity data;
- DELWPs VicPlan Online to ascertain current zoning and environmental overlays (DELWP 2019d);
- DELWP's NatureKit mapping tool modelled mapping of 2005 extant and pre-1750's native vegetation and Ecological Vegetation Classes (EVCs) (DELWP 2019c);
- Victorian Guidelines for the Removal, Destruction or Lopping of Native Vegetation (the Guidelines) (DELWP 2017b),
- The Victorian Biodiversity Atlas (DELWP 2018a) for previously documented flora and fauna records within the project locality, and;
- Aerial photography of the study area.

### 2.2 Field Assessments

#### 3.2.1 Biodiversity Assessment

A field assessment was undertaken on 17 and 21 May 2018 to obtain information on flora and fauna values within the study area. The study area was walked, with all observed vascular flora and fauna species recorded, any significant records mapped and the overall condition of vegetation and habitats noted. EVCs were determined with reference to DELWP pre-1750 and extant EVC mapping and their published descriptions (DELWP 2019c).

#### 3.3 The Guidelines

Under the Planning and Environment Act 1987, Clause 52.17 of the Planning Schemes requires a planning permit from the relevant local Council to remove, destroy or lop native vegetation. The assessment process for the clearing of vegetation follows the *Guidelines for the removal, destruction or lopping of native vegetation* (Guidelines) (DELWP 2017b). The *Assessor's handbook – applications to remove, destroy or lop native vegetation* (Assessor's handbook) (DELWP 2017c) provides clarification regarding the application of the Guidelines.

### 3.3.1 Assessment Pathway

Guidelines manage the impacts on biodiversity from native vegetation removal (DELWP 2017b). The assessment pathway for an application to remove native vegetation reflects its potential impact on biodiversity and is determined from the location and extent of the native vegetation to be removed. The location risk categories (1, 2 or 3) has been determined for all areas in Victoria and is available on DELWP’s NVIM Tool (DELWP 2019b). Determination of assessment pathway is summarised in Table 1.

**Table 1.** Assessment pathways for applications to remove native vegetation (DELWP 2017a)

Extent		Location		
		1	2	3
Native Vegetation	< 0.5 hectares, and not including any large trees	Basic	Intermediate	Detailed
	Less than 0.5 hectares, and including one or more large trees	Intermediate	Intermediate	Detailed
	0.5 hectares or more	Detailed	Detailed	Detailed

**Notes:** For the purpose of determining the assessment pathway of an application to remove native vegetation the extent includes any other native vegetation that was permitted to be removed on the same contiguous parcel of land with the same ownership as the native vegetation to be removed, where the removal occurred in the five year period before an application to remove native vegetation is lodged.

### 2.2.1 Vegetation Assessment

Native vegetation (as defined in Table 2) is assessed using two key parameters: extent (in hectares) and condition. Extent is determined through a field assessment. The condition score for Detailed Assessment pathways must be assessed through a habitat hectare<sup>1</sup> assessment conducted by a qualified ecologist. The condition score for Basic Assessment pathways may be based on either modelled data available on the NVIM Tool (DELWP 2019b), or through a habitat hectare assessment.

**Table 2.** Determination of remnant native vegetation (DELWP 2017b)

Category	Definition	Extent	Condition
Remnant patch of native vegetation	An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native. OR An area with three or more native canopy trees where the drip line of each tree touches the drip line of at least one other tree, forming a continuous canopy.	Measured in hectares. Based on hectare area of the remnant patch.	Vegetation Quality Assessment Manual (DSE 2004).

<sup>1</sup> A ‘habitat hectare’ is a unit of measurement which combines the condition and extent of native vegetation.

Category	Definition	Extent	Condition
Scattered tree	A native canopy tree that does not form part of a remnant patch.	<p>Measured in hectares.</p> <p>A small tree is assigned an extent of 0.031 hectares (10m radius).</p> <p>A large tree is assigned an extent of 0.071 hectares (15m radius).</p>	Scattered trees are assigned a default condition score of 0.2.

**Notes:** Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'.

### 2.2.2 Offsets

Offsets are required to compensate for the permitted removal of native vegetation. The offset requirements for Basic and Intermediate Assessment pathway applications are calculated using the NVIM Tool and the resulting Native Vegetation Removal Report will be provided as a separate report/s to accompany the planning permit application.

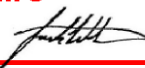
## 2.3 Assessment Qualifications and Limitations

The site assessment was undertaken during a sub-optimal season for the identification of flora and fauna species (autumn). This meant that the assessment undertaken only captured species present at the time of surveys and is not a complete representation of species diversity or extent.

Targeted flora or fauna surveys were not undertaken, as the purpose of this existing conditions assessment was to ascertain whether significant species are likely to occur based on native vegetation and habitat values at the site. If significant flora and fauna are considered by an ecologist to have a moderate – high likelihood of occurring at the site, then targeted surveys are recommended.

This assessment is considered sufficient for the purpose of the Development Plan approval, which is to provide an overview of the existing flora and fauna present in the study area and satisfy the DPO18 requirements under the Macedon Ranges planning scheme. It is appropriate that a detailed assessment, including habitat hectares and targeted surveys, are undertaken at the time of subdivision as part of a planning permit application.

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## 3 RESULTS

### 3.1 Vegetation Condition

The majority of the study area comprises introduced and planted vegetation in the form of crops, pasture, windrows and ornamental plantings. However, there are some small areas of native vegetation scattered within the study area.

#### 3.1.1 Remnant Patches

Remnant native vegetation in the study area is representative of four Ecological Vegetation Classes (EVCs) of the Victorian Volcanic Plain bioregion (Figure 2): Plains Grassland Heavier-soils (EVC 132\_61), Plains Sedgy Wetland (EVC 647), Tall Marsh (EVC 821) and Stony Knoll Shrubland (EVC 649). The presence of these EVCs is generally consistent with the modelled pre-1750s native vegetation mapping (DELWP 2017b). The remainder of the study area comprises introduced and planted vegetation in the form of crops, pasture, windrows and ornamental plantings. Specific details relating to observed EVCs are provided below.

##### 3.1.1.1 Plains Grassland

Heavier-soils Plains Grassland, associated with at least 500 mm of annual rainfall, is located beneath windrows and ornamental planting to the north of the study area (Figure 2). It has a bioregional conservation status of Endangered. The habitat zone has 40% cover of indigenous perennial grasses, in particular Spear Grass *Austrostipa* spp and Common Wallaby-grass *Rytidosperma caespitosum* (Plate 1). There is low diversity within patches, with an absence of native herb diversity (Plate 2).



**Plate 1.** Degraded Plains Grassland within the study area (Ecology and Heritage Partners Pty Ltd 22/05/2018).



**Plate 2.** Plains Grassland within the study area (Ecology and Heritage Partners Pty Ltd 22/05/2018).

#### Stony Knoll Shrubland

Stony Knoll Shrubland would have historically been spread widely across ridges within the study area. It has a Vulnerable bioregional conservation status. Historic clearing for pasture has limited its distribution to small patches which are of poor condition, where the cover of native grasses and sedges only reaches 25-30%.

The extant patches are characterised by the presence of Tall Rush *Juncus procerus*, and Slender Wallaby-grass *Rytidosperma racemosum* var. *racemosum* (Plate 3). Patch herb diversity is low/non-existent, most likely as a consequence of grazing by domestic livestock. The bryophyte and lichen life form component cover is high (20%) and diverse with >5 species present (Plate 4).



**Plate 3.** Stony Knoll Shrubland within the study area (Ecology and Heritage Partners Pty Ltd 22/05/2018).

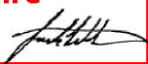


**Plate 4.** Stony Knoll Shrubland within the study area (Ecology and Heritage Partners Pty Ltd 17/05/2018).

### Plains Sedgy Wetland

The creek running through the south/ south-east of the study area contains native vegetation with the highest diversity and condition. Plains Sedgy Wetland is patchy along the creek alignment, ranging from moderate to low condition (Plate 5). The southern half of the creek is dominated by Common Tussock Grass *Poa labillardierei* along the slopes of the creek line (Plate 6), with a diversity of sedges and herbs being present in wetter areas. Common species in these areas include: Bidgee-widgee *Acaena novae-zelandiae*, Tall Rush *Juncus procerus*, Swamp Crane's-bill *Geranium spp.*, and Kidney-weed *Dichondra repens* (Plate 7).

Weed species, including Spiny Rush *Juncus acutus*, Toowoomba Canary-grass *Phalaris aquatica*, Large Quaking-grass *Briza maxima*, Cocksfoot *Dactylis glomerate*, Serrated Tussock *Nassella trichotoma* and Soursob *Oxalis pes-caprae* were commonly found throughout many of the remnant patches.







**Plate 5.** Patchy Plains Sedgy Wetland within the study area (Ecology and Heritage Partners Pty Ltd 17/05/2018).



**Plate 6.** Plains Sedgy Wetland dominated by Tussock Grass within the study area (Ecology and Heritage Partners Pty Ltd 21/05/2018).



**Plate 7.** High diversity Plains Sedgy Wetland within the study area (Ecology and Heritage Partners Pty Ltd 17/05/2018).

### Tall Marsh

Tall Marsh is restricted to the artificial dam located to the south of the study area (Figure 2). It has a bioregional conservation status of Least Concern. The inflow drain is densely populated with sedges (Plate 8), with emergent vegetation occurring in the centre and perimeter of the dam (Plate 9). Condition of this vegetation is high owing to the diversity of life forms, and lack of weeds. Emergent vegetation includes Common Spike-sedge *Eleocharis acuta*, Common Reed *Phragmites australis* and Narrow-leaf Cumbungi *Typha domingensis*.



**Plate 8.** Tall Marsh native vegetation surrounding and emerging from dam (Ecology and Heritage Partners Pty Ltd 17/05/2018).



**Plate 9.** Tall Marsh lining and emerging from dam (Ecology and Heritage Partners Pty Ltd 17/05/2018).

### 3.1.2 Introduced and Planted Vegetation

#### Introduced Vegetation

Areas not supporting remnant native vegetation have a high cover (>80%) of exotic grass species, many of which have been direct-seeded for use as pasture (Plate 10). Scattered planted native grasses are generally present in these areas, however they do not have the required 25% cover to be considered a remnant patch under the Guidelines. Removal of embedded rock has also been undertaken to facilitate the direct seeding of pasture grasses in some locations.

Disturbed areas were dominated by environmental weeds such as Toowoomba Canary-grass, Rye-grass *Lolium* spp., Meadow Fox-tail *Alopecurus pratensis*, Galenia *Galenia pubescens* var. *pubescens*, Ribwort *Plantago lanceolata*, Couch *Cynodon dactylon* var. *dactylon* and Wild Oat *Avena fatua*.

Noxious weeds are present throughout the study area, with scattered occurrences of Artichoke Thistle *Cynara cardunculus*, Spiny Rush *Juncus acutus* subsp. *acutus*, and Spear Thistle *Cirsium vulgare*, along with the Weeds of National Significance (WONS), African Boxthorn *Lycium ferocissimum* and Serrated Tussock.

#### Planted Vegetation

Planted vegetation in the study area consists of exotic and non-indigenous tree species, most commonly Sugar Gum *Eucalyptus cladocalyx* and Pine *Pinus* spp. (Plate 10), which are planted in windrows around dwellings, sheds and laneways. A variety of ornamental shrubs have also been planted around sheds and dwellings.



**Plate 10.** Planted vegetation within the study area (Ecology and Heritage Partners Pty Ltd 21/05/2018).

### 3.2 Fauna Habitat

Planted native vegetation is likely to provide habitat for mobile fauna species, in the form of vantage points and nesting/ roosting areas for birds and small mammals (bats, gliders). Planted eucalypts may also provide stepping-stones for mobile species, including reptiles, small mammals and birds moving through the study area, enhancing landscape connectivity for native fauna.

The patches of Plains Grassland are characterised by native Wallaby Grass *Rytidosperma* spp. and Spear Grass *Austrostipa* spp., which are known to provide habitat for the nationally significant Golden Sun Moth *Synemon plana*. Golden Sun Moth, if present within the study area, are most likely to occur in association with native vegetation, identified to the south/ south-east of the study area, near the creek line (Figure 2b and c).

The entire reach of creek line that intersects the study area, in association with identified native vegetation (Figure 2b and c), provides potential suitable habitat for the nationally significant Growling Grass Frog *Litoria raniformis*.

The Stony Knolls, characteristic of Stony Knoll Shrubland EVC (Plates 3, 4), are highly degraded and are unlikely to provide habitat for significant species. Considering that Striped Legless Lizard *Delma impar* were not recorded within 10 kilometres of the study area, targeted surveys are not considered necessary.

### 3.3 The Guidelines

A planning permit will be required if any clearing of native vegetation is undertaken.

Under the *Planning and Environment Act 1987*, Clause 52.17 of the Planning Schemes requires a planning permit from the relevant local Council to remove, destroy or lop native vegetation. The assessment process for the clearing of vegetation follows the Guidelines (DELWP 2017b).

Based on the NVIM Tool (2019b), the study area is assessable under the Guidelines (DELWP 2017b) and is within Locations 1 and 2. As the Site Concept Plan for the proposed subdivision is not available at this stage, the assessment pathway (Basic/Intermediate/Detailed), based on the location and extent of native vegetation

to be cleared cannot be determined. This assessment pathway will determine the permit application requirements to remove native vegetation under the Guidelines (DELWP 2017b).

### 3.4 Significance Assessment

At the Development Plan stage, targeted surveys for significant species (EPBC Act 1999) are not required. The national and state legislative requirements must be addressed as part of the planning permit application, prior to any development proceeding (Section 4).

Targeted surveys are required to determine if any significant flora or fauna listed under the EPBC Act 1999 occur in the study area. If any matters of National Environmental Significance (NES) are likely to be significantly impacted by the proposed subdivision, then an EPBC Act referral is required (Section 4.1 and Section 5).

#### 3.4.1 Flora

The VBA contains records of several National and State significant flora species within 10 kilometres of the study area (DELWP 2018a), including EPBC Act listed Matted Flax-lily *Dianella amoena*, Swamp Everlasting *Xerochrysum palustre* and Swamp Fireweed *Senecio psilocarpus* (Appendix 2.1). Recent records of Matted Flax-lily *Dianella amoena* (2016 record) were found within a five kilometre search radius, including along the Gisborne railway line and, most recently, within a few kilometres east of the study area in the Dalrymple Road Reserve (Figure 3). Swamp Everlasting *Xerochrysum palustre* and Swamp Fireweed *Senecio psilocarpus* were also found within five kilometres of the study area (2016 records), however all were found within the Gisborne Flora Reserve (Figure 3).

Due to the highly modified nature of the study area and current grazing history, the presence of Matted Flax-lily, Swamp Everlasting and Swamp Fireweed is considered unlikely across the entire study area. However, given the proximity of previous records within 5 kilometres of the study area, targeted surveys are recommended for Matted Flax-lily, Swamp Everlasting and Swamp Fireweed adjacent to the creek line in association with identified native vegetation patches (Figure 2b and 2c).

#### 3.4.2 Fauna

The VBA contains records of a range of National, State and regionally significant fauna species within 10 kilometres of the study area (DELWP 2018a), including EPBC Act listed Growling Grass Frog, Golden Sun Moth and Australasian Bittern *Botaurus poiciloptilus* (Appendix 3.1). Of these species, only Growling Grass Frog (2000 record) and Golden Sun Moth (2006 record) are considered moderately likely to use the study area, based on land use history and available habitat.

Growling Grass Frog has a moderate likelihood of occurring in the south/ south-east of the study area, based on suitable available habitat, given their ability to persist in relatively disturbed aquatic environments including farm dams (Pyke 2002).

Golden Sun Moth has a moderate likelihood of occurring to the south/ south-east of the study area where small patches of native vegetation, including surrounding stony knolls, were identified (Figure 2a and 2b). Remnant native vegetation may provide limited food sources for Golden Sun Moth within the study area (Wallaby Grass and Spear Grass), however the diversity of grasses can be better quantified during the spring-summer seasons when grasses are in seed.

Other nationally significant fauna are considered unlikely to occur within the study area due to the lack of suitable habitat and the disturbed nature of the site. Australasian Bittern (2016 record) was recently recorded

within five kilometres of the study area. However, this species is very cryptic in nature and due to the limited vegetation cover (typically dense beds of reeds and rushes) available at the site, the species is considered unlikely to occur. Swift Parrot *Lathamus discolor* (2001 record) and Diamond Firetail *Stagonopleura guttata* (2005 record) are significant bird species that were recorded within a 10-kilometre radius but are considered unlikely to occur in the study area due to the lack of scattered large native trees and understorey habitat. Striped Legless Lizard *Delma impar* is an EPBC Act listed species known to occur on areas of the Victorian Volcanic Plain, but were not previously recorded within 10 kilometres of the study area and so are considered unlikely to occur on-site.

It is possible that other significant migratory bird species, may visit the study area occasionally or opportunistically whilst en-route to more suitable sites, however it is unlikely that they would reside within the study area.

### 3.4.3 Communities

Five nationally listed threatened ecological communities may occur within 10 kilometres of the study area based on the PMST (DoEE 2015) Report created, 16/05/18:

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain (Critically Endangered);
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (Endangered);
- Natural Temperate Grassland of the Victorian Volcanic Plains (Critically Endangered);
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (Critically Endangered); and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered).

However, vegetation surveyed within the study area did not meet the condition thresholds that define any national or State-significant communities.

## 4 LEGISLATIVE AND POLICY IMPLICATIONS

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### 4.1 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) establishes a Commonwealth process for the assessment of proposed actions likely to have a significant impact on any matters of National Environment Significance (NES).

Targeted surveys conducted for significant flora and fauna species in late 2020 (Ecology and Heritage Partners 2021) did not detect Matted Flax-lily, Swamp Everlasting, Swamp Fireweed, Golden Sun Moth or Growling Grass Frog within the study area. As a result, an EPBC Referral is not required.

### 4.2 *Flora and Fauna Guarantee Act 1988* (Victoria)

The FFG Act is the primary legislation dealing with biodiversity conservation and sustainable use of native flora and fauna in Victoria. Proponents are required to apply for an FFG Act Permit to 'take' listed and/or protected flora species, listed vegetation communities and listed fish species in areas of public land (i.e. within road reserves, drainage lines and public reserves). An FFG Act permit is generally not required for removal of species or communities on private land, or for the removal of habitat for a listed terrestrial fauna species.

The information presented in this report reflects the data available prior to The Flora and Fauna Guarantee Amendment Act 2019 (the Amendment Act), which came into effect on June 1<sup>st</sup> 2020, and included an updated and consolidated threatened species. As a result, the significant species data presented in Appendix 2.1 and Appendix 2.3 has been cross-referenced with the latest FFG Act threatened species list (August 2021) in order to ensure that they adequately capture any changes to recently listed species. Based upon the cross-referencing, apart from those species already searched for during targeted surveys, there are no additional species considered relevant.

One species present in the study area is protected under the FFG Act due its membership of a protected group, the Wattles (*Acacia*): Black Wattle *Acacia mearnsii*.

There is suitable habitat within the study area for several species listed or protected under the FFG Act. However, as the study area is privately owned, a permit under the FFG Act is not required.

### 4.3 *Planning and Environment Act 1987* (Victoria)

The *Planning and Environment Act 1987* outlines the legislative framework for planning in Victoria and for the development and administration of planning schemes. All planning schemes contain native vegetation provisions at Clause 52.17 which require a planning permit from the relevant local Council to remove, destroy or lop native vegetation on a site of more than 0.4 hectares, unless an exemption under clause 52.17-7 of the Victorian Planning Schemes applies or a subdivision is proposed with lots less than 0.4 hectares<sup>2</sup>. Local planning schemes may contain other provisions in relation to the removal of native vegetation (Section 4.3.1).

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<sup>2</sup> In accordance with the Victorian Civil and Administrative Tribunal's (VCAT) decision *Villawood v Greater Bendigo CC* (2005) VCAT 2703 (20 December 2005) all native vegetation is considered lost where proposed lots are less than 0.4 hectares in area and must be offset at the time of subdivision.

#### 4.3.1 Local Planning Schemes

The study area is located within the Macedon Ranges Shire Council municipality and is zoned Rural Living Zone – Schedule 2 (RLZ2). The following overlays apply:

- Development Plan Overlay – Schedule 18 (DPO18) of the Macedon Ranges Planning Scheme
  - The Development Plan requires a buffer up to 30 metres either side of the creek/drainage line, that is maintained for the purpose of protecting native vegetation and excluding stock.

#### 4.3.2 Relevant Exemptions

Native planted vegetation in the study area is exempt from planning permit requirements under Clause 52.17-7 (Table of Exemptions) as it is planted on private land for amenity purposes (DELWP 2018f). In the study area, this includes the planted River Red Gums, Yellow Box and Red Box.

#### 4.3.3 The Guidelines

The State Planning Policy Framework and the decision guidelines at Clause 52.17 (Native Vegetation) and Clause 12.01 require Planning and Responsible Authorities to have regard for 'The Guidelines for the removal, destruction or lopping of native vegetation' (Guidelines) (DELWP 2017h).

#### 4.3.4 Implications

A Planning Permit from Macedon Ranges Shire is required to remove, destroy or lop any native vegetation.

### 4.4 *Wildlife Act 1975* and *Wildlife Regulations 2013* (Victoria)

The *Wildlife Act 1975* (and associated *Wildlife Regulations 2013*) is the primary legislation in Victoria providing for protection and management of wildlife. Authorisation for habitat removal may be obtained under the *Wildlife Act 1975* through a licence granted under the *Forests Act 1958*, or under any other Act such as the *Planning and Environment Act 1987*. Any persons engaged to remove, salvage, hold or relocate native fauna during construction must hold a current Management Authorisation under the *Wildlife Act 1975*, issued by DELWP.

### 4.5 *Catchment and Land Protection Act 1994* (Victoria)

The *Catchment and Land Protection Act 1994* (CaLP Act) contains provisions relating to catchment planning, land management, noxious weeds and pest animals. Landowners are responsible for the control of any infestation of noxious weeds and pest fauna species to minimise their spread and impact on ecological values.

Weeds listed as noxious under the CaLP Act (Artichoke Thistle, Fennel, Paterson's Curse, African Box-thorn, Blackberry, Chilean Needle-grass and Serrated Tussock) were recorded during the assessment. Weeds should be managed in accordance with the Act.

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## 4.6 Best Practice Mitigation Measures

This assessment identifies the creek line to provide the greatest ecological value (Figure 2). In particular, the native vegetation adjacent to the creek line is in moderate-high condition and development in this area should be avoided and minimised, where possible. The linear strip of Plains Grassland and small patches of Stony Knoll Shrubland identified (Figure 2) are of lesser quality and while efforts should be made to retain this native vegetation, it is unlikely to provide important habitat for significant species.

The creek line which intersects the south/ south-east section of the study area contains patches of native vegetation. While the riparian vegetation provides potential habitat for Growling Grass Frog, targeted surveys conducted in accordance with the survey guidelines (DEWHA 2009) in late 2020 did not detect the species within the creek line habitat (Ecology and Heritage Partners 2021). Similarly, while the entire extent of the study area provides potential habitat for Golden Sun Moth, targeted surveys did not detect the species in the study area (Ecology and Heritage Partners 2021).

The mapped Stony Knoll Shrubland located to the south-east of the study area, while very degraded, is identified as native vegetation. While generally this is typical habitat for Striped Legless Lizard, given the lack of records within a 10 kilometre radius of the study area and the degraded nature of the habitat, the species is considered unlikely to occur and targeted surveys were not deemed necessary.

Recommended measures to mitigate impacts upon terrestrial and aquatic values present within the study area may include:

- Minimise impacts to native vegetation and habitats through construction and micro-siting techniques, including fencing retained areas of native vegetation. If indeed necessary, trees should be lopped or trimmed rather than removed. Similarly, soil disturbance and sedimentation within wetlands should be avoided or kept to a minimum, to avoid, or minimise impacts to fauna habitats;
- All contractors should be aware of ecologically sensitive areas to minimise the likelihood of inadvertent disturbance to areas marked for retention. Habitat Zones (areas of sensitivity) should be included as a mapping overlay on any construction plans;
- Tree Retention Zones (TRZs) should be implemented to prevent indirect losses of native vegetation during construction activities (DSE 2011). A TRZ applies to a tree and is a specific area above and below the ground, with a radius 12 x the DBH. At a minimum standard a TRZ should consider the following:
  - A TRZ of trees should be a radius no less than two metres or greater than 15 metres;
  - Construction, related activities and encroachment (i.e. earthworks such as trenching that disturb the root zone) should be excluded from the TRZ;
  - Where encroachment exceeds 10% of the total area of the TRZ, the tree should be considered as lost and offset accordingly;
  - Directional drilling may be used for works within the TRZ without being considered encroachment. The directional bore should be at least 600 millimetres deep;
  - The above guidelines may be varied if a qualified arborist confirms the works will not significantly damage the tree (including stags / dead trees). In this case the tree would be retained and no offset would be required; and,
  - Where the minimum standard for a TRZ has not been met, an offset may be required.



- Where possible, construction stockpiles, machinery, roads, and other infrastructure should be placed away from areas supporting native vegetation, LOTs and/or wetlands, and;
- Ensure that best practice sedimentation and pollution control measures are undertaken at all times, in accordance with Environment Protection Authority guidelines (EPA 1991; EPA 1996; Victorian Stormwater Committee 1999) to prevent offsite impacts to waterways and wetland.

## 5 FURTHER REQUIREMENTS

The DPO18 requirements to support the Development Plan, as well as further requirements associated with development of the study area, are provided in Table 3.

This assessment responds to the DPO18 requirements in support of a Development Plan and provides an overview of ecological values present or likely to occur in the study area.

**Table 3.** Further requirements associated with development of the study area

Relevant Legislation	Implications	Further Action
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Targeted surveys conducted for significant flora and fauna species in late 2020 (Ecology and Heritage Partners 2021) did not detect Matted Flax-lily, Swamp Everlasting, Swamp Fireweed, Golden Sun Moth or Growling Grass Frog within the study area, As a result, an EPBC Referral is not required.	No further action required.
<i>Flora and Fauna Guarantee Act 1988</i>	There is suitable habitat within the study area for several species listed or protected under the FFG Act. However, as the study area is privately owned, a permit under the FFG Act is not required.	No further action required.
<i>Planning and Environment Act 1987</i>	A Planning Permit from Macedon Ranges Shire is required to remove, destroy or lop any native vegetation.	Native vegetation adjacent to the creek line will be retained and stock excluded. At the time of subdivision, a planning permit is required for the removal of any native vegetation, which includes: <ul style="list-style-type: none"> <li>• Demonstrated avoidance and mitigation of native vegetation (DELWP 2017)</li> <li>• Required state Offsets.</li> </ul>
<i>Catchment and Land Protection Act 1994</i>	Several weed species listed under the CaLP Act were recorded within the study area. To meet requirements under the CaLP Act, listed noxious weeds should be appropriately controlled throughout the study area.	Manage weeds in accordance with the CaLP Act.
<i>Wildlife Act 1975</i>	Any persons engaged to remove, salvage, hold or relocate native fauna during construction must hold a current Management Authorisation or Research Permit under the <i>Wildlife Act 1975</i> , issued by DELWP.	No further action required.

## REFERENCES

- DELWP 2017a. *Flora and Fauna Guarantee Act 1988 Protected Flora List – June 2017*. Victorian Department of Environment, Land, Water and Planning. Melbourne, Victoria.
- DELWP 2017b. *Guidelines for the removal, destruction or lopping of native vegetation*. December 2017. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.
- DELWP 2017c. *Assessor’s handbook – applications to remove, destroy or lop native vegetation*. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.
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- Macedon Ranges Shire Council 2018. Biodiversity Strategy. Adopted at the 19 December 2018 Ordinary Council Meeting.

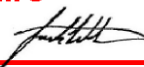
Terraco 2020. Bennett Road Precinct Development Plan and Subdivision Concept Plan. Version 19.

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## FIGURES

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**Legend**

-  Study Area
-  Railway
-  Freeway
-  Major Road
-  Collector Road
-  Minor Road
-  Proposed Road
-  Walking Track
-  Minor Watercourse
-  Permanent Waterbody
-  Land Subject to Inundation
-  Parks and Reserves
-  Crown Land
-  Localities

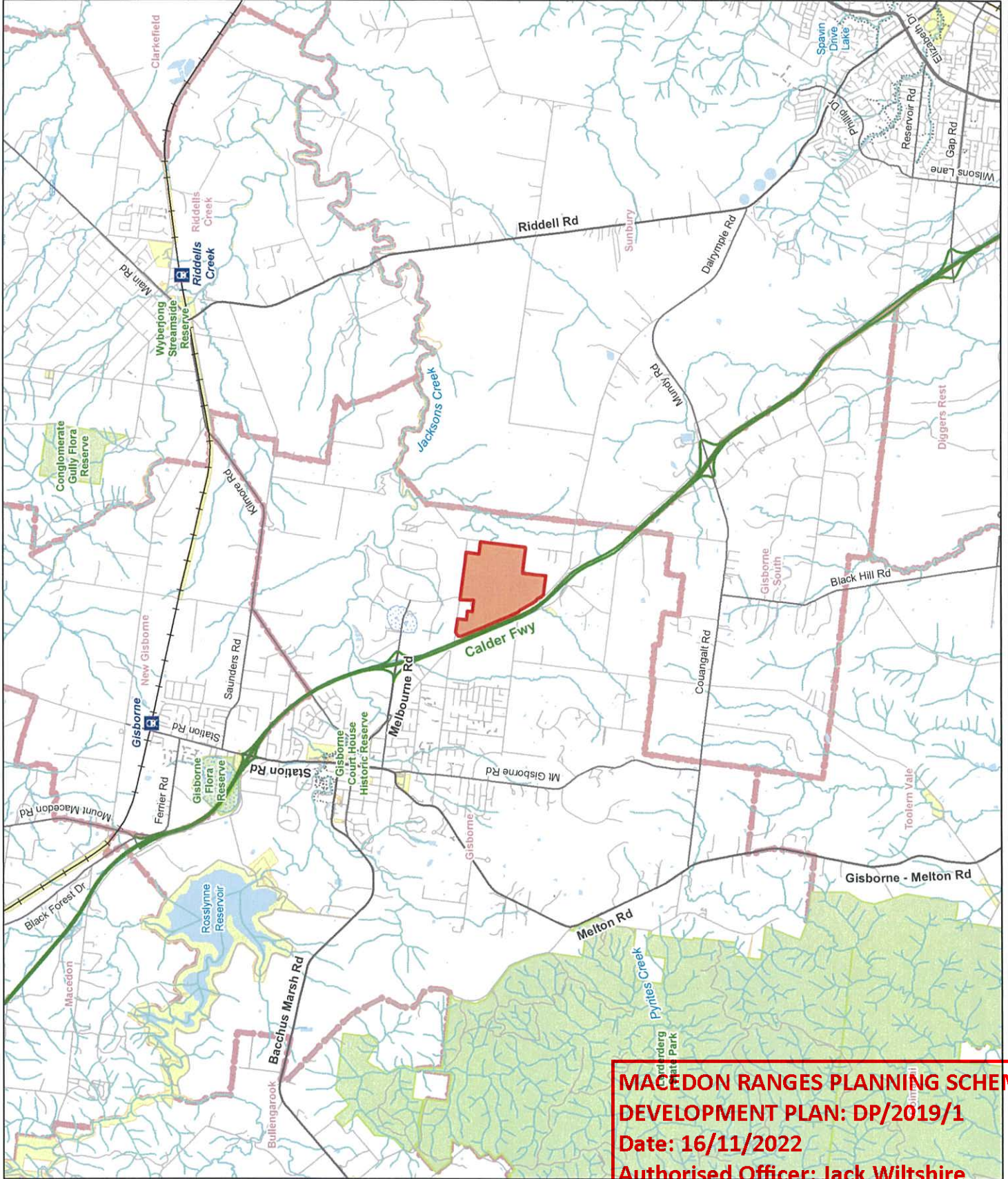


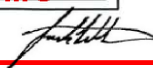
**Figure 1**  
**Location of the study area**  
**Biodiversity Assessment for**  
**Bennett Road, Gisborne**



ViewMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

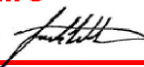
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## APPENDICES

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## Appendix 1.1.1 – Development Plan

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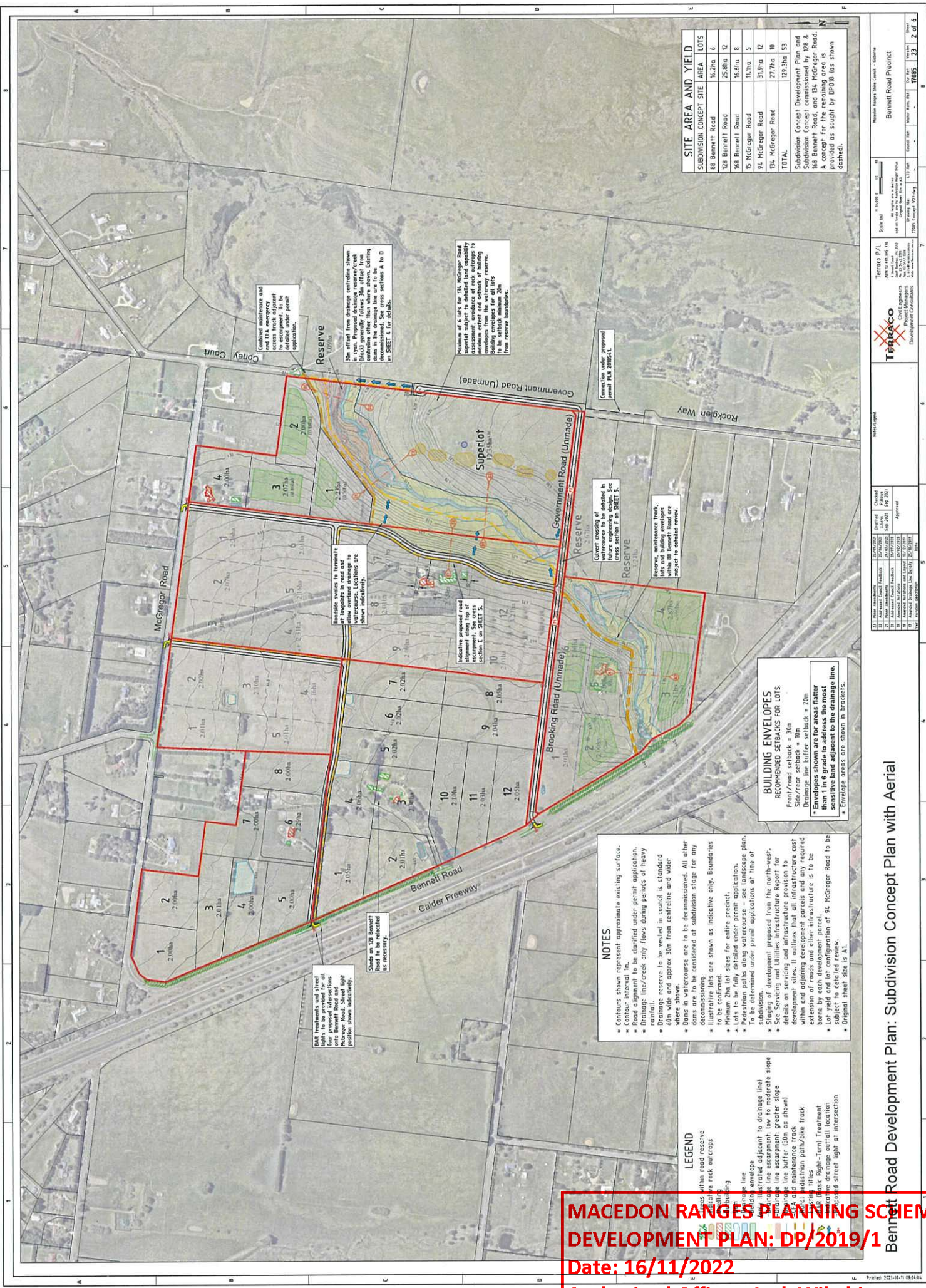


## Appendix 1.2 – Subdivision Concept Plan with Ecological Features

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SUBDIVISION CONCEPT SITE	AREA	YIELD
108 Bennet Road	14.2ha	6
128 Bennet Road	25.8ha	12
168 Bennet Road	16.6ha	8
15 McGregor Road	11.9ha	5
94 McGregor Road	31.9ha	12
134 McGregor Road	27.7ha	10
TOTAL	129.2ha	53

Subdivision Concept Development Plan and Subdivision Concept Commissioned by 128 & 168 Bennet Road, and 134 McGregor Road. A concept for the remaining area is provided as sought by UPOB (as shown detached).

**BUILDING ENVELOPES**  
 RECOMMENDED SETBACKS FOR LOTS

- Front/road setback = 30m
- Side/rear setback = 10m
- Drainage line buffer setback = 20m

\* Envelopes shown are for areas flatter than 1 in 6 grade to address the most sensitive land adjacent to the drainage line. Envelope areas are shown in brackets.

**NOTES**

- Contours shown represent approximate existing surfaces.
- Centreline alignment to be clarified under permit application.
- Drainage line/creek only flows during periods of heavy rain.
- Drainage reserve to be vested in council as standard 60m wide and approx 30m from centreline and wider where shown.
- Dams in watercourse are to be decommissioned. All other dams are to be considered at subdivision stage for any future engineering design. See cross section F on SHEET 5.
- Illustrative lots are shown as indicative only. Boundaries to be confirmed.
- Minimum 2ha lot sizes for entire precinct.
- Pedestrian paths along watercourse - see landscape plan, schedule determined under permit applications at line of watercourse.
- Staging of development proposed from the north-west. See Servicing and Utilities Infrastructure Report for details on servicing and infrastructure provision to development sites. It outlines that all infrastructure cost within and adjoining development parcels and any required infrastructure is to be borne by each development parcel.
- Lot yield and lot configuration of 94 McGregor Road to be subject to detailed review.
- Original sheet size is A1.

**LEGEND**

- Proposed road reserve
- Proposed creek setbacks
- Proposed drainage line
- Proposed drainage line setback
- Proposed drainage line buffer
- Proposed drainage line setback
- Proposed drainage line buffer
- Proposed drainage line setback
- Proposed drainage line buffer
- Proposed drainage line setback

Project Information

Project Name: Bennet Road Precinct

Project Number: 17885

Scale: 1:1000

Date: 16/11/2022

Author: Jack Wiltshire

Checked: [Signature]

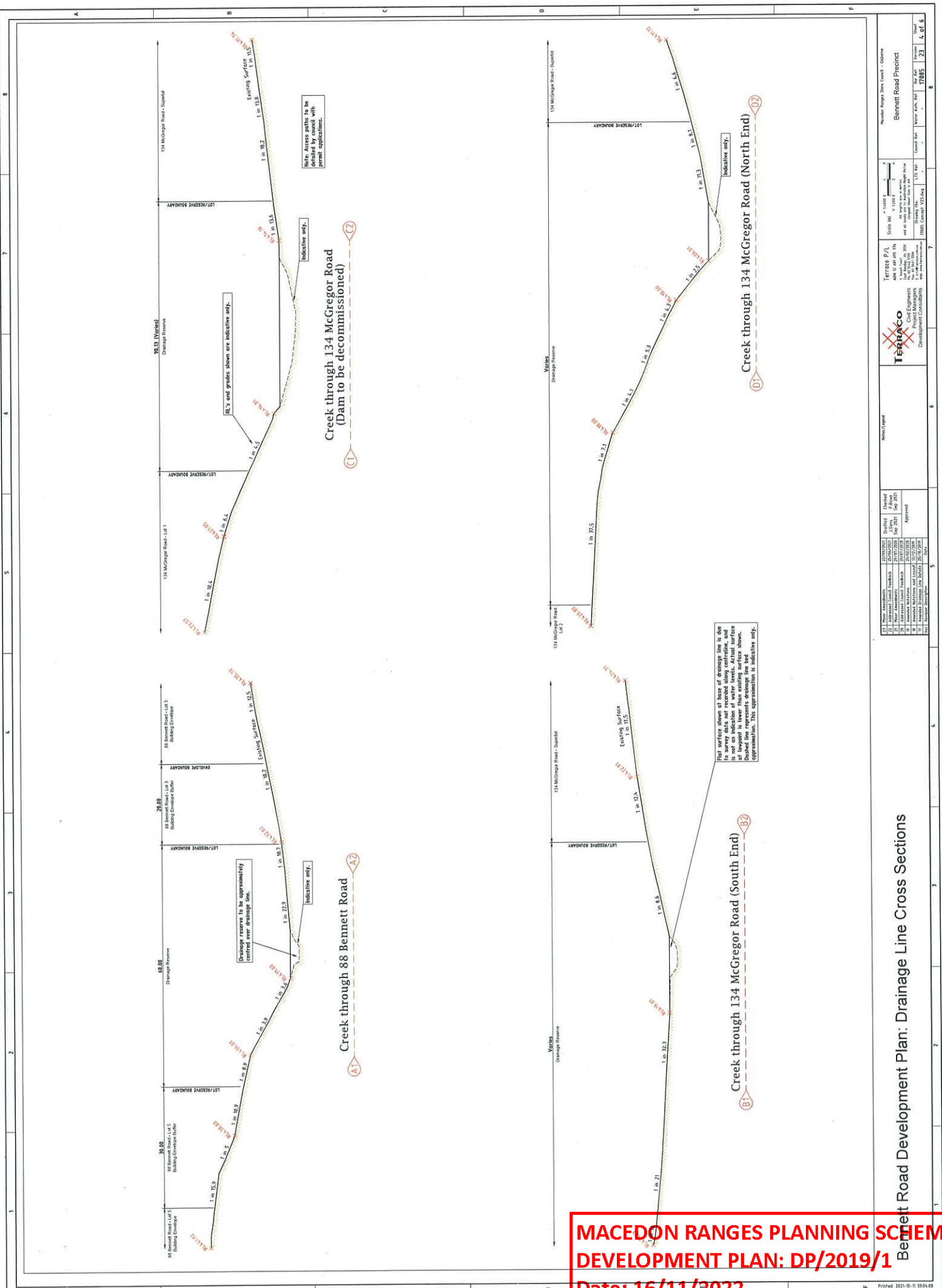
Approved: [Signature]

Version: 2.0 of 6

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Creek through 134 McGregor Road  
(Dam to be decommissioned)

Creek through 88 Bennett Road

Creek through 134 McGregor Road (South End)

Creek through 134 McGregor Road (North End)

Best surface shown at base of drainage line is due to survey data not recorded along centreline, and at locations where the drainage line crosses the road at the road edge. The dashed line represents surface shown. Dashed line represents drainage line bed approximation. This approximation is indicative only.

Note: Access paths to be detailed by consent with local applications.

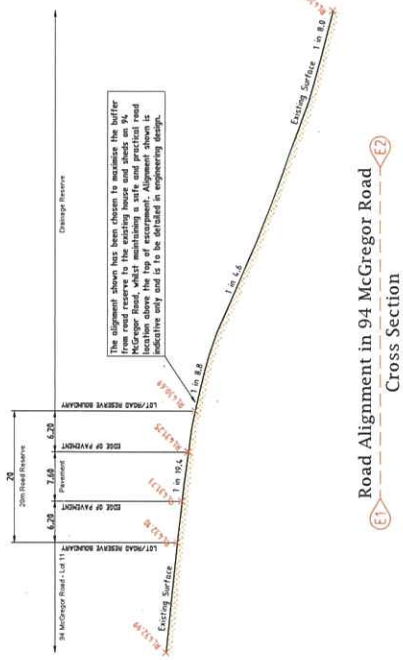
RL's and grades shown are indicative only.

Drainage reserves to be approximately centred over drainage line.

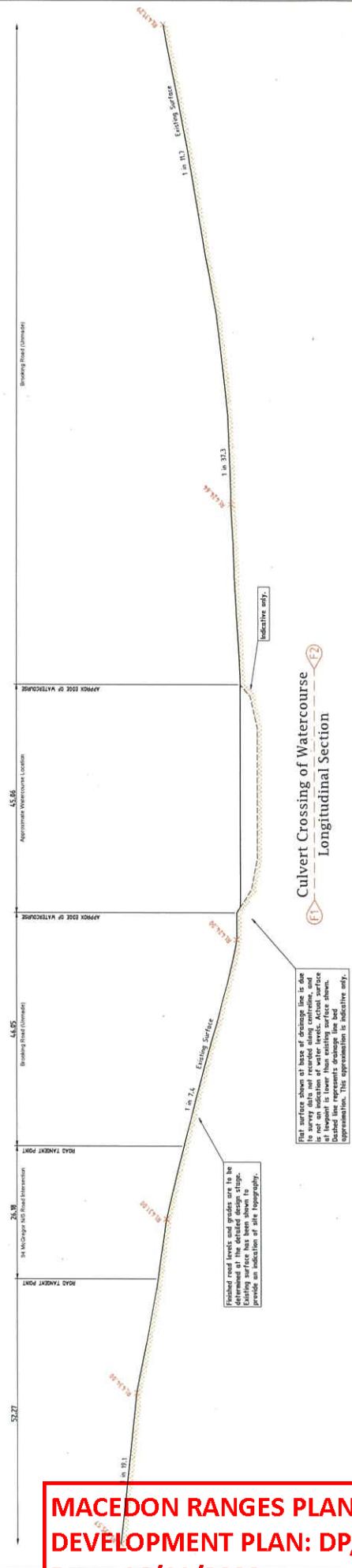
<b>TERRACO</b> Civil Engineers Project Managers Development Consultants		Number Pages: 316 Sheet: 23 of 316 Date: 16/11/2022
Project Name: Bennett Road Precinct	Date: 16/11/2022	Scale: 1:1000
Drawing No: DP/2019/1	Drawing Title: Drainage Line Cross Sections	Drawing Date: 16/11/2022
Drawing Author: Jack Wiltshire	Drawing Checker: Jack Wiltshire	Drawing Approver: Jack Wiltshire

Bennett Road Development Plan: Drainage Line Cross Sections

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Road Alignment in 94 McGregor Road  
Cross Section



Culvert Crossing of Watercourse  
Longitudinal Section

<p>Project Managers Development Consultants</p> <p><b>TERRACO</b></p> <p>11000 Grand Vista Way Unit 110 Melbourne, VIC 3048</p>	<p>Project No: 17885</p> <p>Client: Bennett Road Precinct</p> <p>Scale: 1:1000</p> <p>Drawn: J. Wiltshire</p> <p>Checked: J. Wiltshire</p> <p>Approved: J. Wiltshire</p> <p>Date: 16/11/2022</p>	<p>Revision History</p> <table border="1"> <tr> <th>No.</th> <th>Description</th> <th>Date</th> </tr> <tr> <td>1</td> <td>Issue for Design</td> <td>16/11/2022</td> </tr> <tr> <td>2</td> <td>Issue for Construction</td> <td>16/11/2022</td> </tr> </table>	No.	Description	Date	1	Issue for Design	16/11/2022	2	Issue for Construction	16/11/2022
No.	Description	Date									
1	Issue for Design	16/11/2022									
2	Issue for Construction	16/11/2022									

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## Appendix 2.1 – Significant flora species

Table A2.2 Significant flora recorded within 10 kilometres of the study area

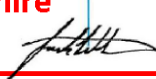
Key:

EPBC *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)  
 FFG *Flora and Fauna Guarantee Act 1988* (FFG Act)  
 DEPI Advisory List of Threatened Flora in Victoria (DEPI 2014)


EX	Extinct	X	Extinct
CR	Critically endangered	e	Endangered
EN	Endangered	v	Vulnerable
VU	Vulnerable	r	Rare
K	Poorly Known (Briggs and Leigh 1996)	k	Poorly Known
#	Records identified from EPBC Act Protected Matters Search Tool.	L	Listed
*	Records identified from the FIS		

Known occurrence	Recorded within the study area recently (i.e. within ten years)
High Likelihood	Previous records of the species in the local vicinity; and/or, The study area contains areas of high quality habitat.
Moderate Likelihood	Limited previous records of the species in the local vicinity; and/or, The study area contains poor or limited habitat.
Low Likelihood	Poor or limited habitat for the species however other evidence (such as a lack of records or environmental factors) indicates there is a very low likelihood of presence.
Unlikely	No suitable habitat and/or outside the species range.


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Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DEPI	Likely occurrence in study area
<b>NATIONAL SIGNIFICANCE</b>							
<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass #	-	-	VU	-	-	4
<i>Caladenia versicolor</i>	Candy Spider-orchid #	-	-	VU	L	e	5
<i>Dodonaea procumbens</i>	Trailing Hop-bush #	-	-	VU	-	v	5
<i>Eucalyptus aggregata</i>	Black Gum #	-	-	VU	L	e	5
<i>Glycine latrobeana</i>	Clover Glycine #	-	-	VU	L	v	4
<i>Pterostylis chlorogramma</i>	Green-striped Greenhood	1	1990	VU	L	v	4
<i>Senecio macrocarpus</i>	Large-headed Fireweed	1	1984	VU	L	e	4
<i>Senecio psilocarpus</i>	Swamp Fireweed	3	2016	VU	-	v	2
<i>Thelymitra matthewsii</i>	Spiral Sun-orchid #	-	-	VU	L	v	5
<i>Xerochrysum palustre</i>	Swamp Everlasting	9	2016	VU	L	v	2
<i>Caladenia tensa</i>	Greencomb Spider-orchid #	-	-	EN	-	v	4
<i>Dianella amoena</i>	Matted Flax-lily	27	2016	EN	L	e	2
<i>Diachnagrostis adamsonii</i>	Adamson's Blown-grass #	-	-	EN	L	v	5
<i>Leptidium hyssopifolium</i> s.s.	Basalt Peppergrass	1	1977	EN	L	e	4
<i>Leucocorysum albicans</i> var. <i>tricolor</i>	Hoary Sunray#	-	-	EN	-	e	5
<i>Parasophyllum frenchii</i>	Maroon Leek-orchid #	-	-	EN	L	e	5
<i>Quintadima leptorhynchooides</i>	Button Wrinklewort #	-	-	EN	L	e	5
<i>Simelea spinescens</i> subsp. <i>Pubiflora</i>	Wimmera Rice-flower #	-	-	CR	L	e	5
<b>STATE SIGNIFICANCE</b>							
<i>Acacia rostriformis</i>	Bacchus Marsh Wattle	8	2013		L	v	2
<i>Diuris punctata</i>	Purple Diuris	14	2001		L	v	3
<i>Gealanium</i> sp. 1	Large-flower Crane's-bill	4	2010		L	e	3
<i>Pterostylis truncata</i>	Brittle Greenhood	35	2006		L	e	2

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Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DEPI	Likely occurrence in study area
<b>REGIONAL SIGNIFICANCE</b>							
<i>Stylidium armeria subsp. pilosifolium</i>	Hairy-leaf Triggerplant	7	2014		L	e	2
<i>Acacia howittii</i>	Sticky Wattle	4	2017			r	2
<i>Acacia leprosa</i> s.s.	Cinnamon Wattle	1	2009			k	2
<i>Acacia leprosa</i> var. <i>uninervia</i>	Large-leaf Cinnamon-wattle	1	2009			r	2
<i>Acacia nanadealbata</i>	Dwarf Silver-wattle	10	2011			r	2
<i>Austrostipa hemipogon</i>	Half-bearded Spear-grass	1	1990			r	5
<i>Bossiaea cordigera</i>	Wiry Bossiaea	1	2011			r	2
<i>Calochilus imberbis</i>	Naked Beard-orchid	5	1953			r	4
<i>Calochilus therophilus</i>	Slender Beard-orchid	1	2014			k	3
<i>Convolvulus angustissimus</i> subsp. <i>omnigracilis</i>	Slender Bindweed	3	2017			k	2
<i>Coronidium gunnianum</i>	Pale Swamp Everlasting	5	2011			v	3
<i>Corymbia maculata</i>	Spotted Gum	3	2017			v	1
<i>Desmodium varians</i>	Slender Tick-trefoil	2	2006			k	3
<i>Dianella callicarpa</i>	Swamp Flax-lily	1	2005			r	3
<i>Dianella</i> sp. aff. <i>longifolia</i> (Benambra)	Arching Flax-lily	1	2017			v	2
<i>Drosera pardalinum</i>	Spotted Hyacinth-orchid	11	2017			r	2
<i>Drosera X palachila</i>	Broad-lip Diuris	1	1900			r	5
<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	3	2017			r	2
<i>Eucalyptus leucoxylon</i> subsp. <i>connata</i>	Melbourne Yellow-gum	18	2017			v	2
<i>Eucalyptus sideroxylon</i> subsp. <i>sideroxylon</i>	Mugga	2	2017			r	2
<i>Eucalyptus yarraensis</i>	Yarra Gum	3	2010			r	3
<i>Gnaphalium solanderi</i> var. <i>solanderi</i> s.s.	Austral Crane's-bill	2	2017			v	2
<i>Grevillea repens</i>	Creeping Grevillea	1	1932			r	4
<i>Grevillea rosmarinifolia</i>	Rosemary Grevillea	4	2017			P	2

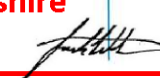
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Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DEPI	Likely occurrence in study area
<i>Lepidium pseudohyssopifolium</i>	Native Peppergrass	1	1977			k	4
<i>Leucopogon microphyllus</i> var. <i>pilibundus</i>	Hairy Beard-heath	1	1980			r	4
<i>Melaleuca armillaris</i> subsp. <i>armillaris</i>	Giant Honey-myrtle	6	2016			r	2
<i>Microseris scapigera</i> s.s.	Plains Yam-daisy	2	1999			v	3
<i>Nicotiana suaveolens</i>	Austral Tobacco	1	1900			r	5
<i>Nymphoides montana</i>	Entire Marshwort	4	1985			r	4
<i>Platylobium montanum</i> subsp. <i>prostratum</i>	Mountain Flat-pea	4	2011			k	2
<i>Pleurosorus subglandulosus</i>	Glandular Blanket-fern	1	1895			k	5
<i>Poranthera corymbosa</i>	Clustered Poranthera	1	1982			r	4
<i>Prostanthera saxicola</i> var. <i>bracteolata</i>	Slender Mint-bush	3	1996			r	3
<i>Pterostylis rubescens</i>	Inland Red-tip Greenhood	1	2000			r	3
<i>Pultenaea reflexifolia</i>	Wombat Bush-pea	1	1932			r	4
<i>Rhagodia parabolica</i>	Fragrant Saltbush	10	2017			r	2
<i>Scaevola laena</i> var. <i>muricata</i>	Black Roly-poly	2	1920			k	4
<i>Scaevola cunninghamii</i> var. <i>cunninghamii</i>	Branching Groundsel	2	2010			r	3
<i>Scaevola microbasis</i>	Slender Fireweed	1	2010			r	3
<i>Taratheca stenocarpa</i>	Long Pink-bells	2	1996			r	3
<i>Thelymitra exigua</i>	Short Sun-orchid	1	1935			k	4

Data source: Victorian Biodiversity Atlas (DELWP 2015); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

Note: While the species listed in Table A3.2 are based on VBA data from 2018, the list has been cross-referenced with the latest FFG Act Threatened species list in order to ensure it appropriately reflects significant species data for the study area and surrounds. There are no changes to the conclusions and recommendations provided in the report.

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## Appendix 3.1 – Significant fauna species

Table A3.2. Significant fauna within 10 kilometres of the study area.

Habitat characteristics of significant fauna species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area were assessed to determine their likelihood of occurrence. The likelihood of occurrence rankings for each of the threatened species are:

1	High Likelihood	<ul style="list-style-type: none"> <li>Known resident in the study area based on site observations, database records, or expert advice; and/or,</li> <li>Recent records (i.e. within five years) of the species in the local area (VBA 2011); and/or,</li> <li>The study area contains the species' preferred habitat.</li> </ul>
2	Moderate Likelihood	<ul style="list-style-type: none"> <li>The species is likely to visit the study area regularly (i.e. at least seasonally); and/or,</li> <li>Previous records of the species in the local area (DSE 2011b); and/or,</li> <li>The study area contains some characteristics of the species' preferred habitat.</li> </ul>
3	Low Likelihood	<ul style="list-style-type: none"> <li>The species is likely to visit the study area occasionally or opportunistically whilst en route to more suitable sites; and/or,</li> <li>There are only limited or historical records of the species in the local area (i.e. more than 20 years old); and/or,</li> <li>The study area contains few or no characteristics of the species' preferred habitat.</li> </ul>
4	Unlikely	<ul style="list-style-type: none"> <li>No previous records of the species in the local area; and/or,</li> <li>The species may fly over the study area when moving between areas of more suitable habitat; and/or,</li> <li>Out of the species' range; and/or,</li> <li>No suitable habitat present.</li> </ul>

*Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*


*Flora and Fauna Guarantee Act 1988 (FFG Act)*

*Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2013); Advisory List of Threatened Invertebrate Fauna in Victoria (DSE 2009)*

*National Action Plan (Cogger et al. 1993; Duncan et al. 1999; Garnet and Crowley 2000; Lee 1995; Maxwell et al. 1996; Sands and New 2002; Tyler 1997)*

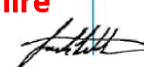
Extinct	DD	Data deficient (insufficiently or poorly known
Regionally extinct	L	Listed as threatened under FFG Act
Critically endangered	I	Invalid or ineligible for listing under the FFG Act
Endangered	#	Listed on the Protected Matters Search Tool
Vulnerable	*	Additional information from the Victorian Fauna Database
Rare		
Near threatened		
Conservation dependent		
least concern		

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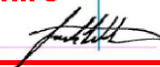




Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	National Action Plan	Likelihood
<b>NATIONAL SIGNIFICANCE</b>								
Eastern Quoll	<i>Dasyurus viverrinus</i>	1900	1	EN	L	RX	NT	4
Greater Glider	<i>Petaurides volans</i>	1990	4	VU	-	VU	VU	4
Long-nosed Potoroo	<i>Potorous tridactylus tridactylus</i> #	-	-	VU	L	NT	EN	4
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i> #	-	-	VU	L	VU	VU	4
Smoky Mouse	<i>Pseudomys fumeus</i> #	-	-	EN	L	EN	RA	4
Australasian Bittern	<i>Botaurus poiciloptilus</i>	2017	4	EN	L	EN	VU	3
Plains-wanderer	<i>Pedionomus torquatus</i> #	-	-	CR	L	CR	EN	4
Australian Painted Snipe	<i>Rostratula australis</i> #	-	-	VU	L	CR	VU	4
Eastern Curlew	<i>Numenius madagascariensis</i> #	-	-	CR	-	VU	-	4
Curlew Sandpiper	<i>Calidris ferruginea</i> #	-	-	CR	-	EN	-	4
Swift Parrot	<i>Lathamus discolor</i>	2001	4	CR	L	EN	EN	3
Regent Honeyeater	<i>Anthochaera phrygia</i>	1975	2	CR	L	CR	EN	3
Painted Honeyeater	<i>Grantiella picta</i> #	-	-	VU	L	VU	NT	4
Pink-tailed Worm-Lizard	<i>Aprasia parapulchella</i> #	-	-	VU	L	EN	-	4
Striped Legless Lizard	<i>Delma impar</i> #	-	-	VU	L	EN	VU	4
Grassland Earless Dragon	<i>Tympanocryptis pinguicollis</i> #	-	-	EN	L	CR	VU	4
Grooving Grass Frog	<i>Litoria raniformis</i>	2000	8	VU	L	EN	VU	2
Dwarf Galaxias	<i>Galaxiella pusilla</i> #	-	-	VU	L	EN	VU	4
Australian Grayling	<i>Prototroctes maraena</i> #	-	-	VU	L	VU	VU	4
Murray Cod	<i>Maccullochella peelii</i>	1974	2	VU	L	VU	-	4
Macquarie Perch	<i>Macquaria australasica</i>	1970	1	EN	L	EN	DD	4
Golden Sun Moth	<i>Synemon plana</i>	2006	4	CR	L	CR	-	2
<b>STATE SIGNIFICANCE</b>								
Bush-tailed Phascogale	<i>Phascogale tapoatafa</i>	2016	14	-	L	VU	NT	3
Common Dunnart	<i>Sminthopsis murina murina</i>	1990	2	-	-	VU	-	4
Musk Duck	<i>Biziura lobata</i>	1977	5	-	-	VU	-	3
Australasian Shoveler	<i>Anas rhynchotis</i>	1975	2	-	-	VU	-	3

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Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	National Action Plan	Likelihood
Hardhead	<i>Aythya australis</i>	1975	2	-	-	VU	-	3
White-throated Needletail	<i>Hirundapus caudacutus</i>	1990	6	-	-	VU	-	4
Eastern Great Egret	<i>Ardea modesta</i>	1977	7	-	L	VU	-	3
Intermediate Egret	<i>Ardea intermedia</i>	1975	2	-	L	EN	-	3
Black Falcon	<i>Falco subniger</i>	1975	2	-	-	VU	-	3
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	2017	1	-	L	VU	NT	1
Baillon's Crane	<i>Porzana pusilla palustris</i>	1975	4	-	L	VU	-	3
Common Sandpiper	<i>Actitis hypoleucos</i>	1977	2	-	-	VU	-	3
Common Greenshank	<i>Tringa nebularia</i> #	-	-	-	-	VU	-	4
Caspian Tern	<i>Hydroprogne caspia</i>	1977	1	-	L	NT	-	3
Powerful Owl	<i>Ninox strenua</i>	2008	9	-	L	VU	-	3
Barking Owl	<i>Ninox connivens connivens</i>	1975	2	-	L	EN	NT	3
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	1975	2	-	L	EN	NT	3
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoricae</i>	1977	3	-	-	NT	NT	3
Chestnut-rumped Heathwren	<i>Calamanthus pyrrhopygius</i>	1990	2	-	L	VU	-	4
Speckled Warbler	<i>Chthonicola sagittatus</i>	1990	8	-	L	VU	NT	4
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	1990	3	-	L	NT	NT	4
Diamond Firetail	<i>Stagonopleura guttata</i>	2005	6	-	L	NT	NT	3
Tasmanian Skink	<i>Pseudemoia pagenstecheri</i>	2003	1	-	-	VU	-	2
Brown Toadlet	<i>Pseudophryne bibronii</i>	1989	3	-	L	EN	DD	3
<b>REGIONAL SIGNIFICANCE</b>								
Fat-tailed Dunnart	<i>Sminthopsis crassicaudata</i>	1967	3	-	-	NT	-	3
Pied Cormorant	<i>Phalacrocorax varius</i>	2017	3	-	-	NT	-	1
Masked Night Heron	<i>Nycticorax caledonicus hillii</i>	2011	5	-	-	NT	-	2
Royal Spoonbill	<i>Platalea regia</i>	1975	3	-	-	NT	-	3
Spotted Harrier	<i>Circus assimilis</i>	1977	1	-	-	NT	-	3
Pham's Snipe	<i>Gallinago hardwickii</i>	2016	7	-	-	NT	-	2
Pectoral Sandpiper	<i>Calidris melanotos</i> #	-	1	-	-	NT	-	4
Whiskered Tern	<i>Chlidonias hybridus javanicus</i>	1975	2	-	-	NT	-	3

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Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	National Action Plan	Likelihood
Azure Kingfisher	<i>Alcedo azurea</i>	1976	1	-	-	NT	-	3
Spotted Quail-thrush	<i>Cinclosoma punctatum</i>	1989	9	-	-	NT	-	3
Golden Perch	<i>Macquaria ambigua</i>	2012	3	-	-	NT	-	3

**Data source:** Victorian Biodiversity Atlas (DELWP 2015); Victorian Fauna Database (Viridans 2011b); Protected Matters Search Tool (DoE 2015).

**Taxonomic order:** Mammals (Strahan 1995 in Menkhorst & Knight 2004); Birds (Christidis & Boles, 2008); Reptiles and Amphibians (Cogger et al. 1983 in Cogger 1996); Fish (Nelson 1994).

**Note:** While the species listed in Table A3.2 are based on VBA data from 2018, the list has been cross-referenced with the latest FFG Act Threatened species list in order to ensure it appropriately reflects significant species data for the study area and surrounds. There are no changes to the conclusions and recommendations provided in the report.

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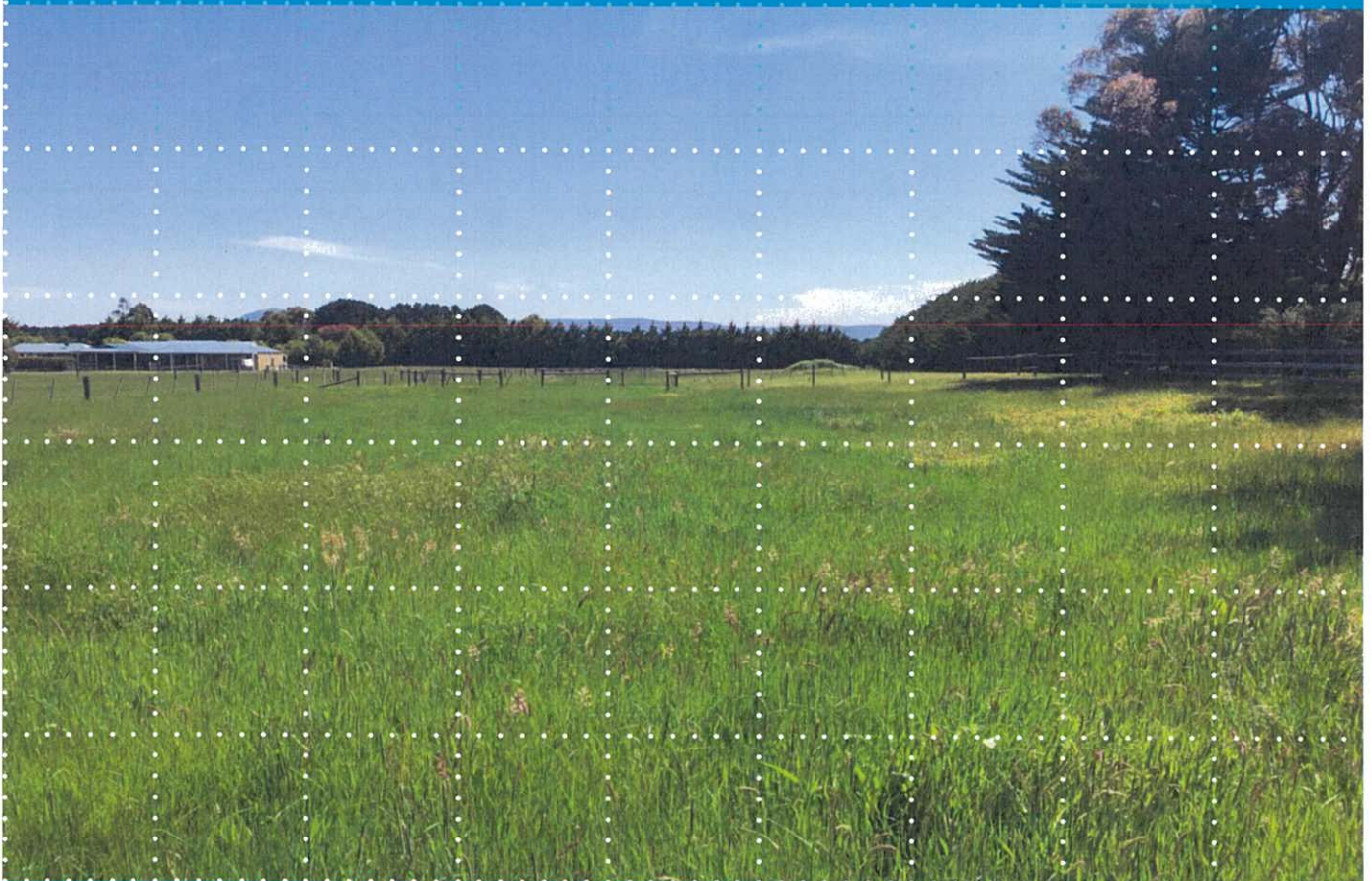
Final Report

# Targeted Significant Flora and Fauna Surveys, Bennett Road Development Plan, Victoria

Prepared for

**G2 Urban Planning**

November 2021



Ecology and Heritage Partners Pty Ltd

## DOCUMENT CONTROL

<b>Assessment</b>	Targeted significant flora and fauna surveys
<b>Address</b>	Bennett Road Development Plan, Victoria
<b>Project number</b>	15768
<b>Project manager</b>	Emma Keith (Botanist)
<b>Report reviewer</b>	Aaron Organ (Director / Principal Ecologist)
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<b>Mapping</b>	Dr Monique Elsley (GIS Coordinator)
<b>File name</b>	15768_TargetedSurveys_BennettRoad_Gisborne_Final_05112021
<b>Client</b>	G2 Urban Planning
<b>Bioregion</b>	Victorian Volcanic Plain
<b>CMA</b>	Port Phillip and Westernport
<b>Council</b>	Macedon Ranges Shire Council

Report versions	Comments by	Comments updated by	Date submitted
Draft	-	-	19/01/2021
Final	Damian Loughnan	EK	11/02/2021
Final	-	SP	5/11/2021

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- Damian Loughnan, who provided landholder liaison and access to the properties throughout the study area; and,
- The Victorian Department of Environment, Land, Water and Planning for access to ecological databases.


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## SUMMARY

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### Introduction

Ecology and Heritage Partners Pty Ltd was engaged by G2 Urban Planning to undertake targeted surveys for significant flora and fauna species, including Matted Flax-lily, Swamp Everlasting, Swamp Fireweed, Growling Grass Frog and Golden Sun Moth as part of the Bennett Road Development Plan, Victoria. The targeted surveys were required to determine the presence or absence of nationally significant species to inform the preparation of the Bennett Road Development Plan and to outline any implications under Commonwealth and State environmental legislation.

### Methods

#### *Flora*

Targeted surveys for nationally significant Matted Flax-lily, Swamp Everlasting and Swamp Fireweed were conducted by qualified ecologists across multiple days between 2 November 2020 and 9 December 2020. Targeted surveys focused on suitable habitat identified within the study area during the preliminary flora and fauna assessment.

#### *Terrestrial Fauna*

Targeted surveys for nationally significant Growling Grass Frog and Golden Sun Moth were conducted by qualified zoologists in November and December 2020. Surveys were conducted in accordance with approved methods identified within the Biodiversity Precinct Planning Kit, and the Commonwealth's Significant Impact Guidelines for the species, with surveys focusing on potentially suitable habitat identified within the study area during the preliminary flora and fauna assessment.

### Results

#### *Flora*

Despite targeted surveys undertaken at an appropriate time of year, Matted Flax-lily, Swamp Everlasting and Swamp Fireweed were not identified within the study area. Based on targeted survey results, landscape context and the proximity of previous records, significant flora species are considered unlikely to occur within the study area.

#### *Fauna*

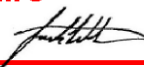
##### *Golden Sun Moth*

Despite targeted surveys on four separate occasions, Golden Sun Moth was not detected within the study area. The species was detected at several known sites within Greater Melbourne on the same day as the surveys were conducted, providing evidence that conditions were suitable to detect the species within the study area if an extant population was present. Based on the survey results an existing population of Golden Sun Moth is not present within the study area.

##### *Growling Grass Frog*

No Growling Grass Frogs were detected during the targeted surveys despite weather conditions being suitable to detect the species if a population was present. Based on targeted survey results, habitat conditions, and

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landscape context, there is a low likelihood that the wetlands within the study area currently support a breeding population of Growling Grass Frogs or forms part of a dispersal corridor for the species.

#### Legislative and Policy Implications

##### *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act - Federal)*

Based on the survey results (empirical data) the proposed future development of the area is unlikely to impact any matter of NES, and therefore a referral to the Commonwealth Environment Minister is not required for matters listed under the EPBC Act (e.g. listed species and ecological communities).

##### *Flora and Fauna Guarantee Act 1988 (FFG Act - Victoria)*

Based on the results of the targeted surveys and ecological assessment, it is unlikely that the study area supports habitat for any species listed under the FFG Act. The study area is also privately owned, therefore a permit under the FFG Act is not required.

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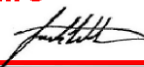
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## 1 INTRODUCTION

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### 1.1 Background

Ecology and Heritage Partners Pty Ltd was engaged by G2 Urban Planning to undertake a Spring flora survey to confirm and map patches of native vegetation within the study area and to undertake targeted significant flora and fauna surveys as part of the proposed Bennett Road Development Plan. A preliminary flora and fauna assessment has been completed within the study area (Ecology and Heritage Partners 2019) and identified suitable habitat for the following nationally significant species:

- Matted Flax Lily *Dianella amoena*
- Swamp Everlasting *Xerochrysum palustre*
- Swamp Fireweed *Senecio psilocarpus*
- Growling Grass Frog *Litoria raniformis*
- Golden Sun Moth *Synemon plana*.

As the field assessments were undertaken during a suboptimal time for flora identification (winter), confirmation of native vegetation patches within the study area was undertaken during an optimal surveying period (spring). Targeted surveys were recommended to determine the presence or absence of these species, and where possible, to ascertain their distribution and abundance within the study area. This additional information addresses Point 4 of the Request for Further Information (RFI) from Melbourne Water, dated 18 November 2019. Point 4 states:

*"A Flora and fauna investigation of the waterway corridor and surrounding areas must be undertaken by an appropriated qualified consults on behalf of the proponent and submitted to Melbourne Water for approval".*

The following addresses any implications under Commonwealth and State environmental legislation, and provides information on mitigation measures associated with the proposed development.

### 1.2 Objectives

The objectives of the targeted surveys were to:

- Confirm patches of native vegetation previously recorded by Ecology and Heritage Partners within the study area during an optimal surveying period (spring);
- Determine the presence/absence of Matted Flax Lily, Swamp Everlasting, Swamp Fireweed, Growling Grass Frog and Golden Sun Moth within the study area;
- Provide information in relation to any implications of Commonwealth and State environmental legislation and government policy associated with the proposed development;
- Determine any potential impacts on Matted Flax Lily, Swamp Everlasting, Swamp Fireweed, Growling Grass Frog and/or Golden Sun Moth and their habitats at a National and State level associated with the proposed development; and,

- Provide advice on mitigation measures that may be undertaken to avoid and/or mitigate potential adverse impacts on significant ecological values.

### 1.3 Study Area

The study area is located at 128-168 Bennett Road, Gisborne, approximately 53 kilometres north-west of Melbourne's CBD (Figure 1). The site covers approximately 130 hectares and is bound by McGregor Road to the north, private property to the south, Coney Court to the east and the Calder Freeway to the west.

The study area consists of six properties and contains areas of undulating topography, mostly cleared for agricultural purposes. Pasture grasses and planted windrows are most common throughout the study area with some small patches of native vegetation present. A creekline traverses the study area from the south to the north-east. The creekline was mostly dry at time of the survey, however, several farm dams are present across the study area, all of which contained water at time of the assessment. The study area has historically been used for agricultural purposes and grazing cattle, sheep and horses. Several dwellings and associated farming infrastructure are present within the properties.

According to the Department of Environment, Land, Water and Planning (DELWP) Native Vegetation Information Management (NVIM) Tool (DELWP 2021a), the study area occurs within the Victorian Volcanic Plain Bioregion. It is located within the jurisdiction of the Port Phillip and Westernport Catchment Management Authority (CMA) and the Macedon Ranges Shire Council municipality.

## 1.4 Targeted Flora Species

### 1.4.1 Matted Flax-lily *Dianella amoena*

EPBC Act Conservation Status: Critically Endangered

FFG Act Conservation Status: Threatened

Victorian Advisory List: Endangered

Matted Flax-lily is a perennial, tufted, mat-forming lily which can form patches of up to five metres wide. The plant can grow vegetatively, through sending underground rhizomatous roots, which rise above the ground with a tiller of several leaves, spread over a distance from the parent plant.

The leaves of the Matted Flax-lily are generally glaucous, blue in colour but may be red at the base and usually but not always having small hooks (teeth) along the margins and midrib. The leaves taper to approximately 45 centimetres long depending on site and climatic conditions and are born on tillers with the leaves arranged alternatively, with several leaves per tiller. Matted Flax-lily generally flowers between November and February but may continue flowering with summer and autumn rains. It has pale blue to violet flowers with bright yellow stamens and berries, which are generally purple in colour. The flowers and berries are born on culms extending to typically 30 cm in height but this may alter depending on location and season (Carter 2010).

Matted Flax-lily generally occurs in grassland and grassy woodland habitats, on well drained to seasonally wet fertile sandy loams to heavy cracking clay soils derived from Silurian or Tertiary sediments, or from volcanic geology (Carter 2010).



Plate 1. Matted Flax-lily *Dianella amoena*. Ecology and Heritage Partners Pty Ltd.

### 1.4.2 Swamp Everlasting *Xerochrysum palustre*

Swamp Ever-lasting is a perennial rhizomatous herb, listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), as vulnerable under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) and as vulnerable under the *Advisory List of Rare and Threatened Plants in Victoria* (DEPI 2014). The species is indigenous to New South Wales, Victoria and Tasmania, and is widely distributed across the south eastern corner of Australia. The species typically occurs in wetlands including sedge-swamps and shallow freshwater marshes, as well as marginal wetland habitats such as seasonally wet areas of native grassland and heath communities (Carter and Walsh 2011).

The species grows between 30 and 100cm tall, with narrow leaves and large yellow daisy-like flowers, up to 50mm across. Flowering occurs between November and March.

### 1.4.3 Swamp Fireweed *Senecio psilocarpus*

Swamp Fireweed is listed as vulnerable under the EPBC act and is considered vulnerable on the DELWP Advisory List (DEPI 2014). The species is indigenous to south-eastern Australia, found within South Australia, Victoria and Tasmania. In Victoria, the species is typically distributed from the South-western corner, along the coast, within the eastern and central areas of the State. The species is also found in the north-western corner of the State.

the Plains Grassy Wetland Ecological Vegetation Class (EVC 125). The species is a medium-sized herb, growing to approximately 80cm tall, with yellow daisy-like flowers. Flowering occurs between November and March (Walsh and Entwisle 1999).

## 1.5 Targeted Fauna Species

### 1.5.1 Growling Grass Frog *Litoria raniformis*

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Listed

Victorian Advisory List: Endangered

Although formerly widely distributed across southern eastern Australia, including Tasmania (Littlejohn 1963, 1982; Hero et al. 1991), the Growling Grass Frog has declined markedly over the past two decades and in many areas, particularly in south and central Victoria where some populations have experienced local extinction.

Growling Grass Frog are largely associated with permanent or semi-permanent still or slow flowing waterbodies (i.e. streams, lagoons, farm dams and old quarry sites) (Hero et al. 1991; Barker et al. 1995; Cogger 1996; Ashworth 1998). The species can also utilise temporarily inundated waterbodies during breeding season, to facilitate reproduction (Organ 2003). The presence of key habitat attributes, primarily an extensive cover of emergent, submerged and floating vegetation (Robertson *et al.* 2002, Organ 2004, 2005), and the spatial orientation of waterbodies (Robertson et al. 2002; Heard et al. 2004; Hamer and Organ 2008) are strong determinants of the species' presence. Terrestrial vegetation (grasses, sedges), rocks and other ground debris around wetland perimeters also provide important foraging, dispersal and over-wintering sites. Dispersal is thought to occur primarily along drainage lines or other low-lying areas between waterbodies, and unhindered movement between and within waterbodies is considered important for population viability.



**Plate 2.** Growling Grass Frog *Litoria raniformis*.  
Ecology and Heritage Partners Pty Ltd.

### 1.5.2 Golden Sun Moth *Synemon plana*

EPBC Act Conservation Status: Critically Endangered

FFG Act Conservation Status: Listed

Victorian Advisory List: Endangered

Golden Sun Moth typically occur in native grassland, grassy woodland, dominated by greater than 40% cover of wallaby-grass, in particular *Rytidosperma* spp. (DSE 2004), but may also inhabit areas dominated by Kangaroo Grass *Themeda triandra* (Endersby and Koehler 2006) and introduced grassland dominated by Chilean Needle-grass *Nassella neesiana* and other introduced species (A. Organ pers. obs.). Male flight is typically low, to about a metre above the ground, fast and can be prolonged, but they are generally not recorded flying more than 100 metres from suitable habitat (Clarke and O'Dwyer 1999). The male of this species generally flies between 11am and 3pm on calm, warm (over 20°C), sunny days.



**Plate 3.** Golden Sun Moth *Synemon plana*. Ecology and Heritage Partners Pty Ltd.

Prior to European settlement, the Golden Sun Moth was widespread and relatively continuous throughout its range, inhabiting grassy open woodlands and grassland, although it now mainly inhabits small isolated sites (DSE 2004a). The species is threatened by habitat loss, disturbance and fragmentation due to agricultural expansion and urbanisation. Many populations are isolated and fragmented, impeding the ability of the relatively immobile females to recolonise areas, thereby reducing the likelihood of genetic exchange (DSE 2004a). Such populations are therefore vulnerable as there is little likelihood of recolonisation in the event of a local extinction.



## 2 METHODS

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### 2.1 Nomenclature

Common and scientific names of vascular plants follow the Victorian Biodiversity Atlas (VBA) (DELWP 2018) and the Census of Vascular Plants of Victoria (Walsh and Stajsic 2007). Vegetation community names follow DELWP's Ecological Vegetation Classes (EVC) benchmarks (DELWP 20201b). The names of aquatic and terrestrial vertebrate and invertebrate fauna follow the VBA (DELWP 2018).

### 2.2 Desktop Assessment

Relevant literature, online-resources and numerous databases were reviewed to provide an assessment of flora and fauna values associated with the study area. The following information sources were reviewed:

- The VBA (DELWP 2018), Flora Information System (FIS) (Viridans 2013a) and Atlas of Victorian Wildlife (AVW) (Viridans 2013b) for previously documented flora and fauna records within the project locality;
- The Commonwealth Department of Agriculture, Water and Environment (DAWE) (formerly Department of Environment and Energy DoEE) Protected Matters Search Tool (PMST) for matters of National Environmental Significance (NES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (DAWE 2021);
- Relevant environmental legislation and policies pertaining to target species including: EPBC Act Policy Statements; FFG Act Action Statements, National Recovery Plans, Advisory Lists;
- Relevant biological and ecological literature pertaining to the target species.
- Previous ecological assessments within the study area;
- Aerial photography of the study area; and,
- Previous ecological reports, including:
  - Existing Conditions Report: 128-168 Bennett Road, Gisborne (Ecology and Heritage Partners 2019).

### 2.3 Native Vegetation Assessment

An assessment of the native vegetation recorded during the previous surveys (Ecology and Heritage Partners 2019) was conducted due to the sub-optimal conditions of the first survey (winter) for identifying cryptic flora species. Where native vegetation was identified, a habitat hectare assessment was undertaken following methodology described in the Vegetation Quality Assessment Manual (Department of Sustainability and Environment (DSE) 2004b).

Four EVCs were recorded during the assessment, in line with the previous assessment. These were Plains Sedgy Wetland (EVC 647), Tall Marsh (EVC 821), Plains Grassland Heavier-soils (EVC 132\_61) and Stony Knoll Shrubland (EVC 649). Habitat hectare condition scores are given in Appendix 1.

## 2.4 Targeted Flora Surveys

Targeted flora surveys for three nationally significant species were undertaken within areas of potential habitat, including along the creekline and around the farm dams. Targeted flora species focussed on Matted Flax-lily, Swamp Fireweed and Swamp Everlasting.

Targeted flora surveys were undertaken on 2 and 5 November 2020 for Matted Flax-lily, Swamp Everlasting and Swamp Fireweed, by qualified botanists, to coincide with the known flowering period of the species (November to February). Areas of potential habitat, including along the creekline and around farm dams, were surveyed for the species using the following standards as outlined in the *Biodiversity Precinct Structure Planning Kit* (DSE 2010):

- Targeted surveys were conducted by people familiar with recognising the species;
- The survey effort was directed to all potential habitat areas (i.e. remnant grassland and the degraded grassy areas surrounding the remnant grassland);
- Transects were walked at five-metre grid intervals through all potential habitat; and
- Where found, locations of Matted Flax-lily were recorded by GPS (accuracy of +/- 3 metres) and the number of plants per land parcel was totalled.

## 2.5 Targeted Fauna Surveys

Targeted surveys for nationally significant fauna species were undertaken within areas of potential habitat during optimal surveying conditions. Surveys focussed on Growling Grass Frog and Golden Sun Moth.

### 2.5.1 Growling Grass Frog

Nocturnal Growling Grass Frog surveys were undertaken at eight (8) sites within the study area. Growling Grass Frog Surveys were undertaken in accordance with the methods outlined in the *Significant Impact Guidelines for the Vulnerable Growling Grass Frog* (SEWPaC 2009). The targeted surveys were completed on 18 and 19 November 2020 and were completed as follows:

- Survey sites within 30 meters of the primary water body were chosen based on the presence of supporting suitable habitat for Growling Grass Frog (i.e. moderate to good water quality, moderate to good percentage cover of fringing, emergent and floating vegetation, presence of other refuge).
- Each survey site was visited on two occasions during weather conditions considered suitable for Growling Grass Frog activity (warm, over 20 degrees, relatively still and clear).
- Two qualified zoologists, experienced in Growling Grass Frog detection, systematically walked along (or around) each watercourse (or waterbody).
- Zoologists searched fringing, emergent and floating vegetation within and adjacent to the watercourse/waterbody with 50W 12V hand-held spotlights and used call-playback to initiate a response from any males that may have been present.
- All frog species heard or seen were recorded and several site-specific habitat variables were documented including a visual assessment of water quality, flow and depth, and records of fringing, emergent, floating and submerged vegetation cover.

### 2.5.2 Golden Sun Moth

Targeted surveys for Golden Sun Moth were undertaken at the study area on four separate occasions on 10 and 25 November, and 4 and 10 December 2020. Areas of suitable habitat were traversed by qualified zoologists during the known flight season (i.e. November to early January). Surveys concentrated in areas identified as supporting indigenous grassland, particularly those supporting wallaby-grass *Rytidosperma* spp. and Chilean Needle-grass *Nassella Neesiana*, which are known food sources for Golden Sun Moth. Surveys were undertaken at a time which is considered suitable for detecting the Golden Sun Moth (i.e. when adult males are flying), and when the species was observed flying at nearby locations.

Survey procedures were in accordance with the *Significant Impact Guidelines for the Critically Endangered Golden Sun Moth* (DEWHA 2009), with the following tasks undertaken:

- A habitat assessment was completed detailing information on habitat quality, presence of weeds and floristic diversity;
- Surveys were conducted by ecologists experienced in the detection and identification of Golden Sun Moth;
- The study area was surveyed on four separate occasions, with at least one week between surveys where possible;
- Surveys took place during the species' flight season (generally described as late October to early January). Moths were confirmed flying at known, nearby reference sites (Broadmeadows) prior to undertaking each survey;
- Surveys were undertaken during weather conditions suitable for detecting the species (i.e. between 10am and 3pm on warm (over 20°C by 10am) days with minimal cloud cover and still conditions); and
- Surveys were conducted by qualified zoologists walking or driving (where access was permitted) 10 to 50-metre-wide parallel transects across all areas of suitable habitat.

## 2.6 Assessment Qualifications and Limitations

Flora and fauna data collected during the field assessment, and information obtained from relevant sources (e.g. biological databases and relevant literature) are considered adequate to provide an accurate assessment of the ecological values within the study area. Fauna surveys were conducted under the Ecology and Heritage Partners Pty Ltd research permit (#10005952) issued by DELWP under the *Wildlife Act 1975*.

### 3 RESULTS

#### 3.1 Flora

##### 3.1.1 Native Vegetation

The majority of the study area comprised introduced and planted vegetation in the form of crops, pasture, windrows and ornamental plantings. The small patches of native vegetation within the study area identified during the previous assessment are still present.

##### Plains Sedgy Wetland

The creek that runs through the southern and eastern extent of the study area contains native vegetation with the highest diversity and condition. Patches of Plains Sedgy Wetland are present along the creek alignment and ranges from moderate to low condition (Plate 4). Species such as Common Tussock-grass *Poa labillardierei*, Tall Rush *Juncus procerus*, Tall Sedge *Carex appressa* and Common Spike-sedge *Eleocharis acuta* were common throughout the patches of Plains Sedgy Wetland. The patches of Plains Sedgy Wetland along the creekline have reduced slightly in area since the previous assessment due to encroachment of weedy species. A small patch of Plains Sedgy Wetland was also present around the edge of a farm dam in the centre of the study area (Figure 2). This patch was not present during the previous survey.

Grassy, herbaceous and woody weeds species were common throughout the creekline and within the patches of Plains Sedgy Wetland (Plate 5). Species such as Spiny Rush *Juncus acutus*, Toowoomba Canary-grass *Phalaris aquatica*, Cape Weed *Arctotheca calendula*, Ribwort *Plantago lanceolata*, Blackberry *Rubus fruticosus* spp. agg. and Gorse *Ulex europaeus* were common throughout the creekline (Plate 5).



**Plate 4.** Small patch of poor-quality Plains Sedgy Wetland along the creekline (Ecology and Heritage Partners Pty Ltd 02/11/2020).



**Plate 5.** Woody weeds, including Blackberry, are common along the creekline (Ecology and Heritage Partners Pty Ltd 02/11/2020).

##### Tall Marsh

One patch of Tall Marsh was present along the edges of a dam within the southern extent of the study area. Sedges densely populated the inflow drain to the dam, and emergent vegetation was present in the centre

and around the edges (Plate 6, Plate 7). Species present included Common Reed *Phragmites Australia*, Common Spike-sedge and Narrow-leaf Cumbungi *Typha domingensis*.



**Plate 6.** Patch of Tall Marsh around the dam in the southern extent of the study area (Ecology and Heritage Partners Pty Ltd 05/11/2020).



**Plate 7.** Patch of Tall Marsh around the dam in the southern extent of the study area (Ecology and Heritage Partners Pty Ltd 05/11/2020).

#### Plains Grassland

One continuous long patch of *Heavier-soils* Plains Grassland was present beneath the row of planted windrows and ornamental plantings in the north of the study area (Figure 2). This EVC has a bioregional conservation status of Endangered and consists of native grasses such as Spear Grass *Austrostipa* spp. and Common Wallaby-grass *Rytidosperma caespitosum* (Plate 8 and 9). Common weeds within this patch included listed noxious weed and Weed of National Significance (WoNS) Chilean Needle Grass *Nassella neesiana*, as well as other common exotic grasses such as Perennial Rye-grass *Lolium perenne* and Yorkshire Fog *Holcus lanatus*.



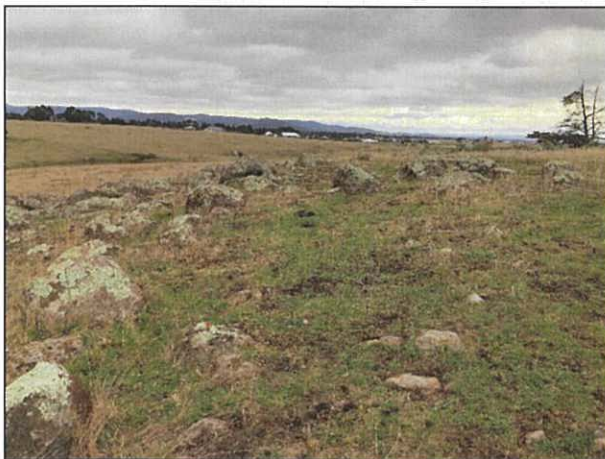
**Plate 8.** Plains Grassland within the study area (Ecology and Heritage Partners Pty Ltd 25/11/2020).



**Plate 9.** Chilean Needle Grass was present within and around the patch of Plains Grassland (Ecology and Heritage Partners Pty Ltd 25/11/2020).

### Stony Knoll Shrubland

Two small patches of Stony Knoll Shrubland were present within the north eastern extent of the study area. These patches were still in a poor condition, with a low diversity of herb species, likely caused by continuous grazing by cattle. However, the bryophyte and lichen life form component cover was high.



**Plate 10.** Stony Knoll Shrubland within the study area (Ecology and Heritage Partners Pty Ltd 25/05/2018).



**Plate 11.** Stony Knoll Shrubland within the study area (Ecology and Heritage Partners Pty Ltd 25/05/2018).

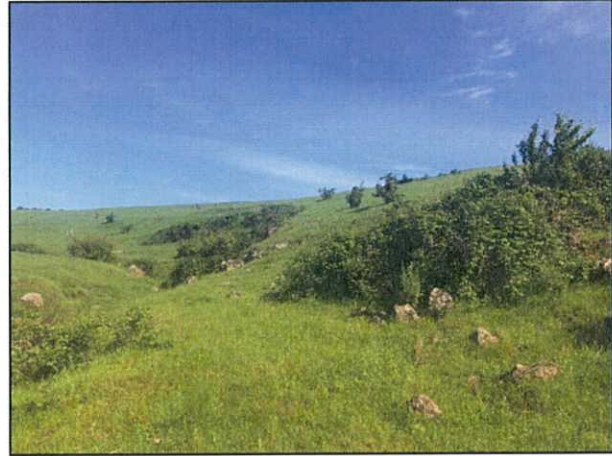
### Introduced and Planted Vegetation

Areas not supporting native vegetation had a high coverage (>95%) of exotic species, the majority being pasture grasses such as Perennial Rye-grass and Oat *Avena* spp (Plate 12). Areas of non-native vegetation within the creekline had a high coverage (>90%) of exotic and invasive species, including 12 species listed as noxious under the *Catchment and Land Protection Act 1994* (CaLP Act), four of which are also listed as Weeds of National Significance (WoNS); Blackberry *Rubus fruticosus* spp. agg., Gorse *Ulex europaeus*, Serrated Tussock *Nassella trichotoma* and Broom *Genista* spp (Plate 13). Many exotic grass species present have been direct-seeded for use as pasture. Disturbed areas along the creekline also had a high coverage of

environmental weeds such as Toowoomba Canary-grass, Perennial Rye-grass *Lolium perenne* and Yorkshire Fog *Holcus lanatus*.



**Plate 12.** The majority of the study area contains pasture grasses (Ecology and Heritage Partners Pty Ltd 25/11/2020).



**Plate 13.** Weeds such as Blackberry were common along the creekline (Ecology and Heritage Partners Pty Ltd 02/11/2020).

### 3.1.2 Targeted Flora Surveys

Targeted surveys for significant flora species were undertaken by two qualified Botanists, experienced in searching for the target species. Surveys were undertaken across two days, 2 and 5 November 2020, during an optimal period for identification. Surveys focussed on areas of potential habitat, including the creekline and around farm dams (Figure 4).

Potential habitat for the EPBC Act-listed Matted Flax-lily, Swamp Everlasting and Swamp Fireweed was identified during previous ecological assessments (Ecology and Heritage Partners 2019). Despite the availability of potential habitat (albeit highly modified) no specimens of any of these species were detected within the study area.

## 3.2 Fauna

Targeted surveys for significant fauna species were undertaken by two qualified ecologists experienced in searching for the target species. Surveys were undertaken during a period optimal for identification of the species and in line with the survey guidelines. Survey effort is outlined below (Table 1 and 2).

Although the weather conditions during the site surveys were conducive for frogs to be active, no Growling Grass Frogs were detected during the targeted surveys (Table 1). During the surveys, three other species (Whistling Tree Frog *Litoria verreauxii verreauxii*, Eastern Common Froglet *Crinia signifera* and Spotted Marsh Frog *Limnodynastes tasmaniensis*) were recorded throughout the study area. Based on targeted survey results and landscape context there is a low likelihood that the wetlands within the study area currently support a breeding population of Growling Grass Frogs or forms part of a dispersal corridor for the species.

Despite targeted surveys on four separate occasions, Golden Sun Moth was not detected within the study area (Table 2). The species was detected at several known sites within Greater Melbourne on the same day as the surveys were conducted, indicating that conditions were suitable for surveying and identifying the species. As such, a Golden Sun Moth population does not occur within the study area.

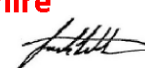
Table 1. Summary of Growing Grass Frog survey results

Date	Time	Survey Number	Temperature (°C)	Rain (mm)	Wind (Km/h)	Relative humidity (%)	Cloud Cover (%)	GGF Observed	Juveniles Observed	Tadpoles Observed
18/11/2020	22:00	1	23.0	0.0	20.4	25	50	0	0	0
19/11/2020	21:45	2	25.9	0.0	24.1	21	30	0	0	0

Table 2. Summary of Golden Sun Moth survey results

Date	Survey times	Reference Site	Temperature (°C)	Wind (km/hr)	Cloud cover (%)	No. of days since rain	No. GSM
10/11/2020	13:00-14:00	Confirmed flying at Broadmeadows	26.2	20.1	5	>2	0
25/11/2020	12:00-13:00	Confirmed flying at Broadmeadows	24.8	18.5	0	>2	0
04/12/2020	12:30-13:30	Confirmed flying at Broadmeadows	20.1	20.4	0	2	0
09/11/2020	12:00-13:00	Confirmed flying at Broadmeadows	20.7	5.5	10	>2	0

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### 3.3 Habitat Assessment

The majority of the study area is highly modified as a result of current land use, being dominated by exotic grassland and cultivated land (i.e. crop) and stock. The areas of exotic grassland comprised improved pasture species, predominantly Perennial Ryegrass *Lolium perenne* and Toowoomba Canary-grass *Phalaris aquatica*. The surrounding area is also highly fragmented and predominantly consists of introduced vegetation, which lacks suitable habitat for Growling Grass Frog and Golden Sun Moth.

The linear strip of Plains Grassland was the primary focus of the targeted surveys for Golden Sun Moth as this presented the highest likelihood of supporting the species. The creekline and surrounds of farm dams were the focus areas for Growling Grass Frog and the significant flora species, as these present the highest likelihood of supporting these species. The remainder of the study area comprised introduced exotic grasses used for pasture and grazing stock, and planted windrows an ornamental species, all of which do not provide suitable habitat for significant species.

## 4 IMPACTS AND MITIGATION MEASURES

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### 4.1 Known Impacts

Based on the results of the targeted surveys, the development is highly unlikely to impact on any matters of NES, including Matted Flax-lily, Swamp Everlasting, Swamp Fireweed, Growling Grass Frog and Golden Sun Moth.

It is highly unlikely that any other matters of NES [including Natural Temperate Grassland of the Victorian Volcanic Plains (NTGVVP) and Striped Legless Lizard] are present within the study area based on the current conditions and therefore will not be impacted by the proposed development.

### 4.2 Potential Impacts

A final Development Plan across the study area has not yet been prepared, and therefore potential impacts on native vegetation within the study area are currently unknown. However, impacts may include:

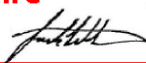
- Potential for further habitat fragmentation in a fragmented landscape and the associated creation of barriers to the movement and migration of indigenous species;
- Potential disturbance associated with increased human activity and noise during construction.
- Potential indirect impacts on adjacent areas outside of the limit of construction if activities and drainage are not appropriately managed;
- The potential for injury and/or mortality from construction activities;
- Potential for the spread of weeds and soil pathogens due to on-site activities;
- Decreased habitat quality downstream of the study area due to improper sedimentation controls and subsequent deterioration of water quality; and,
- Permanent alteration of environmental flows to aquatic habitat.

### 4.3 Mitigation Measures

General recommended measures to minimise impacts to ecological values present within the study area were identified and are outlined in the Existing Conditions report (Ecology and Heritage Partners 2019). A 30-metre buffer along the creekline will be implemented, with all native vegetation inside the buffer protected, and noxious weed species controlled in accordance with the Native Vegetation Management Plan which has been prepared (Ecology and Heritage Partners in 2021). Additional measures recommended to minimise potential impacts may include:

- Removal of any habitat trees or shrubs (particularly hollow-bearing trees) should be undertaken between February and September to avoid the breeding season for the majority of fauna species. If any habitat trees or shrubs are proposed to be removed, this should be undertaken under the

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supervision of an appropriately qualified zoologist to salvage and translocate any displaced fauna. A Fauna Management Plan may be required to guide the salvage and relocation process;

- Infrastructure removed in accordance with agreed end land use in consultation with relevant stakeholders;
- Contaminated waste dumps remediated or removed; no contaminated seepage discharges to the surrounding environment;
- A Construction Environmental Management Plan to be prepared prior to the commencement of any construction to ensure there are no adverse impacts on ecological values within the study area, particularly the creekline;
- Vegetation in rehabilitated areas demonstrate values that trend towards relevant target ecosystem sites;
- Ecosystem function in rehabilitated areas demonstrate values that trend towards relevant target ecosystem sites; and,
- Adherence to the recommendations within the Native Vegetation Management Plan (Ecology and Heritage Partners 2021) for the creekline.

Given that subdivision plans are yet to be prepared, there is potential for the native vegetation recorded within the study area, outside of the creekline buffer to be protected, thereby ensuring that proposed vegetation removal is kept to a minimum. Any impacts to native vegetation that cannot be avoided or minimised by the development must be offset accordingly prior to its removal.

## 5 LEGISLATIVE AND POLICY IMPLICATIONS

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This section identifies biodiversity policy and legislation relevant to the proposed development.

### 5.1 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

The EPBC Act establishes a Commonwealth process for the assessment of proposed actions (i.e. project, development, undertaking, activity, or series of activities) that are likely to have a significant impact on matters of national environmental significance (NES), or on Commonwealth land.

For species listed under the EPBC Act, a 'significant impact' is defined as an impact which is important, notable, or of consequence, having regard to its context or intensity (DoE 2013). Whether an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment, which is affected, and upon the intensity, duration, magnitude and geographic extent of the impacts. Importantly, for a 'significant impact' to be 'likely', it is not necessary for a significant impact to have a greater than 50% chance of happening; it is sufficient if a significant impact on the environment is a real or not remote chance or possibility (DoE 2013).

Given that no significant flora and fauna species were detected during the targeted surveys and no other matters of NES (e.g. NTGVVP) occur within the study area, an EPBC Act referral is not required.

### 5.2 Flora and Fauna Guarantee Act 1988 (Victoria)

The FFG Act is the primary legislation dealing with biodiversity conservation and sustainable use of native flora and fauna in Victoria. Proponents are required to apply for an FFG Act Permit to 'take' listed and/or protected<sup>1</sup> flora species, listed vegetation communities and listed fish species in areas of public land (i.e. within road reserves, drainage lines and public reserves). An FFG Act permit is generally not required for removal of species or communities on private land, or for the removal of habitat for a listed terrestrial fauna species.

Based on the results of the targeted surveys and ecological assessment, it is unlikely that the study area supports habitat for any species listed under the FFG Act. The study area is also privately owned, therefore a permit under the FFG Act is not required.

### 5.3 Wildlife Act 1975 and Wildlife Regulations 2002 (Victoria)

The *Wildlife Act 1975* (and associated *Wildlife Regulations 2002*) is the primary legislation in Victoria providing for protection and management of wildlife. Authorisation for habitat removal may be obtained under the *Wildlife Act 1975* through a licence granted under the *Forests Act 1958*, or under any other Act such as the

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<sup>1</sup> In addition to 'listed' flora species, the FFG Act identifies 'protected' flora species. This includes any of the Asteraceae (Daisies), all orchids, ferns (excluding *Pteridium esculentum*) and *Acacia* species (excluding *Acacia dealbata*, *Acacia decurrens*, *Acacia implexa*, *Acacia melanoxylon* and *Acacia paradoxa*), as well as any taxa that may be a component of a listed ecological community. A species may be both listed and protected.

*Planning and Environment Act 1987.* Any persons engaged to remove, salvage, hold or relocate native fauna during construction must hold a current Management Authorisation under the *Wildlife Act 1975*.

## 6 FURTHER REQUIREMENTS

Further requirements associated with development of the study area, including relevant legislation and policy identified within the preliminary assessment report (Ecology and Heritage Partners 2019), are provided below (Table 3).

**Table 3.** Further requirements associated with development of the study area

Relevant Legislation	Implications	Further Action
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Given that no significant flora and fauna species were detected during the targeted surveys, and no other matters of NES (e.g. NTGVVP) occur within the study area and would be impacted by the future development, an EPBC Act referral is not required	No further action required.
<i>Flora and Fauna Guarantee Act 1988</i>	Based on the results of the targeted surveys and ecological assessment, it is unlikely that the study area supports habitat for any species listed under the FFG Act. The study area is also privately owned, therefore a permit under the FFG Act is not required.	No further action required.
<i>Wildlife Act 1975</i>	Any persons engaged to conduct salvage and relocation or general handling of terrestrial fauna species must hold a current Management Authorisation.	Ensure wildlife specialists hold a current Management Authorisation.
<i>Planning and Environment Act 1987</i>	A Planning Permit from Macedon Ranges Shire Council is required to remove, destroy or lop any native vegetation.	Prepare and submit a Planning Permit Application once impact is known.
<i>Catchment and Land Protection Act 1994</i>	Several weed species listed under the CaLP Act were recorded within the study area. To meet requirements under the CaLP Act, listed noxious weeds should be appropriately controlled throughout the study area.	Planning Permit conditions may include a requirement for a weed management to be incorporated into a CEMP

## 7 CONCLUSION

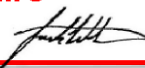
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Targeted surveys of the study area were recommended based on the results of the Existing Conditions assessment of the study area (Ecology and Heritage Partners 2019). Given the presence of potentially suitable habitat identified within the study area during the previous assessment conducted by Ecology and Heritage Partners in 2018, targeted surveys were completed for Matted Flax-lily, Swamp Everlasting, Swamp Fireweed, Golden Sun Moth and Growling Grass Frog. Despite surveys following the recommended guidelines, no individuals of any of these species were recorded within the study area. Based on the survey results, the study area is highly unlikely to support populations of any of the target species.

The VBA contains records of Matted Flax-lily, Swamp Everlasting and Swamp Fireweed within five kilometres of the study area (Figure 5). However, despite several previous records within the local area, based on the results of the targeted surveys, it is unlikely that these nationally significant flora species occur within the study area.

The proposed subdivision and future development may result in the removal of remaining areas of vegetation which do not support any of the target species, therefore based on available information there are no implications under the EPBC Act or under State legislation or policy pertaining to the proposed development in terms of impacts to significant species.

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






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## FIGURES

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**Legend**

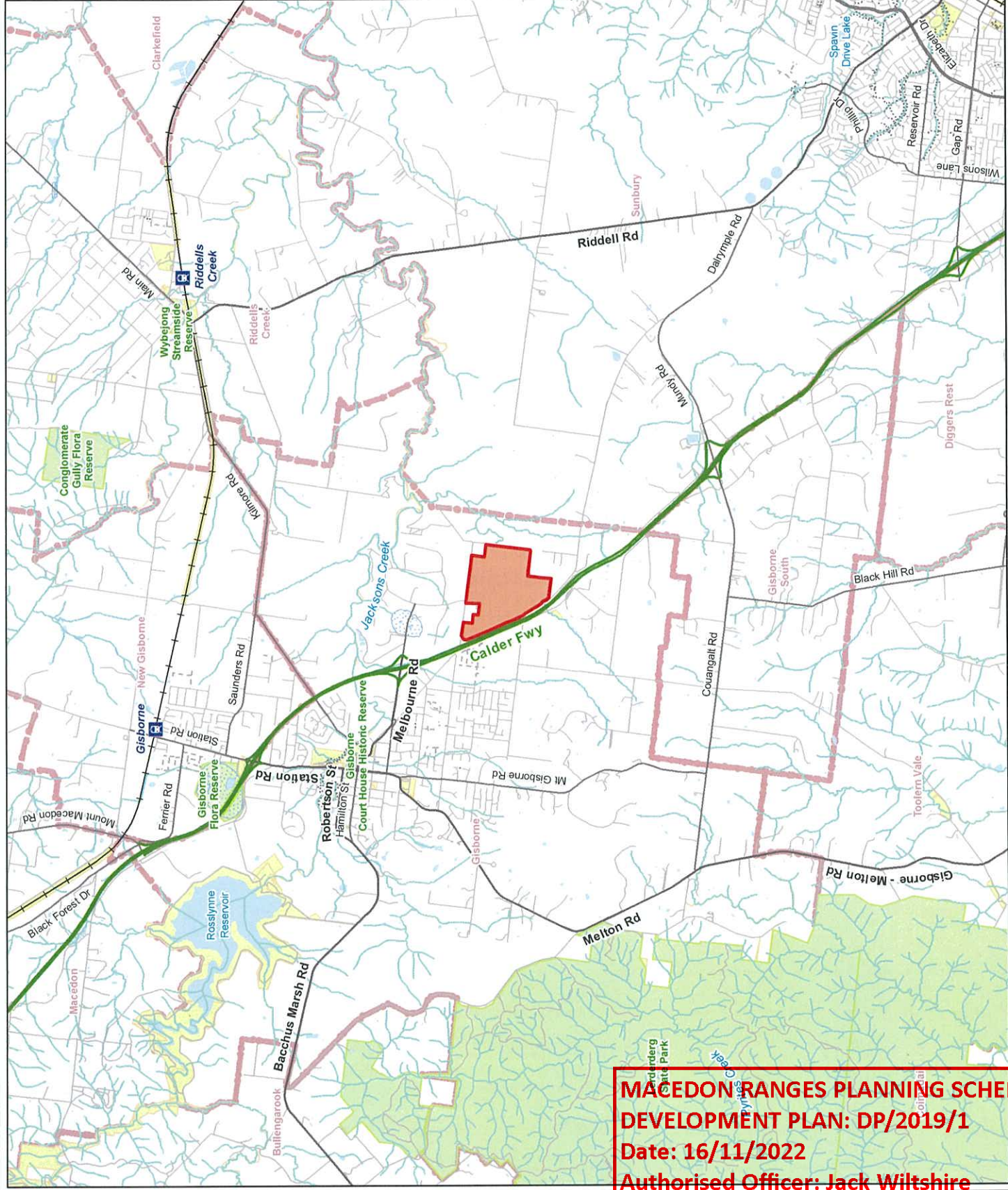
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-  Railway
-  Freeway
-  Major Road
-  Collector Road
-  Minor Road
-  Proposed Road
-  Walking Track
-  Minor Watercourse
-  Permanent Waterbody
-  Land Subject to Inundation
-  Parks and Reserves
-  Crown Land
-  Localities

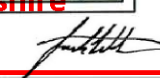


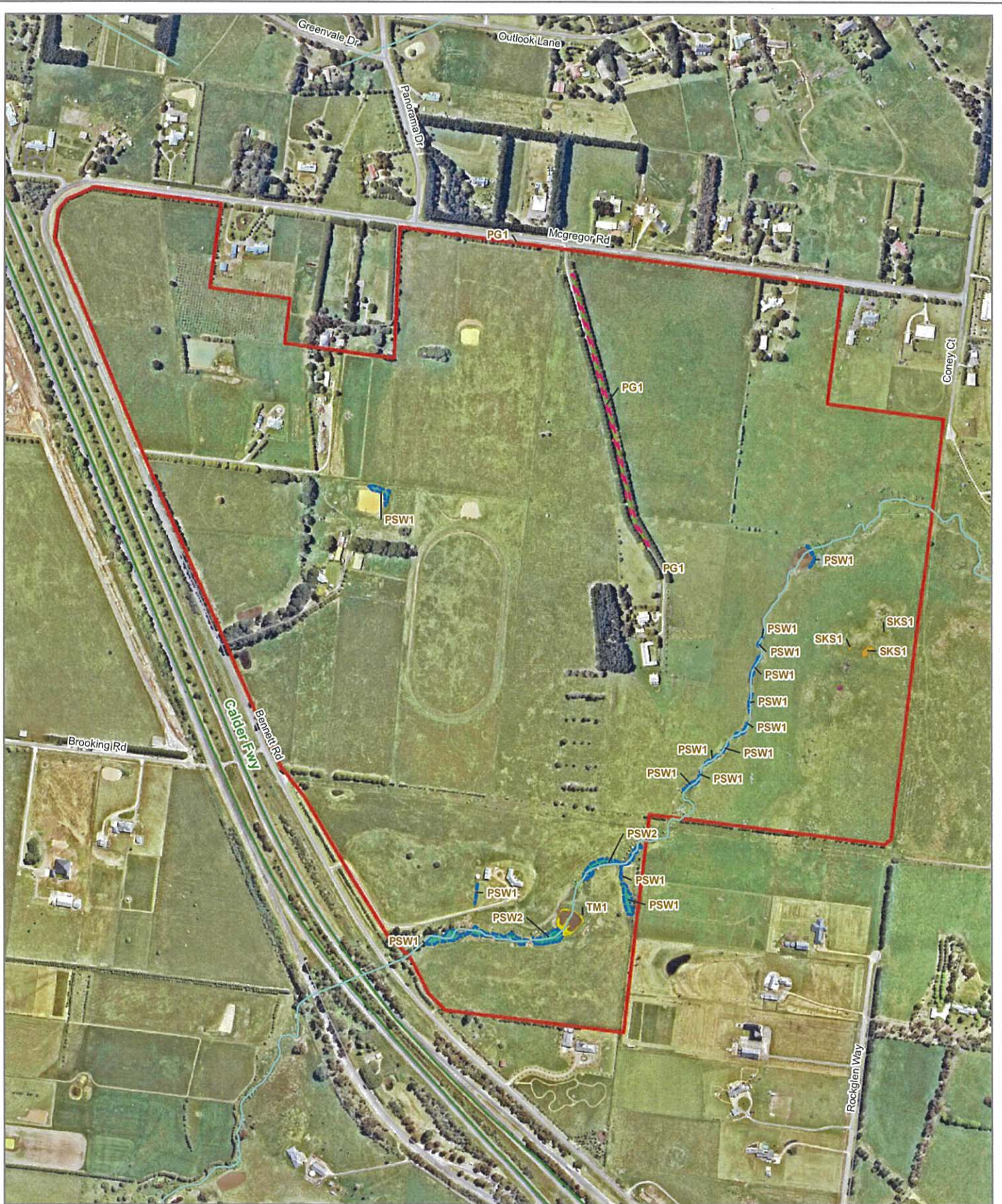
**Figure 1**  
**Location of the study area**  
**Bennett Road Development**  
**Plan, Gisborne**



ViewMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, omissions, defects or omissions in the information.



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**Figure 2 Overview**  
**Ecological features**  
 Bennett Road  
 Development Plan,  
 Gisborne

**Legend**

- Study Area
- Areas of potential Growing Grass Frog habitat
- Potential Golden Sun Moth habitat

- Acacia
- Ecological Vegetation Classes**
- Plains Grassland (EVC 132)
- Plains Sedgy Wetland (EVC 647)
- Stony Knoll Shrubland (EVC 649)
- Tall Marsh (EVC 821)



Aerial source: Nearmap 2020

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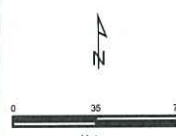
**Figure 2a**  
**Ecological features**  
*Bennett Road*  
*Development Plan,*  
*Gisborne*

**Legend**

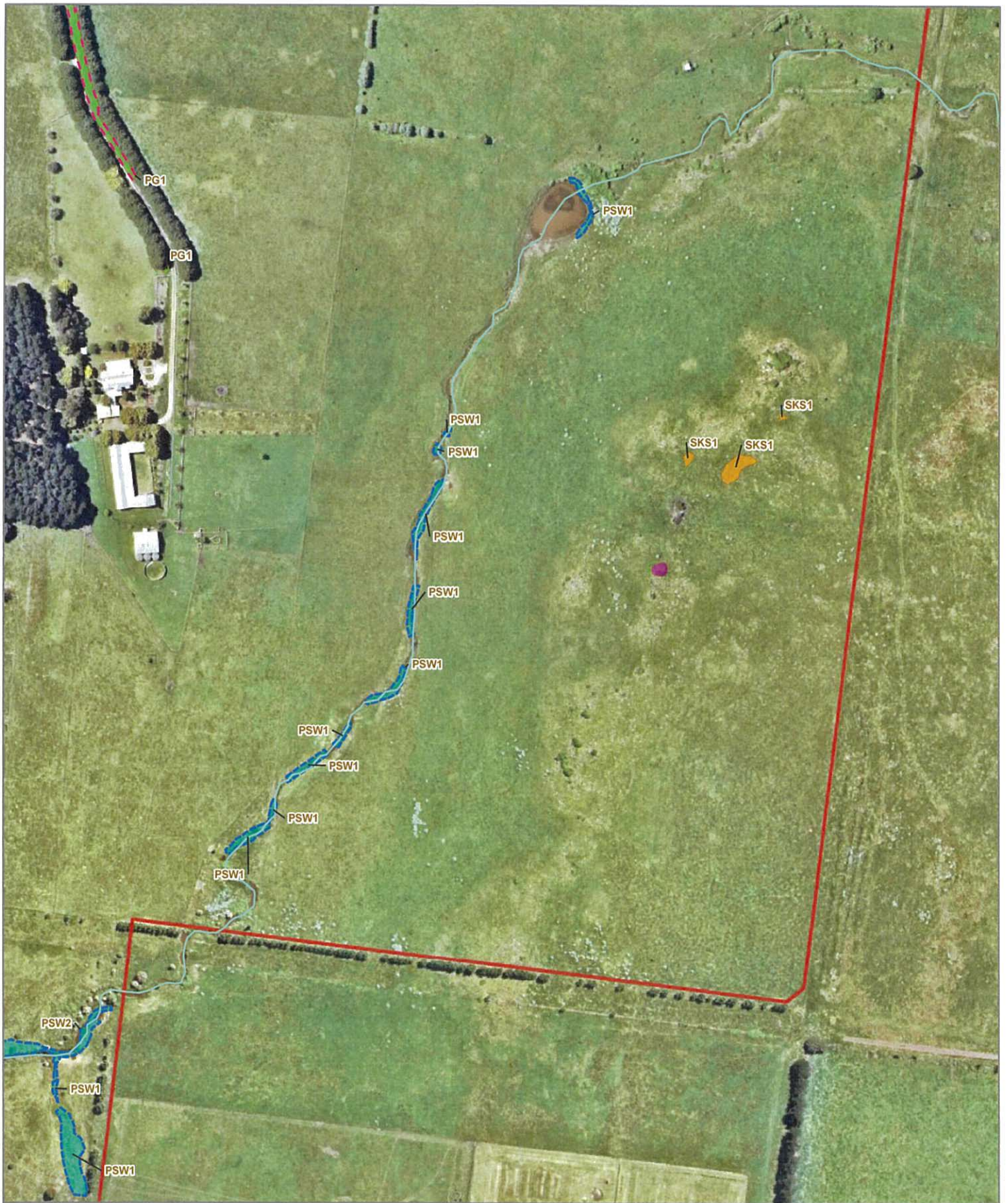
- Study Area
- Areas of potential Growing Grass Frog habitat
- Potential Golden Sun Moth habitat

**Ecological Vegetation Classes**

- Plains Grassland (EVC 132)
- Plains Sedgy Wetland (EVC 647)



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**Figure 2b**  
**Ecological features**  
*Bennett Road*  
*Development Plan,*  
*Gisborne*

**Legend**

- Study Area
- Areas of potential Growing Grass Frog habitat
- Potential Golden Sun Moth habitat

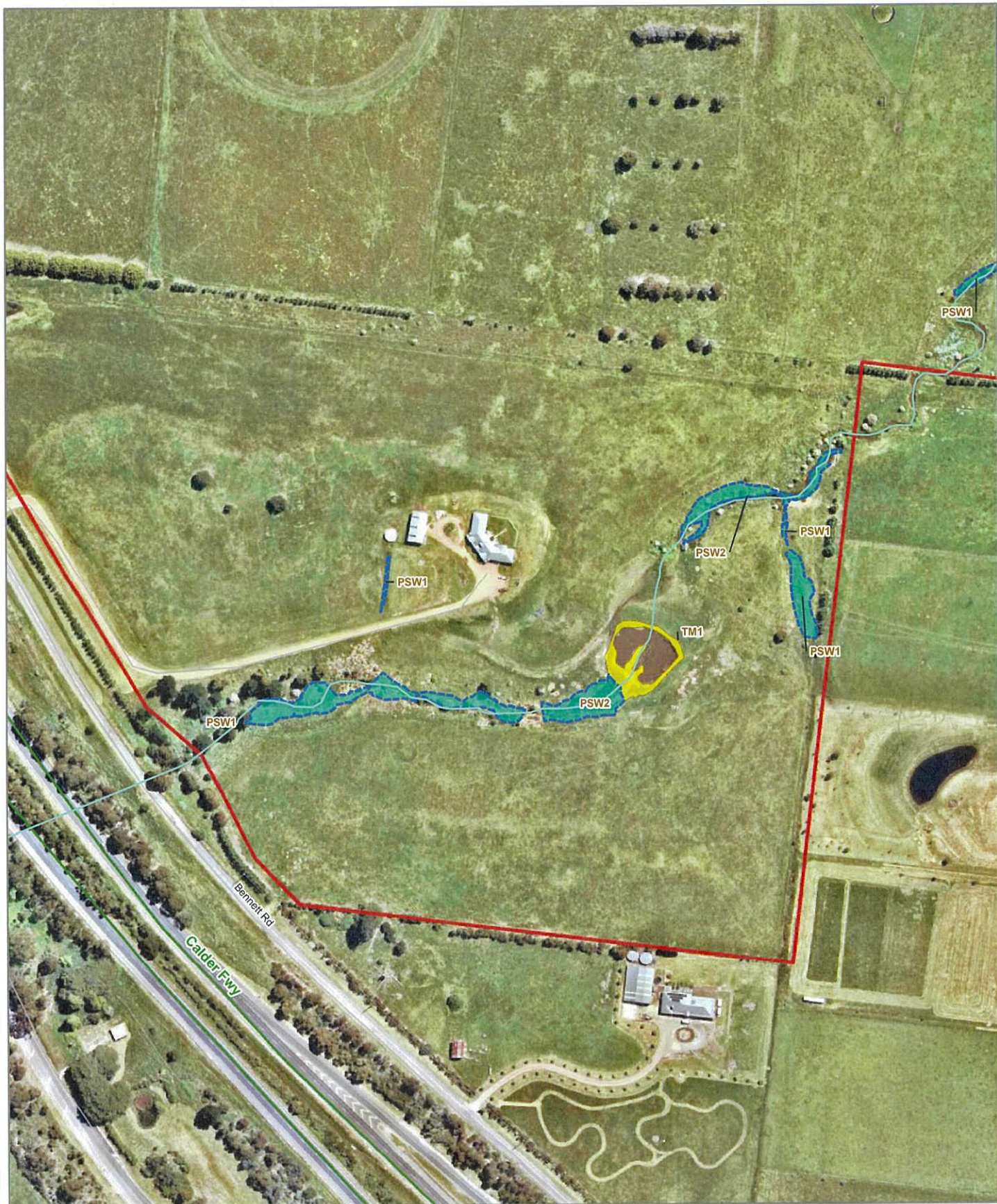
- Acacia
- Ecological Vegetation Classes**
- Plains Grassland (EVC 132)
- Plains Sedgy Wetland (EVC 647)
- Stony Knoll Shrubland (EVC 649)



Aerial source: Nearmap 2020

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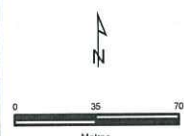
**Figure 2c**  
**Ecological features**  
*Bennett Road  
 Development Plan,  
 Gisborne*

**Legend**

- Study Area
- Areas of potential Growing Grass Frog habitat

**Ecological Vegetation Classes**

- Plains Sedgy Wetland (EVC 647)
- Tall Marsh (EVC 821)



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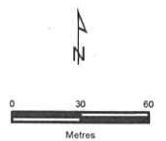


**Figure 3**  
**Targeted Golden Sun**  
**Moth surveys**  
*Bennett Road*  
*Development Plan,*  
*Gisborne*

**Legend**

- Study Area
- Survey tracks\***
- Date: 10/11/2020
- Date: 25/11/2020
- Date: 04/12/2020
- Date: 09/12/2020

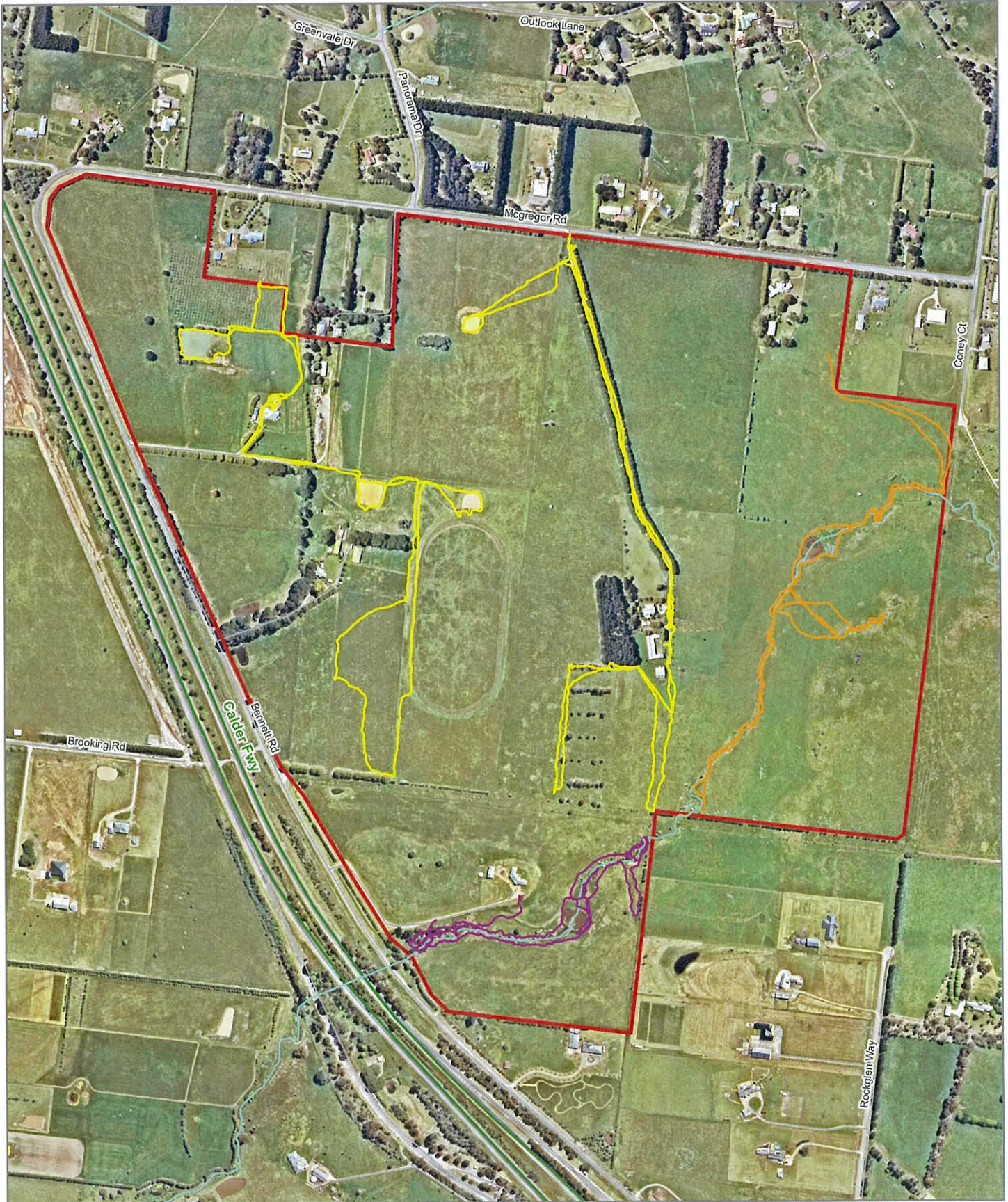
\*No Golden Sun Moth were recorded during the surveys



Aerial source: Nearmap 2020

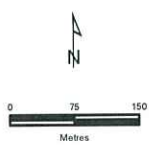
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**Figure 4**  
**Targeted significant flora species surveys**  
*Bennett Road Development Plan, Gisborne*

- Legend**
- Study Area
  - Survey tracks\***
  - Track 1
  - Track 2
  - Track 3



\*No significant flora species were recorded during the surveys

Aerial source: Nearmap 2020

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## APPENDICES

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## Appendix 1.1.1 - Habitat Hectare Assessment

Table A1.2. Habitat Hectare Assessment Table.

Vegetation Zone	PSW1	PSW2	SKS1	TM1	PG1
Bioregion	VVP	VVP	VVP	VVP	VVP
EVC / Tree	PSWe	PSWe	SKS	TM	PG
EVC Number	647	647	649	821	132_62
EVC Conservation Status	Endangered	Endangered	Endangered	Least Concern	Endangered
Large Old Trees /10	0	0	0	0	0
Canopy Cover /5	0	0	0	0	0
Understorey /25	5	15	5	5	5
Lack of Weeds /15	0	9	0	9	4
Recruitment /10	0	6	0	3	0
Organic Matter /5	4	2	4	2	3
Logs /5	0	0	0	0	0
Treeless EVC Multiplier	1.36	1.36	1.36	1.36	1.36
Subtotal =	12.24	43.52	12.24	25.84	16.32
Landscapes Value /25	2	2	2	2	2
Habitat Points /100	14	46	14	28	18
Habitat Score	0.14	0.46	0.14	0.28	0.18

Note: VVP = Victorian Volcanic Plain, PSWe = Plains Sedgy Wetland, SKS = Stony Knoll Shrubland, TM = Tall Marsh, PG = Plains Grassland