Report for Beaufort Bypass Project

Landscape and Visual Impact Assessment

Client: Regional Roads Victoria

Document: Beaufort Bypass

Version: Final

Date: 13.05.2021

Prepared by:

ASPECT Studios®

Prepared for:

REGIONAL ROADS VICTORIA

This Visual and Landscape Impact Assessment Report ('Report'):

1. Has been prepared by ASPECT Studios for Regional Roads Victoria;
2. May only be used for the purpose of informing the Environment Effects Statement and Planning Scheme Amendment for the Beaufort Bypass Project (and must not be used for any other purpose); and
3. May be provided to the Department of Environment, Land, Water and Planning (DELWP) for the purpose of public exhibition as part of the Environment Effects Statement and Planning Scheme Amendment for the Beaufort Bypass Project.

The opinions, conclusions and any recommendations in this Report are based on assumptions made by ASPECT Studios when undertaking services and preparing the Report ('Assumptions).

ASPECT Studios excludes liability for errors in, or omissions from, this Report arising from or in connection with any of the assumptions being incorrect.

Subject to the paragraphs in this section of the Report, the opinions, conclusions and any recommendations in this Report are based on conditions encountered and information reviewed at the time of preparation. ASPECT Studios has not updated, and accepts no responsibility or obligation to update, this Report to account for events or changes occurring subsequent to the date that the Report was signed.

Rev No.	Document Section	Author	Review	Approved for issue	Date
1	Draft Existing Conditions Analysis	Tim D'Agostino	Qidi Li	Kirsten Bauer	03/11/2017
2	Preliminary landscape and visual impact assessment report	Tim D'Agostino	Qidi Li	Kirsten Bauer	13/03/2018
3	Draft landscape and visual impact assessment report	Kirsten Bauer	Kirsten Bauer	Kirsten Bauer	17/04/2019
4	Landscape and visual impact assessment report	Kirsten Bauer	Kirsten Bauer	Kirsten Bauer	06/06/2019
5	Landscape and visual impact assessment report	Kirsten Bauer	Kirsten Bauer	Kirsten Bauer	10/09/2019
6	Landscape and visual impact assessment report	Kirsten Bauer	Kirsten Bauer	Kirsten Bauer	18/11/2019
7	Landscape and visual impact assessment report	Kirsten Bauer	Kirsten Bauer	Kirsten Bauer	29/07/2020
8	Landscape and visual impact assessment report	Kirsten Bauer	Kirsten Bauer	Kirsten Bauer	06/11/2020
9	Landscape and visual impact assessment report	Kirsten Bauer	Kirsten Bauer	Kirsten Bauer	22/03/2021
Final	Landscape and visual impact assessment report	Kirsten Bauer	Kirsten Bauer	Kirsten Bauer	13/05/2021

Contents

Glossary

TERM DEFINITIONS

Alignment Options: The different freeway corridor options.

Experience/experiential impact: The accumulation of different human senses (seeing, hearing, touching, smelling and tasting), experiences and instincts combine to create certain feelings about or within an area. Impacts upon human enjoyment or feelings within an area are highly qualitative, however, professional judgments can be made based on human experience.

Landscape character area (LCA): Distinct areas of landscapes that are relatively similar in visual character and land use. Similarities typically occur due to similar geology, topography, vegetation, historical and recent land use, materials and urban formation.

Scenic view/quality: Scenery or a view that is valued for its pleasantness or attractive setting or backdrop and that typically brings enjoyment and comfort to people living, working, recreating, visiting or traveling through an area.

Visual amenity: Amenity is a broad term that generally means the qualities, attributes and characteristics of a place that make a positive contribution to quality of life. Amenity values can include both visual amenity and the ability for people to live and recreate within their surroundings without any unreasonable interference with their health, welfare, convenience and comfort. Natural landscapes and views often contribute to visual amenity, such as areas of high heritage, cultural or social significance due to their natural features or scenic quality. Amenity values can be highly subjective; what may have amenity value for one person, may not be valued by another. Similarly, people have different levels of perception or tolerance for things that may impact amenity

Visual audience: An individual or group of people who are at risk of being visually or experientially impacted by the proposal; typically described as ‘visual receptors’ in other landscape and visual impact assessments

Executive summary

This landscape and visual impact assessment (LVIA) has been conducted in order to determine the potential impact of the Beaufort Bypass (the project) on surrounding areas.

It is a standalone technical assessment utilising a methodology specific for LVIA, based on and building upon existing industry guidelines and precedents and professional judgment, because there are no existing government or industry endorsed standards for LVIAs.

This methodology is utilised to identify potential risks, sites of sensitivity and impacts of the proposed project.

Existing landscape and visual values

Legislation, policy, site visits and desktop analysis have all been utilised in combination to assess the existing conditions and values of the study area.

The project has identified nine landscape character areas. 'A landscape character area is a broad scale area of land with common distinguishing visual characteristics.' (Leonard and Hammond R, 1983).

Eight of the nine main landscape character types will be affected. The landscape character type "Beaufort" has been identified as not being affected. The affected landscape character types are:

- Open Rural Plains (ORP)
- Eastern Semi-Enclosed Rural Valley (ESERV)
- Western Semi-Enclosed Rural Valley (WSERV)
- Ecological Conservation Reserve (ECR)
- Enclosed Rural Valley (ERV)
- Dense Bushland (DB)
- Highway Infrastructure (HI)
- Beaufort Fringe (BF)

Several moderate to high sensitive sites of community and cultural value are located within the study area, including:

- Camp Hill State Forest
- Camp Hill Picnic Area
- Camp Hill Lookout
- Snowgums Bushland Reserve
- Racecourse Road Mullock Heap
- Main Lead Road waterway
- Yam Holes Creek
- Beaufort train station and Beaufort Hotel
- Bicentennial Park
- Beaufort Main Street
- Apex Park and skatepark

Key views and viewsheds include:

- Beaufort views to Camp Hill
- Camp Hill Lookout views
- Island Uplands views.

Key visual and landscape character impacts

In terms of reviewing overall landscape and visual preference, with the first step is an overview of the key Bypass features that generate detrimental landscape and visual impacts.

All Alignments have a set of these features in common:

- The interchanges at the east and west ends

- The interchange on the north-east fringe of Beaufort
- The large scale cut and change to Camp Hill (in Alignments A0 and A1 the impact is more localised in visual extent, and more detrimental to the landscape, compared to Alignments C0 and C2, where the impact is broader because off the visibility of the Alignments as they move across Camp Hill)
- The length of noise walls.

Where differences start to become more apparent is when reviewing how the two alignment groupings compare in the way they meet project objectives.

Landscape and Visual Impact Assessment – Four Alignment Options

A holistic landscape assessment was undertaken to ascertain the different types and magnitudes of impacts on the landscape and visual character. Firstly, an assessment was undertaken, where the level of impact was given a numerical value, and these were averaged to provide an overall rating for each sub objective.

In addition, a more qualitative assessment was undertaken to complement the more numerical one, and this one provides a more high-level perspective of the relative differences of the alignments.

How well each alignment meets the EES objectives

Table 1: Ability of Alignments to meet EES objectives.

		Alignment			
	Assessment criteria	**A0**	**A1**	**C0**	**C2**
EES Evaluation Objective: Landscape and visual To minimise adverse effects on visual and landscape values as far as practicable, during construction and operation					
Sub-objective 1: To minimise the visual impact upon residents adjacent to the project	Minimises impact on residential properties	Moderately poorly	Moderately poorly	Poorly	Very poorly
Sub-objective 2: To minimise the impact upon publicly accessible places and places of cultural and natural value	Minimises impact on significant local areas (e.g., Camp Hill State Forest, Snowgums Bushland Reserve, Beaufort Trotting Track, Main Lead Road waterway, Beaufort Motorcycle Track, Yam Holes Creek, Central Beaufort, Apex Park)	Moderately well	Moderately well	Neither well nor poorly	Neither well nor poorly
Sub-objective 3: To minimise impact upon existing landscape character	Minimises impact on High to Very high sensitive landscape character areas	Very poorly	Very poorly	Moderately poorly	Moderately poorly
	Minimises the magnitude of change by the proposed Alignments (cut and fill, scale of physical impact, quantity of trees and other vegetation removed, topography)	Moderately poorly	Moderately poorly	Moderately poorly	Moderately poorly
	Minimise impact on key and significant views and viewsheds of the wider landscape	Well	Well	Neither well nor poorly	Neither well nor poorly
LVIA Rating		-0.4	-0.4	-0.8	-1.0
How well does each alignment minimise adverse effects on visual and landscape values as far as practicable, during construction and operation?		Neither well nor poorly – Moderately poorly	Neither well nor poorly – Moderately poorly	Moderately poorly	Moderately poorly

In the above assessment the differences between Alignments AO and A1 and Alignments CO and C2 are relatively modest, and as such no Alignment Option stands out significantly as a preferred alignment to minimise visual and landscape character impact on Beaufort and surrounding landscape.

An additional more qualitative holistic assessment was undertaken, to complement the more numerical one.

The rating differences between the alignments are quite slim, while the types of impacts are quite different for Alignments A0 and A1 compared to Alignments C0 and C2.

Summary Assessment Notes:

- Alignments A0 and A1 perform overall better in the assessment. However, they will have a considerable detrimental impact on the rural, natural and vegetated character landscape, because bringing a large infrastructure element into a more naturalistic environment is difficult to accommodate and even more difficult to mitigate or screen from view.
- The Alignments C0 and C2 perform worse in the assessment (but not by a large margin), and their impact on the landscape character of Beaufort and the number of residents and properties will be significantly larger than Alignments A0 and A1.
- Consequently, Alignments A0 and A1 have more impact on natural and vegetated landscapes, and Alignments C0 and C2 have more impact on Beaufort and residential dwellings.
- Alignments AO and A1 move the impacts further away from Beaufort but create a new infrastructure / urban line through the landscape. Alignments C0 and C2 create impacts closer to Beaufort and new infrastructure / urban line closer to the town, which is more consistent with the town's more urban character than the imposition of an urban structure within the rural/farming environment.
- Alignment C2 has less impact on residential dwellings than Alignment C0.

No alignment, therefore, stands out as clearly preferred by the LVIA assessment.

- Alignments C0 and C2 perform marginally poorer within the numerical assessment. This is largely due to their impact on a greater number of residents and properties and proximity to Beaufort resulting in an impact to the town’s existing character.
- However, the imposition of an urban structure within the A0 and A1 alignment areas is more inconsistent with the existing rural/valley environment than the impact of the imposition of the bypass structure on the existing urban environment of Beaufort.
- Neither Beaufort nor the rural/valley landscapes are protected by Significant Landscape Overlays or similar. Nevertheless, both areas are of high value to the Beaufort community and therefore it is difficult to assign one alignment comparatively greater impact from this perspective.

Project Preferred Alignment Selection

An options assessment was completed for the project alignment options A0, A1, C0 and against the customised set of criteria summarised in section 4.5. The alignment scoring scenarios show that the best performing option is the C2 Alignment, while the worst performing options are the A0 and C0 Alignments. The primary drivers for this outcome were due to the C2 alignment having:

- The lowest amount of total native vegetation clearance
- The least impact on threatened vegetation communities identified under *the Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Flora and Fauna Guarantee Act 1988* (FFG Act).
- The least impact on wildlife corridors, particularly the core habitat areas
- The lowest amount of native vegetation with high conditions to be removed by Ecological Vegetation Class (EVC) Conservation Status
- The lowest potential impacts on known or registered sites of Aboriginal and historic heritage significance
- The smallest number of dwellings within 100m, 200m and 300m of the alignment corridor.

The most significant landscape and visual impacts of the C2 Alignment, which are shown in Figure 1, are:

- Impacts on nearby dwellings (especially within the 500m of the alignment)
- Areas of fill and noise walls (especially to the north of the township where there are a number of residential dwellings and a wide waterway valley)
- Areas of significant visual cut along the southern face of Camp Hill, directly north of the township
- Large scale Bypass interchanges, with the Beaufort-Lexton Road interchange forming a new landscape edge or intrusion to the north-east of the Beaufort
- Impacts on sensitive and public sites, primarily Camp Hill.

Rating of C2 Alignment in meeting the EES objectives and assessment criteria

Table 2: Rating of Preferred Alignment to meet EES objectives and assessment criteria.

Sub-objective	Criteria	LVIA Rating
Sub-objective 1: To minimise the visual impact upon residents adjacent to the project	Assess the level of impact on residential properties adjacent to the project within 500m	Very poorly
Sub-objective 2: To minimise the impact upon publicly accessible places and places of cultural and natural value	Minimises impact on significant local areas (e.g. Camp Hill State Forest, Snowgums Bushland Reserve, Beaufort Trotting Track, Main Lead Road waterway, Beaufort Motorcycle Track, Yam Holes Creek, Central Beaufort, Apex Park)	Neither well nor poorly
Sub-objective 3: To minimise impact upon existing landscape character	Minimises impact on High to Very high sensitive landscape character areas	Moderately poorly
	Minimises the magnitude of change by the proposed Alignments (cut and fill, scale of physical impact, quantity of trees and other vegetation removed, topography)	Moderately poorly
	Minimise impact on key and significant views and viewsheds of the wider landscape	Neither well nor poorly

Sub-objective 1: To minimise the visual impact upon residents adjacent to the project

Overall the alignment rated Very Poorly in achieving minimising impact on existing dwellings. Alignment C2 has the highest number of residential properties with the 500m of the alignment when compared to all alignments. The majority of the dwellings – 52 out of the 66 – are within the 251–500m zone and as such there is opportunity for design mitigation of the alignment to reduce the visual impact of the dwellings, through earth mounding, vegetation and well-designed noise walls, bridges and other large-scale visible elements.

Sub-objective 2: To minimise the impact upon publicly accessible places and places of cultural and natural value

Alignment C2 has seven sites of moderate to high sensitivity within 500m. They are

- Snowgums Bushland Reserve
- Yam Holes Creek
- Racecourse Road Mullock Heap
- Camp Hill Lookout
- Camp Hill Picnic Area
- Camp Hill State Forest
- Main Lead Road waterway

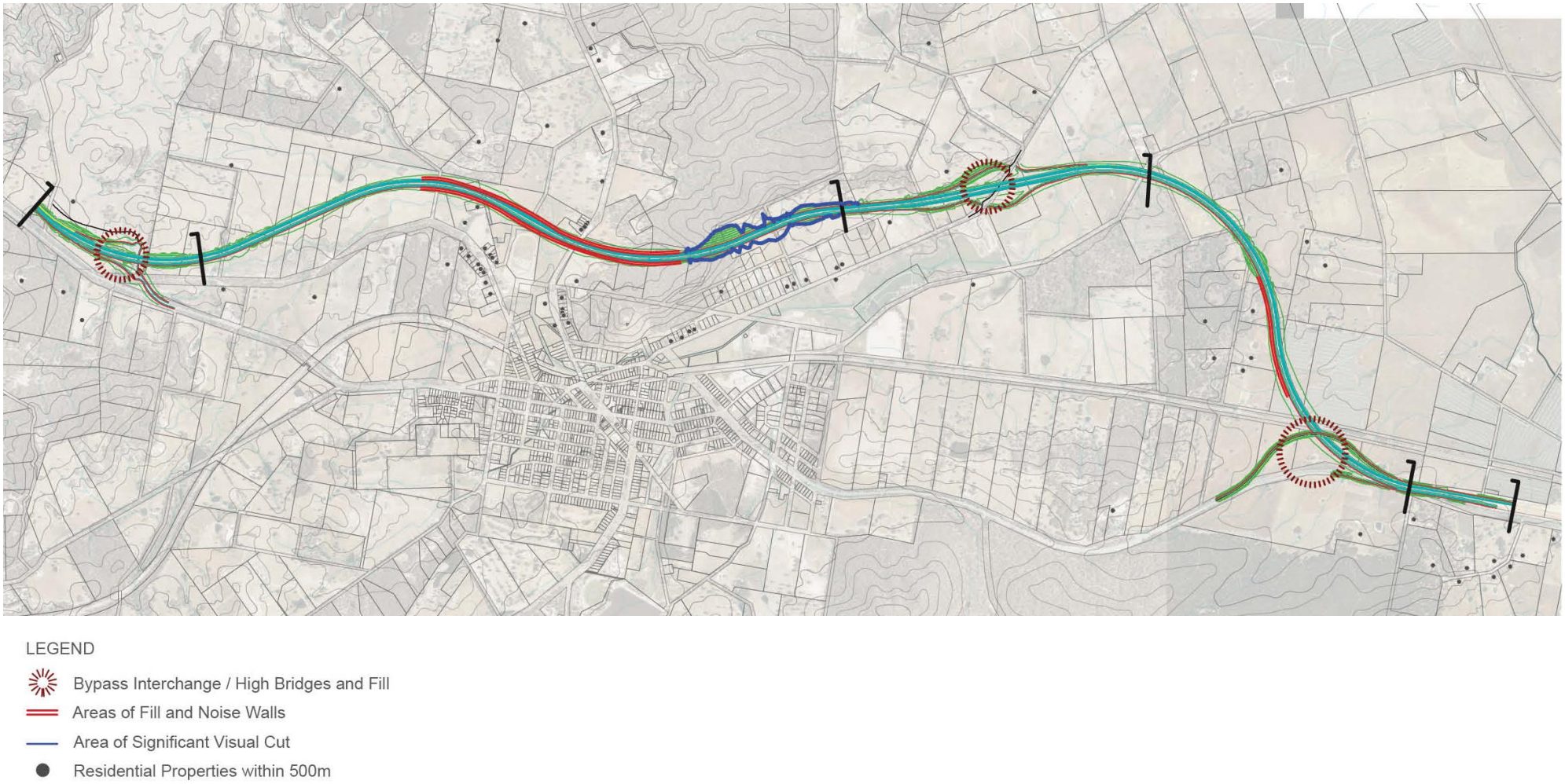

Figure 1. Alignment C2. Overview of the most significant Landscape impacts

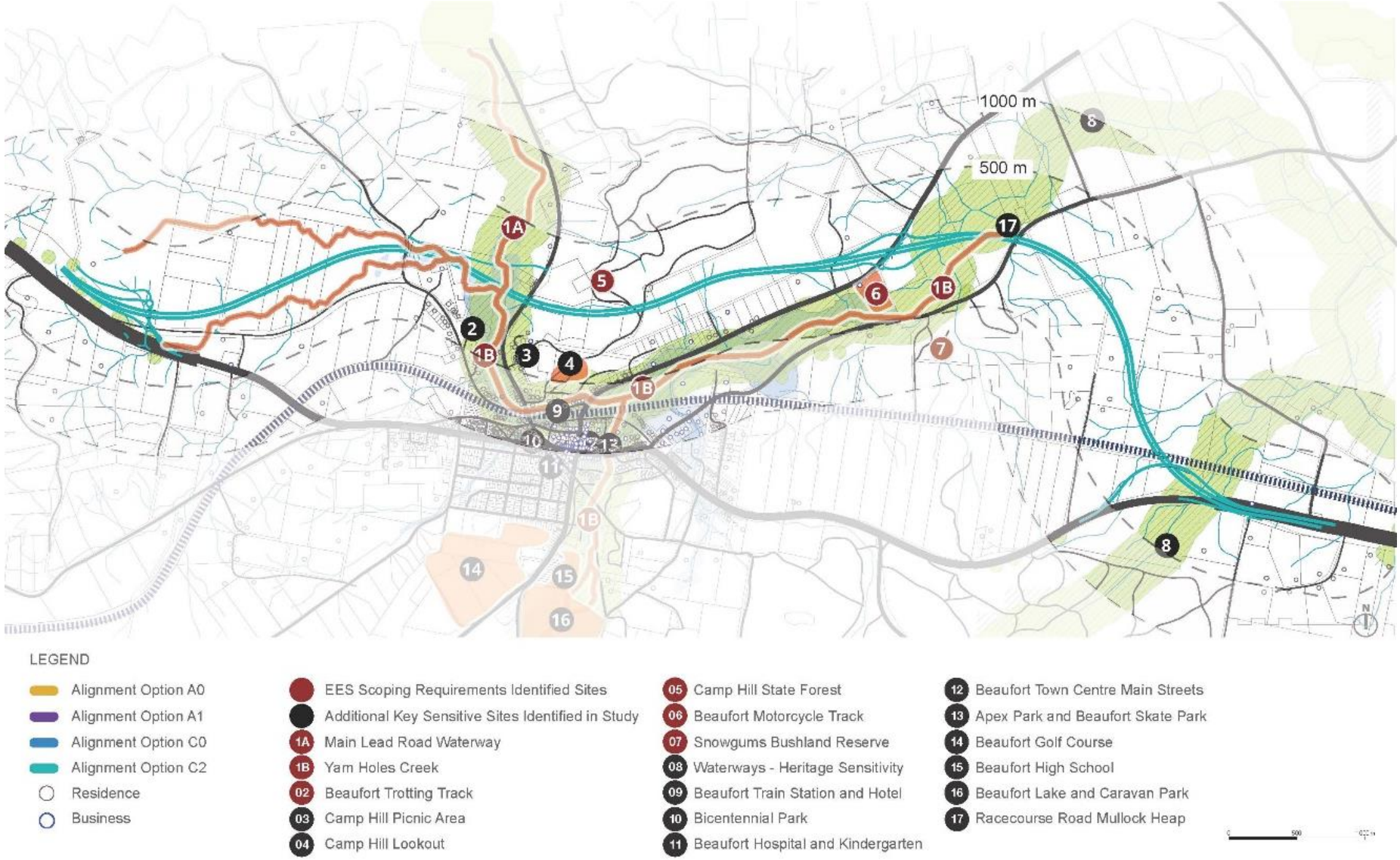

Figure 2. Alignment C2, highlighting sensitive sites within 500m of alignment.

The sites most affected include Camp Hill Forest, Yam Holes Creek and Main Lead Road waterway. Camp Hill is affected because of its high level of sensitivity and the significant reduction in its overall extent. Yam Holes Creek and Main Lead Road waterway are also affected primarily because the alignment will be quite visible from these entities.

Alignment C2 is close to three sensitive viewsheds, primarily the Camp Hill area and the Eastern Range. The Eastern Range is quite some distance from the alignment, and as such will not detrimentally affect the significance of the site. The Camp Hill viewshed is significant in terms of views both to and from the hill. Camp Hill and the overall mountain range will be affected by large-scale cut on its southern side and overall disturbance caused by the alignment.

Sub-objective 3: To minimise impact upon existing landscape character

Alignment C2 is made of five segments. Each segment was assessed for impact on landscape character and then assessed against the LVIA objectives (rating). Overall the alignment rated Moderately–Poorly in achieving minimising impact on landscape character. Key landscape character impacts include:

- Significant cut into the Camp Hill hillside with visibility of this for some distance and from within Beaufort.
- Lengths of elevated embankment and bridge structures within low, wide waterway areas.

1. Introduction

Regional Roads Victoria (RRV), formerly VicRoads, proposes to construct a new freeway section of the Western Highway to bypass the town of Beaufort (the project), linking completed sections of the Western Highway duplication to the east and west of Beaufort.

On 22 July 2015, the Minister for Planning determined an Environment Effects Statement (EES) would be required under the *Environment Effects Act 1978* (EE Act) to assess the potential environmental effects of the project. The EES includes consideration of four alternative alignments and selection of a preferred bypass alignment which identifies the land to be reserved for the future construction. The EES process provides for identification and analysis of the potential environment effects of the project and the means of avoiding, minimising and managing adverse effects. It includes public involvement and allows stakeholders to understand the likely environmental effects of the project and how they will be managed.

1.1 Project background

The Western Highway is the primary road link between Melbourne and Adelaide. It serves interstate trade between Victoria and South Australia and is a key transport corridor through Victoria's west. Over 6,500 vehicles utilise the Western Highway, west of Ballarat each day. Of these 6,500 vehicles, 1,500 are classed as commercial heavy vehicles. These traffic volumes are expected to increase to approximately 7,500 by 2025 and 9,500 by 2040. RRV have identified the need to upgrade the Western Highway from Ballarat to Stawell to:

- Improve road safety at intersections
- Improve safety of access to adjoining properties
- Enhance road freight efficiency
- Reduce travel time
- Provide better access to local facilities
- Improve roadside facilities.

As part of planning studies commissioned by the Commonwealth and State Governments, bypass route options around the town of Beaufort have been considered to meet the objectives identified by RRV and the National Land Transport Network's Nation Building Program.

The project would include construction of a dual carriageway, connections to major intersecting roads, interchanges to connect Beaufort to the Western Highway at the eastern and western tie-in points, several waterway crossings, an overpass of the Melbourne-Ararat rail line, and intersection upgrades at local roads and provision for service roads as required.

1.2 Project objectives

The objectives of the project are to:

- Improve road safety and maintain the functionality of Beaufort's road network
- Improve freight movement and efficiency across the road network
- Improve Beaufort's amenity by removing heavy vehicles
- Improve access to markets and the competitiveness of local industries.

1.3 Purpose of the report

ASPECT Studios has been engaged by WSP and RRV to provide a Landscape and Visual Impact Assessment (LVIA) for the Beaufort Bypass EES. RRV proposes to construct a dual carriageway along a new alignment around the town of Beaufort.

The EES is to document investigations of potential environmental effects of the proposed project, including the feasibility of associated environmental mitigation and management measures. The key EES draft evaluation objective, which is most relevant to the LVIA, is;

- Landscape and visual – To minimise adverse effects on visual and landscape values as far as practicable, during construction and operation.

This report provides a desktop evaluation of the anticipated landscape and visual impacts for each bypass alignment based on a series of evaluation criteria. This assessment aims to assist in the selection of a preferred alignment.

2. Project description

The project would comprise of an 11 km freeway standard bypass to the north of the township of Beaufort, connecting the two recently duplicated sections of the Western Highway to the east and west of Beaufort. The project would be constructed under a Design and Construct or Construct only contract administered by a superintendent at RRV/MRPV, following a competitive tender process. Department of Transport would manage and maintain the asset.

2.1 Freeway standard bypass

The project would connect the duplicated sections of the Western Highway to the east and west of Beaufort via the Option C2 bypass to the north of Beaufort that avoids Snowgums Bushland Reserve and cuts through Camp Hill. The bypass would include the following key components:

- Designed as a freeway standard bypass
- Approximately 11 km long
- Designed to 120 km/hr and sign posted to 110 km/hr for its entirety
- Two tie-in interchanges
- One road over rail bridge
- Waterway crossings
- Diamond interchange to connect with the local road network
- Overpass bridge structures over the local road
- Four overpass bridge structures over the local road network.

2.2 Interchanges

The project would have interchanges at the following locations:

- Tie-in points to existing Western Highway at the eastern and western ends of the bypass
- Diamond interchange at existing local road network connection (Beaufort-Lexton Road).

2.3 Bridges and culverts

The route option would have bridge structures at the following locations:

- Road over rail bridge structure for the Melbourne–Ararat rail line
- Several waterway bridge structures over Yam Holes Creek
- Overpass bridge structures for the existing local road network:
  - Main Lead Road
  - Beaufort-Lexton Road (diamond interchange)
  - Racecourse Road
  - Back Raglan Road.

2.4 Alignment descriptions

Four alignment options, referred to as Options A0, A1, C0 and C2, were assessed in order to identify a preferred bypass (see Figure 3). Following extensive community consultation and technical assessments, Option C2 was selected as the preferred route. The study areas shown in Figures 3–7 are defined by the EES scoping requirements, and additional information on this process may also be found in EES Attachment IV: *Options assessment* (RRV 2019).

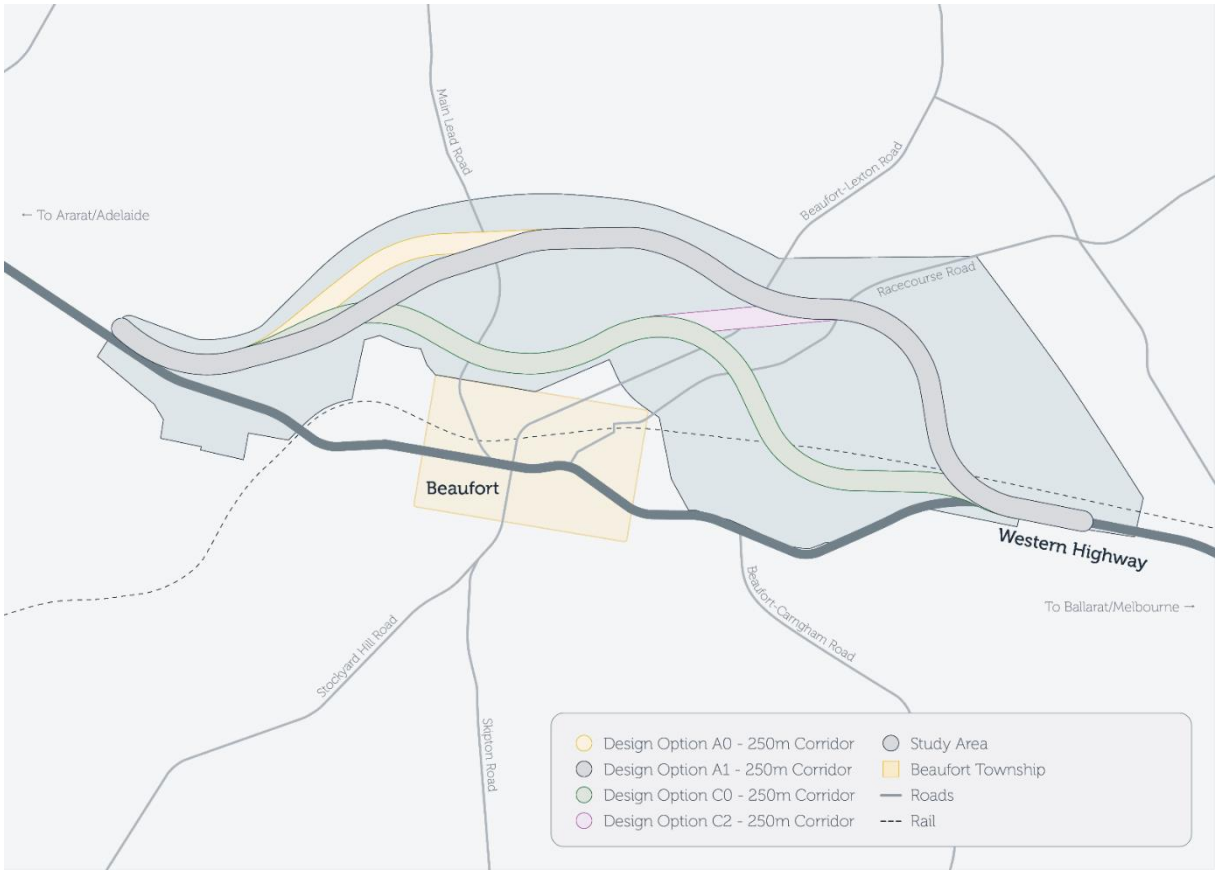

Figure 3. Beaufort Bypass alignment options and study area

2.4.1 Option A0

The A0 bypass alignment is 11.2km in length and is the northern most bypass option (see Figure 4). From the western tie-in point, approximately 3km from the Beaufort township, this alignment curves north–north-east, where there will be a west-facing, half diamond interchange to maintain access to private properties and the township via the existing Western Highway. The alignment passes over Main Lead Road then climbs through the State Forest north of Camp Hill. From here it descends to a full diamond interchange at Beaufort–Lexton Road, which will provide access to the north and south of the township, before re-joining the Western Highway at its eastern extent, approximately 4.5km from Beaufort. An outbound exit ramp at the eastern interchange will allow for eastern access to Beaufort via the existing Western Highway. Bridges will pass over Main Lead and Racecourse Roads, as well as over the Melbourne–Ararat rail line. The main areas of fill occur at bridge and interchange locations with a large cut section north of Camp Hill.

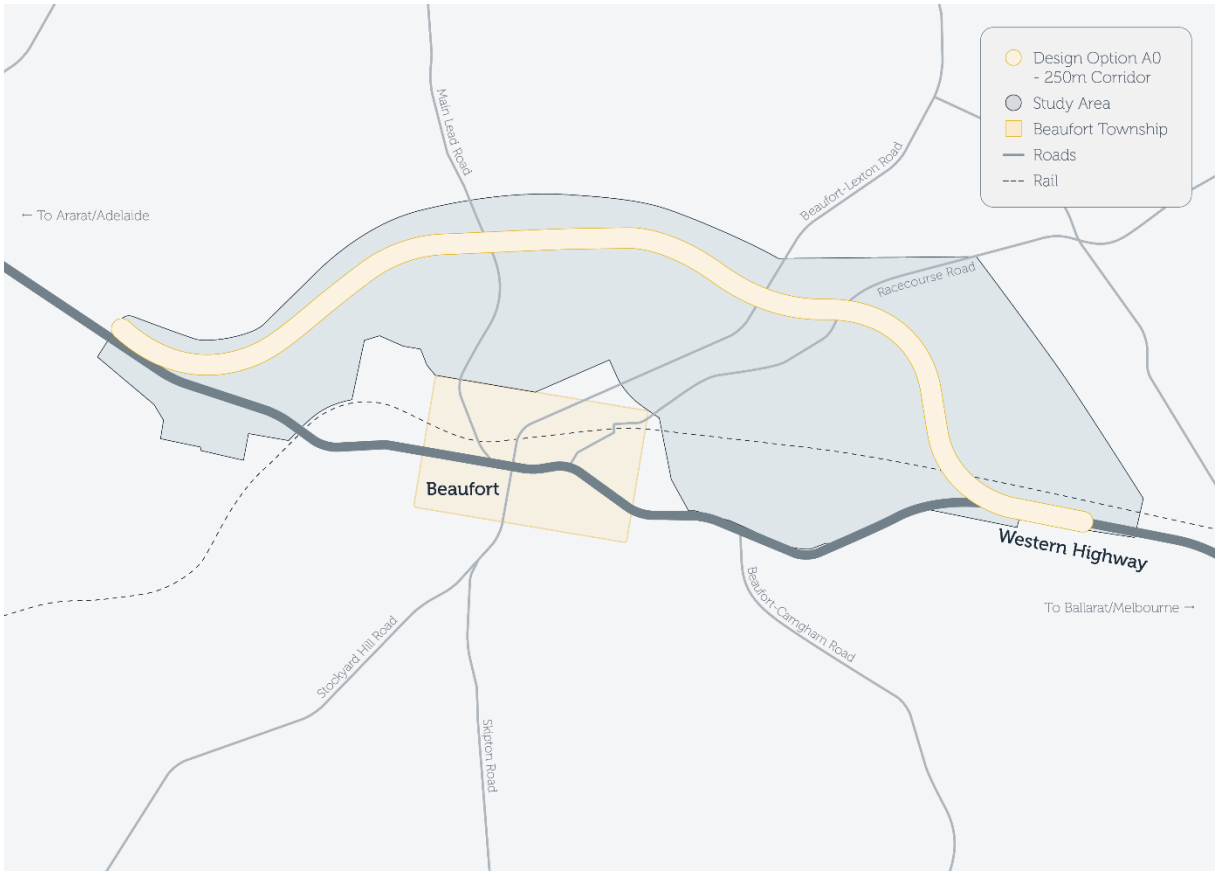

Figure 4. Beaufort Bypass A0 alignment option

2.4.3 Option A1

The A1 bypass alignment option is 11.1km in length (see Figure 5). Approximately 3km from the Beaufort township, this alignment deviates north-east from the Western Highway, staying slightly south of option A0 until a point east of Main Lead Road, where it re-joins the A0 alignment. There will be a west-facing, half diamond interchange at the western tie-in to maintain access to private properties and the township of Beaufort via the existing Western Highway, and a full diamond interchange at Beaufort-Lexton Road to maintain north-south access. The A1 alignment will re-join the Western Highway approximately 4.5km to the east of the township. An outbound exit ramp at the eastern interchange will allow for eastern access to Beaufort via the existing Western Highway. Bridges will pass over Main Lead and Racecourse Roads, as well as over the Melbourne–Ararat rail line. The main areas of fill occur at bridge and interchange locations, with cuts north-east of Back Raglan Road, and north of Camp Hill.

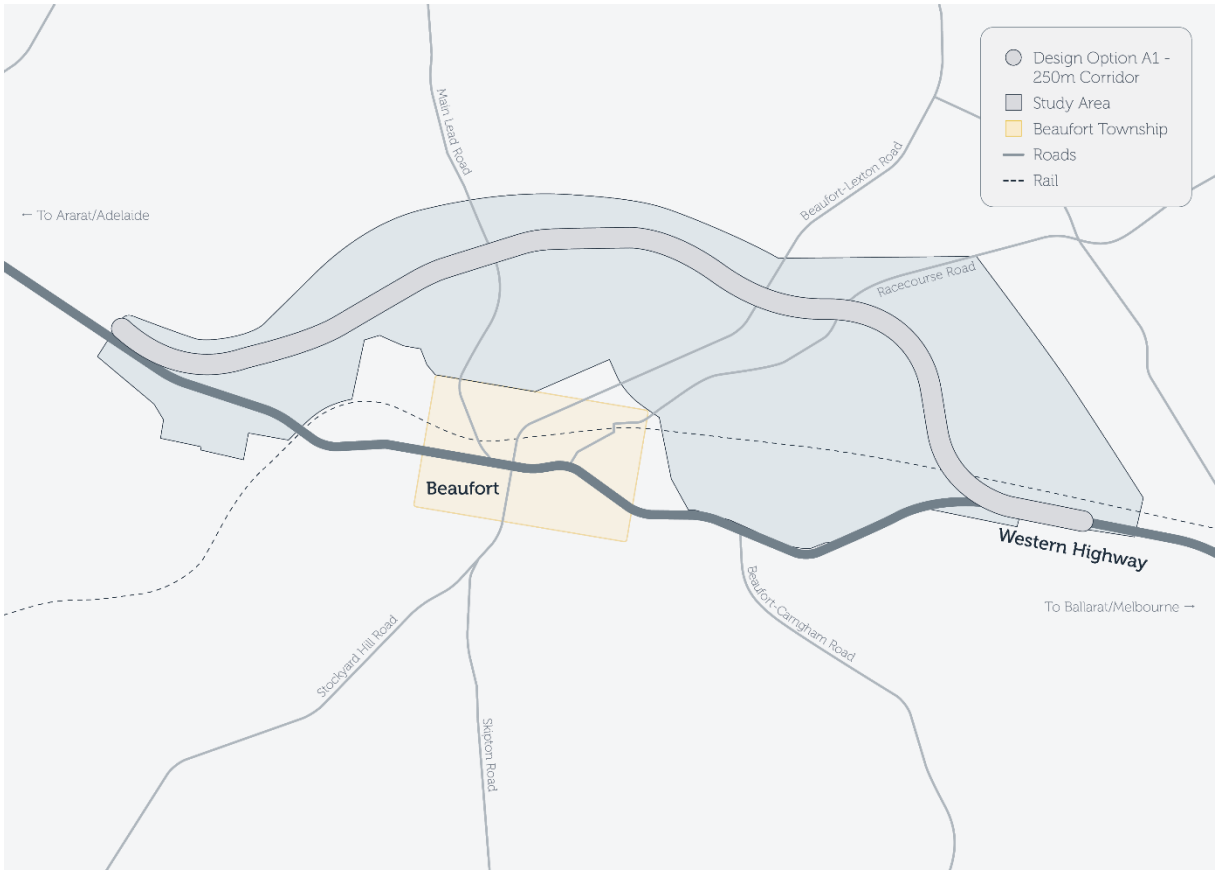

Figure 5. Beaufort Bypass A1 alignment option

2.4.5 Option C0

The southernmost option, C0, is approximately 10.6km in length from the west to east tie-in points of the Western Highway (see Figure 6). Access to the Beaufort township via the existing Western Highway will be maintained by a west -facing, half diamond interchange in the west. The C0 option follows the A0 option from the western tie-in point, approximately 3km from the Beaufort township, before deviating at Back Raglan Road in a more easterly direction almost parallel to the existing Western Highway. This option passes close to the north of Camp Hill, with some cut and fill required in this section, before curving south-east to a full diamond interchange at Beaufort-Lexton Road, providing north-south access. The C0 alignment will re-join the Western Highway approximately 4.5km to the east of the township. Bridges will pass over Main Lead and Racecourse Roads, as well as over the Melbourne–Ararat rail line. The main areas of fill occur at bridge and interchange locations, with the largest cut and fill areas north and north-east of Camp Hill.

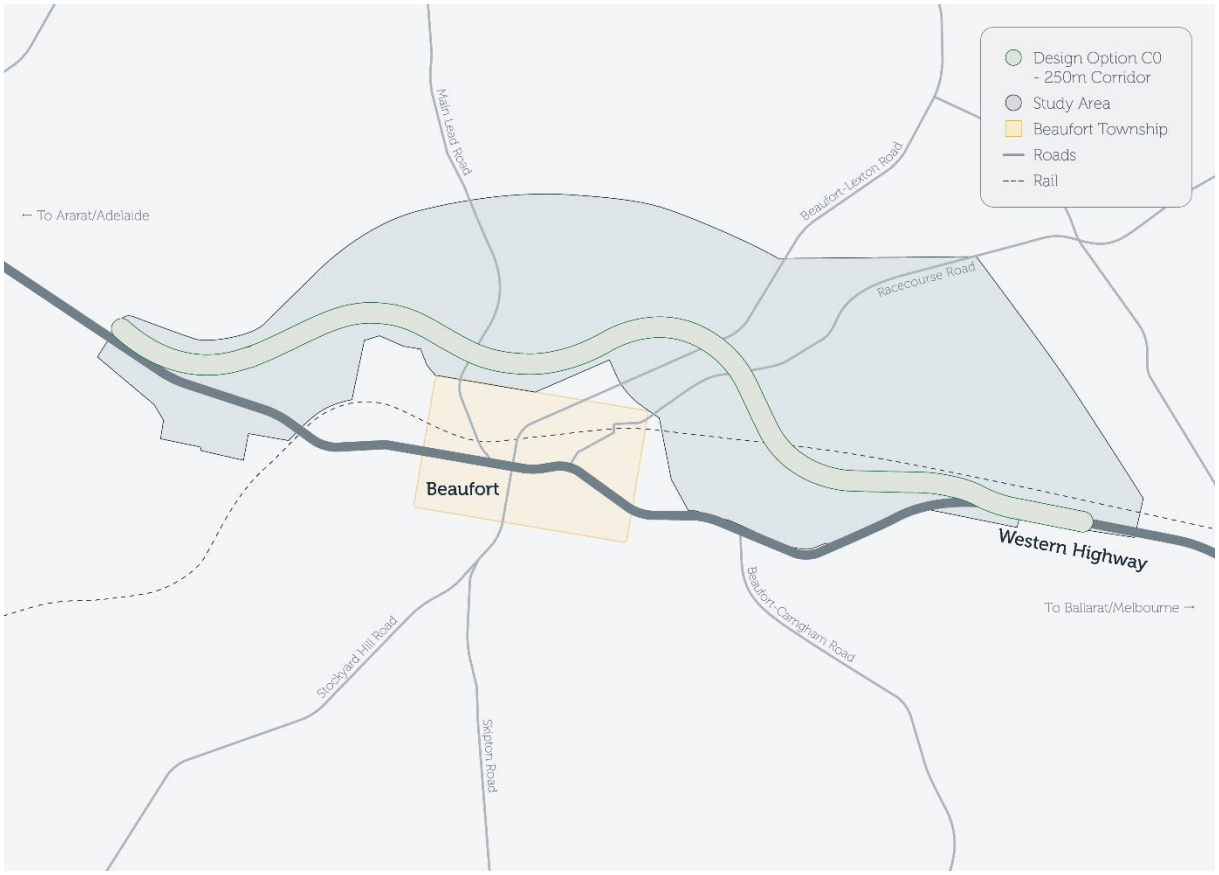

Figure 6. Beaufort Bypass C0 alignment option

2.4.7 Option C2, preferred alignment

Option C2 is 11km in length and is a hybrid between the A0 and the C0 options (see Figure 7). It follows the C0 option from the western tie-in point (approximately 3km from the Beaufort township) until Beaufort-Lexton Road, where it continues in an easterly direction and joins the A0 alignment near Racecourse Road. The C2 alignment will re-join the existing Western Highway at the eastern tie-it point, approximately 4.5km from the township. At the western extent, access to Beaufort via the existing Western Highway will be maintained by a half diamond interchange, and there will be a full diamond interchange over Beaufort-Lexton Road. Access to Beaufort via the existing Western Highway at the eastern approach will be maintained by an outbound exit ramp at the eastern interchange. Bridges will pass over Main Lead and Racecourse Roads, as well as over the Melbourne–Ararat rail line. The main areas of fill occur at bridge and interchange locations, with the largest cut and fill areas north and north east of Camp Hill.

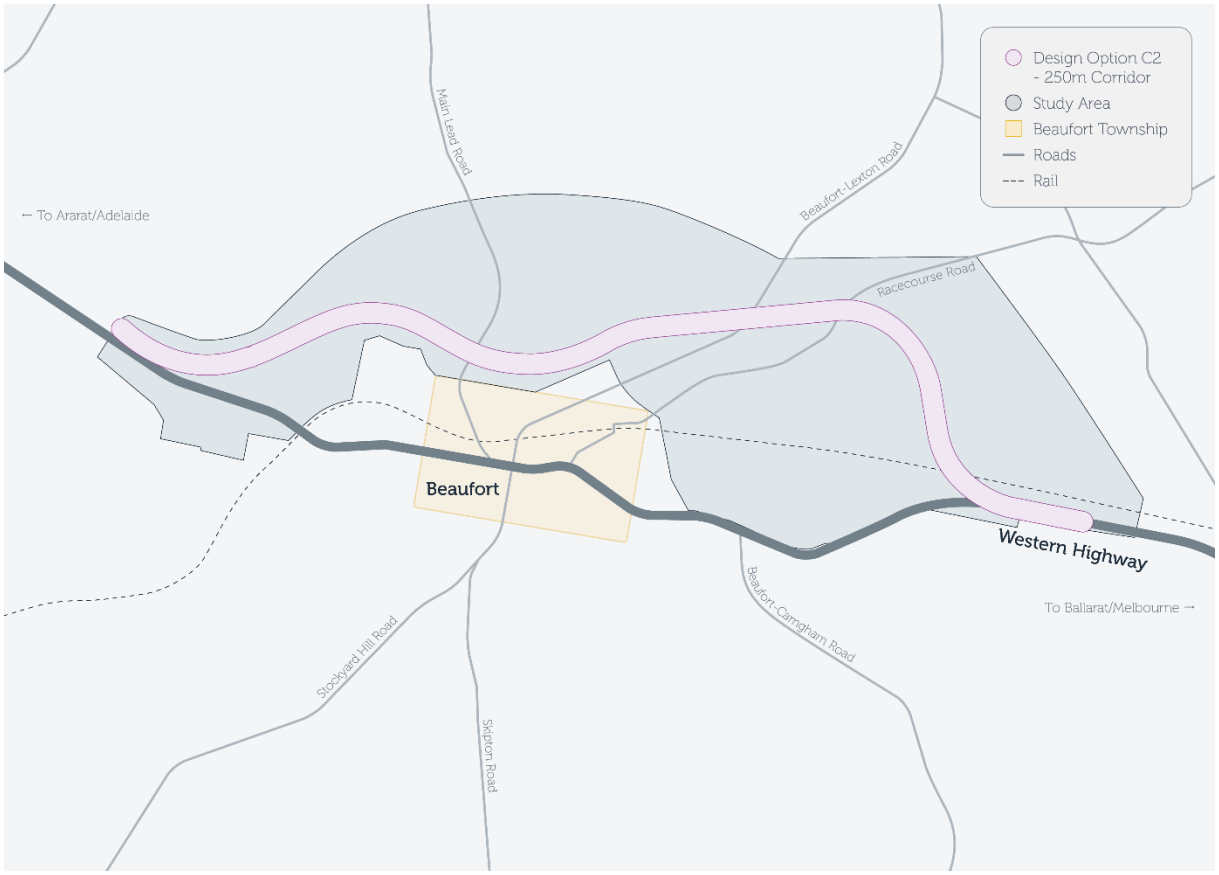

Figure 7. Beaufort Bypass C2 alignment option

2.5 Project construction

The following construction sub-sections describe the construction activities for the project. Construction of the bypass is expected to take two years and commence once construction funding and approvals are obtained.

2.5.1 Construction activities

Construction activities would include:

- Preconstruction site delineation and compound setup, which may include (but not be limited to) tree clearance and vegetation lopping / removal, and establishment of construction site(s) and access tracks
- Establishment of environmental and traffic controls
- Route clearance and relocation and / or protection of utilities
- Channel realignments to maintain existing flow paths
- Construction drainage and sediment and erosion control mitigation
- General earthworks:
  - Excavation of a cut including stripping of topsoil and placement of fill
  - Import, export and stockpiling of fill
  - Treatment of contaminated soil or removal of hazardous material, if required
- Development of structures, interchanges, batters, drainage and pavement
  - Development of ancillary infrastructure:
  - Noise barriers
  - Lighting
  - Safety barriers
- Line marking
- Landscaping and site reinstatement.

2.6 Operations and maintenance

Operations and maintenance of the project would be consistent with current practices and standards, including the VicRoads' *Roadside Management Strategy* (2011). Key objectives include:

- Asset management of landscaped areas, stormwater drains, bridges and culverts, road pavement, signage. barriers and line marking
- Enhancement of transport safety, efficiency and access
- Protection of environmental and cultural heritage values
- Management of fire risk
- Preservation and enhancement of roadside amenity
- Routine and life cycle maintenance activities throughout operations
- Monitoring and management of areas of environmental sensitivity such as water bodies and wildlife corridors.

3. EES scoping requirements

The *Scoping Requirements for Beaufort Bypass Project Environment Effects Statement* (Department of Environment, Land, Water and Planning (DELWP) 2016) (Scoping Requirements) have been prepared by DELWP on behalf of the Minister for Planning. The Scoping Requirements set out the specific environmental matters to be investigated and documented in the EES, which informs the scope of the EES technical studies.

The EES evaluation objective outlined in the Scoping Requirements relevant to the LVIA is:

Evaluation objective: To minimise adverse effects on visual and landscape values as far as practicable, during construction and operation

Table 3: EES scoping requirements

Scoping requirements sub-section	Matter to be addressed	Relevant assessment	Addressed in this assessment
Key issues	The potential for adverse effects on landscape and visual values, particularly the sensitive landscape areas of local or regional significance including; Camp Hill State Forest, Snowgums Bushland Reserve, Beaufort Trotting Track, Main Lead Road waterway and Beaufort Motorcycle Track, and waterway crossings including culturally significant watercourses in the landscape.	Landscape and Visual	✓
	The adverse effects on landscape and visual values associated with potential impacts to 'treed roadsides' and, in general, the impacts associated with loss of trees and other vegetation.	Landscape and Visual	✓
	The interaction of the proposed alignment alternatives with viewsheds to the wider landscape and significant landscapes in the area.	Landscape and Visual	✓
Priorities for characterising the existing environment	Landscape character types and values and their sensitivity to change for each relevant alignment alternative, including the preparation of a photomontage to scale where appropriate.	Landscape and Visual	✓
	Viewsheds to the areas of works for relevant alignment alternatives from Beaufort and other settlements.	Landscape and Visual	✓
Design and mitigation measures	Potential and proposed design alternatives and measures to protect landscape values which could be affected by relevant alignment alternatives. Provide design solutions to enhance the visual amenity of the immediate environs of each alignment alternative.	Landscape and Visual	✓
		Landscape and Visual	✓
Assessment of likely effects	The likely effects of relevant alignment alternatives on landscape and visual amenity values including impacts from vegetation removal and any loss of landscape connectivity.	Landscape and Visual	✓
	The likely effects of relevant alignment alternatives on landscape and visual amenity values to the sensitive landscape areas of local or regional significance.	Landscape and Visual	✓
Approach to manage performance	Proposed principles for managing residual effects on landscape and visual amenity, including enhancement of the visual amenity for residents and farmers living in the vicinity of the project as part of the EMF.	Landscape and Visual	✓

4. Methodology

4.1 Study area

The terminology utilised throughout the current technical assessment relating to the study area and alignment options is defined below.

Study area: The study area for the Beaufort Bypass EES project includes approximately 1,800 ha of land north of the Beaufort township, which contains the four bypass options assessed in this report. During the development stages of the alignment options, the study area was assessed to determine potential environmental impacts and constraints to individual alignment options.

Alignment options: Alignment options (A0, A1, C0 and C2) refer to the four selected bypass options assessed within the study area. Each alignment option consists of a 250 m corridor in which the specific bypass option has been designed. Each alignment option, unless otherwise stipulated, is the area assessed for direct and indirect impacts resulting from the construction, operation and maintenance of the project.

4.1.1 Landscape and Visual Impact study area

The LVIA study area is broader than the project study area. The LVIA must consider broader views and landscape character areas that the project may have impact on. For example, views to the Eastern Ranges have been included because they have landscape significance. Moreover, potentially impacted landscape character areas are bounded by topography, vegetation and viewsheds, which extend beyond the 250m corridors utilised for the options assessment. The LVIA study area typically assesses landscape character impacts within 1km corridors for each alignment option, with viewshed impacts extending beyond the project study area to the Eastern Ranges. Figures within Section 6.3.7 illustrate these boundaries.

4.2 Risk assessment methodology

An environmental risk assessment (ERA) has been utilised in the Beaufort Bypass EES to identify environmental impacts associated with the construction and operation phases of the project. The risk assessment process is consistent with the guidance provided in Sections 3.1 and 4 of the *Scoping Requirements for the Beaufort Bypass Project EES* (DELWP 2016) and the *Ministerial guidelines for assessment of the environmental effects under the Environment Effects Act 1978* (Department of Sustainability and Environment (DSE) 2006).

The purpose of the ERA was to provide a systematic approach to the identification and further assessment of potential impacts resulting from the project, whether they be environmental, social or economic. The ERA articulates the probability of an incident with environmental, social or economic effects occurring and the consequence of that impact to the environment. Identified impacts with a medium or higher initial risk are subject to detailed impact assessment and mitigation treatments, detailed within each discipline impact assessment

RRV defines risk and impact as:

- “Environmental risk reflects the potential for negative change, injury or loss with respect to environmental assets” (DSE 2006). This approach is consistent with ISO 31000: 2018, which defines risk as “the effect of uncertainty of [environmental] objectives”. Both definitions reflect the fact that risk is typically expressed in terms of the likelihood of a change occurring and the consequence of that change.
- Environmental impact is described as any change to the environment as a result of project activities.

The risk assessment is a critical part of the EES process as it guides the level and range of impact assessment for the EES and facilitates a consistent approach to risk assessment across the various disciplines.

4.2.1 Risk Assessment Process

The ERA has guided the environmental impact assessment for the project. The objectives of the ERA are to:

- Identify primary environmental risks that relate to the construction and operation of the project

- Guide the level and extent of investigation and data gathering necessary for accurately characterising the existing environment and assessing the project's environmental impact
- Help identify mitigation measures to avoid, minimise and mitigate environmental risks
- Inform assessment of likely residual effects that are expected to be experienced after standard controls and proposed mitigations have been implemented.

The risk assessment process for the EES adopts a risk management framework as detailed in the VicRoads Environmental Sustainability toolkit. The process includes:

- An approach to environmental management which is aligned with ISO 31000: 2018
- Systems used to manage environmental risk and protect the environment, and how these are implemented at different stages of road construction, operation and maintenance
- Tools and reporting requirements which provide guidance in managing environmental issues throughout the project.

The ERA identifies impact events for each relevant element of the environment, details the primary risks and has informed the level and range of technical reporting required to address predicted impacts. The ERA utilises a risk matrix approach where the likelihood and consequence of an event occurring are considered (**Error! Reference source not found.**, **Error! Reference source not found.** and **Error! Reference source not found.**). All risks are reassessed at regular intervals during all phases of the project, from the development of the EES to operation and maintenance, to ensure they are still applicable, that controls are appropriate and effective, and that they reflect most recent outcomes of specialist technical studies.

Table 4: Risk Assessment Matrix

			LIKELIHOOD				
	Risk Categories		**Rare (A)**	**Unlikely (B)**	**Possible (C)**	**Likely (D)**	**Almost Certain (E)**
CONSEQUENCE	**Catastrophic**	**5**	Medium	High	High	Extreme	Extreme
	Major	**4**	Medium	Medium	High	High	Extreme
	Moderate	**3**	Low	Medium	Medium	High	High
	Minor	**2**	Negligible	Low	Low	Medium	Medium
	Insignificant	**1**	Negligible	Negligible	Negligible	Low	Low

Based on the project objectives and context, a set of project-specific and appropriate assessment, likelihood and consequence criteria were developed.

The likelihood categories and consequence descriptions are used as a guide for evaluating risk and are shown below in **Error! Reference source not found.** and **Error! Reference source not found.**.

Table 5: Likelihood categories.

RARE (A)	UNLIKELY (B)	POSSIBLE (C)	LIKELY (D)	ALMOST CERTAIN (E)
Less than once in 12 months OR 5% chance of recurrence during course of the contract	About once in 6 months OR 10% chance of recurrence during course of the contract	About once in 4 months OR 30% chance of recurrence during course of the contract	About once in 2 months OR 50% chance of recurrence during course of the contract	About once in a month OR 100% chance of recurrence during course of the contract
The event may occur only in exceptional circumstances	The event could occur but is not expected	The event could occur	The event will probably occur in most circumstances	The event is expected to occur in most circumstances
It has not happened in Victoria but has occurred on other road projects in Australia.	It has not happened regionally but has occurred on other road projects in Victoria	It has happened in the Beaufort region	It has happened on an adjoining section of the Western Highway	It has happened on more than one of the adjoining Western Highway projects OR It has happened multiple times on an adjoining Western Highway project.

Consequence criteria have been developed for the project in consultation with technical specialists. The result is a discipline and aspect-specific set of consequence descriptors used to define what would be considered an Insignificant, Minor, Moderate, Major and Catastrophic consequence associated with a risk event.

Table 6: Description of risk consequence categories.

ASPECT	INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC
Construction impacts on landscape values	An imperceptible or barely perceptible change in a particular view or landscape characteristic within a restricted area.	A barely perceptible change in landscape characteristics over a wide area or a noticeable change over a restricted area, which will not fundamentally change the character of the landscape.	A noticeable change to landscape characteristics over a wide area or a considerable change over a restricted area, which will result in changes to the character of a landscape.	A considerable change to landscape characteristics, frequent or continuous and over a wide area or a clearly evident change, but over a restricted area, which will fundamentally change the character of a landscape.	A dominant and frequent change to landscape characteristics affecting an extensive area, which will fundamentally change the character of a landscape or view considered to be of at least regional importance.
Construction impacts on visual amenity	Change which is barely visible, typically at a very long distance and/or visible for a very short duration, and/or are expected to blend with the existing view.	Minor changes in views typically at longer distances or visible for a short duration, and/or are expected to blend in with the existing view to a moderate extent.	Clearly perceptible changes in views, typically at intermediate distances and/or resulting in either a distinct new element in a significant part of the view, or a wider ranging, less concentrated change across a wider area.	Major changes in view, typically at close distances and/or affecting a substantial part of the view, continuously visible for a long duration, or obstructing a substantial part or important elements of a view.	Major changes in view, typically at close distances and/or affecting a substantial part of the view, continuously visible for a long duration, or obstructing a substantial part or important elements of a view considered to be of at least regional importance.

The risk assessment was undertaken for each discrete alignment option as each option had a distinct profile, type and extent of environmental impacts. The assessment of these impacts is detailed within Sections **Error! Reference source not found.** and **Error! Reference source not found.** of this report.

See Appendix: Landscape and visual impact risk assessment for the Preferred Alignment and Appendix: Landscape and visual environmental risk assessment register for outcomes of the ERA process.

4.3 LVIA assessment methodology

4.3.1 LVIA objectives

In order to assess the alignment options in relation to the key objective of the EES, to 'minimise adverse effects on visual and landscape values as far as practicable, during construction and operation', ASPECT Studios has determined the following appropriate assessment sub-objectives:

- Sub-objective 1: To minimise the impact upon residential dwellings adjacent to the project
- Sub-objective 2: To minimise impact upon locally sensitive places, views and viewsheds
- Sub-objective 3: To minimise impact upon existing landscape character.

In order to undertake the landscape and visual impact evaluation the following key assessment criteria have been identified. The assessment criteria are overarching and apply to all three sub-objectives.

As such, this landscape and visual impact assessment report has the following objectives:

- To identify the landscape character and the values of the area
- To identify locations and areas of valued places, views and viewsheds
- To assess the potential impact on existing landscape character and value
- To assess the potential impact on valued places, views and viewsheds
- To assess the potential visual impact on residents adjacent to the project
- To assess the potential light spill impacts from the project
- To recommend mitigation measures, if required, that may minimise or avoid impacts to the landscape character and visual amenity
- To assess the potential residual impacts that may remain following the implementation of the recommended mitigation measures.
- Note that the final impact assessment assumes that standard mitigation practices will be undertaken. These are outlined in Section 10

4.3.2 Scope of work

Task 1 – Identifying key landscape characters, value and sensitivity to change

Task 1 identifies the landscape and visual values within the study area. The analysis was informed by:

- Review of other relevant strategic documents
- Review of maps and reports prepared by various consultants, which identify values important to the assessment
- Site investigation and photography from public land – no access to private land was sought
- Identification of existing physical features
- Identification of natural and cultural values
- Identification of the landscape character areas
- Identification of key views and places of public significance and value.

Task 2: Landscape and visual impact assessment

The purpose of this task is to undertake an evaluation of the anticipated urban design, landscape and visual impacts for the alignments, based on a series of evaluation criteria.

The assessment is informed by:

- 3D modelling of alignment on 3D topography
- Photomontages of the project from key viewpoints
- Use of the WSP 3d model
- Cross sections
- Viewshed analysis.

Task 3: Final assessment

The purpose of this task is to undertake a general assessment of the alignments and to ascertain the preferred Alignment.

Assessment limitations

Assessment limitations associated with this project include:

- Limited alignment design information.
- Limited access to assess impact on private property. All views and photographs were assessed from publicly accessible locations for this stage.
- Viewshed mapping is an estimate only using Google Earth Pro.

4.3.3 Assessment methodology

There are two key ways in which the impact of the project on the landscape and visual amenity of the community is assessed: firstly, by looking at the overall landscape character of the area and its ability to accommodate the project; secondly, by looking at the views and residential visual amenity of the area and how the project will affect them. In order to identify potential impacts, a risk assessment is undertaken.

4.3.4 Landscape character assessment methodology

Landscape character type

The landscape impact assessment is based on identifying landscape character areas and their values, identifying the main sites of visual sensitivity and ascertaining the effects of the project on these areas and sites.

'A landscape character area is a broad scale area of land with common distinguishing visual characteristics.' (Leonard and Hammond R, 1983)

A landscape character area provides a picture or sense of the landscape and is defined by an area of visually distinct common features. Additionally, cultural elements and aesthetic, perceptual and experiential aspects can make different places distinctive (Guidelines for Landscape and Visual Impact Assessment, United Kingdom Landscape Institute and the Institute of Environmental Management and Assessment, third edition 2013). Landscape character areas are the product of a combination of multiple elements that impact how a landscape appears and is utilised, which Guidelines for Landscape and Visual Impact Assessment categorises as: geomorphology, waterways, vegetation, land uses, and visual and sensory aspects. The experience in, to and from landscapes can also influence their character. Through defining landscape character areas, the values of the landscape can be clearly identified, which in turn aids in determining the capacity for the landscape to accommodate and absorb the proposed Beaufort Bypass.

Landscape character value

Landscape character value provides an indication of whether the landscape, or elements within the landscape, is of significance to the local or wider community, residents and other parties. The values assigned to the landscape

character areas depend in part on their prominence and also on the extent to which they are present within the landscape context.

A landscape may have value in terms of its usability and usefulness to society, ecological and hydrological importance and functionality, social and wellbeing benefits, and economic worth. Different layers contribute to making an accurate characterisation of landscape and its associated value. For example:

- **Policy** may provide an understanding of the government and community's value of a landscape or visual resource. For instance, legislation and policies may protect an important visual resource, and so identify it as being of value to the general public or important to the landscape's function.
- **Community value** is based upon an estimate of a landscape's value to the community. The community value ratings are based upon professional judgment, community engagement on the project, which was conducted by RRV, and review of council reports and strategies.
- **Culturally valued** sites or areas may be of varying levels of value, depending on different cultures.
- **Ecologically valued environments**, including protected environment vegetation classes, flora, fauna, habitat, areas of ecological function, etc. can have significant values.
- **Historical sites** or areas may be highly valued.
- **Geologically valued** elements such as soil types or natural structures and formations can influence a landscape's value.
- **Public open space** is generally considered of value, with views to and from these areas considered as standard in LVIA reporting because these are utilised by society as a whole.
- **Land use** can influence a landscape's character and how it is perceived, which impacts value.
- Rarity of landscape character, type or use can be of significance in determining value.

Additional information received from other relevant EES specialist reports may also influence landscape value, key sites and views.

Level of sensitivity and ability to absorb change

Landscape sensitivity provides an indication of the landscape's ability to absorb change without dramatically altering its character. This is typically dependent on the anticipated level of physical and visual impact (magnitude of change) the development proposal has upon the existing qualities of the landscape character area.

Magnitude of change

The magnitude of change to the landscape depends on the scale and duration of the proposed change. Roads at grade, roads that are elevated and overpasses all affect the surrounding landscapes and views in different ways and magnitudes. Typically, the taller the change, the more visible it may be to surrounding areas.

This assessment identifies the level of change to the landscape in terms of loss or addition of existing landscape features or elements being impacted (e.g. vegetation), the size, scale and mass. For example, changes to the area of the existing landscape character or large changes in topography may impact key functions of the character of the landscape. Moderate changes to topography are considered to be 2.5 m of either cut or fill, while significant changes are considered to be more than 5 m of either cut or fill.

Landscape Impact score

The final landscape Impact score for each site is developed through a combination of the assessment tools. The following table shows the system that will be used to communicate the overall impact assessment of the project on the landscape.

Victoria does not have specific standards, guidelines or rules on defining landscape and visual impact assessment reports. Therefore, experienced professional judgment is relied upon to assess the significance of the level of change and sensitivity. Impact scores are specific to each location and based on the landscape character value, the sensitivity of the site, and the view of the movement network, then assessed against the proposed level of geographical and visual change the project will create. The matrix (Table 4) below is used to determine an overall rating of landscape and visual impacts based on the two key factors, sensitivity of site, and the magnitude

of change. It should be viewed in conjunction with Table 5, which serves as a key to the colours representing the scales of landscape impact.

The method for determining the level of sensitivity of a site is discussed in the following Section, 4.2.5, as well as in Section 6.2.1. Assessment of a site's sensitivity takes into account: the level of government policy protection; its value to the community for its history, scenic amenity, character, nature or cultural connections; its ability to absorb physical change; the landscape's extent; and its typicalness.

Magnitude of change is determined through professional judgement and incorporates assessment of the views to and from the site before and after construction from key locations, as well as landscape features such as vegetation character and landform. Further details of this assessment process can be found in Section 6 and Section 7 of the four Alignments.

Table 7: Landscape character areas Impact score table. Colours represent different level of landscape impact.

	Magnitude of change						
Sensitivity of site	Very high	High	Moderate	Moderately low	Low	Very low	Negligible
Very high							
High							
Moderate							
Moderately low							
Low							
Very low							
Negligible							

The **Landscape Impact score** is the overall evaluation of the project's likely effects on the landscape character of an area. An area of high value landscape character is more likely to be highly impacted than an area of low value. The values of a defined set of landscape character types are further discussed in Section 6.2 and their assessed value. Value is determined by professional judgement and incorporates the value the landscape character has in the community through statutory protection, policy or strategic local government studies, and through community perceptions.

Table 8: Landscape Impact score and associated qualities

Landscape Impact score	Evaluation
Very high	The landscape character is of very high value and is unable to absorb development without significant detrimental effect upon it. The proposed project will result in a very high level of change to the existing landscape character. There is limited ability for mitigation measures to reduce impact.
High	The landscape character is of high value and is unable to absorb development without significant detrimental effect upon it. The proposed project will result in a high level of change to the existing landscape character. There is limited ability for mitigation measures to reduce impact.
Moderate	The landscape character is of moderate to high value and able to absorb some of the development without detrimental effect upon it. The proposed project will result in a moderate level of change to the existing landscape character. There is ability for mitigation measures to reduce impact.
Moderately low	The landscape character is of moderate to low value and able to absorb some of the development without detrimental effect upon it. The proposed project will result in a Moderately low level of change to the existing landscape character. There is ability for mitigation measures to reduce impact.
Low	The landscape character is of moderate to low value and able to absorb development without detrimental effect upon it. The proposed project will result in a low level of change to the existing landscape character qualities. There is high ability for mitigation measures to reduce impact.
Very low	The landscape character is of low value and able to absorb development without detrimental effect upon it. The proposed project will result in a negligible change upon the landscape character. There is high ability for mitigation measures to reduce impact
Negligible	The landscape character is of low value and able to absorb development without detrimental effect upon it. The proposed project will result in a negligible change upon the landscape character. No mitigation measures will be required.

4.3.5 Sensitive sites assessment methodology

This assessment involves the analysis of visual change, in views or in the visual amenity experienced by individuals and groups of people, in identified sensitive public places and private residential areas. This report assesses visual impact in two ways.

Sensitive public places visual amenity:

- Identifies places and sites that are valued by the public and are within proximity of the project (i.e. sensitive sites).
- Assesses the sensitivity of their users (i.e. the sensitivity of the visual audience).
- Assesses the potential visual impact on users.

Sensitive residential dwelling visual amenity:

- Identifies residential dwellings that are within proximity to the project (i.e. the visual audience).
- Assesses the potential visual impact on the visual audience.

Sensitive sites visual amenity

KEY SENSITIVE SITES

Key sites have been identified throughout the study area based on their proximity to the project, cultural or community value, and their level and type of public usage.

These sites are sensitive to change in their visual amenity.

These sites typically include public open space, shared user paths, trails, regularly visited commercial areas (e.g. a local café with outdoor dining), recreational spaces, cultural heritage sites, wetlands and associated lookouts and viewing areas.

METHOD FOR DETERMINING THE SIGNIFICANCE OF THE VISUAL IMPACT AT SENSITIVE SITES

The extent of the visual impact at sensitive public sites is determined through professional judgement that incorporates:

- The degree of significance the site is considered to have, determined by community engagement and analysis of policy documents at the local, state and federal levels
- The level of sensitivity of the visual audience (see below)
- An assessment of the sensitive site's ability to absorb change
- An understanding of the types of change that the sensitive site is most impacted by and, conversely, those types of change which can be accommodated
- The distance of the site from the project
- The site's viewshed, as determined through viewshed mapping (see below)
- Photomontages and modelling showing the proposed changes from key viewpoints
- Reference to industry guidelines.

Further detail can be found in Section 6 and Section 7 of the four alignments.

LEVEL OF SENSITIVITY OF THE VISUAL AUDIENCE

The visual audiences were assessed as people within the LVIA study area who have the potential to have their views impacted upon by the project.

The level of sensitivity of the audience is based on:

- Distance of the audience to the project;
- Type of audience (e.g. residents, those passing through the area by vehicle, public space users, workers). Different viewer types may be impacted to varying degrees dependent on their experiences of the area and concerns about the change;

- Expectations of an experience in a given setting: for example, the expectation of a high level of visual amenity in a national park or from a scenic lookout.

RESIDENTIAL VISUAL AMENITY

The visual impact on residential dwellings is assessed using the same techniques as for the public space visual amenity. It is important to note that assessments are not made for each individual residence, but rather for residential areas as a larger group or geographic area.

The impact on residential visual amenity is assessed by firstly identifying those residential areas that are within proximity to the project and that have the potential to be able to see the project and its associated infrastructure (either day or night).

Initially, all residential areas within 500m of the project are considered to be visually impacted by the project. Then a more detailed viewshed analysis (using a 3D model of the project and context) is used to ascertain from where and to what extent residents may be able to see the project.

DISTANCE FROM PROJECT

Sites that are within 500m of the project area have been identified as having a higher level of sensitivity of the visual audience than sites further away.

As a viewer's distance from the project increases, the field of view the project occupies decreases; the project's components diminish in scale and are more readily absorbed into the landscape. Thus, the further from the project, the less the level of sensitivity.

There are no standards that fix appropriate assessment distances because visibility is affected by a broad range of factors, including elevation, slope, land cover and the nature of the project (e.g. road at grade, overpass, noise wall or fill).

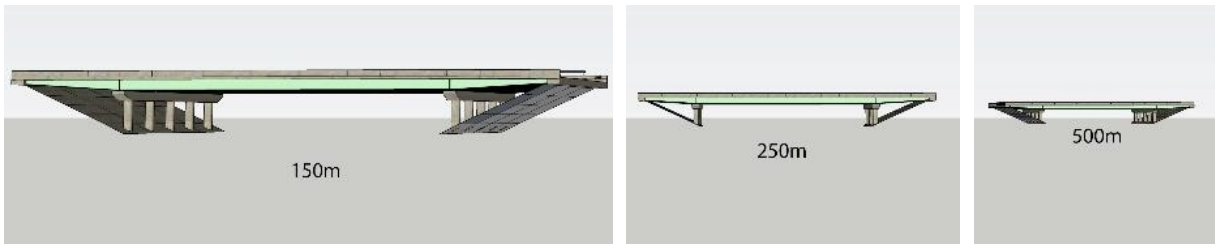

Figure 8. An object (in this case, a bridge) reduces in scale when it is viewed from increasing distances.

Viewshed mapping

Viewshed mapping was not a requirement of the project, however it was useful to add a desktop viewshed analysis using Google Pro Earth, which contains a general 3d terrain or topography, to the assessment of the visual impact. Viewshed mapping is a useful tool to provide additional review from sensitive locations. This viewshed analysis shows areas that can be viewed from a location on the plan. The yellow pin shows the view location positioned approximately 10m above the ground surface, and the green the extent of the viewshed from that location. The view location is raised above the surface to enable a viewshed map to be produced in Google Pro Earth: too close to the ground surface and Google Pro Earth will not show a viewshed. No trees or buildings are presented in 3d.

Figure 9. The green shows the extent of the viewshed of the map point (yellow pin). Using Google Earth Pro.

Description of photomontage visualisation process

Photomontages digitally introduce the proposed project into an existing view or photograph to assist in the assessment of visual impact. The process used to construct these images is conventional. The methods are professionally agreed to and are accurate to a level accepted by Planning Panels Victoria and the Victorian Civil and Administrative Tribunal.

The process is as follows:

- 3D modelling of alignment on 3D topography;
- High resolution renders of the model are taken without the terrain and other contextual elements;
- The render of the alignment is then photo matched to high resolution digital photographs taken on site. Photographs have been taken using a Canon EF 24–105mm f/4L IS USM;
- A GPS reading and manual survey information taken are for each photograph location. This information is then used to position a camera in the model with the same location, rotation, and focal length characteristics as the real camera; and
- Renders are created from each of these cameras, and the resulting image is then composited into the photograph.

There are two types of renders utilised within this report being;

Wireframe view: wireframe renders are basic geometries of the 3D model outlined and overlaid on the photo. This aids in highlighting potential impacts and an understanding of the project. An example image of a wireframe render is provided below.

Figure 10. Example of wireframe render.

Photomontage view: These renders utilise the 3D model and add textured surfaces to depict different materials of the project within the existing photos. These models are placed within the existing landscape and are placed behind existing objects within the view to give a representation of what the project may be hidden or covered by that is existing within the landscape and associated view. An example image of a basic textured model is provided below.

Figure 11. Example of a photomontage.

As visual impact assessments of major development projects rely on onsite GPS readings to inform the photomontage process, it is necessary to understand their limitations. Although GPS readings have a certain error margin, the process of using a GPS is regarded as 'best practice' and is more reliable than on-site measurements or other estimations.

It is widely accepted in the industry and by planning panels that minor adjustments occasionally need to be made to bring the origins of images into line with the 3D model to rectify any inaccuracies. Where this has occurred, survey information, matching photographic points, aerial photography and other base material has been used as a reference.

Note that the use of photomontages is resource intensive and a more complex process that the use of wireframe and 3d terrain models. The use of photomontages was strategically targeted to provide a level of equity across the LVIA study area and Alignment options.

4.4 Mitigation

Mitigations for identified impacts were developed by discipline specialists in consultation with RRV. All identified mitigations developed for the project have been informed by specialist experience with proven feasible control measures for major civil infrastructure projects, industry best practice measures and regulatory measures defined by State, Commonwealth and International Government agencies.

Mitigations for the project were developed throughout the impact assessment process to inform the residual impacts of the preferred alignment, which are detailed in Section 11.

4.5 Options assessment methodology

The alignment refinement for the Beaufort Bypass has been undertaken in three distinct phases since project inception. These are discussed in EES Attachment IV: *Options assessment* as:

- Phase 1 – Concept alignment development
- Phase 2 – Option development and assessment
- Phase 3 – Identification of preferred alignment.

This options assessment method section considers the Phase 3 assessment and details the process for selection of the preferred alignment.

The Phase 3 assessment considered four alignment options to select the preferred alignment, utilising a customised comparative options assessment to rank each option against the following areas:

- Biodiversity

- Catchment values and hydrology
- Cultural heritage (Aboriginal and Historic)
- Social and Community
- Amenity
- Landscape and Visual.

Multiple scoring scenarios and sensitivity testings were undertaken against each option to ensure the environmental, social, heritage and economic assessment criteria aligned with the EES evaluation objectives. The scoring framework developed sought to ensure a wholistic decision-making process was undertaken, and that no single scoring or sensitivity scenario would be the primary determining factor in the identification and selection of the preferred alignment.

Weightings for the assessment included the application of six scenarios and sensitivity tests to eliminate bias of specific environmental constraints. These scenarios included:

- Scenario 1: Apply a score of 1 to 4 from least to highest impact
- Scenario 2: Alignment with highest number of least impact scores
- Scenario 3: Apply a score of 1 to the highest impact and the subtract the percentage difference between alignments
- Scenario 4: Apply a score of 1 to least impact and then add the percentage difference between remaining alignments
- Scenario 5: As per Scenario 3, but minus criteria that can be mitigated
- Scenario 6: As per Scenario 4, but minus criteria that can be mitigated

The sensitivity tests included:

- Scoring sensitivity scenario 1:
  - Options with the lowest impact and other options within 5% of the lowest impact are apportioned a score of one point and a green light
  - Options within 5-20% of the lowest impact option are apportioned a score of zero points and an amber light
  - Options with an impact of 20% or greater than the lowest impact option are apportioned a score of minus one and a red light.
- Scoring sensitivity scenario 2:
  - Options with the lowest impact and other options within 5% of the lowest impact are apportioned a score of one point and a green light
  - Options within 5-25% of the lowest impact option are apportioned a score of zero points and an amber light
  - Options with an impact of 25% or greater than the lowest impact option are apportioned a score of minus one and a red light.
- Scoring sensitivity scenario 3:
  - Options with the lowest impact and other options within 5% of the lowest impact are apportioned a score of one point and a green light
  - Options within 5-15% of the lowest impact option are apportioned a score of zero points and an amber light
  - Options with an impact of 15% or greater than the lowest impact option are apportioned a score of minus one and a red light.

The assessment process included an iterative process with RRV, the Technical Reference Group (TRG), legal and discipline specialists to refine the assessment environmental risk workshops and develop a customised assessment matrix. The suite of assessment criteria are detailed within EES Attachment IV: *Options assessment.*

5. Legislation, polices and guidelines

This section assesses the project against the Commonwealth and State legislation, policies and guidelines relevant to the LVIA.

5.1 Commonwealth

No commonwealth legislation was found to be directly relevant to this LVIA.

5.2 State

5.2.1 Planning Policy Framework

The Planning Policy Framework informs planning and responsible authorities on the planning policies that need to be considered when planning in their respective areas. Clauses relevant to landscape and visual values of the project are as follows, but not limited to:

11.03–5S Distinctive areas and landscapes

- To protect and enhance the valued attributes of identified distinctive areas and landscapes.

12.03–1s River corridors, waterways, lakes and wetlands

- To protect and enhance river corridors, waterways, lakes and wetlands

12.05–2S Landscapes

- To protect and enhance significant landscapes and open spaces that contribute to character, identity and sustainable environments.

15.01–6S Design for rural areas

- To ensure development respects valued areas of rural character.

5.2.2 Victorian Heritage Act 2017 – Victorian Heritage Register and Inventory

The Victorian Heritage Act 2017 provides for the protection and conservation of places and objects of cultural heritage significance and the registration of such places and objects.

'Heritage Victoria' maintains a list of State-significant heritage places and objects which are protected under the Victorian Heritage Act 2017. The Victorian Heritage Register is the highest level of protection and lists the heritage places/objects.

Relevance

The Victorian Heritage Inventory lists the archaeological sites in Victoria that are older than 50 years. Within Beaufort there are three areas protected by Heritage Overlays: HO502, HO20 and HO30. The latter is the closest protected area to the alignments – 'The Furze', 20 King Street. There is no information relating to the value of this heritage element to its landscape setting.

The value of heritage places and objects can be related to the landscape and visual setting.

5.2.3 State Planning Policy Framework – studies

In 2013 the South West Victoria Landscape Assessment Study was undertaken for the then Department of Planning and Community Development. The Study, prepared in partnership with local governments throughout the region and a range of stakeholders, provides a comprehensive understanding of landscape values, their location and their spatial extent. This was prepared to assist regional planning to support economic growth and development investment in the right locations into the future through the Great South Coast, Central Highlands, and Lodden Mallee South Regional Growth Plans, and implementation through local government planning schemes. The State Government states that it is continuing to work in partnership with local councils to incorporate recommendations into the relevant planning schemes, and as part of the ongoing implementation of Regional Growth Plans across the state.

Relevance

The alignments do not pass through any identified landscapes of significance, however, the overall larger viewshed of the landscape to the east of the alignments has been identified as having regional significance. No landscapes of state significance were identified in the study area.

The area called Island Uplands is a series of hills to the north east of Beaufort. They are approximately 14km away from the eastern end of the alignments and approximately 19km from central Beaufort. The distant hills are visible from Smiths Lane in the far distance. The distance from the alignment is quite far and general views across the landscape to them will not be detrimentally altered.

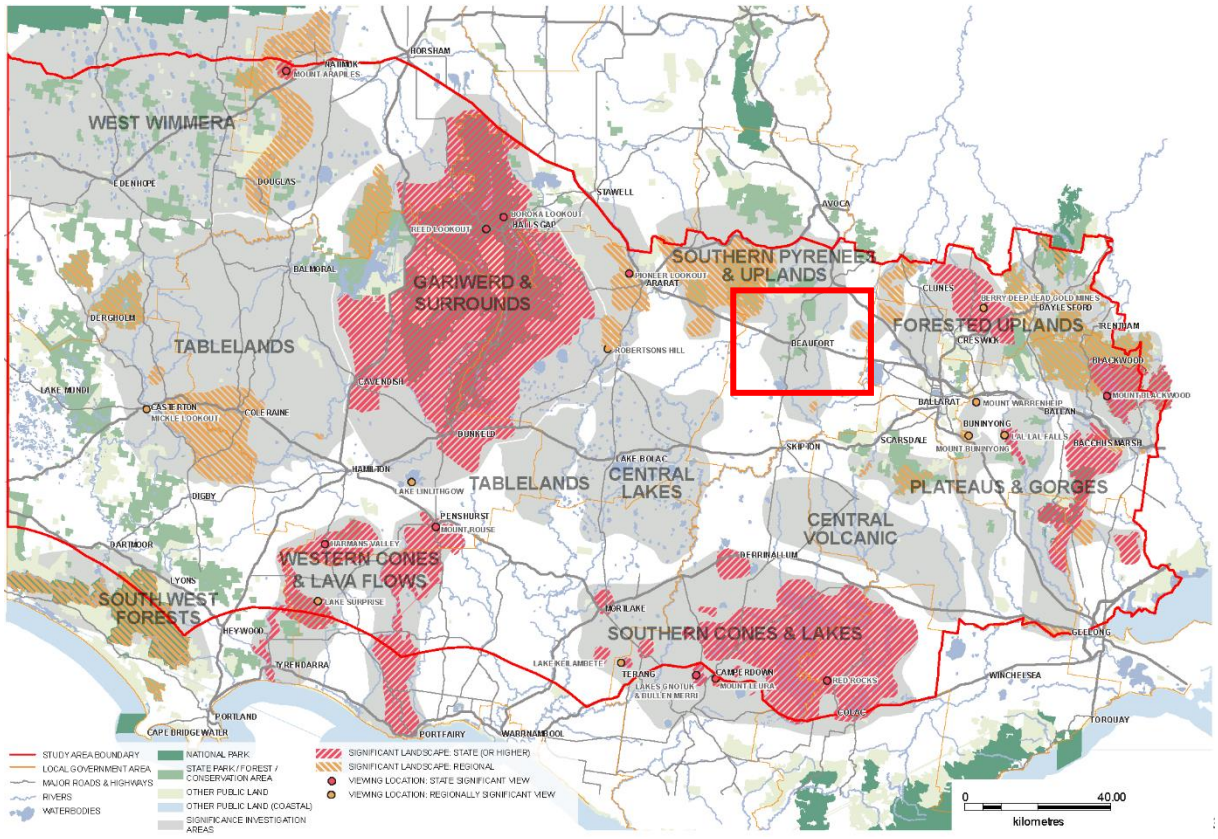

Figure 12. Western Victoria significant landscapes, showing site in red box.

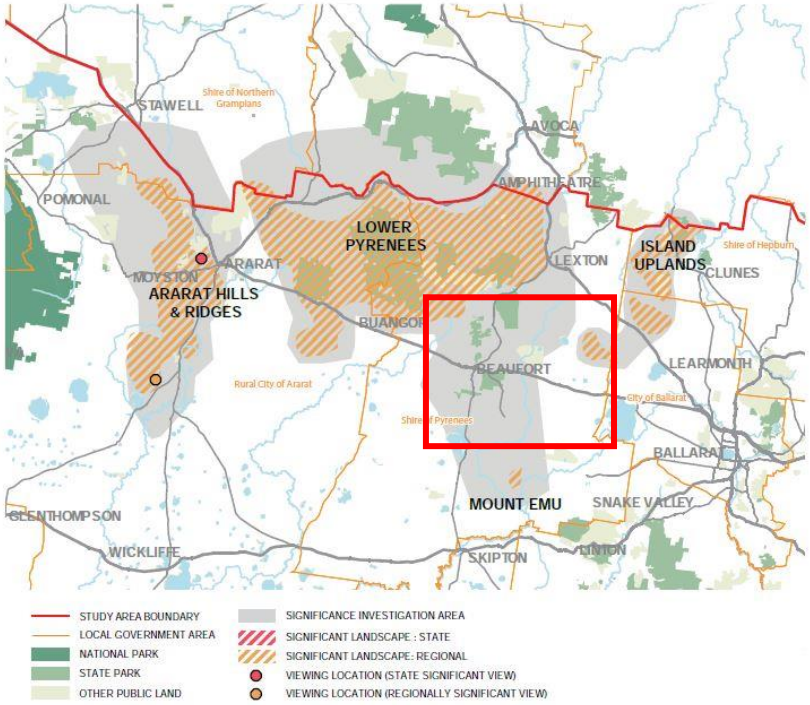

Figure 13. Relevant investigation area, showing site in red box.

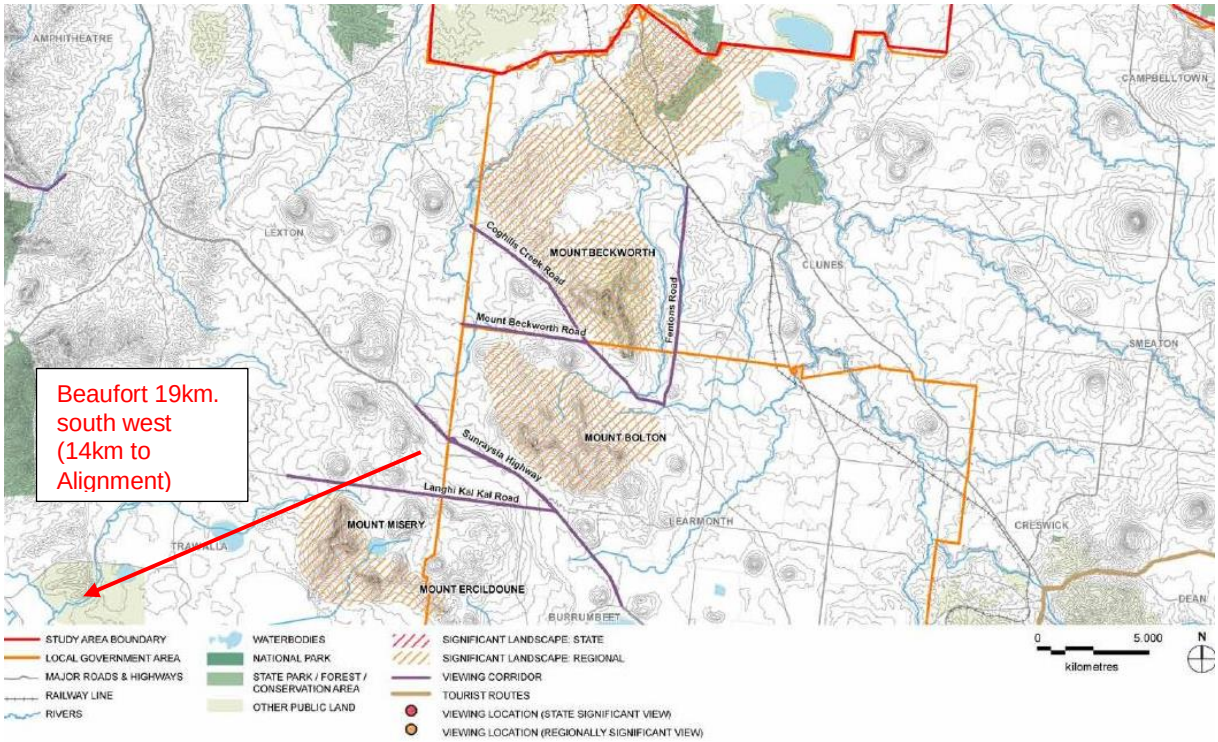

Figure 14. Regionally significant landscape, the Island Uplands.

Table 9: Aesthetic values of the Island Uplands

	Source	Description	Aesthetic values rating considerations (i.e. exemplary, iconic, scarce)	Level of significance
Landscape features	Survey	The Island Uplands rise as three individual landforms (Mount Beckworth, Mount Bolton and Mount Ercildoune) from the northern edges of the Western Volcanic Plain. Their prominence is visible from long distances away. The Waubra wind farm is sited to the east of the rises, and the tops of turbines are a visible feature in many parts of this landscape.	The Island Uplands are an iconic feature of the region and are easily identifiable within the broader landscape. The three formations are exemplary volcanic landscape features in this area.	High (Regional)
Edges or contrasts	Survey	The Island Uplands create easily distinguishable landforms that rise from the surrounding undulating agricultural land. The granitic outcrops and tors are an outstanding feature that provides additional visual interest. Edges of pine plantation also provide a contrast, though this has resulted in ugly scarring on the landscape where they have been felled in a number of places.	Granite outcrops and defined topography make this landscape an iconic feature of the area.	High (Regional)
Composition	Survey	The steep slopes are partially vegetated which has left the rock-strewn faces and bulging granitic outcrops exposed. These rugged features differentiate the Island Uplands from the smooth, rounded volcanic rises found in the adjacent area east of Clunes.	The highly distinctive landscape features of the Island Uplands provide an interesting visual composition within the area.	Moderate (Local)
Overall aesthetic significance rating				**Regional**

Table 10: Other cultural values of the Island Uplands

Source	Description
Historic significance	
Desktop research	Aboriginal artefact scatters, earth mounds and scarred trees occur throughout the area.
Parks Victoria	Major Mitchell passed through this area as a part of his Australia Felix expedition in 1836.
Register of the national Estate, Victorian Heritage Register	Jubilee company Quartz Gold Mine, Jubilee Road, Scarsdale is listed on both registers as a characteristic example of an important form of gold mining.
Victorian Heritage Register	Ercildoune Homestead is protected under the Heritage Overlay of the Pyrenees Planning Scheme and included on the Victorian Heritage Register (HO23).
Significance rating	Regional
Environmental and scientific significance	
Ballarat Planning Scheme	Mount Bolton is included within the Significant Landscape Overlay (SLO2) as a unique landscape characterised by granite outcrops with remnant mature forest supporting a range of habitats
Parks Victoria Hepburn Planning Scheme	Mount Beckworth Scenic Reserve, (Formerly Mount Beckworth State Forest), is protected under the Heritage Overlay (HO895) and the Environmental Significance Overlay (ESO1). The Reserve is a significant flora and fauna habitat.
IUCN	Protected areas on the IUCN list include the Dunach Nature Conservation Reserve, category IA (Strict Nature Reserve) and Mount Beckworth Scenic Reserve, category III (Natural Monument or Feature).
Significance rating	Regional
Social significance	
Aboriginal Affairs Victoria	The Island Uplands are the traditional country of the Dja Dja Warrung people to whom it holds social, cultural and spiritual significance. The waterbodies, distinctive natural features and places of ecological value within this area are likely to have high Aboriginal cultural heritage sensitivity.
Desktop research	Mount Beckworth Scenic Reserve attracts visitors for bushwalking and picnicking. The grounds of Ercildoune Homestead are open to visitors.
Significance rating	Regional

5.3 Local

5.3.1 Pyrenees Planning Scheme

The Municipal Planning Strategy contains a number of directions relevant to the LVIA. In summary, the policy identifies the following directions:

- The protection and management of the Shire's natural resources and environment;
- The retention of the established character and ethos of existing townships;
- The protection of the cultural and heritage assets of the Shire.

Relevance

All current local planning issues within the Pyrenees Planning Scheme affecting the LVIA have been considered.

5.3.2 Areas of Cultural Heritage Sensitivity (ACHS) Overlay

The *Aboriginal Heritage Act 2006* provides for the protection and management of Victoria's Aboriginal cultural heritage.

Relevance

Whilst a separate assessment of Cultural Impact is being assessed for this EES, it is important to highlight where key publicly known registered Aboriginal cultural heritage places are located within the study area, as these are of direct relevance to cultural value. There are multiple sites within the study area that are under the ACHS overlay.

5.3.3 Vegetation Protection Overlay VPO1

The Vegetation Protection Overlay (VPO1) seeks to protect significant vegetation for its natural beauty, special significance, interest and importance.

Relevance

The VPO identifies areas of vegetation that contributes to the scenic and visual quality of the area. This overlay covers an area along the rail line that is inside of the study boundary to the east of Beaufort.

5.3.4 Pyrenees Shire Council, Council Plan 2017–2021

Identifies key elements within Beaufort important to the region.

Relevance

This informs the overall public significance of spaces and activities.

5.3.5 Pyrenees Shire Council Towards 10,000

Some notable key values highlighted in this 2019 draft economic development strategy are:

- Respect the key characteristics of the rural lifestyle offered in the region.
- Encourage increased opportunities for the Pyrenees communities and support their capacity to participate in them.
- Foster a positive reputation for the Pyrenees Shire.

Relevance

This informs the overall public significance of spaces and activities.

5.3.6 Pyrenees Shire Tourism Strategy 2016–2019

Beaufort is highlighted as one of two key destinations for the Pyrenees Shire, associated with being a refreshment stop (cafes) and having nearby nature walks (Camp Hill) and mountain biking opportunities.

This plan also highlights opportunity for Pyrenees Shire to make improvements which include;

- Improve the appearance of the main street to make Beaufort a more appealing place to visit.
- Support local residents and community groups to improve the visitor experience at Camp Hill.
- Interpret the heritage of Beaufort and surrounds for visitors.

Relevance

Informs our understanding of current and future tourist distribution thus informing the frequency of use to certain areas.

5.3.7 Pyrenees Shire Beaufort Walkability Plan 2016

A key objective within this document is to increase connections and walkability of Beaufort. There is a strong desire for increased walkability and amenity improvements between Camp Hill Lookout to Beaufort Lake as these are viewed by the community as two key nature destinations. Camp Hill Picnic Ground is also highlighted for improvement.

Relevance

Informs our understanding of the current and future pedestrian flow thus informing the frequency of use to certain areas.

5.3.8 Pyrenees Shire Council Recreation Strategy 2010–2020

Highlights key recreational facilities utilised by the local community.

Relevance

Informs our understanding of the current and future use of public spaces.

5.4 Industry guidelines

5.4.1 Urban Design Guidelines for Victoria, August 2017

The Urban Design Guidelines for Victoria are policy guidelines within the Planning Policy Framework of the Victoria Planning Provisions. Relevant guidelines for this project include to:

- Locate major infrastructure corridors and installations to minimise their potential to be a barrier to cross movement
- Provide conveniently located grade-separated pedestrian and bicycle crossings across rail corridors, motorways and other natural barriers, to connect neighbourhoods and key destinations
- Establish a continuous system of pedestrian paths connecting neighbourhoods, along all streets, continuing through public spaces, and to activity centres and public transport nodes
- Locate pedestrian and bicycle crossings on direct, desirable routes to destinations such as schools, parks, activity centres and public transport stops, or that link neighbourhoods
- Use a style, scale and materials for barriers that contribute to the existing or desired future character of an area
- Light only those public space areas and paths intended for night use
- Where a path passes through an underpass, light the approach and exit path to the same level as the underpass
- Control unwanted light spill to sensitive uses from public space lighting.

5.4.2 Landscape and visual impact assessment industry guidelines

There are no Victorian Government guidelines or legislation directly relating to the manner in which LVIA is to be undertaken. To ensure that sound methodology, principles and elements are adhered to and included in the development of this report, we have:

- Referred to the highly regarded and globally utilised *Guidelines for Landscape and Visual Impact Assessment* (published by the United Kingdom's Landscape Institute and the Institute of Environmental Management and Assessment, third edition 2013); and
- Thoroughly reviewed many EES LVIA reports undertaken for RRV and other federal, state and local organisations, including those for both urban and regional contexts, to understand the breadth of LVIA scopes.

6. Existing conditions

6.1 Landscape features

6.1.1 Landform

Beaufort sits within the low point (390m high) of four surrounding hillsides. The hillsides' ridgelines range in heights from 420m to 450m. There are many small watercourses of creek character running across Beaufort. Of these creeks, Yam Holes Creek is a key watercourse that runs through Beaufort and rural farmlands of Beaufort. Yam Holes Creek runs from Beaufort Lake in the south, toward the north-east and into Mount Emu Creek in the east.

6.1.2 Key viewsheds

Several key views and viewsheds have been identified across the LVIA study area. These have been identified in Ministerial directions, by policy and an assessment of the local landscape character and dominant landscape features, and Figure 15 summarises these State and local government identified key views and viewsheds. In addition to these key views and viewsheds, numerous further viewsheds have been captured in this LVIA though the sensitive sites analysis.

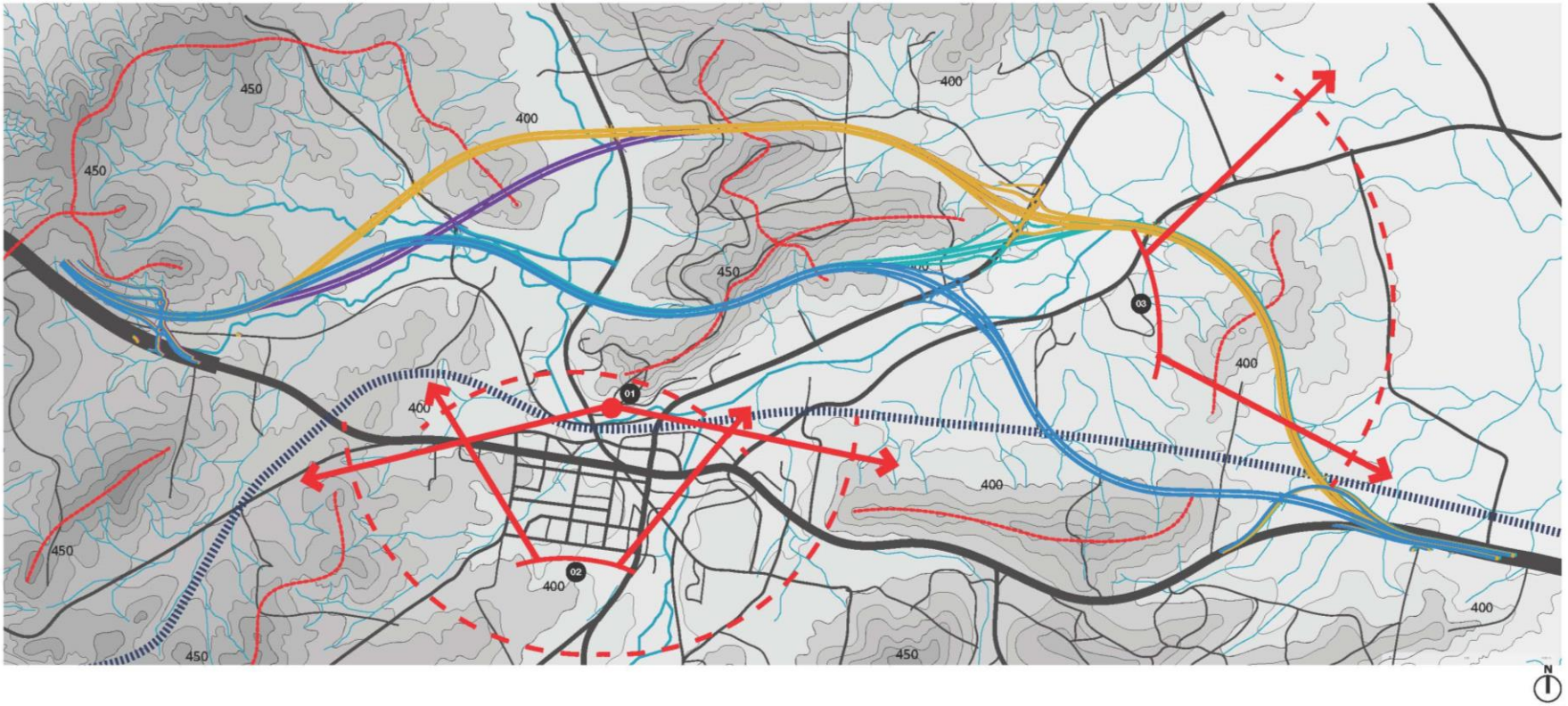

Figure 15. Viewsheds and landform.

Camp Hill

- An important feature of Beaufort is the surrounding treed ridgelines and hilltops on all sides.
- Views from Beaufort area of the northern Camp Hill and north east ridgeline are distinct.
- Camp Hill is an important landscape feature for Beaufort and can be seen throughout Beaufort.

Figure 16. View of Camp Hill from Apex Park.

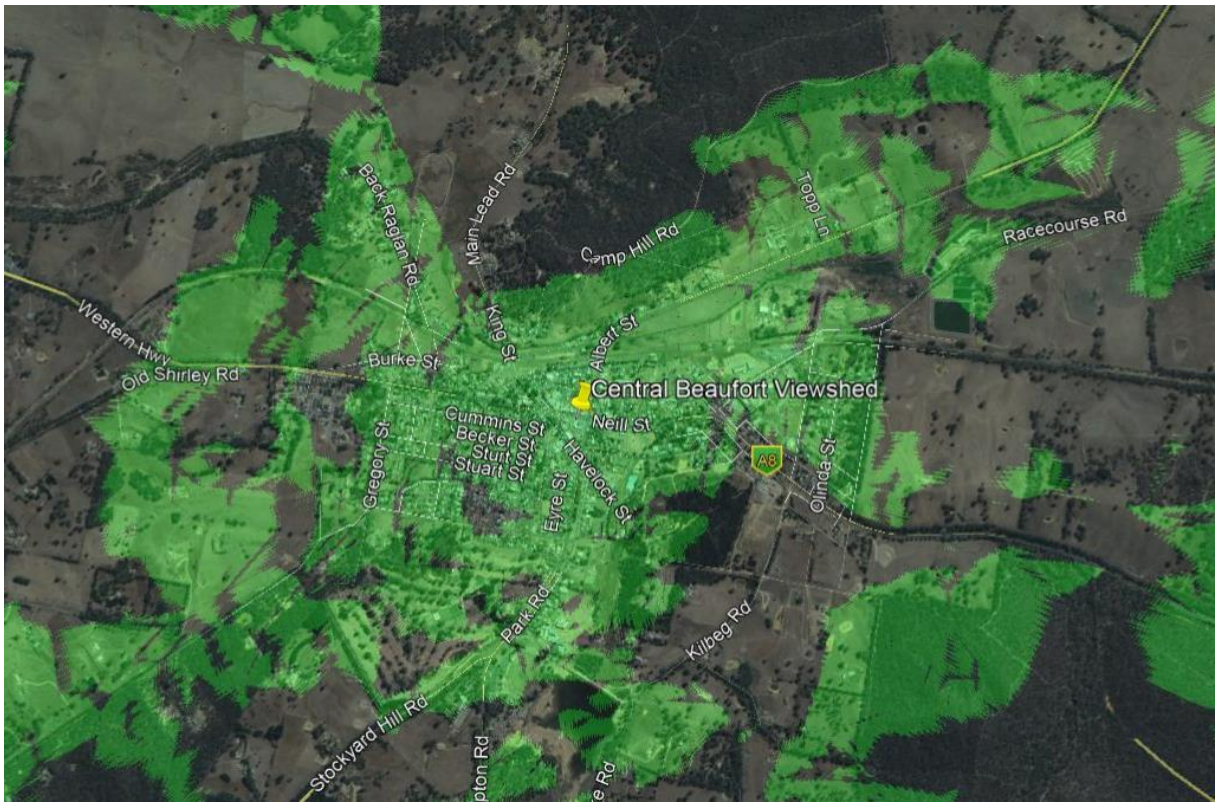

Figure 17. Indicative viewshed from Beaufort to Camp Hill (Google Earth Pro, does not consider vegetation and built form).

Camp Hill Lookout view

- The view from Camp Hill Lookout is broad and offers views of the south-eastern to south-western landscape.
- The view is a combination of Beaufort, Beaufort fringe and distant treed ridgelines.
- The view from here is important, because it is a local lookout and recreational location.

Figure 18. View from camp Hill Lookout towards Beaufort.

Figure 19. Indicative viewshed from Camp Hill Lookout (Google Earth Pro, does not consider vegetation and built form).

Island Uplands viewshed

- In 2013 the South West Victoria Landscape Assessment Study was undertaken for the then Department of Planning and Community Development. The study identified an area of regional landscape significance called the 'Island Uplands Unit'.
- The area called Island Uplands Unit is a series of hills to the north-east of Beaufort. They are approximately 14km away from the eastern end of the alignments and approximately 19km from central Beaufort.
- The distant hills are visible from Smiths Lane and the Western Highway east of Beaufort.
- The distance from the alignment is quite far and general views across the landscape to them will not be detrimentally altered.

Figure 20. View of the Island Uplands from Smiths Lane.

6.1.3 Vegetation character

There is a diverse range of vegetation across Beaufort, ranging from open farmland plains to dense bushland. For the purposes of identifying landscape and visual impacts, diverse vegetation has been simplified into the following key characters as identified in Figure 21 and discussed in the text below.

For full ecological value of vegetation please refer to EES Appendix C: *Flora and fauna impact assessment* (WSP 2021).

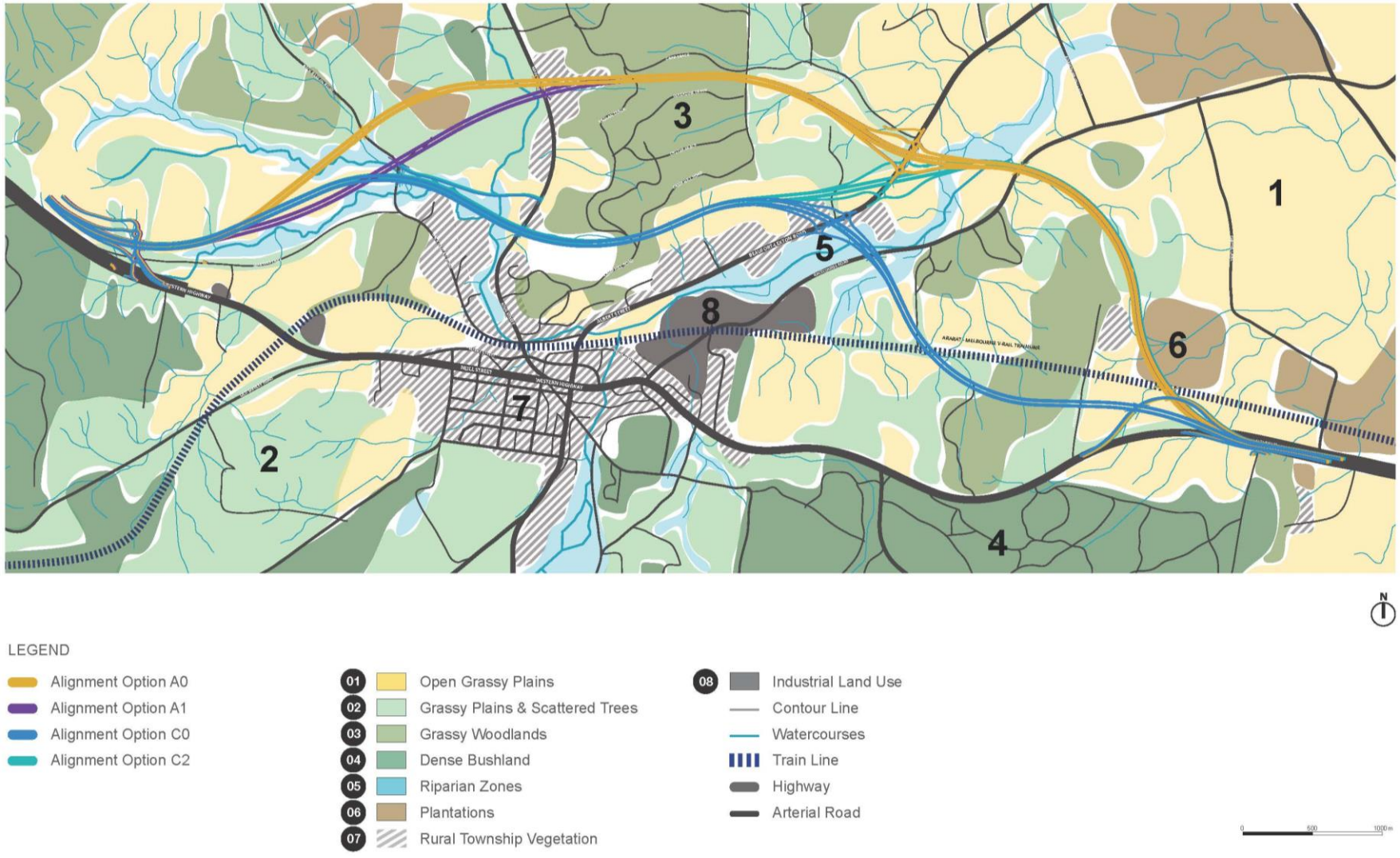

Figure 21. Vegetation character, Beaufort and surrounds.

Vegetation character description

1. OPEN GRASSY PLAIN

Open plains, predominantly private farmland consisting of open pasture.

Figure 22. Example of open grassy plains vegetation character.

2. OPEN GRASSY PLAIN AND SCATTERED TREES

Open plains, predominantly farmland consisting of grasses with some patches of scattered trees and shrubs.

Figure 23. Example of open grassy plains and scattered trees vegetation character.

3. GRASSY WOODLAND

Woodlands, majority being indigenous, with grassy understorey. Many of these areas have been modified since colonial settlement.

Figure 24. Example of grassy woodlands vegetation character.

4. DENSE BUSHLAND

Dense woodlands with thick understorey, shrubs and grasses.

Figure 25. Example of dense bushland vegetation character.

5. RIPARIAN ZONE

Creek-style watercourses run through diverse landscape characters, but commonly occurring in conjunction with wetland-style planting vegetation.

Figure 26. Example of riparian zone vegetation character.

6. INDUSTRIAL PLANTATION

Eucalyptus timber plantations for the purpose of creating timber for industrial uses are typically planted in strict and formal rows. These trees are regularly cleared and re-planted.

Figure 27. Example of industrial plantation vegetation character.

7. RURAL TOWNSHIP VEGETATION

Typical suburban or rural township streets with predominantly exotic trees and grasses in nature strips and private planting on residential properties.

Figure 28. Example of rural township vegetation character.

8. INDUSTRIAL LAND USE

Due to the industrial nature and heavy use of industrial sites, there is typically limited vegetation besides patches of short grasses and potentially some exotic trees for screening purposes.

Figure 29. Example of industrial land use vegetation character.

6.2 Landscape character types and their assessed value

The landscape character provides a picture or sense of the landscape and is defined by the area's visually distinct common features. Defining the landscape character types and their values aids in determining the capacity for the landscape to accommodate the proposed Beaufort Bypass. There are nine distinctive landscape character types within the Beaufort Bypass study area.

'A landscape character type is a broad scale area of land with common distinguishing visual characteristics.' (Landscape Character Types of Victoria, 1983)

Value: is the value the landscape character has in the community through statutory protection, policy or strategic local government studies, and through community perceptions.

Sensitivity: is the landscape character's sensitivity, including the sensitivity of its users, to change by the introduction of the bypass. This is influenced primarily by proximity to the proposed bypass and the influence of views of the proposed bypass from the site.

The following landscape charcater types have been identified:

1. Open Rural Plains
2a. Eastern Semi-Enclosed Rural Valley
2b. Western Semi-Enclosed Rural Valley
3. Ecological Conservation Reserve
4. Enclosed Rural Valley
5. Dense Bushland
6. Industrial Zone
7. Highway Infrastructure
8a. Beaufort Fringe North
8b Beaufort Fringe South
9. Beaufort

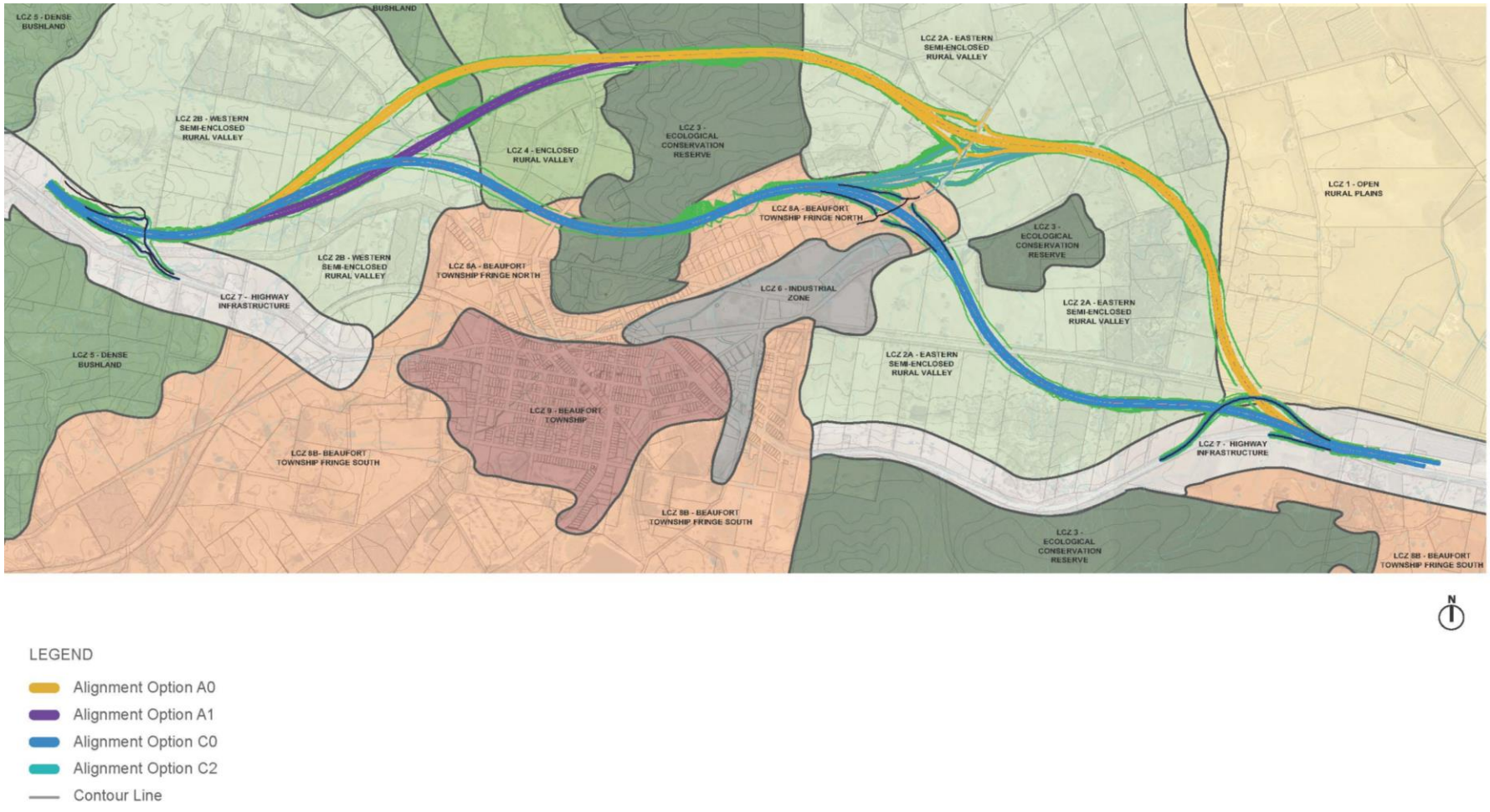

Figure 30. Landscape character types, Beaufort and surrounds.

6.2.1 Sensitivity rating

Landscape sensitivity is an indication of the landscape's ability to absorb change without dramatically altering its character. Sensitivity is typically dependent on the anticipated level of physical and visual impact (magnitude of change) that the development proposal has on the existing qualities of the landscape character area. The sensitivity ratings also factor in user sensitivity to change caused by the introduction of the project.

Table 11: Landscape sensitivity ratings and associated qualities.

Sensitivity rating	Explanation
Very high	The landscape has a high level of government policy protection and it has been identified through government policy as a place or area highly valued by the community for its history, scenic amenity, character, nature or cultural connections And It cannot absorb physical change readily
High	The landscape has been identified as being highly valued by the community for its history, scenic amenity, character, nature or cultural connections And It cannot absorb physical change readily
Moderate	The landscape has been identified as being valued by the community for its history, scenic amenity, character, nature or cultural connections And It can absorb some level of change
Moderately low	The landscape is typical for the area and covers a large area And It can absorb a moderate level of change
Low	The landscape is typical for the area, covers a large area and is valued less than other landscapes And It can absorb some level of change
Very low	The landscape is typical for the area and in over a large area and is valued less than other landscapes. And It can absorb a moderate level of change
Negligible	The landscape is typical for the area and in over a large area and is valued less than other landscapes. And It can absorb a high level of change

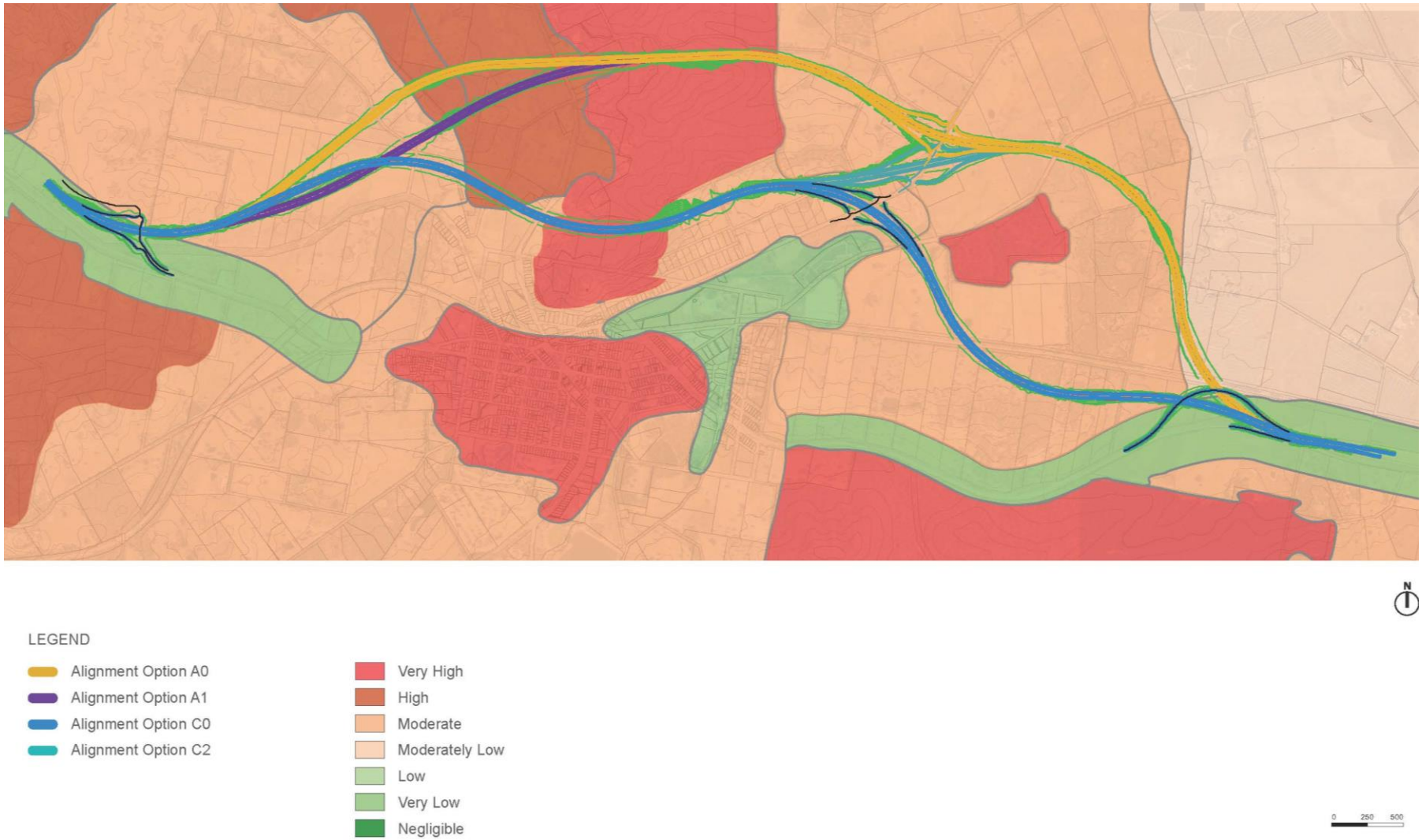

Figure 31. Sensativity ratings of landscape characters types, Beaufort and surrounds.

6.2.2 Open Rural Plains

Figure 32. Example of Open Rural Plains landscape character type.

Description

- Relatively flat topography of typical rural farmland character with open pasture
- Occasional dispersed trees or tree clumps, predominantly indigenous, typically along roadsides and property boundaries
- Open views in three or more directions uninhibited by topography higher than 10m within 2km radius
- Low density large (5–40ha) private parcels of land with scattered rural infrastructure, including dams and low scale rural sheds and residences
- Flat plain reduces potential views to at-grade road infrastructure.

Landscape value – Moderately low

- There is extensive open pasture with only occasional tree clumps
- Open Rural Plains is a common character seen throughout Western rural Victoria.

Ability to absorb change – Moderate

- The ability to absorb change is Moderate because the open pasture is fairly homogenous in appearance and has few trees, therefore little variety would be lost, and few trees would be removed through the addition of infrastructure. The ability to absorb change also depends on the overall height of the alignments: the closer to grade the alignment is, the more the Open Rural Plains character can absorb the change without detrimentally affecting its existing landscape character.

6.2.3 Eastern Semi-Enclosed Rural Valley

Figure 33. Example of Eastern Semi-Enclosed Rural Valley landscape character type.

Description

- Undulating and enclosed environment created by surrounding hillside topography
- Dispersed trees and limited hectares of dense bushland occur across the character
- Three or more directional views are inhibited by topography higher than 10m within 2km radius
- Low density large (5–40ha) private parcels of land with scattered rural infrastructure, including dams and low scale rural sheds and residences
- Undulating topgraphy will require structural support for grade road infrastructre
- Rural residential properties scattered around the site
- Yam Holes Creek runs through this area and forms the spine of the valley and charcater area.

Landscape value – Moderate

- The landscape has a Moderate value because it is typical of around Beaufort, but the overall valley scale and scattered trees and waterway creates a more intimate and scenic experience.

Ability to absorb change – Moderately low

- The ability to absorb change is Moderately low because of the small scale of the open spaces and their scattered vegetation, which do not cope well with large scale topographic changes.

6.2.4 Western Semi-Enclosed Rural Valley

Figure 34. Example of Western Semi-Enclosed Rural Valley landscape character type.

Description

- Semi-enclosed environment created by surrounding hillside topography
- Dispersed trees and hectares of dense bushland occur on hillsides
- Three directional views are inhibited by topography higher than 10m within 2km radius
- Multiple creeks run through low topographical points of valleys in area
- Low density large (5–40ha) private parcels of land with scattered rural infrastructure, including dams and low scale rural sheds and residences
- Creek catchment and run-off require careful management
- Rural residential properties scattered around the site.

Landscape value – Moderate

- The landscape has a Moderate value because it is typical of around Beaufort, but the overall valley scale and scattered trees and various small waterways create a more intimate and scenic experience

Ability to absorb change – Moderately low

- The ability to absorb change is Moderately low because of the small scale of the open spaces and their scattered vegetation, which does not cope well with large scale topographic changes.

6.2.5 Ecological Conservation Reserve

Figure 35. Example of Ecological Conservation Reserve landscape character type.

Description

- Of rural bushland character, comprising densely packed trees and grasslands
- Generally, the topography is high and undulating
- Of significant cultural and natural value due to its conservation status, this also signifies it has been less impacted by pasture animals and westernised agriculture than other areas
- Of regional significance
- Dense vegetation is sensitive to disturbance
- Distant visibility is low due to dense tree screening.

Landscape value – Very high

- The landscape value is Very high. The forest has state level policy protection for its ecological value
- The forest is used for recreation.

Ability to absorb change – Very low

- The ability to absorb change is Very low as any changes to the forest will be highly visible and will fundamentally change or reduce the character area.

6.2.6 Enclosed Rural Valley

Figure 36. Example of Enclosed Rural Valley landscape character type.

Description

- Undulating and enclosed environment created by close proximity to surrounding hillside topography
- Dense bushland covers surrounding hillsides with patches of trees frequently dispersed across the area
- The Main Lead Road waterway forms the spine of the valley and charcater area.
- Three or more directional views inhibited by topography higher than 10m within 1km radius
- Dwellings are scattered throughout this character.

Landscape value – High

- The landscape value is High because it's an enclosed valley, highly treed and edged on both sides by dense bushland, creating an overall scenic experience
- Significant creeks run throughout this character and alongside Main Lead Road which adds scenic value.

Ability to absorb change – Low

- The ability to absorb change is Low as any changes to the small-scale valley will be highly visible and will change or reduce the character area.

6.2.7 Dense Bushland

Figure 37. Example of Dense Bushland landscape character type.

Description

- Privately owned dense bushland consisting of tightly packed trees with dense understorey, shrubs and grasses
- The topography is generally high and undulating.

Landscape value – High

- The landscape value is High. It consists of distinct indigenous vegetation of a high density
- Vegetation is valued by the community for its perceived naturalness and ecological benefits
- Vegetation provides screening of the project.

Ability to absorb change – Low

- The ability to absorb change is Low because the landscape value is high.

6.2.8 Industrial Zone

Figure 38. Examples of Industrial Zone landscape character type.

Description

- Industrial land use area, large sheds, trucks, storage units and other industrial infrastructures are prevalent throughout the area
- A water processing plant is also associated within the area.

Landscape value – Very low

- The landscape value is Very low because there is little to no vegetation in the zone.
- This character is heavily modified for industrial purposes.

Ability to absorb change – High

- The ability to absorb change is High because there is little to no vegetation in the zone and there are no residential dwellings in the zone. The industrial land use of the site is already heavily modified and susceptible to change.

6.2.9 Highway Infrastructure

Figure 39. Example of Highway Infrastructure landscape character type.

Description

- Comprises of the existing Western Highway with patches of roadside vegetation.

Landscape value – Low

- The landscape value is Low because there is little to no vegetation in the zone and is already utilised as a highway corridor.

Ability to absorb change – Very high

- The ability to absorb change is Very high because there is little to no vegetation in the zone, minimal dwellings in the character and already of a highway character. The ability to absorb change also depends on the overall height of the alignments: the closer to grade the alignment is, the more the character is able to absorb the change without detrimentally affecting the existing landscape character.

6.2.10 Beaufort Fringe (north and south)

Figure 40. Example of Beaufort Fringe landscape character type.

Description

- Characterised as a transition zone between rural land and rural town centre, containing an increase in density of low scale residential, industrial land parcels (0.2–2.0ha), open spaces and community infrastructure
- Linear bands of canopy vegetation, both indigenous and exotic line property boundaries and road reserves
- Topographically, these areas are usually gently undulating.

Landscape value – Moderate

- The landscape value is Moderate because Beaufort fringe is a combination of open landscape and closed internal gardens, with broad views across away from Beaufort into the surrounding landscape.

Ability to absorb change – Moderately low

- The ability to absorb change is Moderately low because there is a density of residential dwellings in the zone combined with open and closed landscape spaces. Many of the dwelling clusters have scenic views across existing valleys which are valued by the residents. Residents of Back Raglan Road are particularly sensitive to potential impacts on views.

6.2.11 Beaufort

Figure 41. Example of Beaufort landscape character type.

Description

- Rural township character comprises of main street shops and community spaces, suburban residential housing, open spaces, schools and a hospital
- Streets are typically wide, of suburban residential character, have sealed roads and scattered lines of mature native and exotic planted trees
- Typically, residential allotments are small on detached single storey dwellings 400–1000m^2 blocks with varying architectural styles
- The topography is generally flat near main Beaufort streets and railway, transitioning to gently undulating topography toward southern areas of Beaufort.

Landscape value – Very high

- The landscape value is Very high because it offers central location for goods and services, open spaces, heritage and culturally valued sites and is the main meeting place of the local community. There is also a significantly increased number of dwellings within Beaufort compared with Beaufort fringe and rural living areas.

Ability to absorb change – Low

- The ability to absorb change is Low because there is a significantly increased number of dwellings within Beaufort compared with Beaufort fringe and rural living areas
- The ability to absorb change also depends on the overall height of the alignments: the closer to grade the alignment is the more the character is able to absorb the change without detrimentally affecting the existing landscape character.

6.2.12 Summary

Table 12: Summary of landscape character types, their sensitivity rating and their capacity to absorb change.

Landscape character type	Value rating	Ability to absorb change
Open Rural Plains	Moderately low	Moderate
Eastern Semi-Enclosed Rural Valley	Moderate	Moderately low
Western Semi-Enclosed Rural Valley	Moderate	Moderately low
Ecological Conservation Reserve	Very high	Very low
Enclosed Rural Valley	High	Low
Dense Bushland	High	Low
Industrial Zone	Very low	High
Highway Infrastructure	Low	Very high
Beaufort Fringe North and South	Moderate	Moderately low
Beaufort	Very high	Low

6.3 Identified places of sensitivity and their assessed value

The *Scoping Requirements for Beaufort Bypass Project Environment Effects Statement* (DELWP 2016) (Scoping Requirements) identifies several local sensitive places to be assessed for adverse landscape and visual impact. In addition to these, additional sites have been identified through site analysis and a review of local government policies and strategies.

Sites identified in the EES scoping report include:

- Main Lead Road waterway
- Yam Holes Creek
- Beaufort Trotting Track
- Camp Hill State Forest
- Snowgums Bushland Reserve
- Beaufort Motorcycle Track.

Additional sites identified in this LVIA include:

- Camp Hill Picnic Area
- Camp Hill Lookout
- Beaufort train station and Beaufort Hotel
- Bicentennial Park
- Beaufort Main Street
- Apex Park and skatepark
- Racecourse Road Mullock Heap.

6.3.1 Clarification note on waterways

The watercourses are part of the overall landscape character assessment and form important elements in certain landscape character types; for example, valleys. There are three landscape character areas that contain waterways.

Some watercourses have more sensitivity as they have been identified by the community as being of value to them and they also sit within higher sensitive landscape character types.

Figure 42. Location of sensitive sites.

6.3.2 Key sensitive sites identified in the EES scoping requirements and additional sites

Main Lead Road waterway (general area identified as Main Leads Common in EES Scoping)

A highly valued site by local policy and community, predominantly for its water management and ecological functions.

Level of sensitivity – High

Figure 43. View of Main Lead Road waterway.

Yam Holes Creek

A highly valued site by local policy and the community, not just for its water management and ecological functions but also for its cultural history.

Level of sensitivity – High

Figure 44. View of Yam Holes Creek.

Beaufort Trotting Track

Beaufort trotting track has been identified through community engagement to be disused by the local community, therefore the sensitivity of this as a community site is considered Low.

Level of sensitivity – Low

Figure 45. View of Beaufort Trotting Track.

Camp Hill Picnic Area

A local and regional park for picnicking and BBQs, it is of Moderate value because it has outlooks across existing arterial road infrastructure. The entire reserve is highlighted as a location to visit on travelvictoria.com.au/beaufort. It is also recognised in the local planning scheme.

Level of sensitivity – Moderate

Figure 46. View of Camp Hill Picnic Area.

Camp Hill Lookout

A local and regional lookout point with scenic views across broader Beaufort and the region. Because it is specifically highlighted on travelvictoria.com.au/beaufort, it is of high value to the local community and visitors.

Level of sensitivity – High

Figure 47. View of Camp Hill Lookout.

Camp Hill State Forest

Of significance for its ecological value and general natural character, it is also utilised as a place of recreation.

Level of sensitivity – Very high

Figure 48. View of Camp Hill State Forest.

Beaufort Motorcycle Track – Beaufort–Lexton Road

A local motorcycle track, highly modified for recreational driving and riding of vehicles. In community engagement, the project was not seen to impact significantly upon this site.

Level of sensitivity – Low

Figure 49. View of Beaufort Motorcycle Track.

Snowgums Bushland Reserve

This reserve is of state significance for its high ecological value and it is also utilised as a place of recreation.

Level of sensitivity – Very high

Figure 50. View of Snowgums Bushland Reserve.

Beaufort train station and Beaufort Hotel

The only public train connection for Beaufort, which brings new visitors and commuters into the area. The station is adjacent to the local hotel which is utilised by local community day and night. The area has views to Camp Hill.

Level of sensitivity – High

Figure 51. View from the Beaufort train station and Beaufort Hotel area, north towards Camp Hill.

Beaufort town centre and Bicentennial Park

The highly valued town centre and main street of Beaufort, this strip provides goods and services to the broader Beaufort community, and therefore is heavily utilised. Views to Camp Hill are glimpsed along the main street and associated open spaces. Bicentennial Park is a valued local park and historical memorial location in the centre of Beaufort.

Level of sensitivity – High

Figure 52. View of Beaufort town centre.

Figure 53. View of Bicentennial Park.

Apex Park and skatepark

Locally valued skatepark and open space link utilised by the local community for recreation and leisure. Views from the open space to Camp Hill in the north.

Level of sensitivity – High

Figure 54. View of Beaufort open space link.

Racecourse Road Mullock Heap

A mullock heap from gold digging history is a highly modified and unusual feature in the landscape. It is locally valued lookout and a historical location of gold-digging history in Beaufort.

Level of sensitivity – Moderate

Figure 55. View of Racecourse Road Mullock Heap.

6.3.3 Other sites identified through the Landscape and Visual Impact Assessment process

There are other sensitive sites within Beaufort. However, because they are over 1km from the project they are predicted to experience minimal to no impact from the project.

Beaufort High School

- This regionally valued high school is part of everyday life of Beaufort and therefore is assumed to be of high value to the local community.

Beaufort Lake and caravan park

- This regionally valued lake is seen as a key attraction of Beaufort. The nearby caravan park is valued locally and by regional visitors.

Beaufort Golf Course

- Locally valued golf course utilised for recreational and leisure uses.

Beaufort hospital and kindergarten

- Regionally valued hospital adjacent to local kindergarten.

6.3.4 Summary of sensitivity of sites

Table 13: Sites and their level of sensitivity

Site	Level of Sensitivity
Main Lead Road waterway	High
Yam Holes Creek	High
Beaufort Trotting Track	Low
Camp Hill State Forest	Very High
Snowgums Bushland Reserve	Very high
Beaufort Motorcycle Track	Low
Camp Hill Picnic Area	Moderate
Camp Hill Lookout	High
Beaufort train station and Beaufort Hotel	High
Bicentennial Park	High
Beaufort Main Street	High
Apex Park and skatepark	High
Racecourse Road Mullock Heap	Moderate

6.3.5 Alignment C0 proximity to sensitive sites

Alignment C0 has six moderate to high sensitive sites within 500m, as shown in Figure 56. They are:

- Snowgums Bushland Reserve
- Yam Holes Creek
- Camp Hill Lookout
- Camp Hill Picnic Area
- Camp Hill State Forest
- Main Lead Road waterway.

6.3.6 Alignment C2 Proximity to sensitive sites

Alignment C2 has seven of moderate to high sensitive sites within 500m, as shown in Figure 57. They are

- Snowgums Bushland Reserve
- Yam Holes Creek
- Racecourse Road Mullock Heap
- Camp Hill Lookout
- Camp Hill Picnic Area
- Camp Hill State Forest
- Main Lead Road waterway.

6.3.7 Alignments A0 and A1 Proximity to sensitive sites

Both alignments A0 and A1 have four moderate to high sensitive sites within 500m, as shown in Figures 58 and 59. They are:

- Yam Holes Creek
- Racecourse Road Mullock Heap
- Camp Hill State Forest
- Main Lead Road waterway.

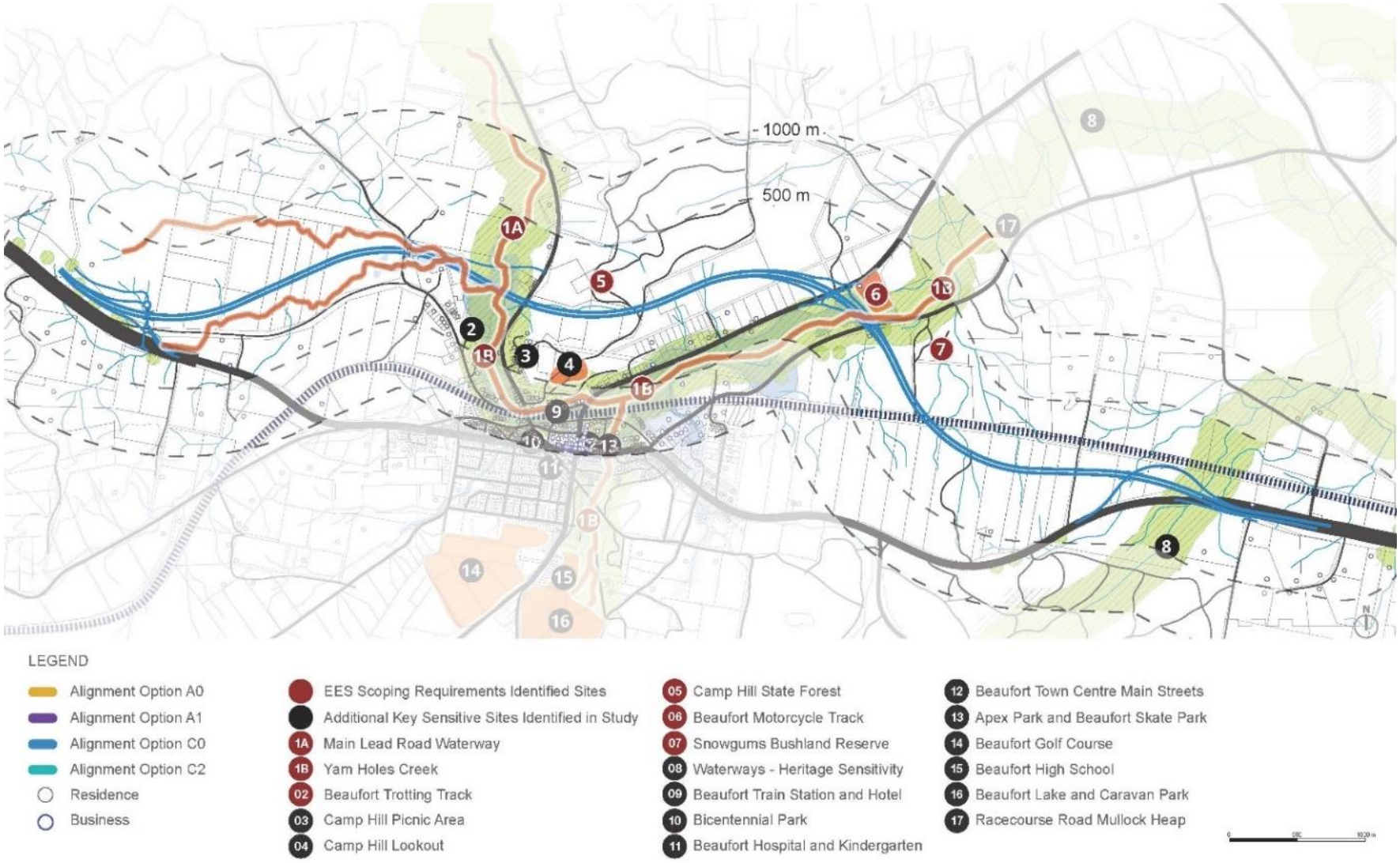

Figure 56. Alignment C0, highlighting sensitive sites within 500m of alignment.

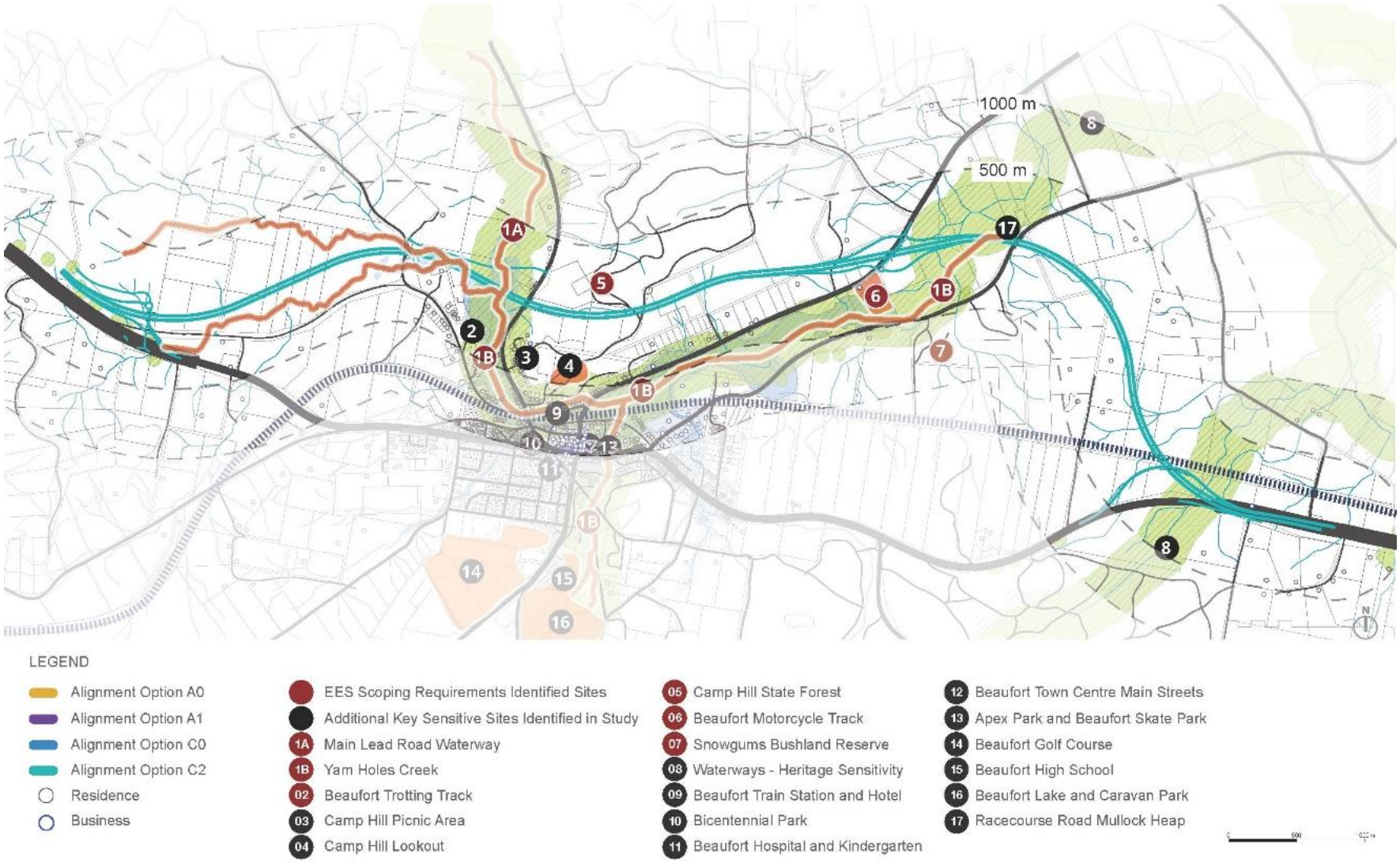

Figure 57. Alignment C2, highlighting sensitive sites within 500m of alignment.

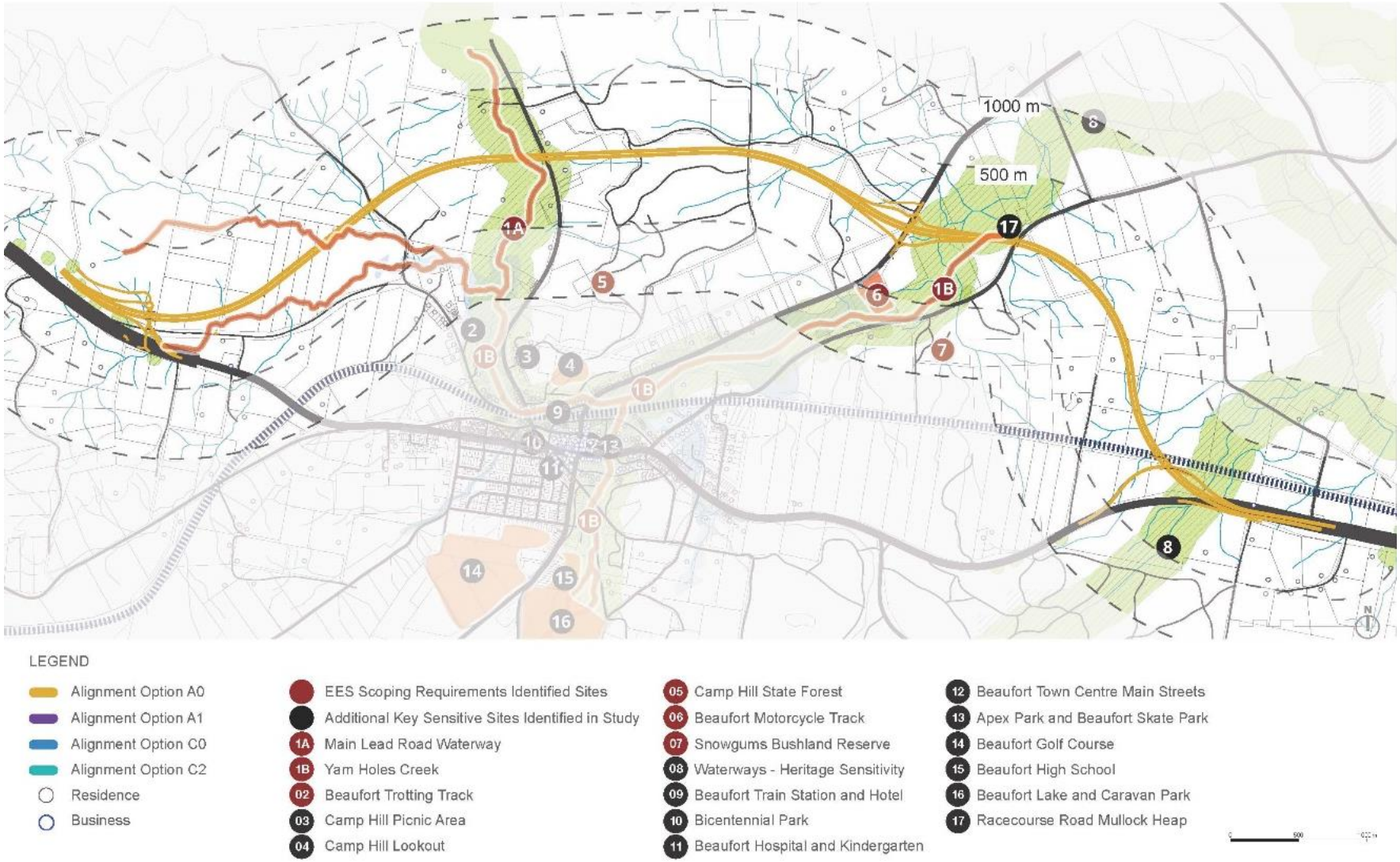

Figure 58. Alignment A0, highlighting sensitive sites within 500m of alignment.

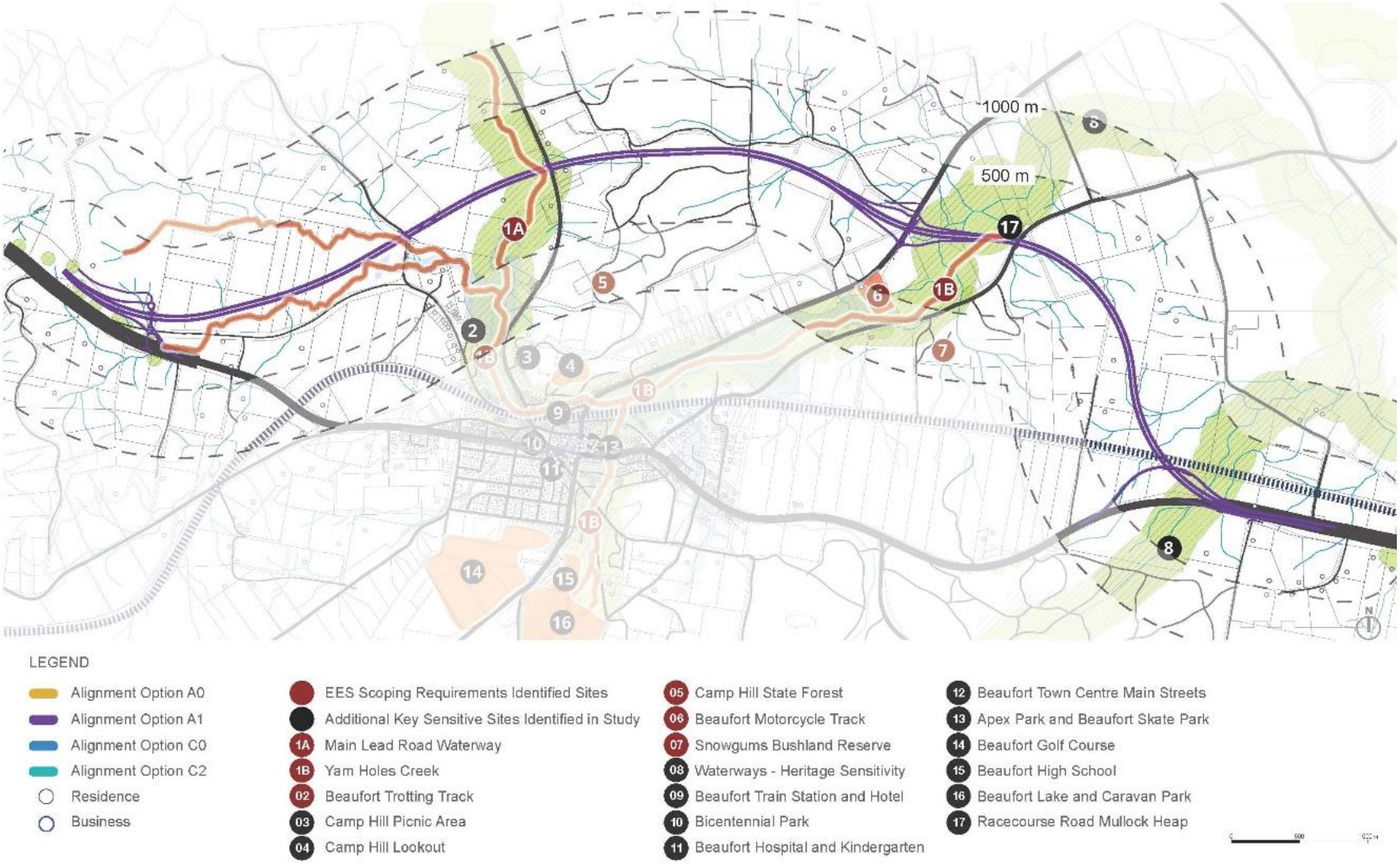

Figure 59. Alignment A1, highlighting sensitive sites within 500m of alignment.

7. Impact assessment of four Alignments

7.1 Impact assessment by segment

Typically, in a LVIA each alignment would be assessed separately. However, as this project covers four alignments across a large landscape area, to assess each one separately would entail significant repetition in assessment.

Each alignment shares to some extent the same route with another alignment for some way. These shared areas have been defined as segments for this report.

Therefore, to reduce length of assessment, the LVIA is firstly undertaken by segment, and then these segment assessments are recompiled to provide an overview of each alignment.

Table 14 demonstrates where the segments are shared by alignments and where they are not. Detailed maps of segments associated with each alignment can be found in Appendix: Alignment segment maps.

Table 14: Segments associated with Alignments.

Segment	1	2	3	4	5	6	7	8	9
Alignment AO									
Alignment A1									
Alignment CO									
Alignment C2									

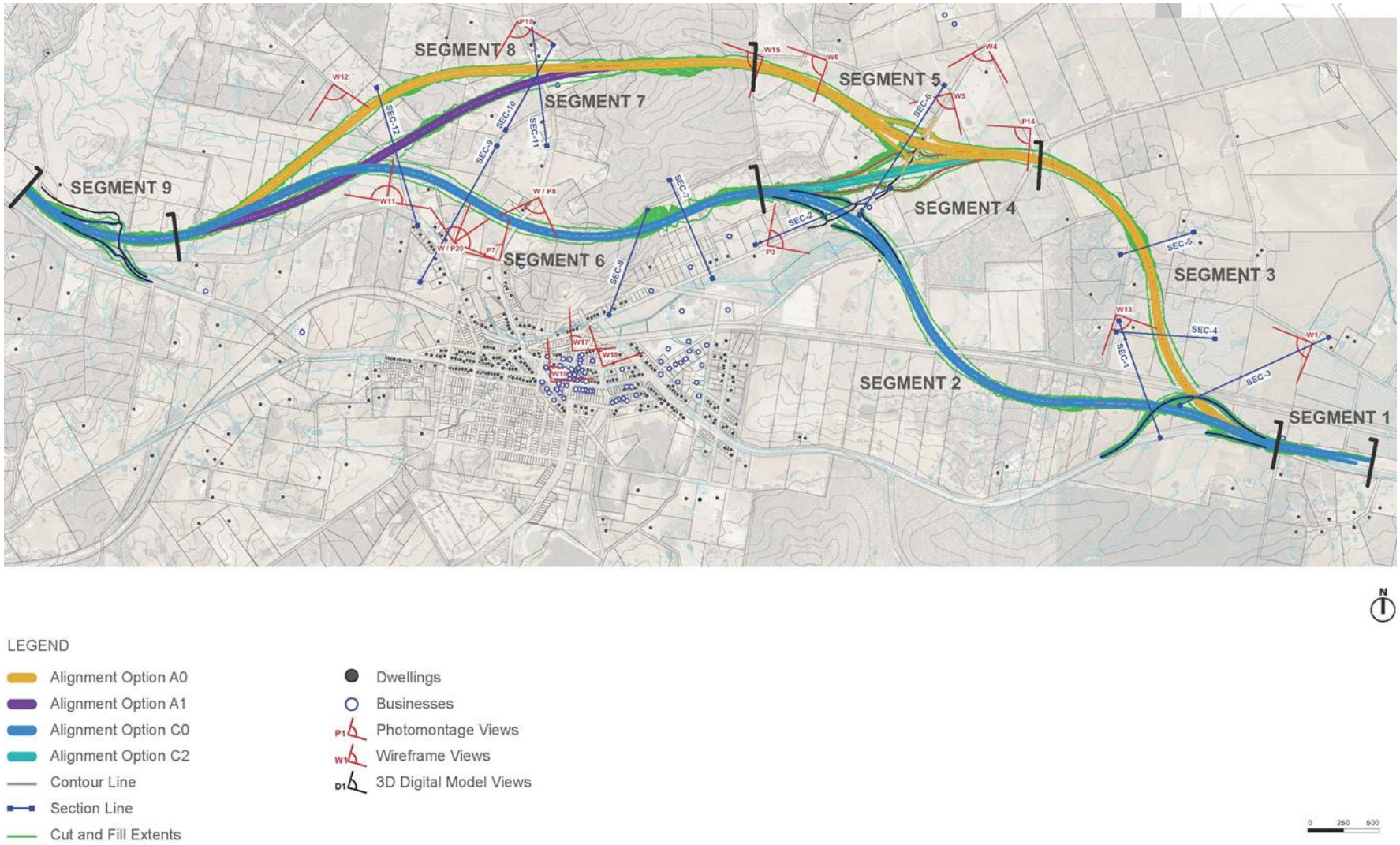

Figure 60. Plan of Bypass segments.

7.1.1 Segment details

Each segment is introduced through a table of details that identifies key characteristics of the segment.

Table 15: Key characteristics of Bypass segments.

Segment characteristic	Explanation
Length of segment	This highlights the physical length of the segment.
Key alignment features	Major features of the alignment that may have a visual and landscape impact, such as cut and fill, or walls.
Landscape character types	The general landscape character of the segment.
Anticipated vegetation loss	The extent of vegetation loss that may occur. Significant vegetation loss may impact the landscape character and alter the visual impact on adjacent residents and viewpoints.
Watercourses impacted	Documents the numbers of watercourses crossed. Typically, more crossings of a single watercourse means more change to the overall character of the waterway/landscape character type.
No. of adjacent dwellings or businesses or businesses within 100m of the outer carriageway edge of the road	As a rule, occupied buildings within 100m of either side of the outer carriageway edges of the alignment are impacted more than those further away.
No. of adjacent dwellings or businesses or businesses within 500m of the outer carriageway edge of the road	Occupied buildings within 500m of either side of the outer carriageway edges of the alignment may be impacted, depending on their orientation, specific location, vegetation coverage and topography.
No. of sensitive sites within 500m of the outer carriageway edge of the road	As a rule, the number of identified sensitive sites within 500m of the alignment are typically impacted more than those further away.
No. of key views and viewsheds	Key views and viewsheds that may be affected within the segment.

7.1.2 Segment 1 – Western Highway, eastern entrance and exit

Segment details

Table 16: Segment 1 characteristics.

Segment elements	Description
Length of segment	700m o A0: CH11100–CH10400 o A1: CH11000–CH10300 o C0: CH10400–CH9700 o C2: CH10900–CH10200
Key alignment features	Dual Carriageway – Fill. Minor topographic changes. o Fill min: 0m o Fill max: 2.5m
Landscape character types	Highway Infrastructure (700m,100%)
Anticipated vegetation loss	Removal of some trees on road edge
Watercourses impacted	3 small waterways are crossed. These are small waterways and do not inform significantly the overall landscape and visual character, and thus the impact is not significant.
No. of adjacent dwellings or businesses within 100m of the outer carriageway edge of the road	1 dwelling
No. of adjacent dwellings or businesses between 101 and 500m of the outer carriageway edge of the road	9 dwellings
No. of sensitive sites within 500m	0
No. of key views and viewsheds	1: Island Uplands Viewshed

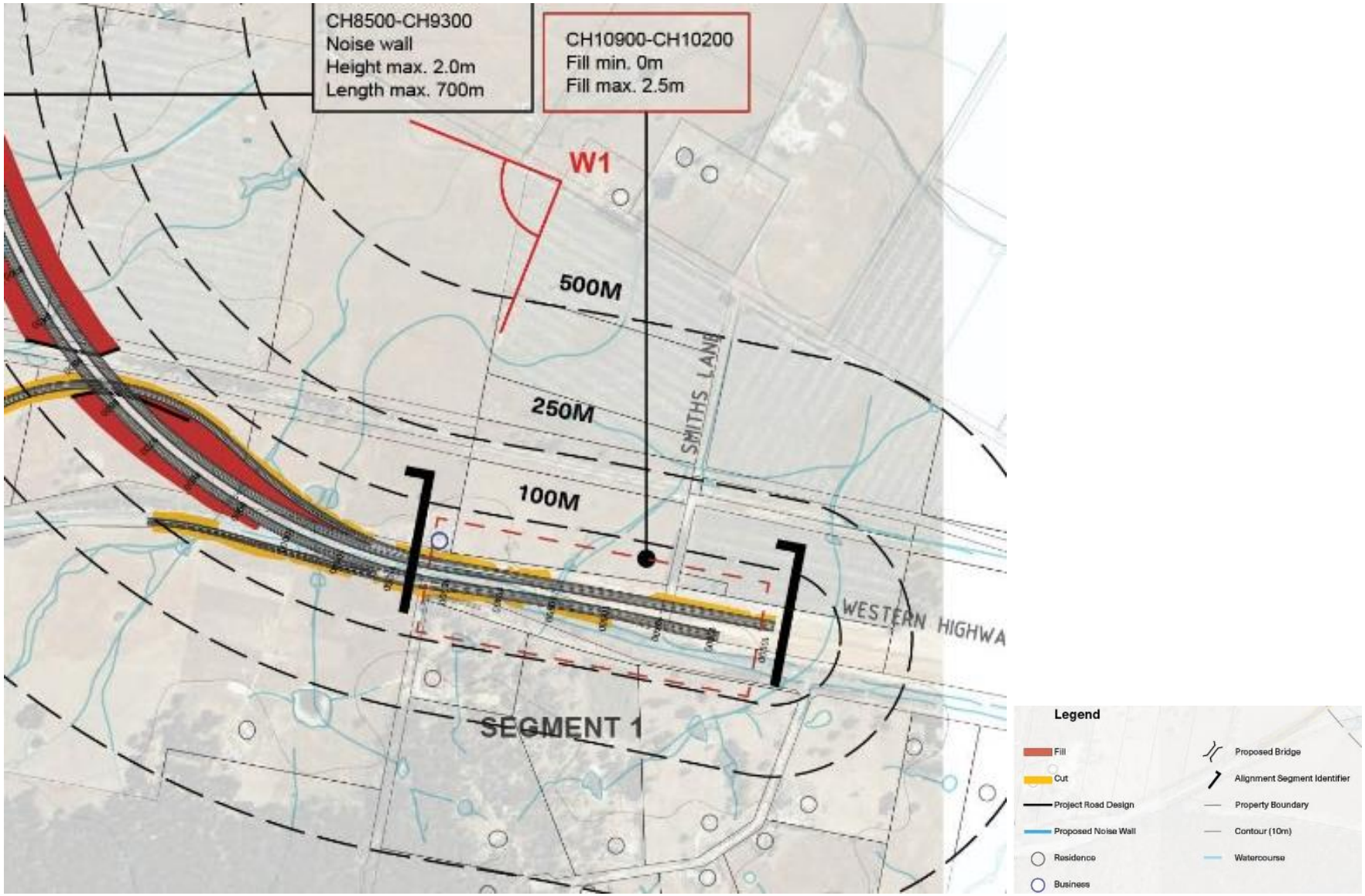

Figure 61. Summary plan of alignment features.

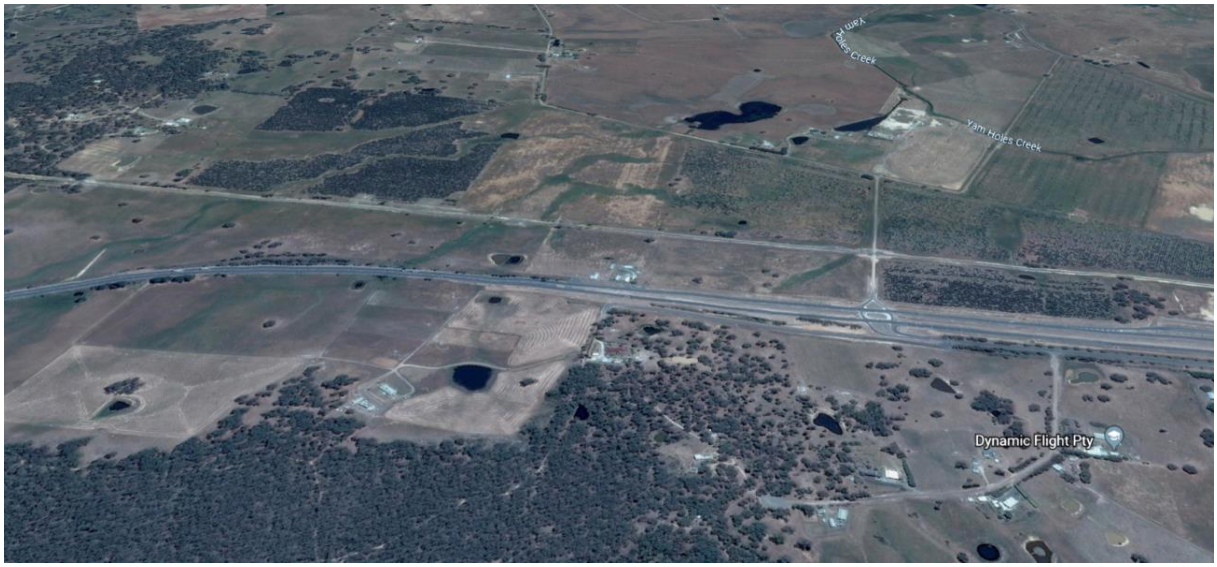

Figure 62. Aerial view (Google Earth).

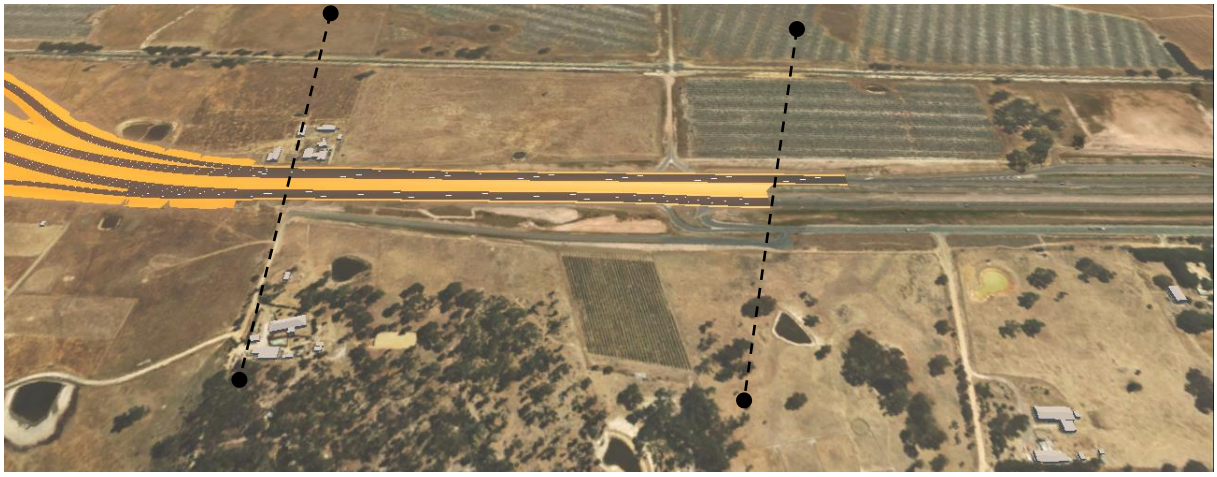

Figure 63. Segment 1 – View (Virtual Model WSP), showing all Alignments.

Landscape character impact assessment

Table 17: Summary of Segment 1 impact on landscape character.

Landscape character	Value	Ability to absorb change	Level of change in landscape by bypass	Final landscape character Impact score
Highway Infrastructure	Low	Very high	Low	Very low
Overall landscape character impact assessment = Very low				

Sensitive sites impact assessment

No sensitive sites in this segment.

Key views and viewsheds impact assessment

The only key viewshed in this segment is the northern views to the regionally significant Island Uplands area, which are the four hills of Mount Misery, Mount Ercildoune, Mount Bolton and Mount Beckworth, as identified by the South West Landscape Assessment Study, 2013.

These hills are quite a distance away, over 12 kilometres in a north-east direction. They can be seen in the distance when travelling east along the current Highway. Depending on growth or harvesting of plantations over time, the view will become more obscured or open.

Table 18: Summary of impact on key views and viewsheds.

Key view and viewshed	Level of sensitivity	Impact score
Island Uplands	High	Very low
Overall key views and viewsheds impact = Very low		

Adjacent residential dwellings impact assessment

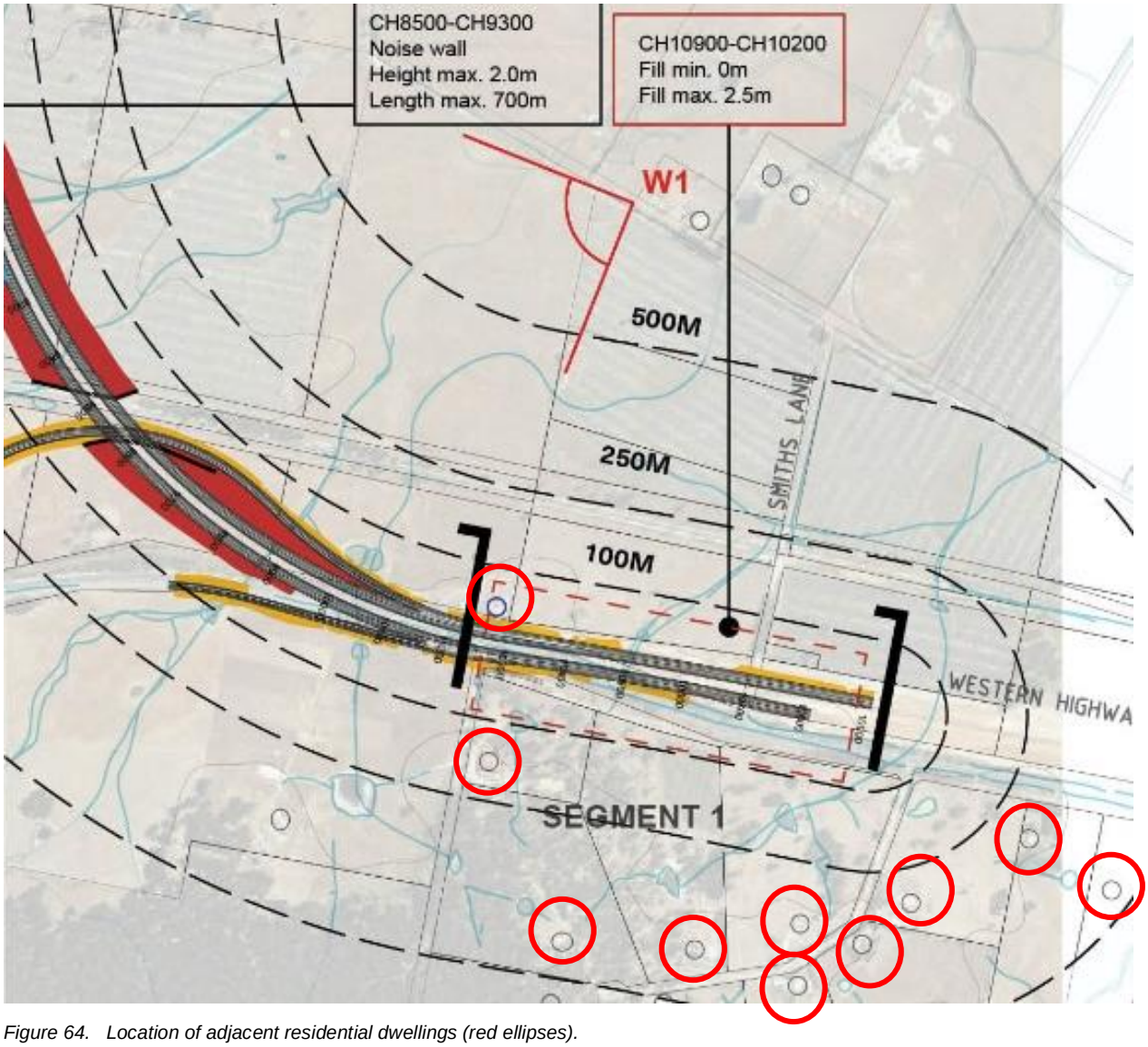

Figure 64. Location of adjacent residential dwellings (red ellipses).

There are a number of residences within 500m of the outer carriageway edge of the road. However, because the works in this segment are similar to the existing Highway features, the impact will be low.

Table 19: Summary of Segment 1 impacts on residential dwellings.

Distance	Adjacent residential dwellings	Impact
< 100m	1	None
101–250m	1	Low
250–500m	8	Very low
Overall adjacent residential dwellings impact = Very low		

7.1.3 Segment 2 – Western Highway to Beaufort–Lexton Road through eastern valley

Segment details

Table 20: Segment 2 characteristics.

Segment elements	Description
Length of segment	4300m o C0: CH9700– CH5400
Key alignment features	• Dual Carriageway – Cut and Fill. Predominant topographic changes include: o Carriageway 400m in length where: Fill min: 0m Fill max: 9m o Carriageway 1700m in length where: Fill min: 5m Fill max: 10m • On-ramp bridge over bypass (CH9000–CH8900) • 3 bridges. Listing from east to west: o 10m high bridge over Melbourne–Ararat Railway o 10m high bridge over Racecourse Road o 11m high bridge over Beaufort–Lexton Road • Four arterial on and off ramps (associated with bridge over Beaufort–Lexton Road) • One bypass intersection (associated with bridge over Beaufort–Lexton Road)
Landscape character types	Highway Infrastructure (850m, 20%) Eastern Semi-Enclosed Rural Valley (2460m, 57%) Beaufort Fringe (990m, 23%)
Anticipated vegetation loss	Direct vegetation loss would occur mainly within the Eastern Semi-Enclosed Rural Valley that has dispersed trees and some large areas of scattered trees. Some direct vegetation loss could occur within Beaufort Fringe which generally has roadside and scattered vegetation.
Watercourses impacted	7 small waterways are crossed. These are small waterways and do not inform significantly the overall landscape and visual character, and thus the impact is not significant. Two large bridges and associated embankments cross one waterway and the Yam Holes Creek. These impacts do have a detrimental impact on the waterways character and value.
No. of adjacent dwellings or businesses within 100m of the outer carriageway edge of the road	0
No. of adjacent dwellings or businesses between 101 and 500m of the outer carriageway edge of the road	9
No. of sensitive sites within 500m	2: • Snowgums Bushland Reserve • Beaufort Motorcycle Track
No. of key views and viewsheds	1: • Camp Hill Lookout

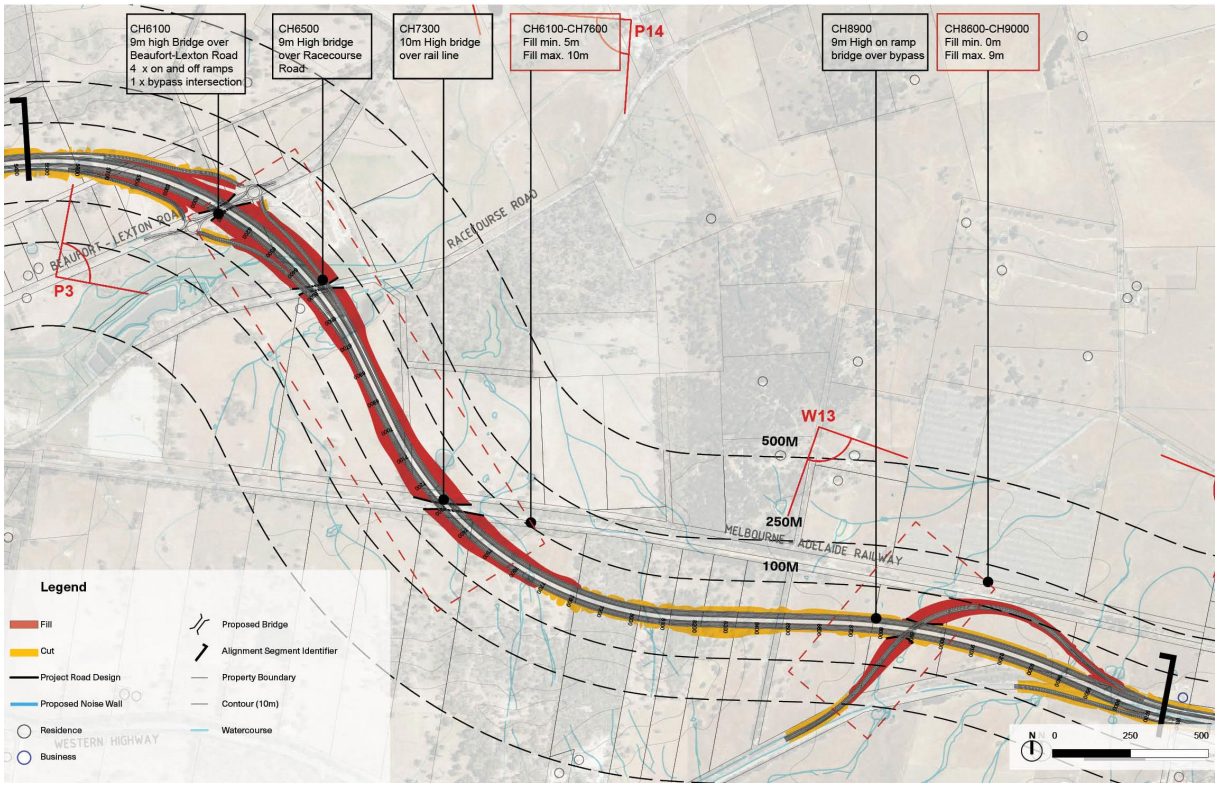

Figure 65. Summary plan of alignment features.

Figure 66. Aerial view (Google Earth).

Figure 67. Segment 2 – View (Virtual Model WSP), showing Alignment C0.

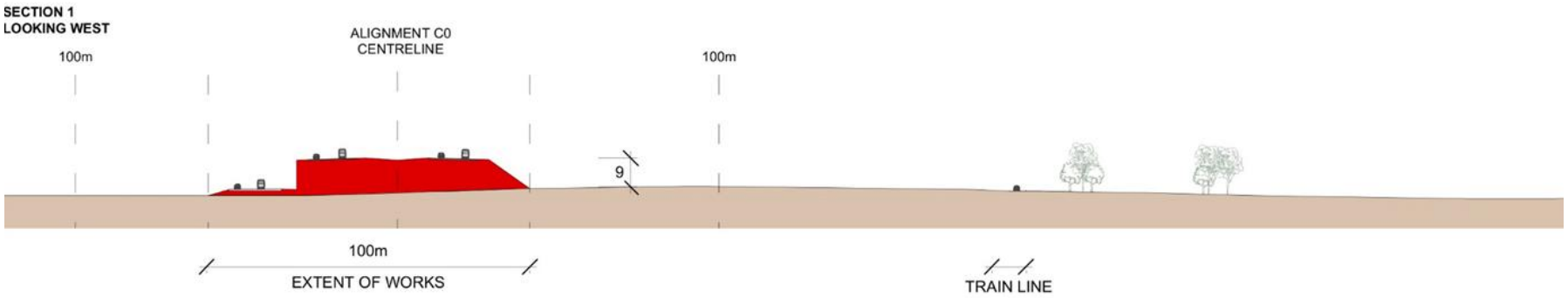

Figure 68. Cross Section 1 – Packhams Lane.

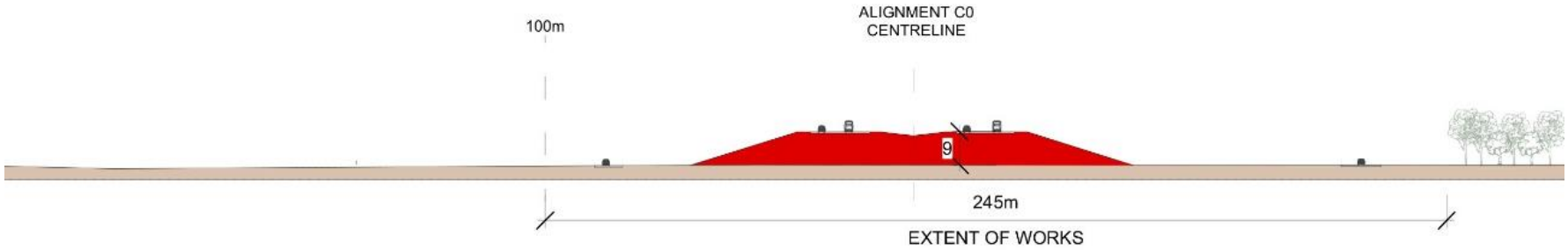

Figure 69. Cross Section 2 – Alignment as it crosses Beaufort–Lexton Road.

Landscape character impact assessment

BEAUFORT FRINGE

Figure 70. Street view from Beaufort–Lexton Road, looking north-west (Viewpoint 3), showing existing conditions.

Figure 71. Photomontage view from Beaufort–Lexton Road – Looking north-west (Viewpoint 3) – Alignment C0.

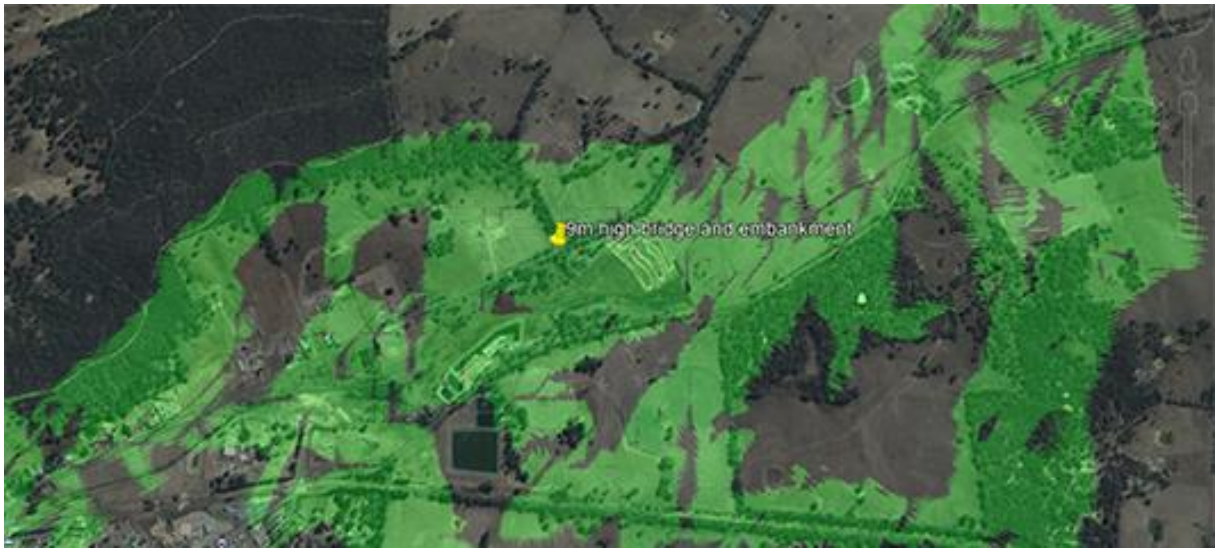

Figure 72. Indicative visibility of interchange with 9m high bridge and embankment (Google Earth Pro, does not consider vegetation and built form).

The photomontage shows one area to the east of Beaufort Fringe that will be altered by views to the interchange. The high bridge and embankment and loss of vegetation will be visible from further afield as shown by the viewshed figure. In addition, the landscape will also be altered by the areas of hillside cutting to the north, which will be visible.

EASTERN SEMI-ENCLOSED RURAL VALLEY

Figure 73. View (Virtual Model WSP), showing Alignments A0, A1 and C2 in background.

Figure 74. View (Virtual Model WSP) of landscape character type with Alignment C0.

Table 21: Summary of Segment 2 impacts on landscape character.

Landscape character	Value	Ability to absorb change	Level of change in landscape by bypass	Final landscape character Impact score
Highway Infrastructure	Low	Very high	Moderate	Moderately low
Eastern Semi-Enclosed Rural Valley	Moderate	Moderately low	High	Moderate
Beaufort Fringe	Moderate	Moderately low	Very high	High
Overall landscape character impact = Moderate				

Sensitive sites impact assessment

Identified sensitive local sites in this segment are:

- Snowgums Bushland Reserve
- Beaufort Motorcycle Track.

SNOWGUMS BUSHLAND RESERVE

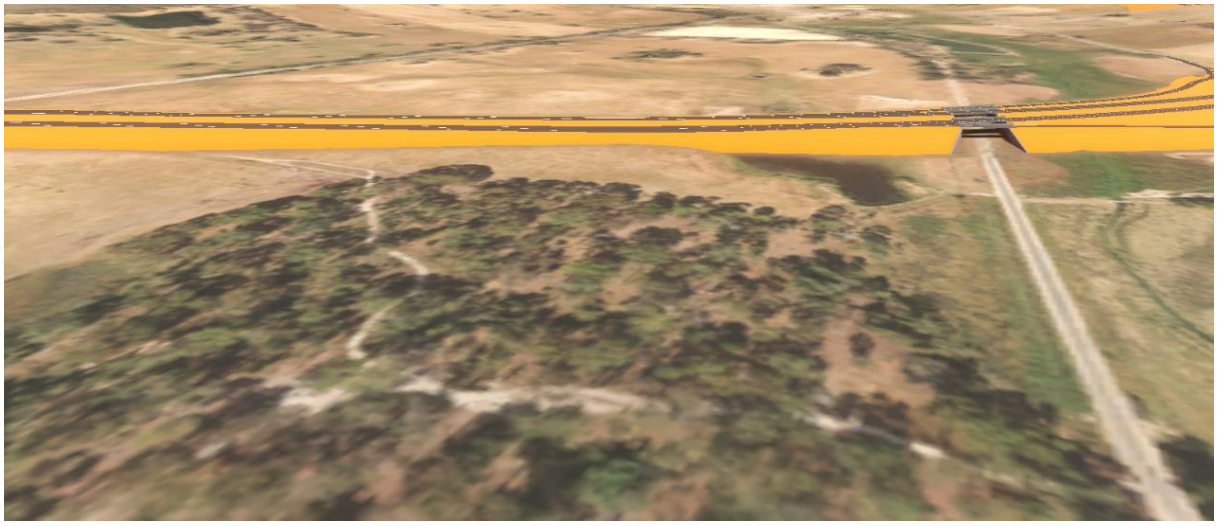

Figure 75. View (Virtual Model WSP) of Snowgums Bushland Reserve – showing C0 Alignment.

Figure 76. View from inside Snowgums Bushland Reserve, showing existing conditions.

Tree coverage within the Snowgums Bushland Reserve will mitigate views of the bypass from within the Reserve. At the edges of the Reserve, to the east and south, the bypass will become more visible and dominate in the landscape view.

BEAUFORT MOTORCYCLE TRACK

Figure 77. Beaufort Motorcycle Track, looking north.

Figure 78. View (Virtual Model WSP) of Beaufort Motorcycle Track.

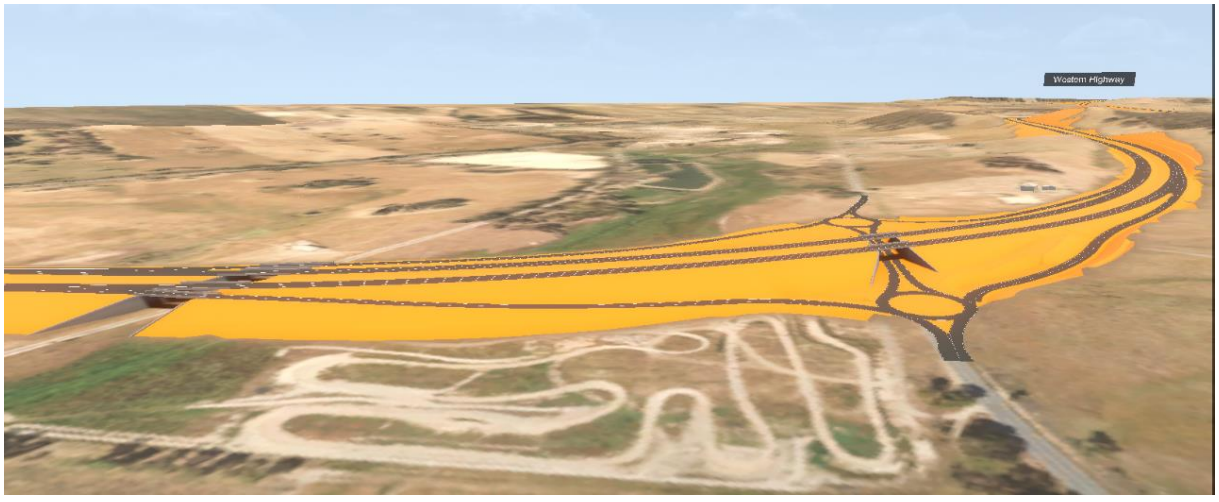

Figure 79. View (Virtual Model WSP) of Beaufort Motorcycle Track showing Alignment C0.

Table 22: Summary of Segment 2 impacts on sensitive sites

Site	Level of sensitivity	Impact score
Snowgums Bushland Reserve	Very high	Moderate
Beaufort Motorcycle Track	Low	Low
Overall sensitive local sites impact = Moderately low		

Key views and viewsheds impact assessment

Identified key views and viewsheds in the segment are:

- Camp Hill Lookout (Refer to Segment 6 for assessment).

Adjacent residential dwellings impact assessment

There are four main groupings of residential properties:

- Smiths Lane (1)
- Packhams Lane (2)
- South of Alignment (3)
- Beaufort Fringe (4)
- Slaughterhouse Lane (5).

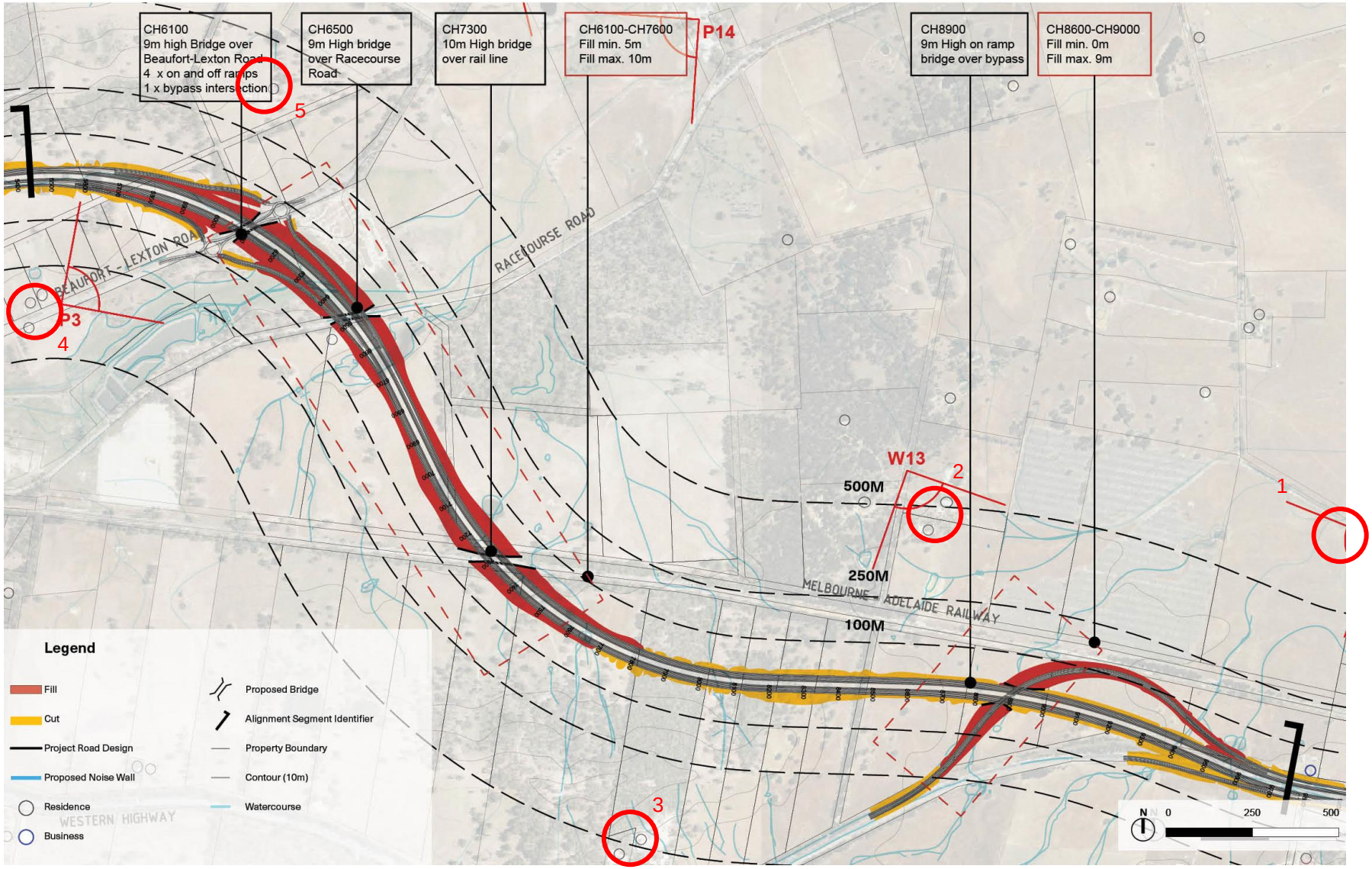

Figure 80. Location of adjacent residential dwellings (red circles)

SMITHS LANE (1)

Figure 81. Street view from Smiths Lane – existing.

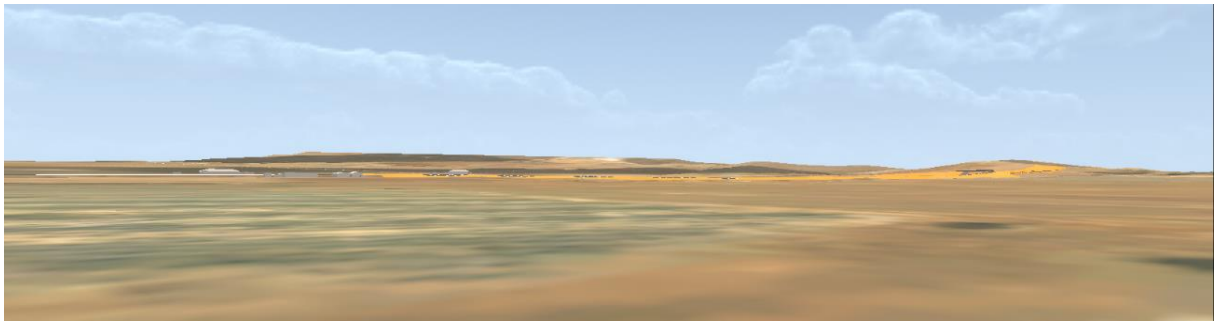

Figure 82. View (Virtual Model WSP) from Smiths Lane – showing Alignment C0.

PACKHAMS LANE (2)

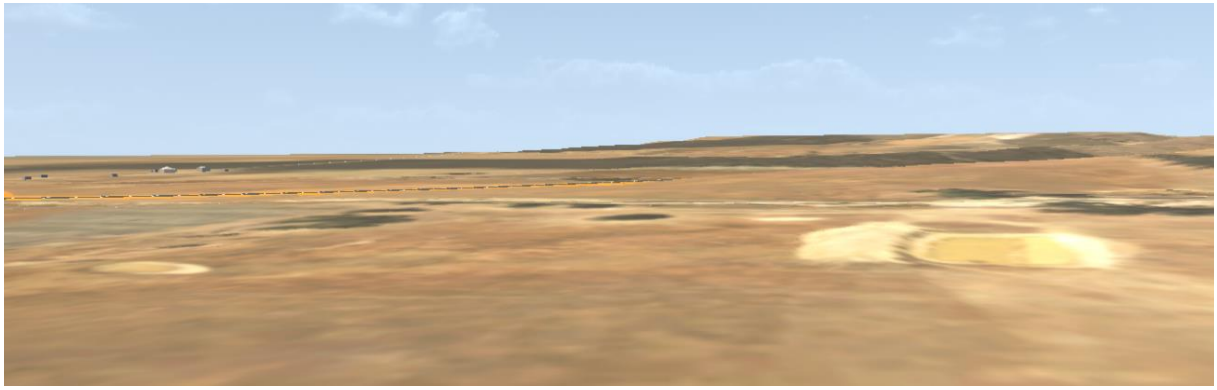

Figure 83. View (Virtual Model WSP) from Packhams Lane east dwelling.

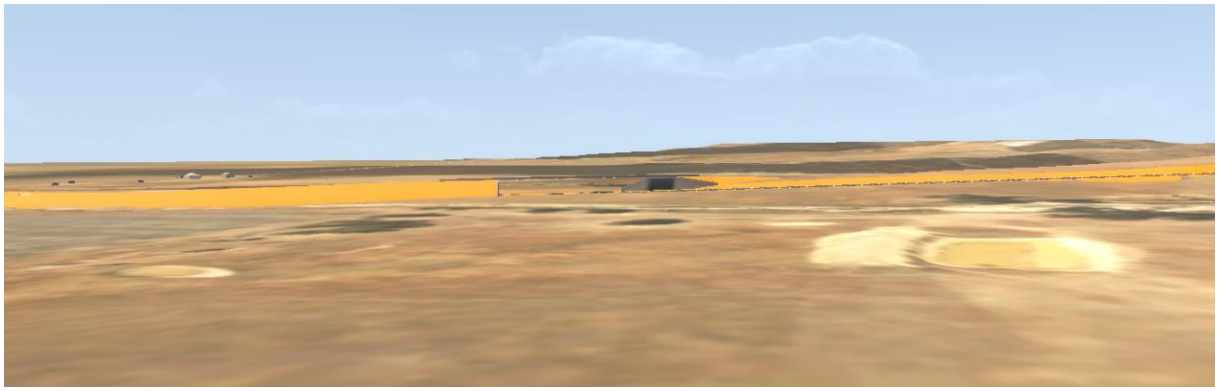

Figure 84. View (Virtual Model WSP) from Packhams Lane east dwelling – showing Alignment C0.

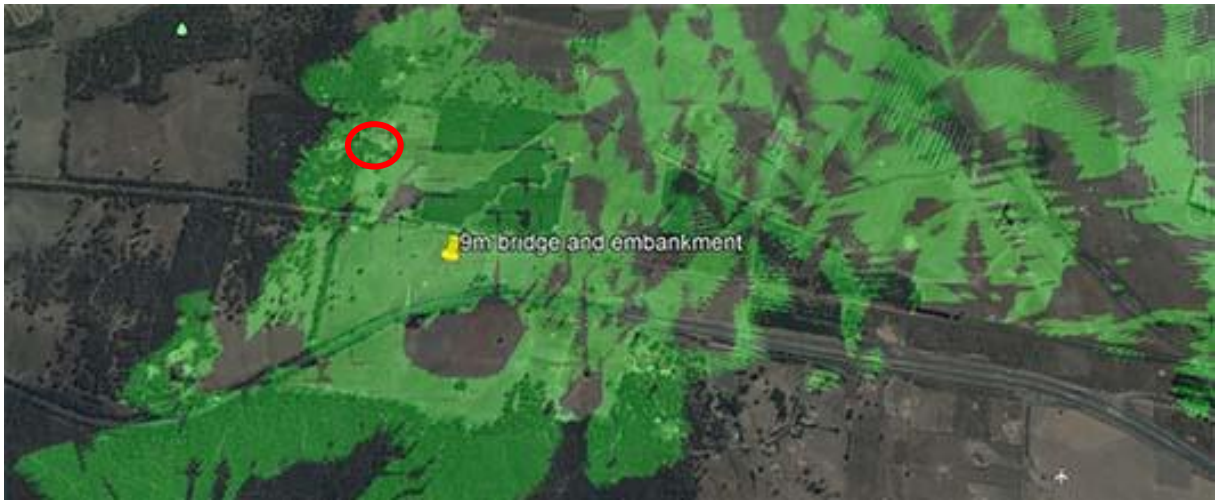

Figure 85. Indicative visibility of interchange with 9m bridge and embankment, with residents in Packhams Lane east shown in red ellipse (Google Earth Pro, does not consider vegetation and built form).

SOUTH OF ALIGNMENT (3)

- Residential dwellings in this location will not be detrimentally affected by the alignment as they are south of a ridgeline and within vegetated areas.

SLAUGHTERHOUSE LANE (5)

Figure 86. View (Virtual Model WSP) from Slaughterhouse Lane dwelling – looking south.

Figure 87. View (Virtual Model WSP) from Slaughterhouse Lane dwelling – looking south – Alignment C0.

Table 23: Summary of Segment 2 impacts on residential dwellings.

Location	Adjacent residential dwellings	Impact score
Smiths Lane east (1)	1, 750m.	Very low
Packhams Lane (2)	3, approx. 500m	Moderate
South of Alignment (3)	2, approx. 500m	Negligible
Beaufort Fringe (4)	3, within. 500m	Moderate
Slaughterhouse Lane (5)	1, approx. 350m	Moderate
Overall adjacent residential dwellings impact = Moderate		

7.1.4 Segment 3 – Western Highway to Beaufort–Lexton Road through eastern valley

Segment details

Table 24: Segment 3 characteristics.

Segment elements	Description
Length of segment	2700m o A0: CH10400–C7700 o A1: CH10300–CH7600 o C2: CH10200–CH7500
Key alignment features	• Dual Carriageway – Cut and Fill. Predominant topographic changes include: o Carriageway 470m in length where: Fill min: 5m Fill max: 14m o Carriageway 1100m in length where: Cut min: 5m Cut max: 14m • 10m high bridge over Melbourne–Ararat Railway • Elevated arterial off ramp • 2m high noise wall on top of 5–14m fill (700m in length) – west side o A0: CH9400–CH8700 o A1: CH9400–CH8700 o C2: CH9250–CH8550
Landscape character types	Highway Infrastructure (590m, 22%) Open Rural Plains (600m, 22%) Eastern Semi-Enclosed Rural Valley (1510m, 56%)
Anticipated vegetation loss	Direct vegetation loss would occur mainly within the Eastern Semi-Enclosed Rural Valley that has dispersed trees areas. Some direct vegetation loss could occur within the Open Rural Plains (mostly planted vegetation).
Watercourses impacted	6 small waterways are crossed. These are small waterways and do not inform significantly the overall landscape and visual character, and thus the impact is not significant.
No. of adjacent dwellings or businesses within 100m of the outer carriageway edge of the road	1
No. of adjacent dwellings or businesses between 101 and 500m of the outer carriageway edge of the road	9
No. of sensitive sites within 500m	2 • Snowgums Bushland Reserve • Racecourse Road Mullock Heap
No. of key views and viewsheds	1 • Island Uplands Viewshed

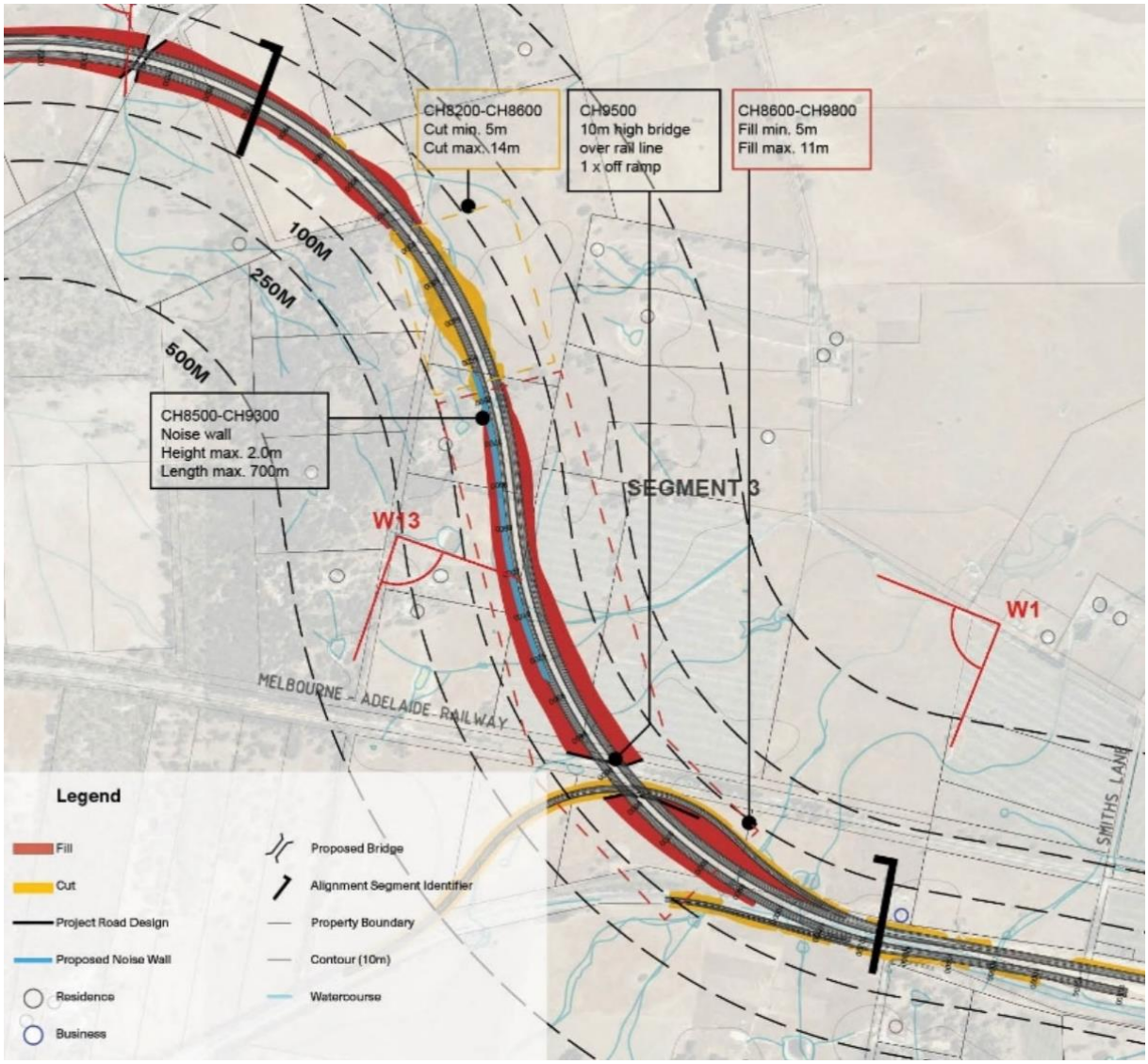

Figure 88. Summary plan of alignment features.

Figure 89. Aerial view (Google Earth).

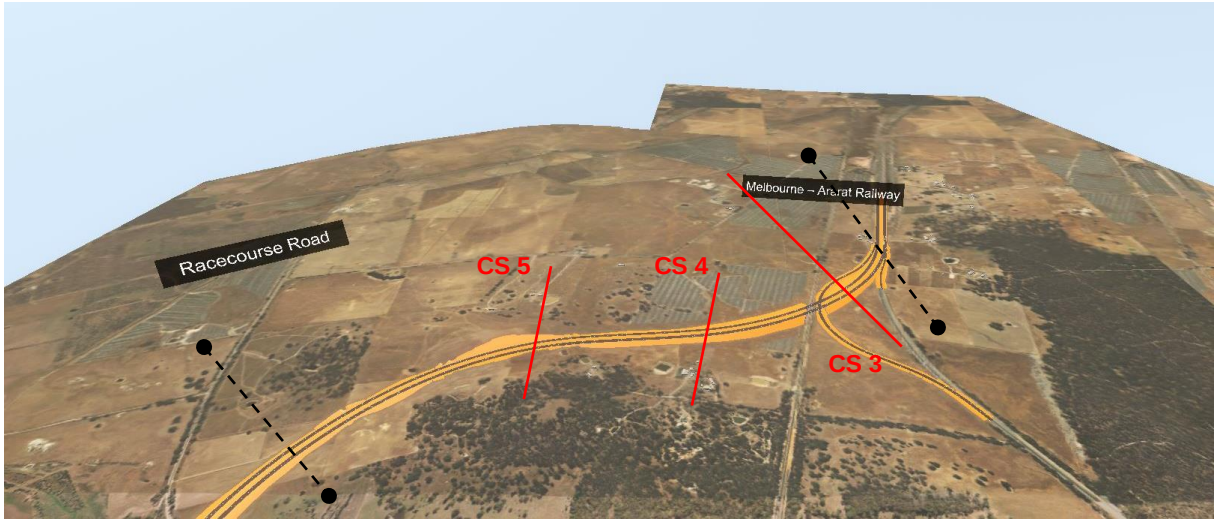

Figure 90. Segment 3 – View (Virtual Model WSP), showing Alignments A0, A1 and C2.

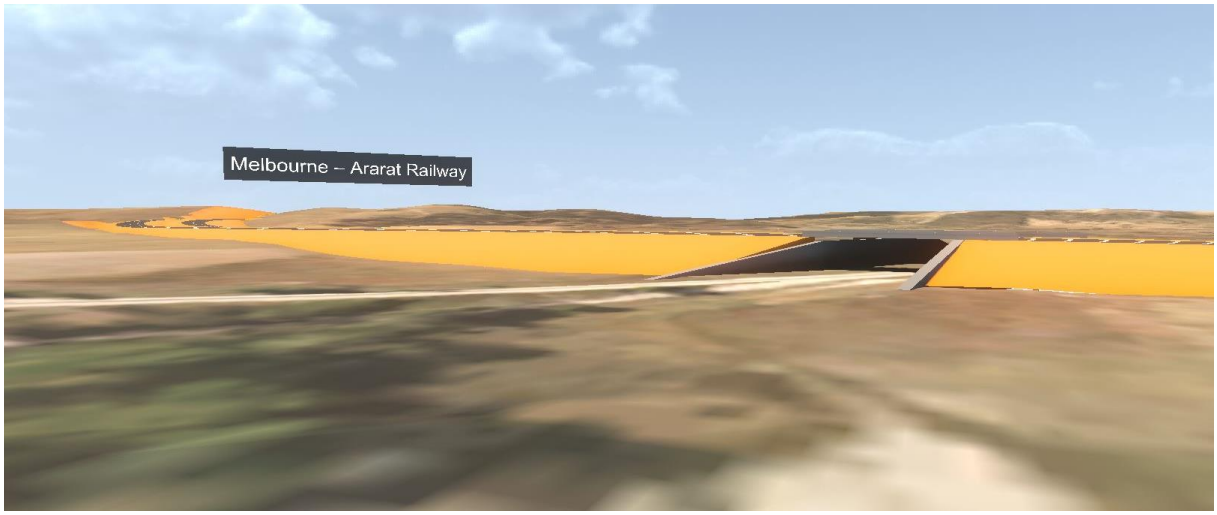

Figure 91. Looking north east as alignment crosses Melbourne – Ararat Rail line

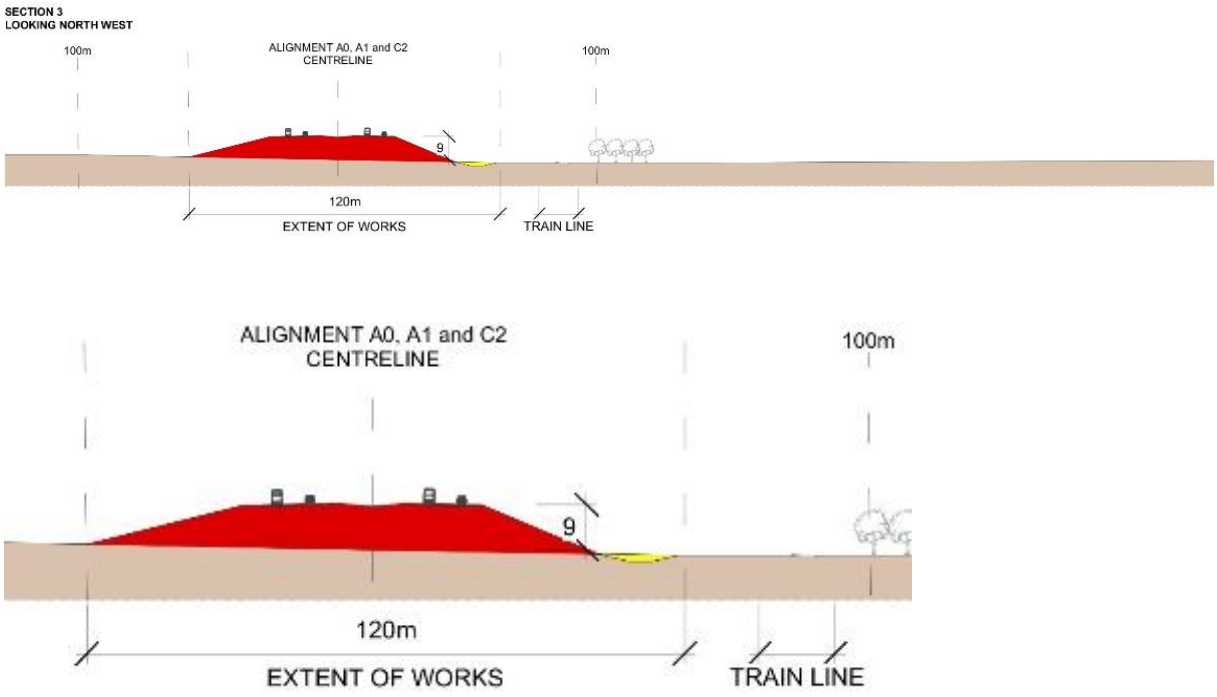

Figure 92. Cross Section No. 3 – South of Smiths Lane to Alignment (and close-up section)

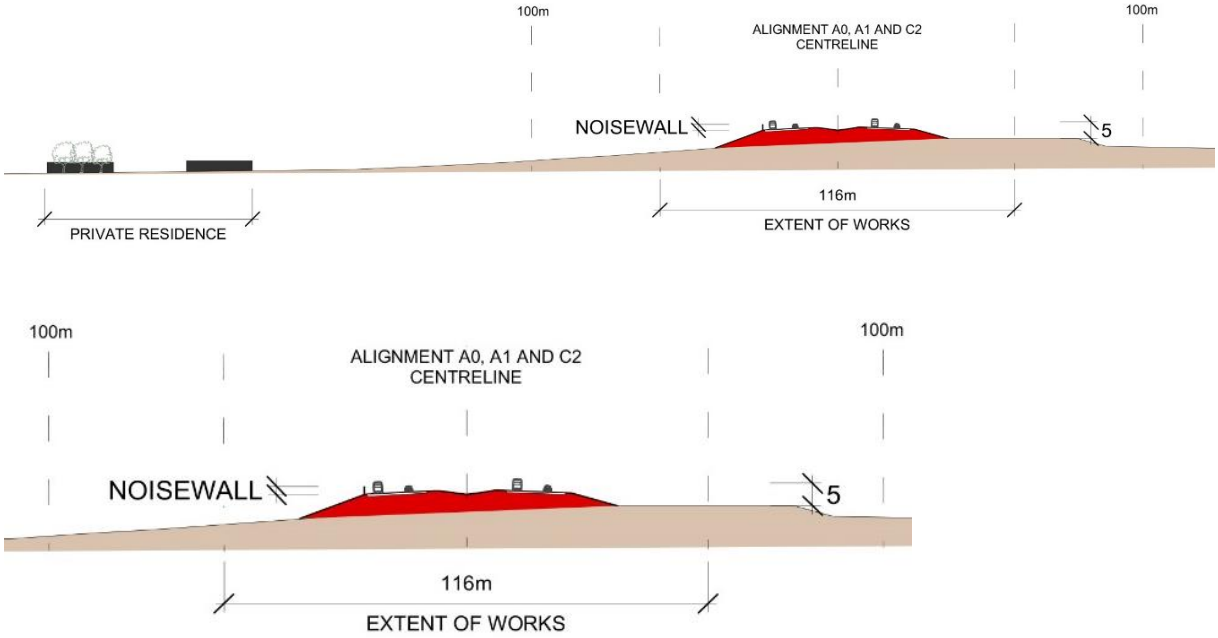

Figure 93. Cross Section No. 4 – Packhams Lane east to Alignment (and close up-section)

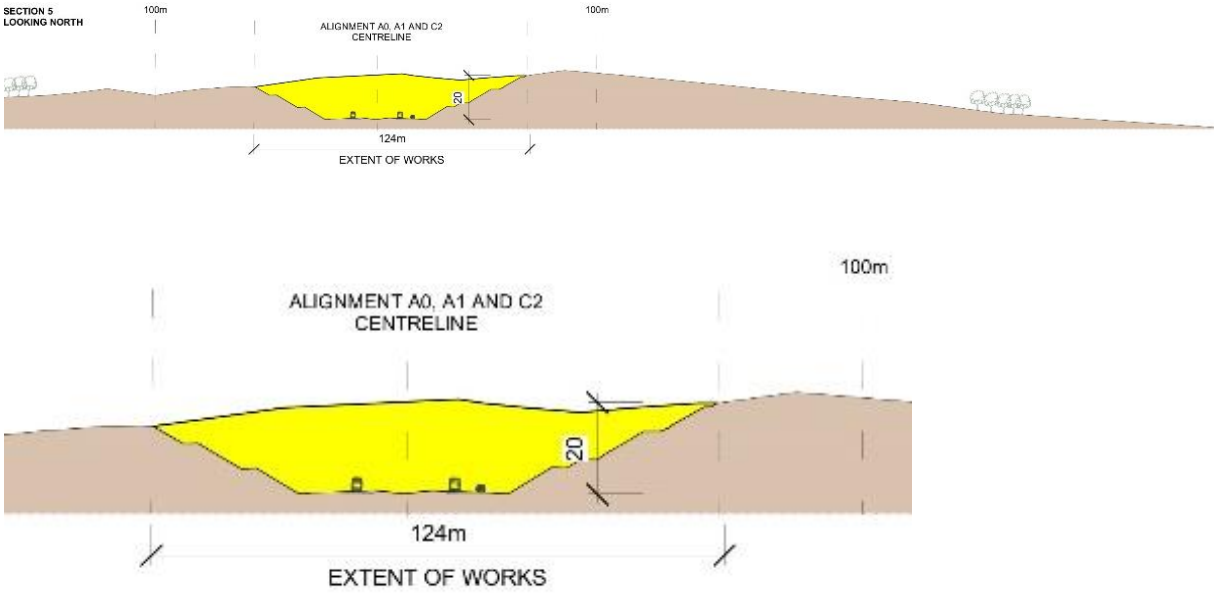

Figure 94. Cross Section No. 5 – Looking north as Alignment cuts through low hill (and close-up section)

Landscape character impact assessment

OPEN RURAL PLAINS

Figure 95. View from Smiths Lane – looking south.

Figure 96. Wireframe view from Smiths Lane – looking south to Alignments A0, A1 and C2.

EASTERN SEMI-ENCLOSED RURAL VALLEY

Figure 97. View from Packhams Lane – looking south.

Figure 98. Wireframe view from Packhams Lane – looking south-west to Alignment A0, A1, C2.

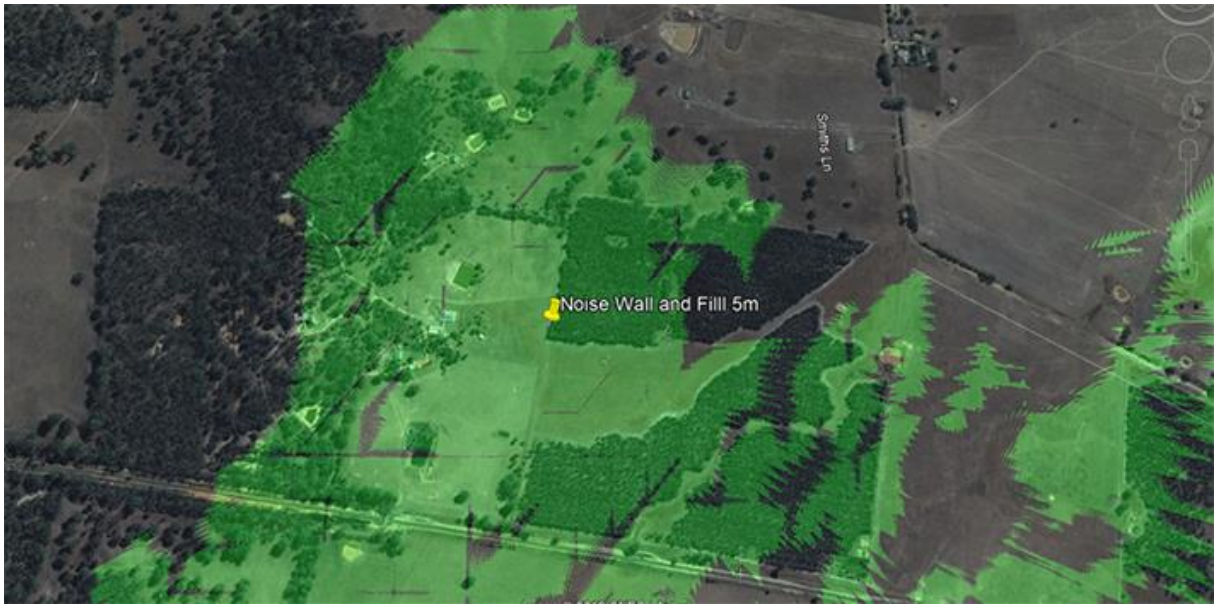

Figure 99. Indicative visibility of 5m fill and 2m high noise walls (Google Earth Pro, does not consider vegetation and built form).

Table 25: Summary of Segment 3 impacts on landscape character.

Landscape character	Value	Ability to absorb change	Level of change in landscape by bypass	Final landscape character Impact score
Highway Infrastructure	Low	Very high	Moderate	Moderately low
Open Rural Plains	Moderately low	Moderate	High	Moderately low
Eastern Semi-Enclosed Rural Valley	Moderate	Moderately low	Moderate	Moderate
Overall landscape character impact = Moderate				

Sensitive sites impact assessment

Identified sensitive local sites in the segment are:

- Snowgums Bushland Reserve
- Racecourse Road Mullock Heap.

RACECOURSE ROAD MULLOCK HEAP

Figure 100. View looking south-east from Racecourse Road Mullock Heap.

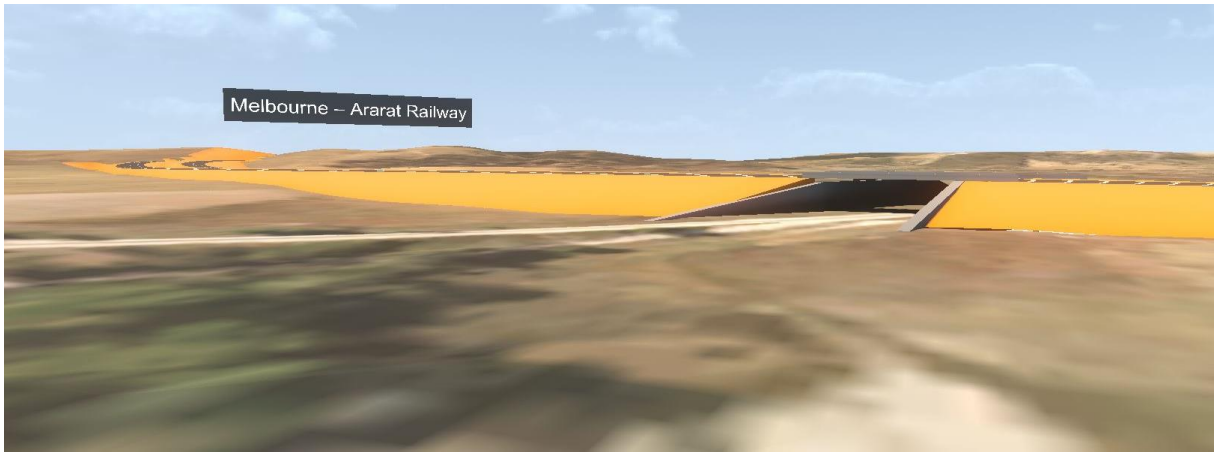

Figure 101. View (Virtual Model WSP) looking south-east from Racecourse Road Mullock Heap, showing Alignment A0, A1 and C2.

Figure 102. Indicative visibility from Racecourse Road Mullock Heap (Google Earth Pro, does not consider vegetation and built form).

Racecourse Road Mullock Heap is a locally sensitive site. One must climb up the heaps to gain the full views across the landscape. The landscape to the south is quite open and Yam Holes Creek flows through it. The alignments in Segment 3 will all be visible from this location, depending on the level of vegetation removal and given the height of the alignments and the hillside cut further west.

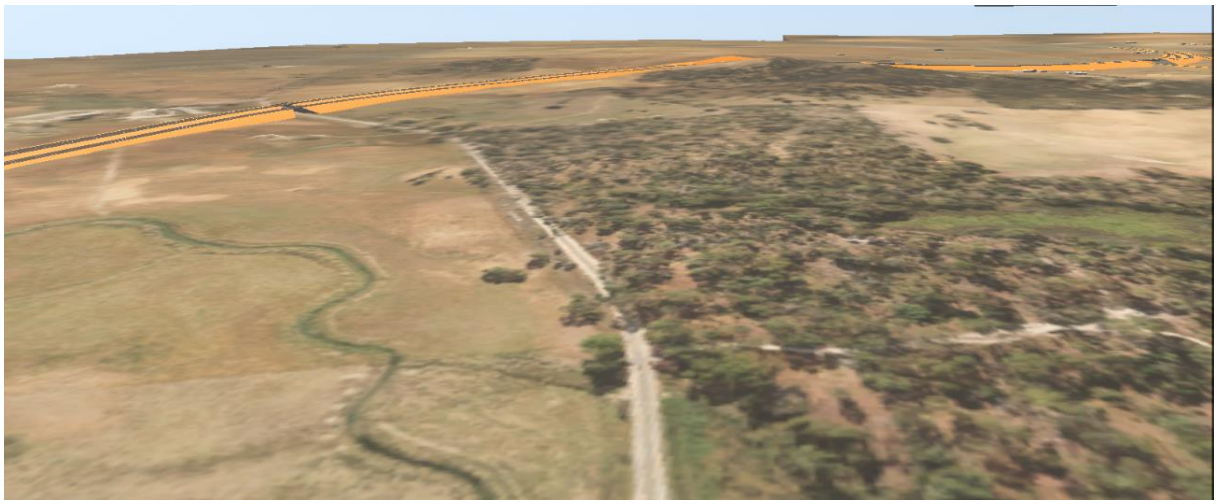

Figure 103. View (Virtual Model WSP) of Snowgums Bushland Reserve – showing Alignment A0, A1 and C2.

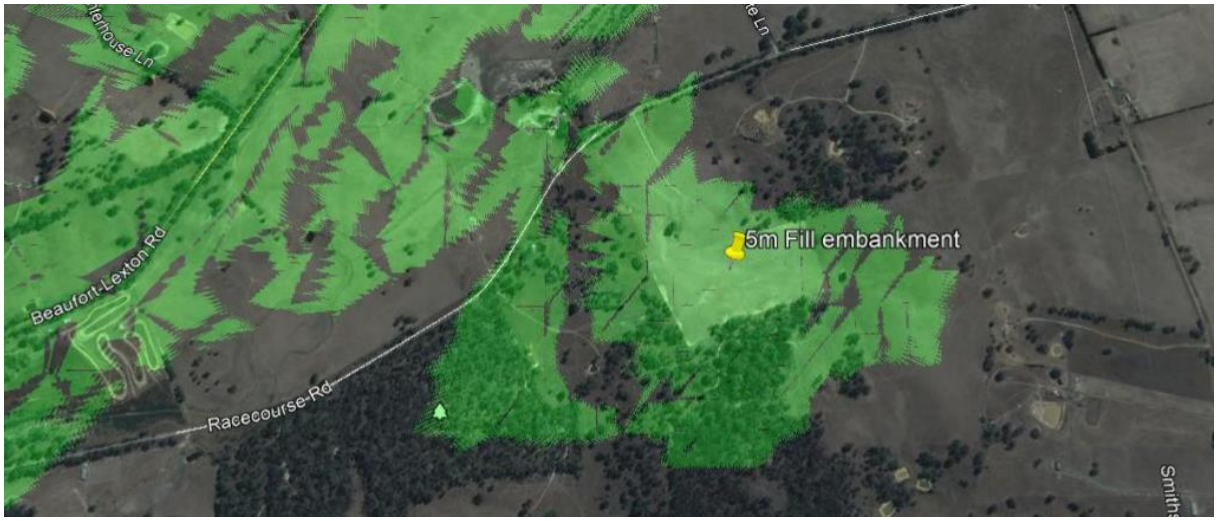

Figure 104. Indicative visibility of 5m embankment north-east of Snowgums Bushland Reserve (Google Earth Pro, does not consider vegetation and built form).

Snowgums Bushland Reserve is about 270m south of the alignment at its most northerly point. Tree coverage within the reserve will mitigate views in the north from within of the bypass. At the edges of the Reserve, to the north and west, the bypass will become more visible and dominate in the landscape view.

Table 26: Summary of Segment 3 impacts on sensitive sites.

Site	Level of sensitivity	Impact score
Snowgums Bushland Reserve	Very high	Moderately low
Racecourse Road Mullock Heap	Moderate	Moderate
Overall sensitive local sites impact = Moderate		

Key views and viewsheds impact assessment

Identified key views and viewsheds in the segment are:

- Views to the Island Uplands

Figure 105. View from Smiths Lane to the distant Island Uplands – the hills of Mt Misery. Mt Ercildoune, Mt Bolton and Mt Beckworth.

The general public's distant views of the Island Uplands regionally significant landscape area is not impacted by the alignments. The fill embankment and noise walls of Alignments A0, A1 and C2 may obscure residents' views of the Island Uplands to the east.

Table 27: Summary of Segment 3 impacts on key views and viewsheds.

Key view and viewshed	Level of sensitivity	Impact score
Island Uplands	High	Very low
Overall key views and viewsheds impact = Very low		

Adjacent residential dwellings impact assessment

There are five main groupings of residential properties:

- Smiths Lane east (1)
- Smiths Lane Central (2)
- Smiths Lane north-west (3)
- Packhams Lane east (4)

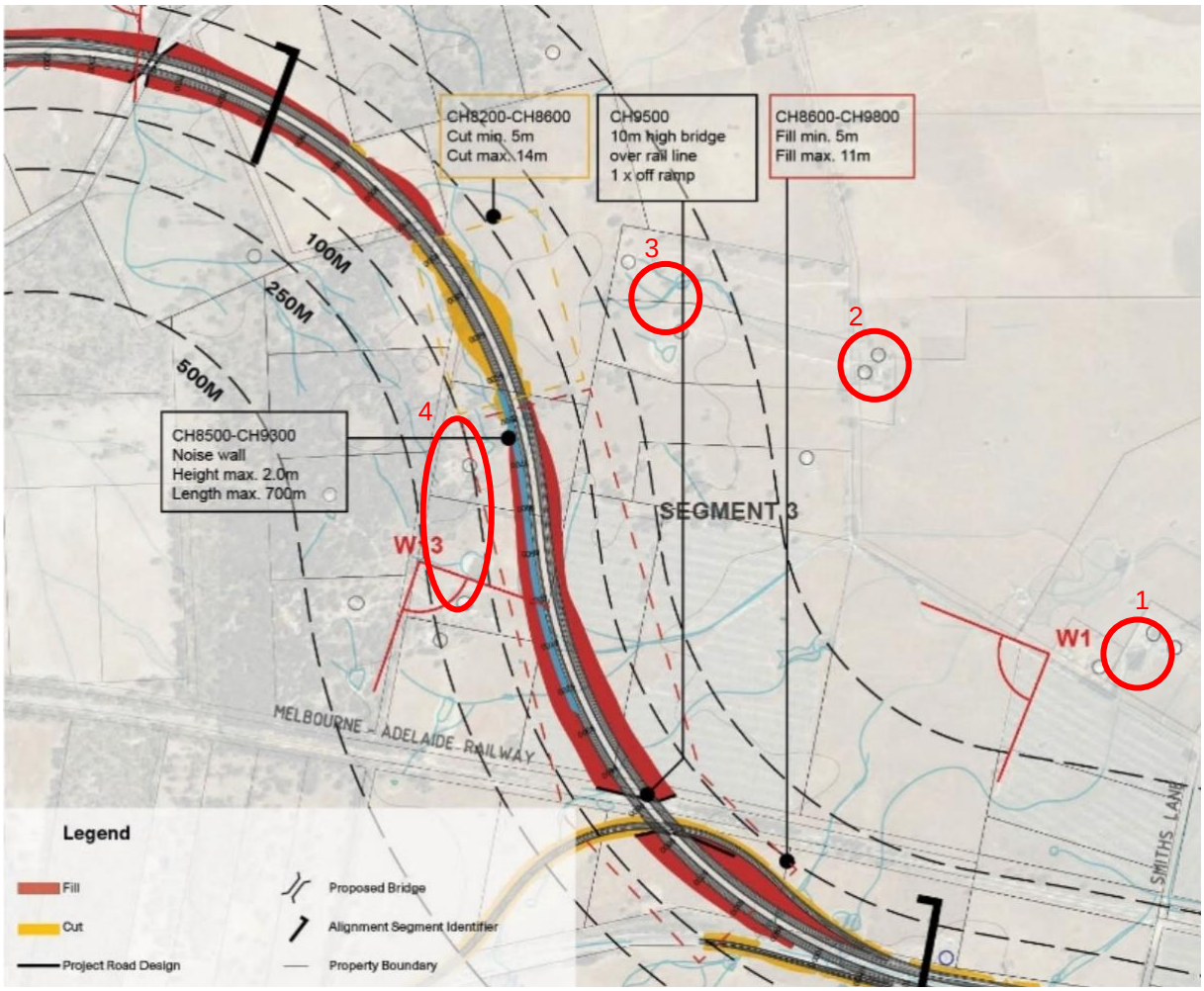

Figure 106. Location of adjacent residential dwellings (red ellipses).

SMITHS LANE EAST (1)

Figure 107. View from Smiths Lane east, Looking south-west – existing conditions.

Figure 108. Indicative wireframe view from Smiths Lane east, looking south-west, showing Alignment A0, A1 and C2.

These residents are over 500m from the outer carriageway edge of the road. Because the works in this segment are like the existing Highway features, they will receive some distant views (when plantations do not obscure views) of the alignments as the bypass passes over the Railway Line and the bypass interchange roads, and so the impact on them is Low to Very low.

SMITHS LANE CENTRAL (2)

Figure 109. View of existing conditions – looking west.

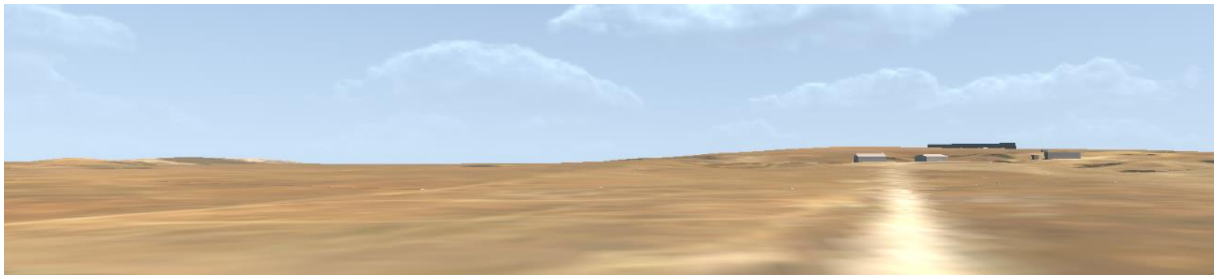

Figure 110. View (Virtual Model WSP) from Smiths Lane Central – with Alignments A1, A0 and C2.

These residential properties are just over 500m from Alignments A1, A2 and C2. They will have limited views of the alignments, because there is a ridgeline that blocks their view just north of the railway line, and when the alignments go into cut they will not be visible.

SMITHS LANE NORTH-WEST (3)

These residents are directly east of the alignments, which are in cut, and may be impacted through loss of vegetation on the hillside to the west, but the hilltop between them and the cut will significantly minimise any visual impacts.

PACKHAMS LANE EAST (4)

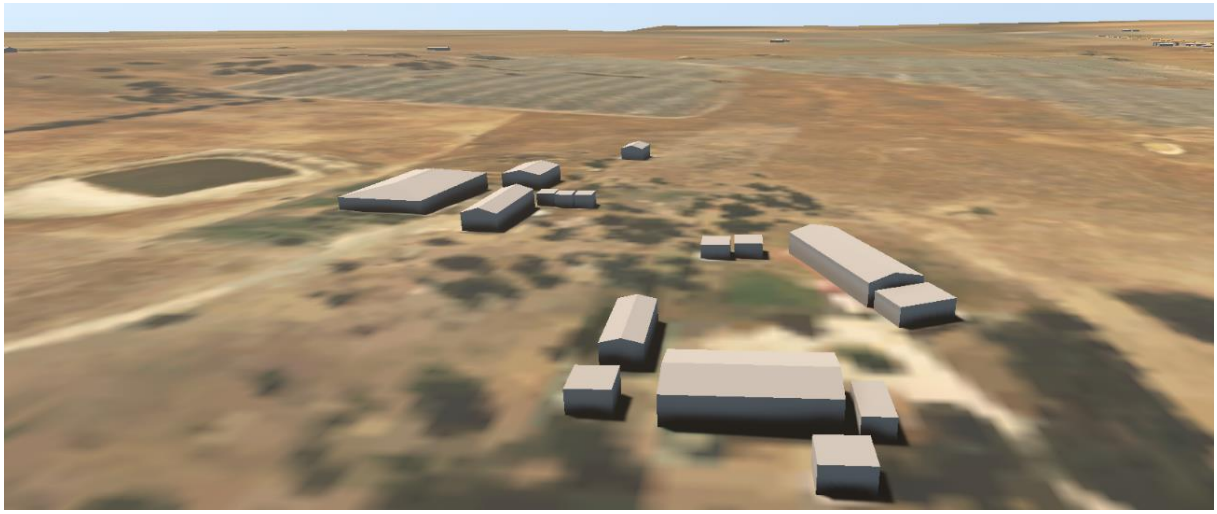

Figure 111. View (Virtual Model WSP) of residential dwellings in Packhams Lane east, showing existing conditions.

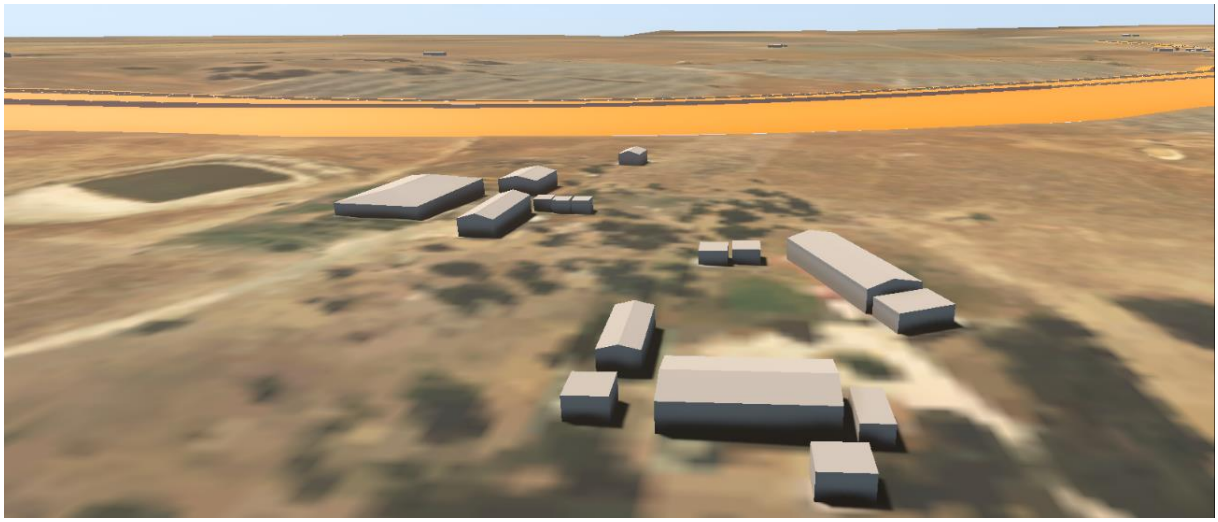

Figure 112. View (Virtual Model WSP) of residential dwellings in Packhams Lane east, showing Alignments A1, A0 and C2, with 2m noise walls.

Figure 113. View (Virtual Model WSP) from residential dwellings in Packhams Lane north, showing existing conditions.

Figure 114. View (Virtual Model WSP) from residential dwellings in Packhams Lane north, showing Alignment A0 and noise walls (2m) – similar to alignments A1 and C2.

Figure 115. View (Virtual Model WSP) from residential dwellings in Packhams Lane north, showing Alignment C2 and 2m noise walls.

The three residential properties on the west side of the alignments are within 250m of the alignments, which are primarily on fill and with noise walls to a general overall height of 5m above ground. The alignments then become deep cut as they pass through the hill to the north. These residential properties will be significantly impacted by the alignments.

Table 28: Summary of Segment 3 impacts on residential dwellings.

Location	Adjacent residential dwellings	Impact score
Smiths lane east (1)	3	Low
Smiths Lane central (2)	3	Low
Smiths Lane north-west (3)	2	Very low
Packhams Lane east (4)	3	Very high
Overall adjacent residential dwellings impact = Low		

7.1.5 Segment 4 – Racecourse Road to Beaufort–Lexton Road

Segment details

Table 29: Segment 4 characteristics.

Segment elements	Description
Length of segment	○ 2100m ○ C2: CH7500–CH5400
Key alignment features	• Dual Carriageway – Cut and Fill. Predominant topographic changes include: ○ Carriageway 400m in length where: Fill min: 5m Fill max: 8m ○ Carriageway 600m in length where: Fill min: 5m Fill max: 8m ○ Carriageway 600m in length where: Fill max: 10m Cut max:10m ○ Carriageway 300m in length where: Fill max: 6m Cut max:7m • 2 bridges. Listing from east to west: ○ 10m high bridge over Racecourse Road ○ 11m high bridge over Beaufort– Lexton Road • Four arterial on- and off-ramps (associated with bridge over Beaufort–Lexton Road) • One bypass intersection (associated with bridge over Beaufort–Lexton Road)
Landscape character types	Eastern Semi-Enclosed Rural Valley (1300m, 62%) Beaufort Fringe (800m, 38%)
Anticipated vegetation loss	Some roadside vegetation along and Beaufort–Lexton Road and Racecourse Road. Scattered trees in paddocks.
Watercourses impacted	4 small waterways are crossed. These are small waterways and do not inform significantly the overall landscape and visual character, and thus the impact is not significant. One large bridge and associated embankment cross the Yam Holes Creek. This does have an detrimental impact on the waterways character and value.
No. of adjacent dwellings or businesses within 100m of the outer carriageway edge of the road	1
No. of adjacent dwellings or businesses between 101 and 500m of the outer carriageway edge of the road	2
No. of sensitive sites within 500m	4: • Snowgums Bushland Reserve • Beaufort Motorcycle Track • Yam Holes Creek • Racecourse Road Mullock Heap
No. of key views and Viewsheds	0

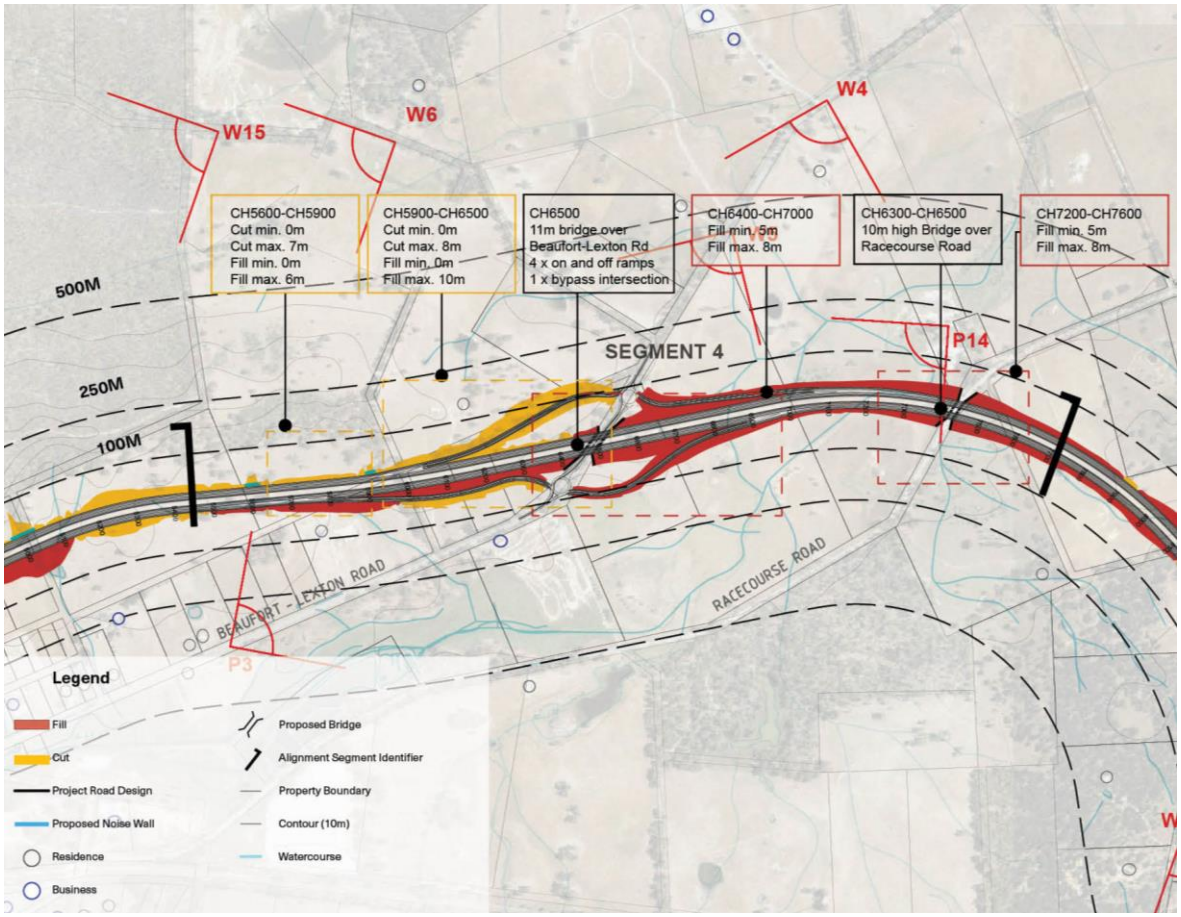

Figure 116. Summary plan of alignment features.

Figure 117. Aerial view (Google Earth).

Figure 118. Segment 4 – View (Virtual Model WSP), showing Alignment C2.

Landscape character impact assessment

BEAUFORT FRINGE

VIEW 1

Figure 119. View along Beaufort–Lexton Road (Viewpoint 3) – looking north-west, showing existing conditions.

Figure 120. Wireframe view along Beaufort–Lexton Road (Viewpoint 3) – Looking north-west, showing Alignment C2.

VIEW 2

Figure 121. View along Beaufort–Lexton Road – Looking north-west, showing existing conditions.

Figure 122. View (Virtual Model WSP) looking north along Beaufort–Lexton Road to Interchange, showing existing conditions, with Alignment A1 in the background.

Figure 123. View (Virtual Model WSP) looking north along Beaufort–Lexton Road to Interchange, showing Alignment C2.

EASTERN SEMI-ENCLOSED RURAL VALLEY

Figure 124. View from Beaufort–Lexton Road, looking south (Viewpoint 5), showing existing conditions.

Figure 125. Wireframe view from Beaufort–Lexton Road, looking south (Viewpoint 5), showing Alignment C2.

Figure 126. Indicative visibility area of 11m high bridge and associated fill areas (Google Earth Pro, does not consider vegetation and built form).

Segment 4 includes only Alignment C2. Key impacts include the creation of the interchange on the Beaufort–Lexton Road and effects on the creek valley environment and the large visible cuts along the northern hillside. Throughout the landscape there is roadside native vegetation, scattered mature trees and bushland. At times these will mitigate the direct views of Alignment C2 from main public access roads and places.

Both landscape areas will change significantly in topographic form and from the loss of roadside and other vegetation, and the overall landscape character will be changed.

Table 30: Summary of Segment 4 impacts on landscape character.

Landscape character	Value	Ability to absorb change	Level of change in landscape by bypass	Final landscape character Impact score
Beaufort Fringe	Moderately low	Moderate	High	Moderate
Eastern Semi-Enclosed Rural Valley	Moderate	Moderately low	Very high	High
Overall landscape character impact = Moderate				

Sensitive sites impact assessment

Identified sensitive local sites in the segment are:

- Beaufort Motorcycle Track
- Snowgums Bushland Reserve
- Yam Holes Creek
- Racecourse Road Mullock Heap

BEAUFORT MOTORCYCLE TRACK

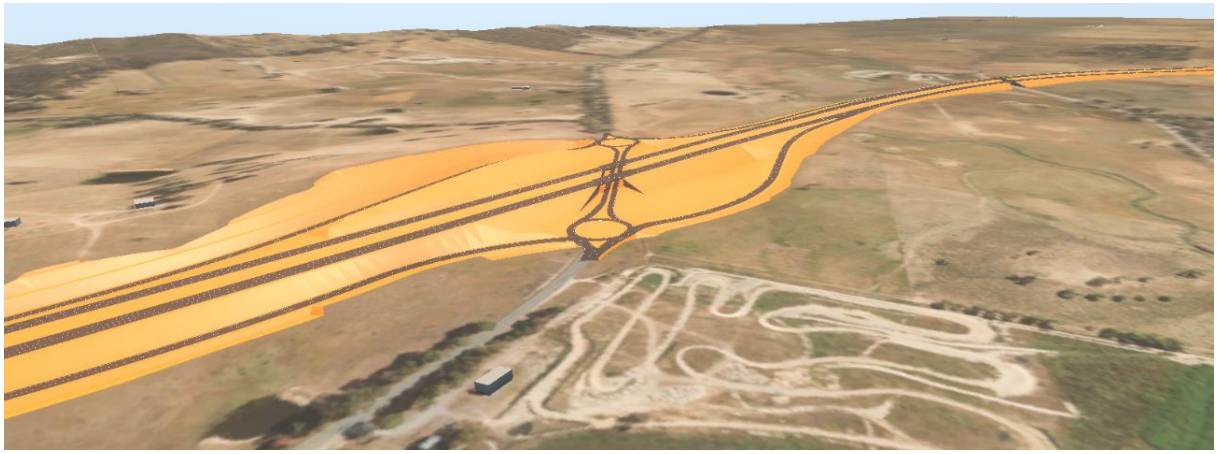

Figure 127. View (Virtual Model WSP) looking north along Beaufort–Lexton Road to Interchange, showing Alignment C2.

Figure 128. View (Virtual Model WSP) from Motorcycle Track to Interchange, showing Alignment C2.

Roadside vegetation will mitigate some views to the interchange.

SNOWGUMS BUSHLAND RESERVE

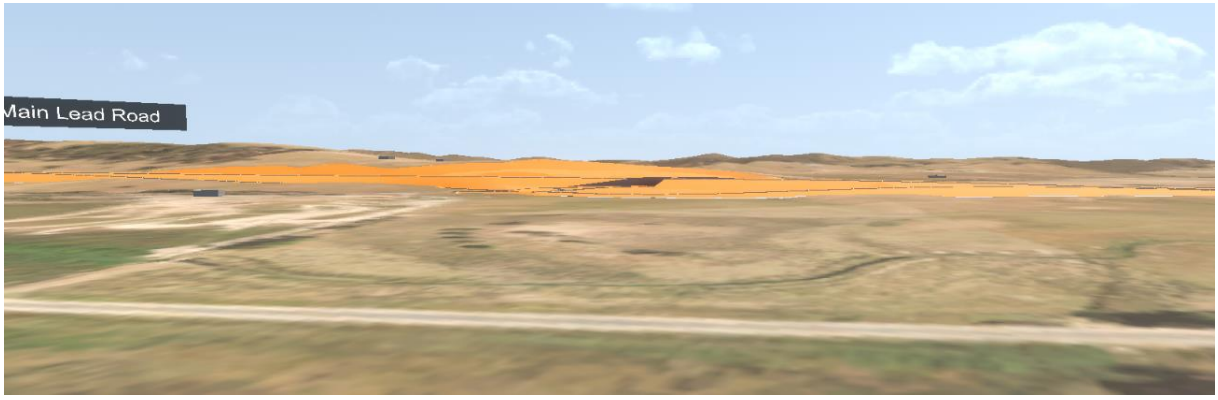

Figure 129. View (Virtual Model WSP) looking west from Racecourse Road adjacent to Snowgums Bushland Reserve to Interchange, showing Alignment C2.

Figure 130. View looking south-west over Yam Holes Creek to C2 interchange, with Snowgums Bushland Reserve to the left, showing existing conditions.

Snowgums Bushland Reserve is about 270m south of the alignment at its most northerly point. Tree coverage within the Reserve and trees along Racecourse Road will mitigate views in the north of the bypass. At the edges of the Reserve, to the north and west, the bypass will become more visible and dominate in the landscape view.

YAM HOLES CREEK

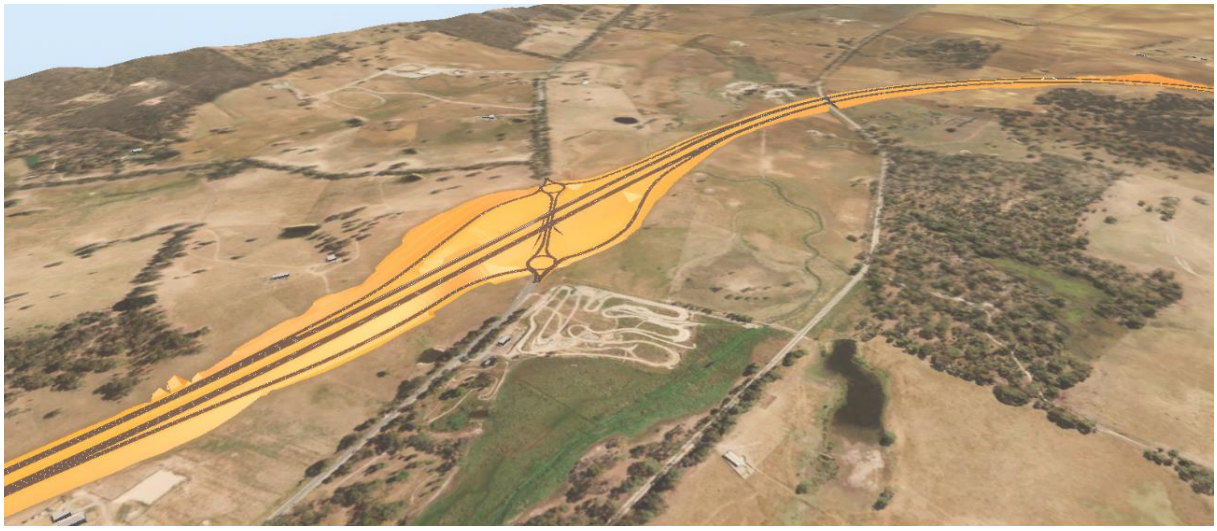

Figure 131. View (Virtual Model WSP) looking north-west over Yam Holes Creek, showing Alignment C2.

Yam Holes Creek runs through Beaufort, then between Beaufort–Lexton Road and Racecourse Road and then past Racecourse Road Mullock Heap. There is no one distinctive view or viewshed for Yam Holes Creek, but it creates an overall valley environment with a landscape character that allows open and tree-framed views to the creek. The creek has a varied character, from being within an open paddock, to within a treed environment.

The overall impact is High, as the alignment all break the spatial sense of one continuous waterway.

RACECOURSE ROAD MULLOCK HEAP

Figure 132. View looking south from Racecourse Road Mullock Heap, showing existing conditions.

Figure 133. Photomontage view looking south from Racecourse Road Mullock Heap, showing Alignment C2 (which is very similar to Alignments A0 and A1 in this view).

Figure 134. Indicative visibility from the Racecourse Road Mullock Heap (Google Earth Pro, does not consider vegetation and built form).

Racecourse Road Mullock Heap is a locally sensitive site. One must climb up the Heap to gain the full views across the landscape. The landscape to the south is quite open and Yam Holes Creek flows through it. Alignment C2 in Segment 4 will all be highly visible from this location, given the height of the alignment and its proximity to the site.

Table 31: Summary of Segment 4 impacts on sensitive sites.

Site	Level of Sensitivity	Impact score
Beaufort Motorcycle Track	Low	Very low
Snowgums Bushland Reserve	Very high	Moderately low
Yam Holes Creek	High	Moderate
Racecourse Road Mullock Heap	Moderate	Moderate
Overall impact = Moderate		

Key views and viewsheds impact assessment

Identified key views and viewsheds in the segment are:

- Camp Hill Lookout (refer to Segment 6 assessment).

Adjacent residential dwellings impact assessment

There are four main groupings of residential properties:

- Beaufort–Lexton Road Central (1)
- Beaufort–Lexton Road north-west (2)
- Beaufort–Lexton Road – Slaughterhouse Lane (3)
- Beaufort–Lexton Road far-north (4).

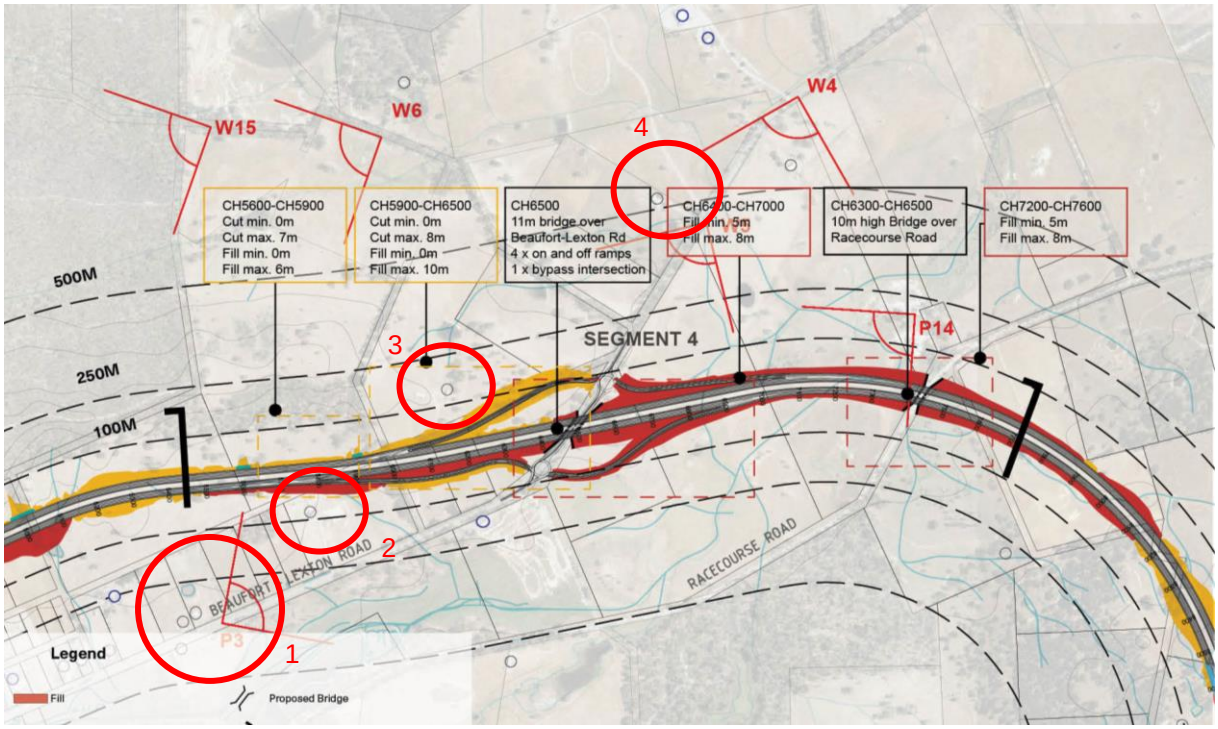

Figure 135. Location of adjacent residential dwellings (red ellipses).

BEAUFORT–LEXTON ROAD CENTRAL (1)

These residents are around 250m away from the outer carriageway edge of the road. They are typically looking more south – down the hillside rather than directly looking north-west. They will have some views of the alignment, particularly through the initial removal of vegetation on the hillside and valley. But overall the impact will be on the low side.

BEAUFORT–LEXTON ROAD NORTH-WEST (2)

Figure 136. View of residential dwelling close to Alignment C2, showing existing conditions.

Figure 137. View (Virtual Model WSP) of residential dwelling within 100m of Alignment C2.

The residential dwelling is within 100m from the outer carriageway edge of the road. It will have significant views of the alignment, both to the north and to the east.

BEAUFORT–LEXTON ROAD TO SLAUGHTERHOUSE LANE (3)

Figure 138. View (Virtual Model WSP) of residential dwellings within 100m of Alignment C2.

Figure 139. View (Virtual Model WSP) of residential dwellings, looking east to the interchange.

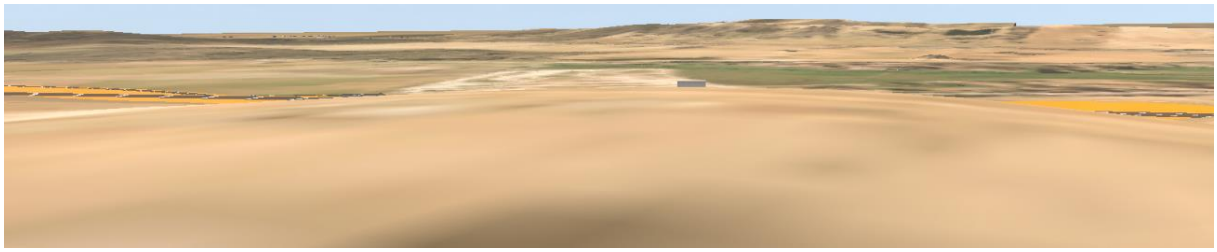

Figure 140. View (Virtual Model WSP) of residential dwellings looking south to Alignment C2.

The residential dwelling is within 100m of the outer carriageway edge of the road. It will have significant views of the alignment, to the south and to the east. A row of trees will be removed from the southern view. Some of the interchange is in cut at this point, and this will reduce the impact somewhat. However, overall the impact will be quite significant for this residential dwelling.

BEAUFORT–LEXTON ROAD FAR-NORTH (4)

These residents are over 500m from Alignment C2 and will have minimal visual impact.

Table 32: Summary of Segment 4 impacts on residential dwellings.

Location	Adjacent residential dwellings	Impact score
Beaufort–Lexton Road Central	3	Moderately low
Beaufort–Lexton Road north-west	1	Very high
Slaughterhouse Lane	1	Very high
Beaufort–Lexton Road far-north	2	Very low
Overall adjacent residential dwellings impact = High		

7.1.6 Segment 5 – Beaufort–Lexton Road to Camp Hill State Forest

Segment details

Table 33: Segment 5 characteristics.

Segment elements	Description
Length of segment	2200m o A0: CH7700–CH5500 o A1: CH7600–CH5400
Key alignment features	• Dual Carriageway – Cut and Fill. Predominant topographic changes include: o Carriageway 1000m in length where: Fill min: 2m Fill max: 10m o Carriageway 300m in length where: Cut min: 0m Cut max: 12m • 2 bridges. Listing from east to west: o 10m high bridge over Racecourse Road o 11m high bridge over Beaufort– Lexton Road • Four arterial on- and off-ramps (associated with bridge over Beaufort– Lexton Road) • One bypass intersection (associated with bridge over Beaufort– Lexton Road)
Landscape character types	Eastern Semi-Enclosed Rural Valley (2200m, 100%)
Anticipated vegetation loss	Some roadside vegetation along Slaughterhouse Lane, Beaufort–Lexton Road and Racecourse Road. Scattered trees in paddocks.
Watercourses impacted	4 small waterways are crossed. These are small waterways and do not inform significantly the overall landscape and visual character, and thus the impact is not significant. Yam Holes Creek is crossed twice and this impacts detrimentally on its character and value.
No. of adjacent dwellings or businesses within 100m of the outer carriageway edge of the road	0
No. of adjacent dwellings or businesses between 101 and 500m of the outer carriageway edge of the road	2
No. of sensitive sites within 500m	4: • Snowgums Bushland Reserve • Beaufort Motorcycle Track • Yam Holes Creek • Racecourse Road Mullock Heap
No. of key views and Viewsheds	0

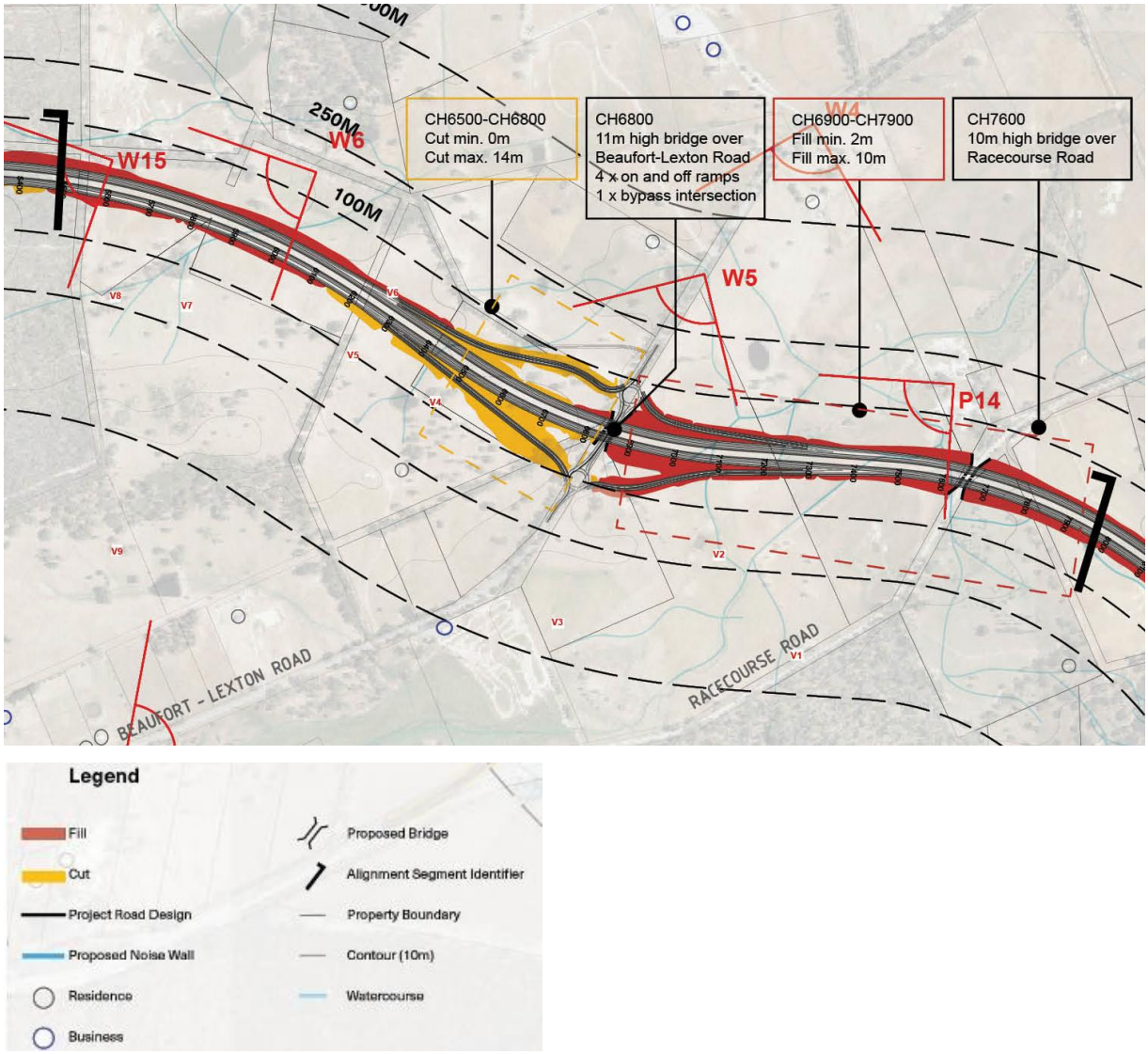

Figure 141. Summary plan of alignment features.

Figure 142. Aerial view (Google Earth).

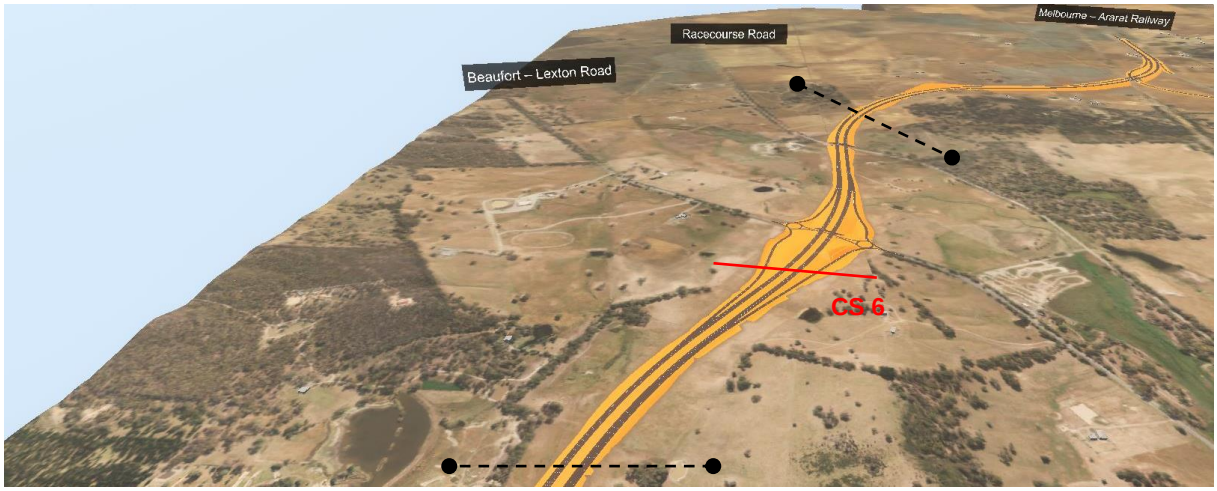

Figure 143. Segment 5 – View (Virtual Model WSP) showing Alignments A0 and A1.

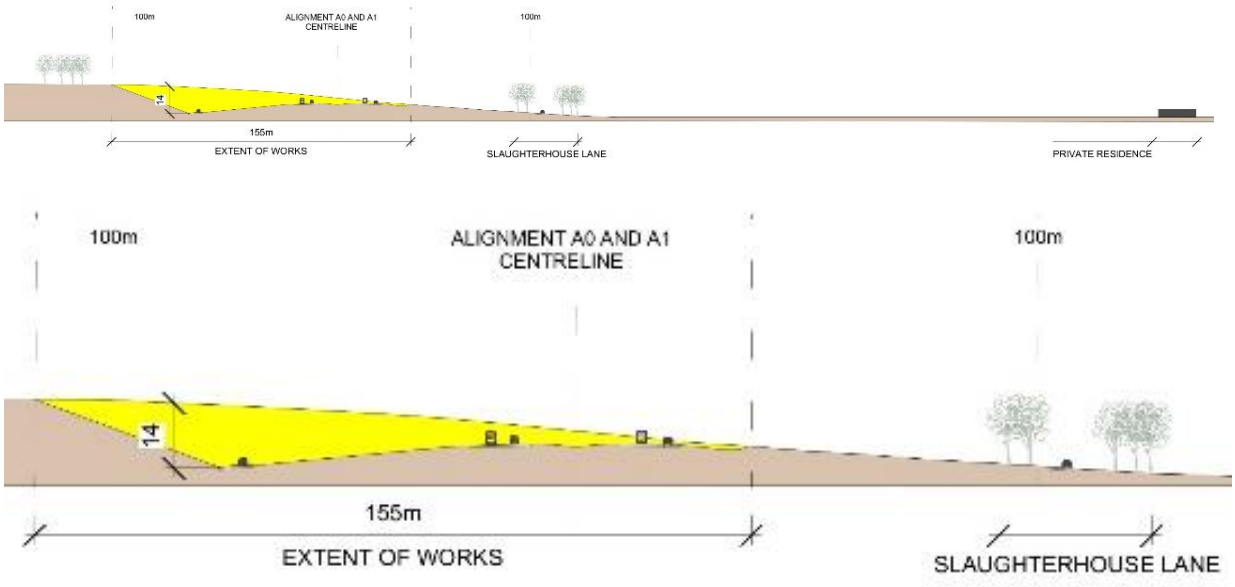

Figure 144. Cross Section 6 – just west of Beaufort–Lexton Road, showing Alignments A0 and A1 (and close-up section).

Landscape character impact assessment

EASTERN SEMI-ENCLOSED RURAL VALLEY

VIEW 4

Figure 145. View from Beaufort–Lexton Road, looking south, showing existing conditions.

Figure 146. Indicative wireframe view (in brown) from Beaufort–Lexton Road, looking south, showing Alignments A0 and A1.

VIEW 5

Figure 147. View from Beaufort–Lexton Road, looking south, showing existing conditions.

Figure 148. Indicative wireframe view (in brown) from Beaufort–Lexton Road, looking south, showing Alignments A0 and A1.

VIEW 6

Figure 149. View from Slaughterhouse Lane (near vineyard), looking south-east, showing existing conditions.

Figure 150. Wireframe view from Slaughterhouse Lane (near vineyard), looking south-east, showing Alignments A0 and A1.

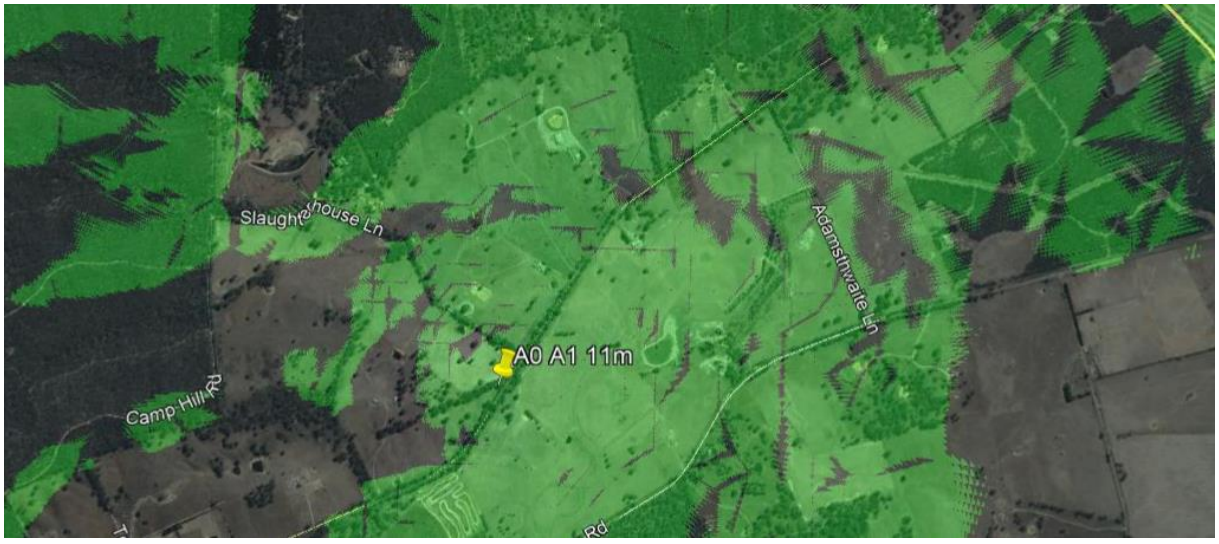

Figure 151. Indicative visibility areas of proposed 11m high bridge and associated fill areas (Google Earth Pro, does not consider vegetation and built form).

Segment 5 includes Alignments A1 and A0. Key impacts include creation of the interchange on the Beaufort–Lexton Road, effects on the creek valley environment and the cuts along the hillside.

Throughout the landscape there is roadside native vegetation, scattered mature trees and areas of bushland. At times these will obscure direct views from main public access roads and places to the alignments.

The landscape areas will change in topographic form, and the loss of lengths of mature roadside and other vegetation will change the overall character. This is more so for the western valley centred on Slaughterhouse Lane.

Summary of landscape character impact

Table 34: Summary of Segment 5 impacts on landscape character.

Landscape character	Value	Ability to absorb change	Level of change in landscape by bypass	Final landscape character Impact score
Eastern Semi-Enclosed Rural Valley west	Moderate	Moderately low	Very high	High
Eastern Semi-Enclosed Rural Valley east	Moderate	Moderately low	High	Moderate
Overall landscape character impact = Moderately high				

Sensitive sites impact assessment

- Identified sensitive local sites in the segment are:
- Beaufort Motorcycle Track
- Snowgums Bushland Reserve
- Yam Holes Creek
- Racecourse Road Mullock Heap.

BEAUFORT MOTORCYCLE TRACK

Figure 152. View (Virtual Model WSP) looking north along Beaufort–Lexton Road to Interchange, showing Alignments A0 and A1.

Figure 153. View (Virtual Model WSP) from Motorcycle Track to Interchange, showing Alignments A0 and A1.

Roadside vegetation will mitigate some views to the interchange.

SNOWGUMS BUSHLAND RESERVE

Figure 154. View (Virtual Model WSP) looking west from Racecourse Road, adjacent to Snowgums Bushland Reserve, to Interchange, showing Alignments A0 and A1.

Figure 155. View looking north-north-west over Yam Holes Creek to Alignments A0 and A1 (Snowgums Bushland Reserve behind).

Snowgums Bushland Reserve is about 270m south of the alignment at its most northerly point. Tree coverage within the reserve, and trees along Racecourse Road, will mitigate views in the north of the bypass. At the edges of the reserve to the north and west, the bypass will become more visible and dominate in the landscape view.

YAM HOLES CREEK

Figure 156. View (Virtual Model WSP) looking north-west over Yam Holes Creek, showing Alignments A0 and A1.

Yam Holes Creek runs through Beaufort, then between Beaufort–Lexton Road and Racecourse Road and then past Racecourse Road Mullock Heap. There is no one distinctive view or viewshed for Yam Holes Creek, but it creates an overall valley environment with a landscape character that allows open and tree-framed views to the creek. The creek has a varied character, from being within an open paddock, to within a treed environment.

The overall impact is high, as the Alignments all break the spatial sense of one continuous waterway.

RACECOURSE ROAD MULLOCK HEAP

Figure 157. View looking south from Racecourse Road Mullock Heap, showing existing conditions.

Figure 158. Photomontage view looking south from Racecourse Road Mullock Heap, showing Alignment A0. (which is very similar to Alignment C2 in this view).

Figure 159. Indicative visibility from Racecourse Road Mullock Heap (Google Earth Pro, does not consider vegetation and built form).

Racecourse Road Mullock Heap is a locally sensitive site. One must climb up the Heap to gain the full views across the landscape. The landscape to the south is quite open and Yam Holes Creek flows through it. The Alignments A0 and A1 in Segment 5 will all be highly visible from this location, given the height of the alignments and their proximity to the site.

Table 35: Summary of Segment 5 impact on sensitive sites.

Site	Level of Sensitivity	Impact score
Beaufort Motorcycle Track	Low	Very low
Snowgums Bushland Reserve	Very high	Moderately low
Yam Holes Creek	High	High
Racecourse Road Mullock Heap	Moderate	Moderate
Overall impact = Moderate		

Key views and viewsheds impact assessment

No key views and viewsheds are identified in this area.

Adjacent residential dwellings impact assessment

There are three residential properties in close proximity to Alignments A1 and A0 in this area.

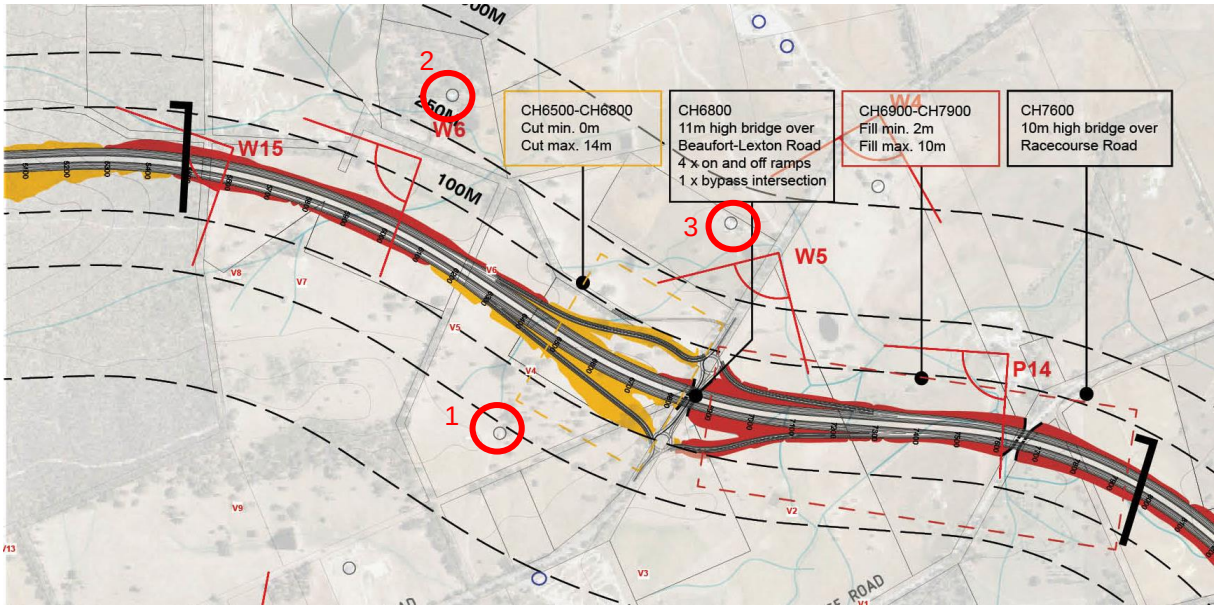

Figure 160. Location of adjacent residential dwellings (red ellipses).

RESIDENTIAL DWELLING 1

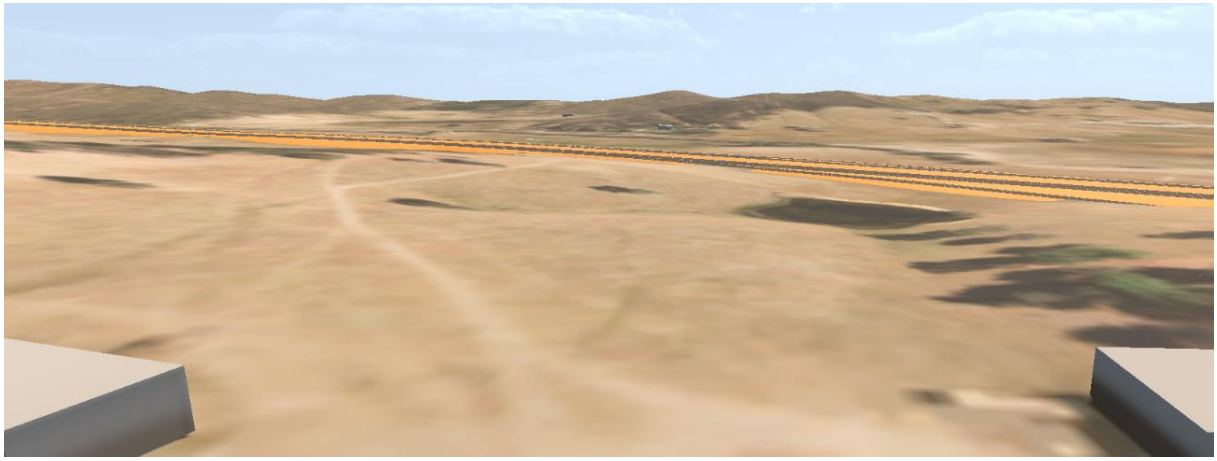

Figure 161. View (Virtual Model WSP) of residential dwelling within 250m south of Alignments A0 and A1.

Between this property and the alignments there is some vegetation to obscure views, however, there are areas of clear paddock as foreground view to alignments.

RESIDENTIAL DWELLING 2

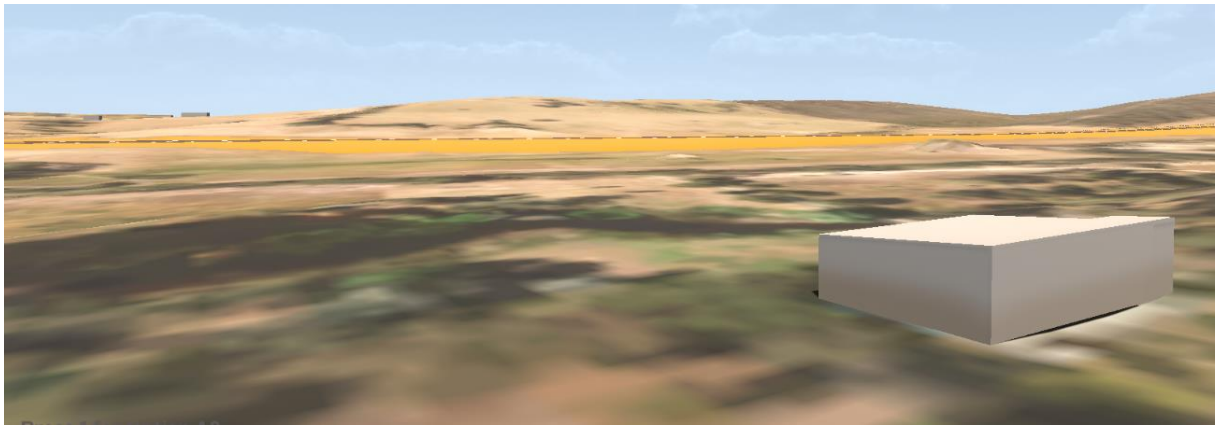

Figure 162. View (Virtual Model WSP) of residential dwelling on Slaughterhouse Lane. north approximately 280m from Alignments A0 and A1.

Between this property and the alignments there is both scattered paddock mature trees and roadside vegetation that will reduce direct views to the alignments.

RESIDENTIAL DWELLING 3

Figure 163. View of residential dwelling looking south to Alignments A0 and A1, showing existing conditions.

Figure 164. View (Virtual Model WSP) of residential dwelling on Beaufort–Lexton Road, north approximately 300m from Alignments A0 and A1.

Between this property and the alignments there is both scattered paddock mature trees and roadside vegetation on Slaughterhouse Road and Beaufort–Lexton Road, which will reduce direct views to the alignments.

Table 36: Summary of Segment 5 impacts on residential dwellings.

Location	Adjacent residential dwellings	Impact score
Property south of Alignment	1	Moderate
Slaughterhouse Lane	1	Moderately low
Beaufort–Lexton north	1	Moderately low
Overall adjacent residential dwellings impact = Moderately low		

7.1.7 Segment 6 – Camp Hill to Martins Lane

Segment details

Table 37: Segment 6 characteristics.

Segment elements	Description
Length of segment	4100m o C0: CH5400–CH1300 o C2: CH5400–CH1300
Key alignment features	• Dual Carriageway – Cut and Fill. Predominant topographic changes include: o Carriageway 300m in length where: Cut min: 5m Cut max: 12m o Carriageway 400m in length where: Cut max: 8m Fill max: 12m o Carriageway 400m in length where: Cut min: 0m Cut max: 17m o Carriageway 1200m in length where: Fill min: 7m Fill max: 10m o Carriageway 300m in length where: Fill min: 5m Fill max: 7m • 2 bridges. Listing from east to west: o 10m high bridge over Main Lead Road o 10m high bridge over Back Raglan Rd • 2m high noise wall on top of 7–10m fill (1750m in length) o C0: CH4400–CH2650 o C2: CH4400–CH2650
Landscape character types	Western Semi-Enclosed Rural Valley (1820m, 44%) Enclosed Rural Valley (410m, 10%) Beaufort Fringe north-west Ecological Conservation Reserve (195m, 5%) Beaufort Fringe – north-east (1020m, 25%)
Anticipated vegetation loss	A significant amount of vegetation is lost through The Camp Hill State Forest, then scattered trees in the valleys and hillsides. Areas of roadside vegetation are removed.
Watercourses impacted	9 small waterways are crossed. These are small waterways and do not inform significantly the overall landscape and visual character, and thus the impact is not significant. Yam Holes Creek and Main Lead Road waterway are crossed and this impact detrimentally on their character and value.
No. of adjacent dwellings or businesses within 100m of the outer carriageway edge of the road	3
No. of adjacent dwellings or businesses between 101 and 500m of the outer carriageway edge of the road	3 dwellings 6 businesses
No. of sensitive sites within 500m	4 Beaufort Trotting Track, Camp Hill Picnic Area, Camp Hill Lookout, Camp Hill State Forest
No. of key 0views and Viewsheds	2: • Camp Hill Lookout • Views to Camp Hill from Beaufort

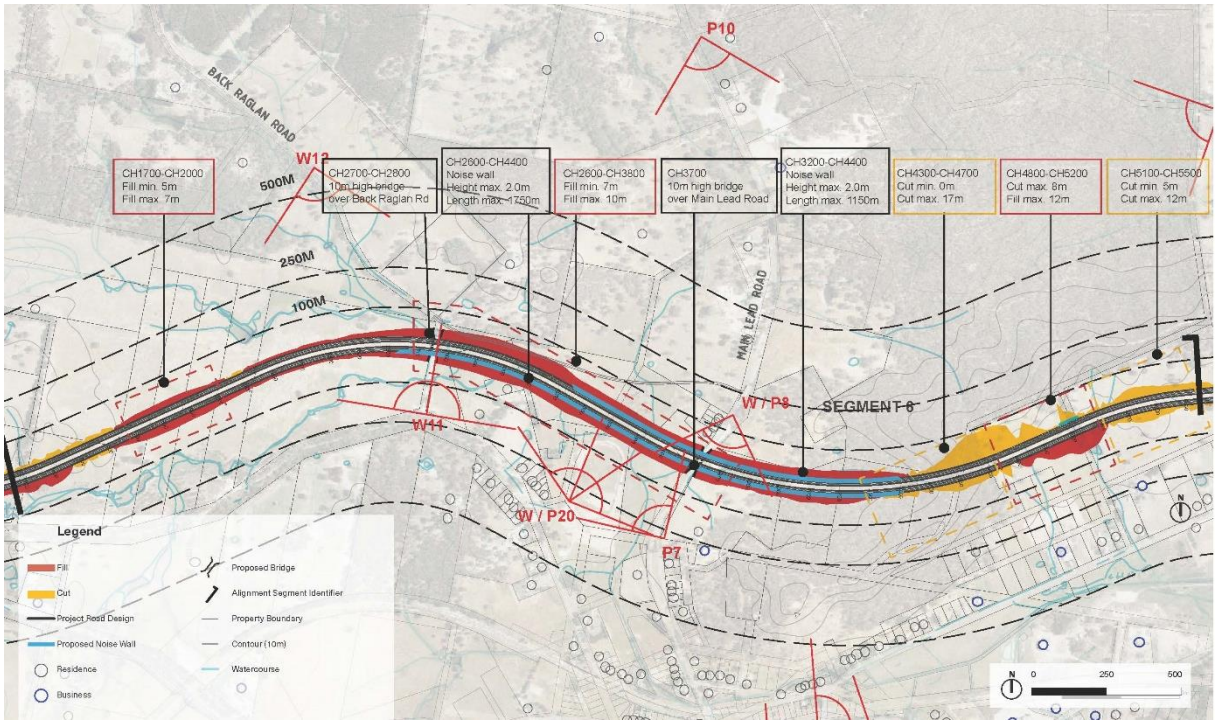

Figure 165. Summary plan of alignment features.

Figure 166. Aerial view (Google Earth).

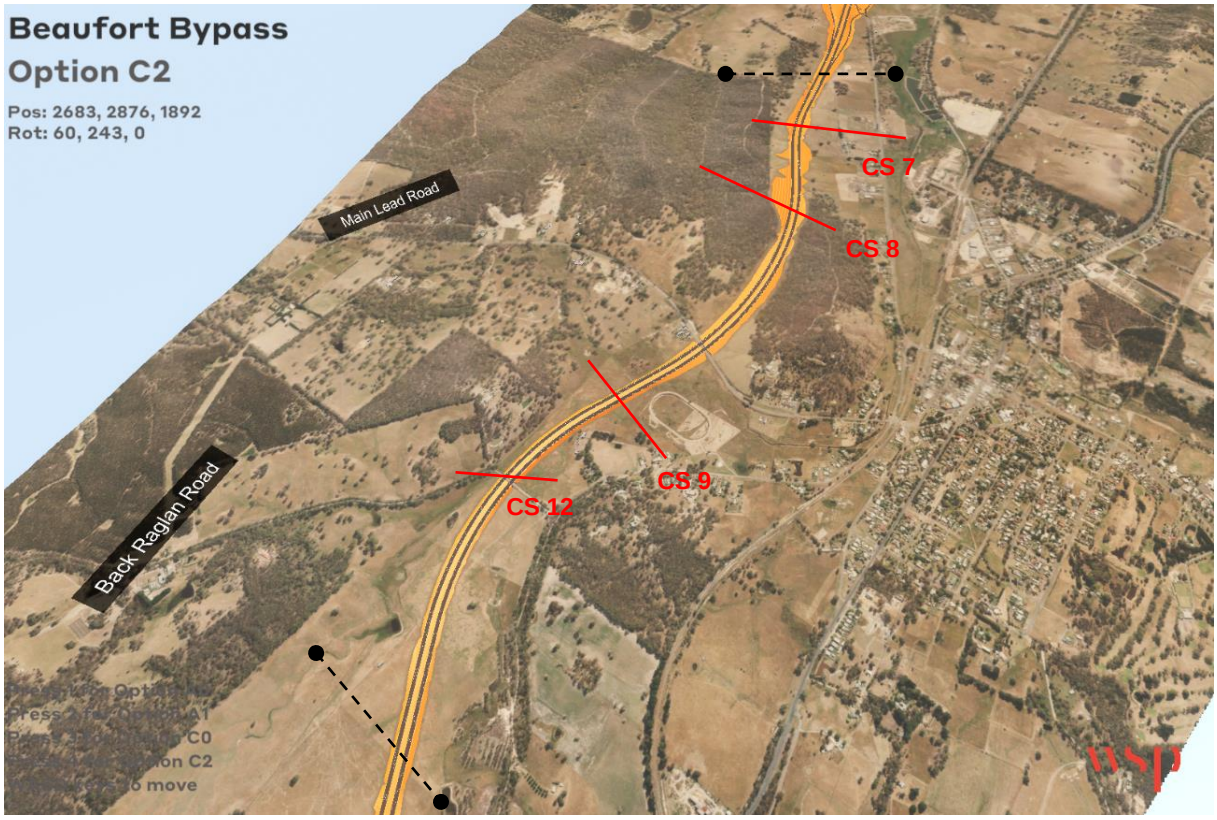

Figure 167. Segment 6 – View (Virtual Model WSP) showing Alignments C0 and C2.

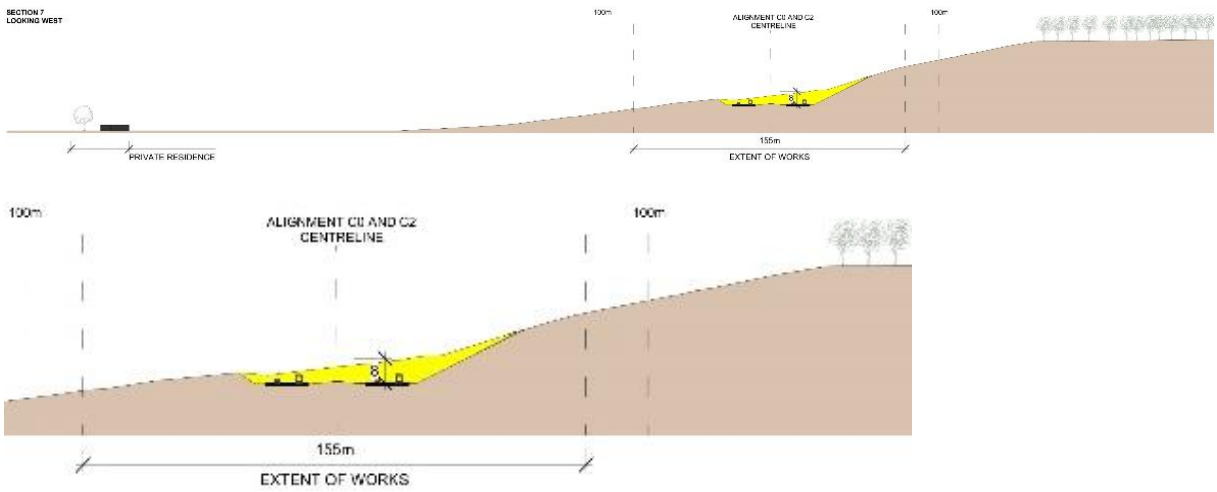

Figure 168. Cross Section 7 – Alignments C0 and C2 (and close-up section)

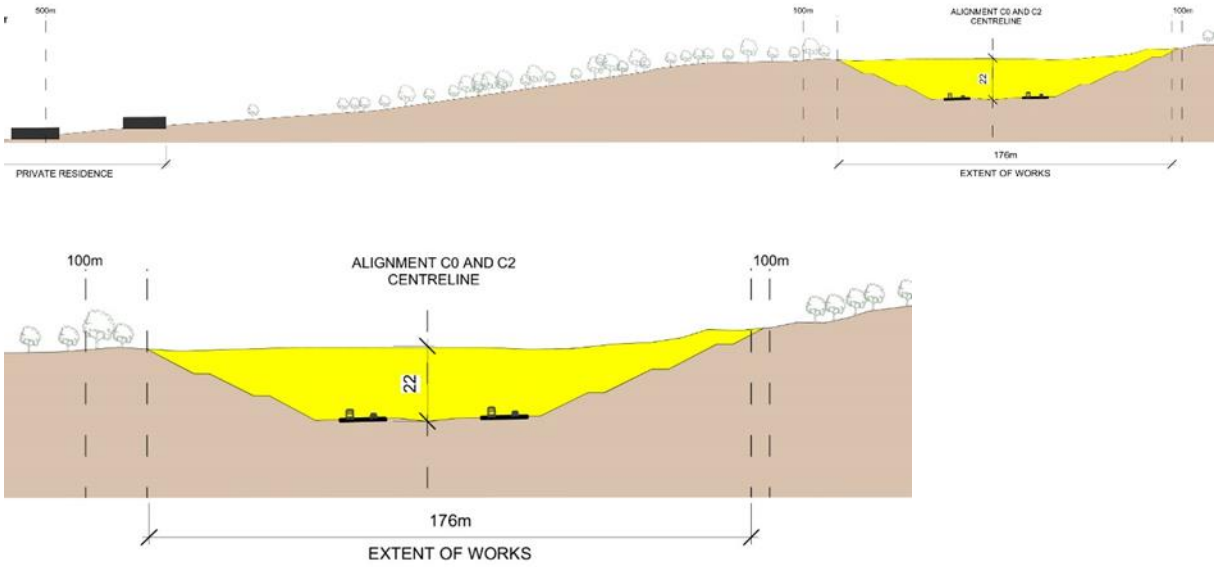

Figure 169. Cross Section 8 – Alignments C0 and C2. (and close-up section)

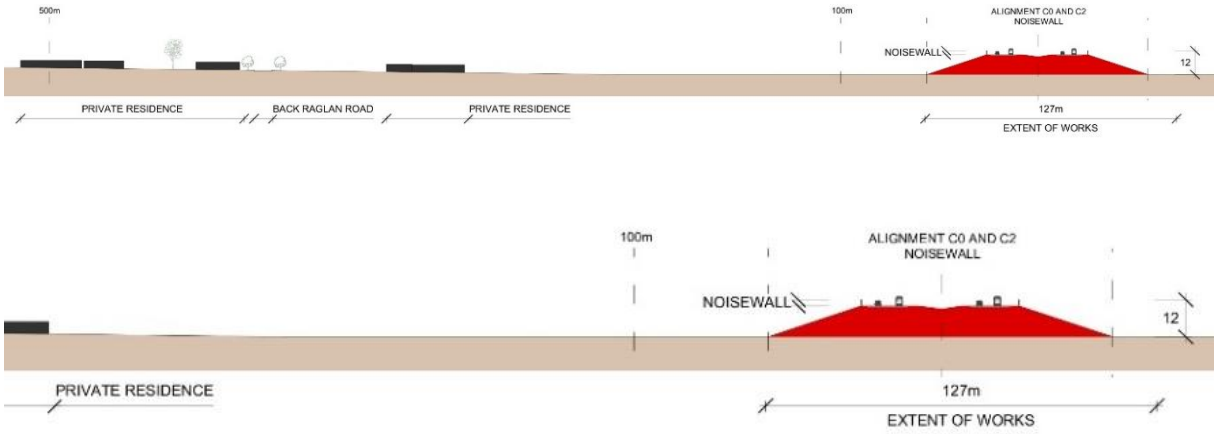

Figure 170. Cross Section 9 – Alignments C0 and C2. (and close-up section)

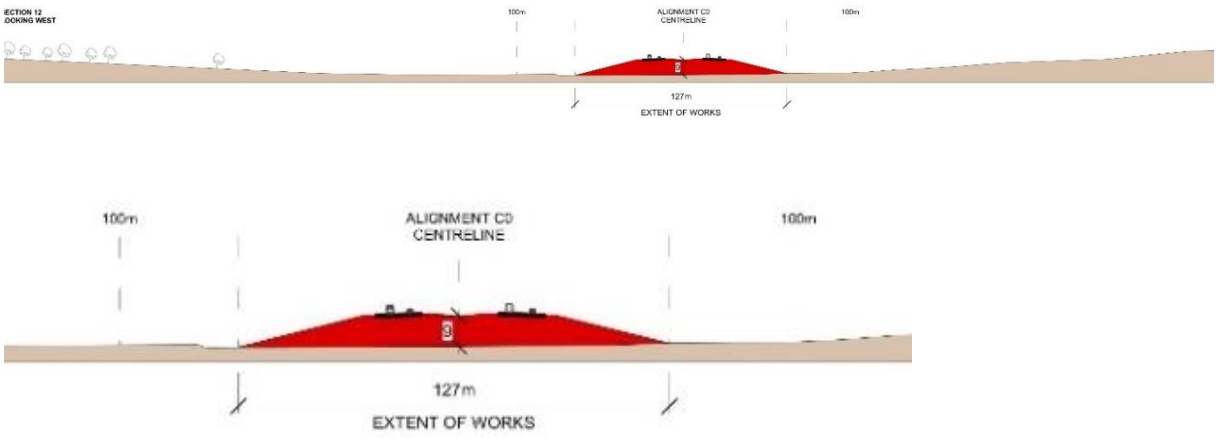

Figure 171. Cross Section 12 – Alignments C0 and C2. (and close-up section)

Landscape character impact assessment

WESTERN SEMI-ENCLOSED RURAL VALLEY

Figure 172. View along Back Raglan Road (Viewpoint 11a), looking west, showing existing conditions.

Figure 173. Wireframe view along Back Raglan Road (Viewpoint 11a), looking west, showing Alignments C0 and C2.

Figure 174. View along Back Raglan Road (Viewpoint 11b), looking north, showing existing conditions.

Figure 175. Wireframe view along Back Raglan Road (Viewpoint 11b), looking north, showing Alignments C0 and C2.

Figure 176. View along Back Raglan Road (Viewpoint 11c), looking east, showing existing conditions.

Figure 177. Wireframe view along Back Raglan Road (Viewpoint 11c), looking east, showing Alignments C0 and C2.

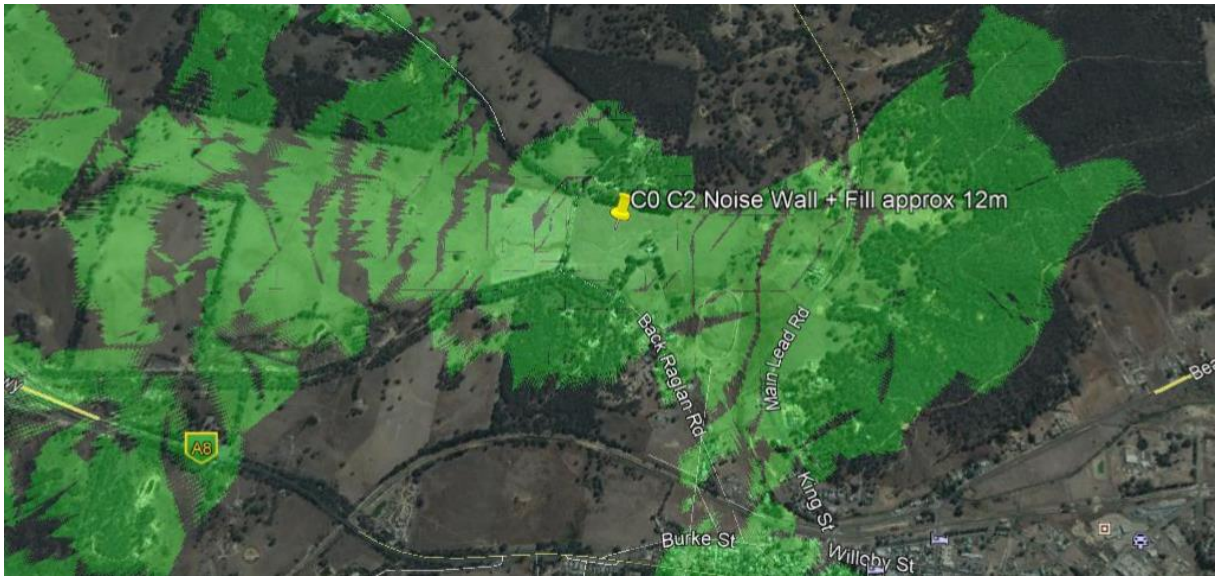

Figure 178. Indicative visibility areas of 10m high bridge, 2m high noise walls and associated fill areas (Google Earth Pro, does not consider vegetation and built form).

ENCLOSED RURAL VALLEY

Figure 179. View from Main Lead Road looking south (View 8a), showing existing conditions.

Figure 180. Photomontage view from Main Lead Road looking south (View 8a), showing Alignments C0 and C2.

Figure 181. Indicative visibility areas in the Enclosed Rural Valley landscape of the 10m high bridge, 2m high noise walls and associated fill areas (Google Earth Pro, does not consider vegetation and built form).

Figure 182. View from Main Lead Road looking west (Viewpoint 7), showing existing conditions.

Figure 183. View from Main Lead Road looking west (Viewpoint 7), showing Alignments C0 and C2.

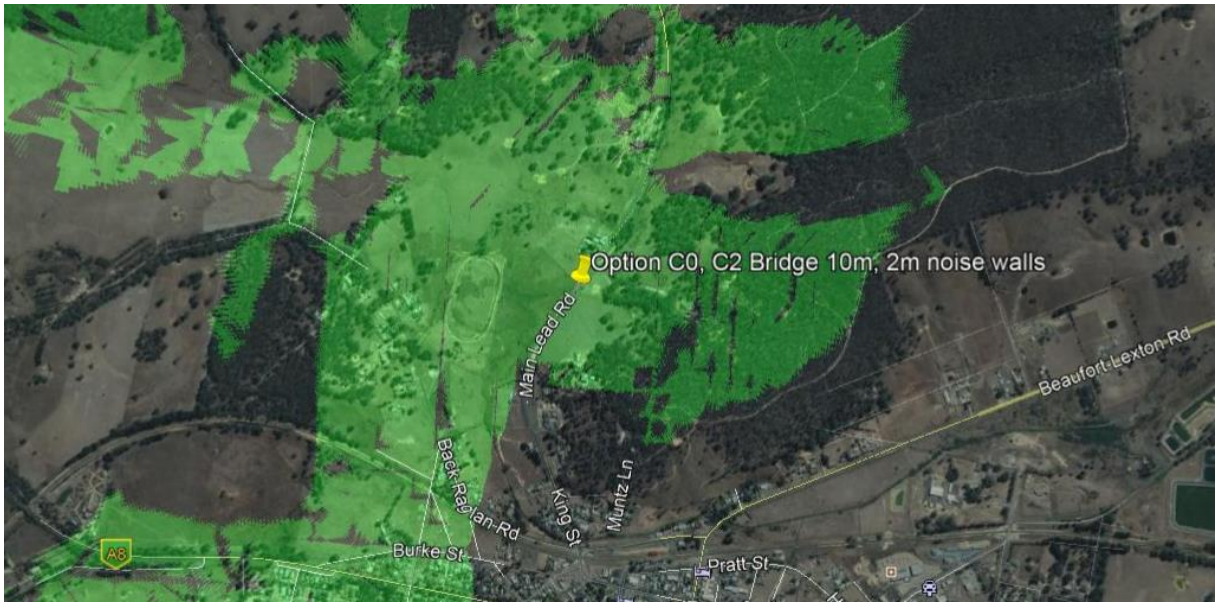

Figure 184. Indicative visibility in Beaufort Fringe north-west Viewshed of the 10m high bridge, 2m high noise walls and associated fill areas (Google Earth Pro, does not consider vegetation and built form).

ECOLOGICAL CONSERVATION RESERVE

Figure 185. View (Virtual Model WSP), looking north, showing Alignment A0 in the background.

Figure 186. View (Virtual Model WSP) looking north, showing Alignments C0 and C2.

Figure 187. Indicative visibility from Camp Hill Forest, showing indicative extent of visibility of fill in valley area from Alignments C0 and C2 (Google Earth Pro, does not consider vegetation and built form).

BEAUFORT FRINGE NORTH-EAST

Figure 188. View from Beaufort–Lexton Road, looking north-west, showing existing conditions.

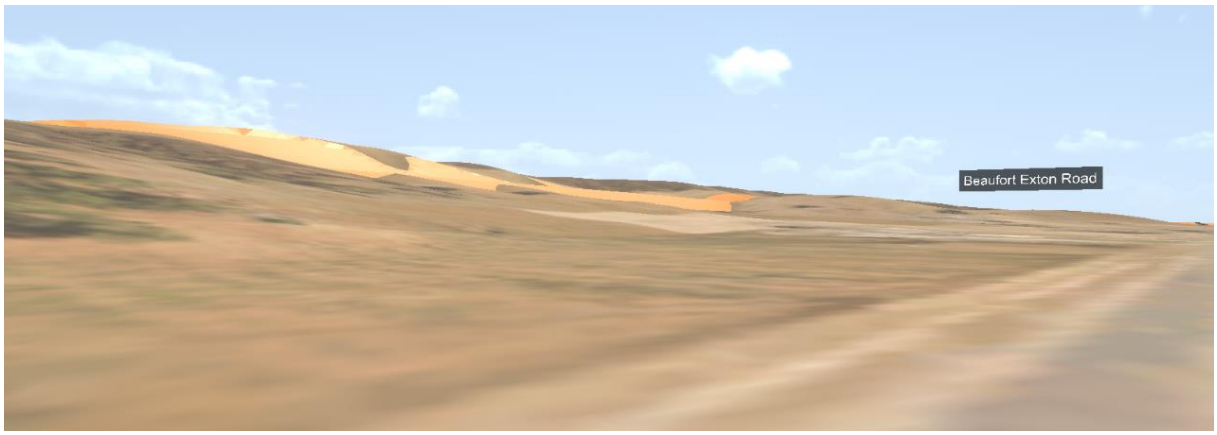

Figure 189. View (Virtual Model WSP) from Beaufort–Lexton Road, looking north-west, showing Alignments C0 and C2.

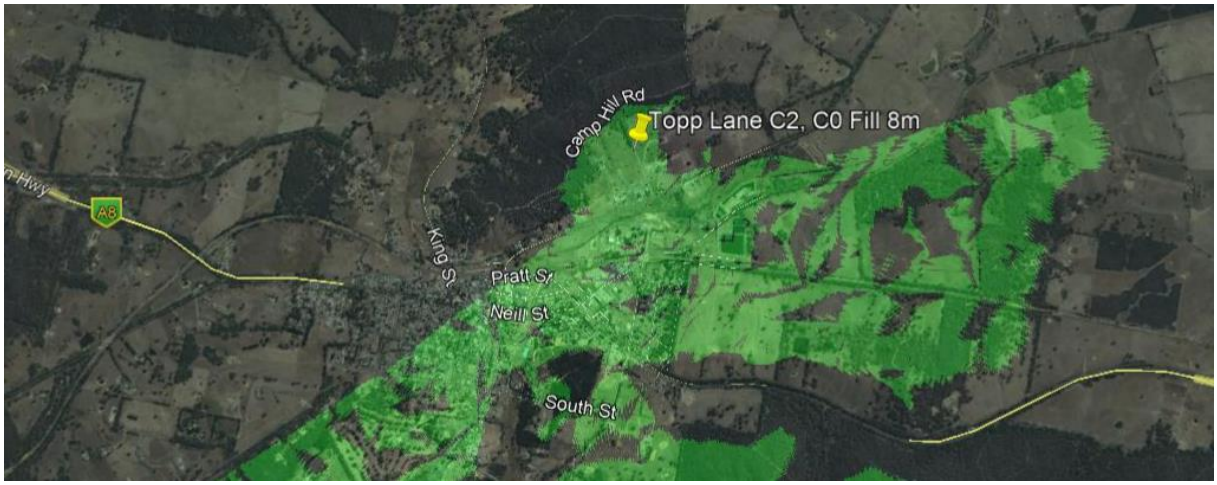

Figure 190. Indicative visibility areas of proposed areas of deep exposed cut and 8m fill (Google Earth Pro, does not consider vegetation and built form).

Table 38: Summary of Segment 6 impacts on landscape character.

Landscape character	Value	Ability to absorb change	Level of change in landscape by bypass	Final landscape character Impact score
Western Semi-Enclosed Rural Valley	Moderate	Moderately low	Moderate	Moderate
Enclosed Rural Valley	High	Low	High	High
Beaufort Fringe north-west	Moderate	Moderately low	High	Moderate
Ecological Conservation Reserve	Very high	Very low	Very high	Very high
Beaufort Fringe north-east	Moderate	Moderately low	Very high	High
Overall landscape character impact = Moderate–High				

Sensitive sites impact assessment

Identified sensitive local sites in the segment are:

- Beaufort Trotting Track
- Camp Hill Picnic Ground
- Camp Hill State Forest.

BEAUFORT TROTTING TRACK

Figure 191. View of Beaufort Trotting Track (Viewpoint 20), looking north, showing existing conditions.

Figure 192. Photomontage view of Beaufort Trotting Track (Viewpoint 20), looking north, showing Alignments C0 and C2.

CAMP HILL PICNIC GROUND

Figure 193. View from Camp Hill Picnic Ground, looking north, showing existing conditions.

Figure 194. View (Virtual Model WSP) from Camp Hill Picnic Ground, looking north to Alignments C0 and C2.

Figure 195. Indicative visibility areas from Camp Hill Picnic Ground (Google Earth Pro, does not consider vegetation and built form).

Table 39: Summary of Segment 6 impacts on sensitive sites.

Site	Level of Sensitivity	Impact score
Beaufort Trotting Track	Low	Moderate
Camp Hill Picnic	Moderate	Moderately low
Camp Hill Forrest	Very high	Very high
Overall impact = Moderate–High		

Key views and viewsheds impact assessment

Identified key views and viewsheds in the segment are:

- Camp Hill Lookout
- Beaufort View to Camp Hill.

CAMP HILL LOOKOUT (VIEWPOINT 16)

Figure 196. View from Camp Hill Lookout, looking east, showing existing conditions.

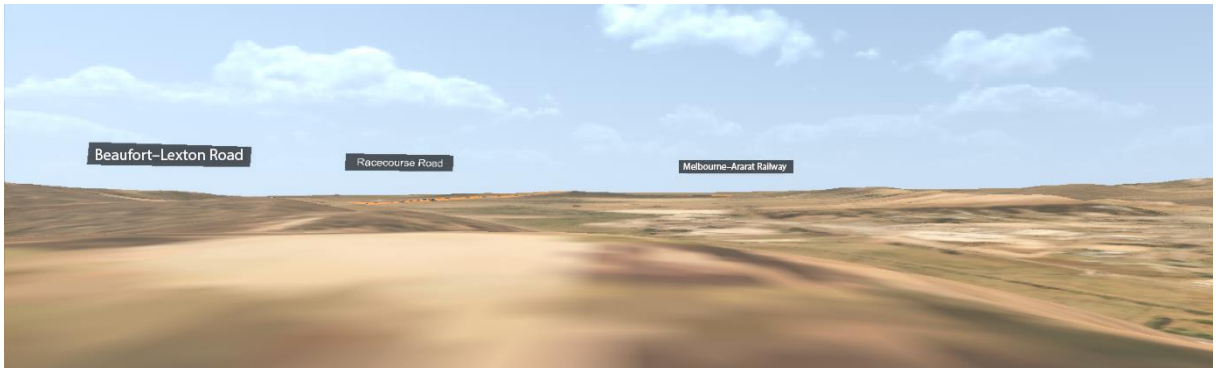

Figure 197. View (Virtual Model WSP) from Camp Hill Lookout, showing Alignments A0 and A1.

Figure 198. View (Virtual Model WSP) from Camp Hill Lookout, showing Alignment C0.

Figure 199. View (Virtual Model WSP) from Camp Hill Lookout, showing Alignment C2.

Figure 200. View from Camp Hill Lookout, looking west, showing existing conditions.

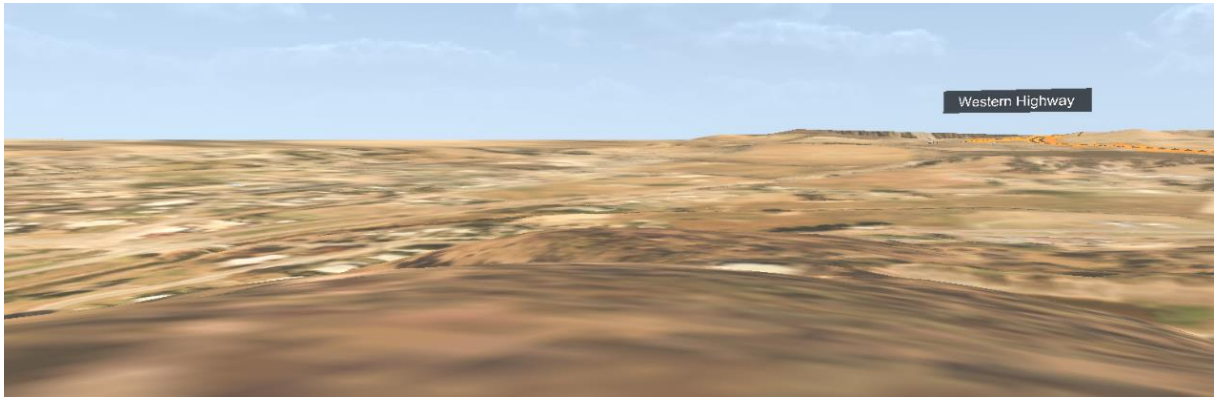

Figure 201. View (Virtual Model WSP) from Camp Hill Lookout, showing Alignments A0 and A1.

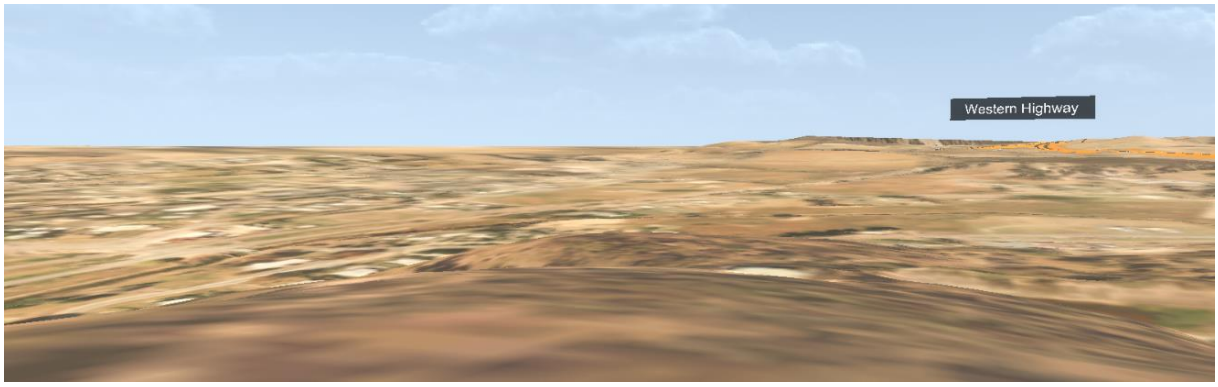

Figure 202. View (Virtual Model WSP) from Camp Hill Lookout (Viewpoint 16), showing Alignments C0 and C2.

Figure 203. Indicative visibility areas from Camp Hill Lookout – east side (Google Earth Pro, does not consider vegetation and built form).

Figure 204. Indicative visibility areas from Camp Hill Lookout – west side (Google Earth Pro, does not consider vegetation and built form).

Overall, from Camp Hill Lookout, Alignments C0 and C2 are the most visible to the east. But to the west, it is highly likely that there will be no view of any of the alignments.

BEAUFORT VIEW TO CAMP HILL (VARIOUS VIEWS)

BEAUFORT HOTEL (VIEWPOINT 17)

Figure 205. View from Beaufort Hotel (Viewpoint 17), showing existing conditions.

Figure 206. Wireframe view from Beaufort Hotel (Viewpoint 17), showing Alignments C0 and C2.

Some areas of large cut may be visible to the north-east from this area.

APEX PARK (VIEWPOINT 18)

Figure 207. View from Apex Park (Viewpoint 18), looking north-east, showing existing conditions.

Figure 208. View from Apex Park (Viewpoint 18), looking north-east, showing Alignments C0 and C2.

Some areas of large cut may be visible to the north east from this area.

MAIN STREET BEAUFORT (VIEW NO.19)

Figure 209. View of Main Street Beaufort (Viewpoint 19), from Neil Street, looking north, showing existing conditions.

Figure 210. Wireframe view of Main Street Beaufort (Viewpoint 19), from Neil Street, looking north, showing Alignments C0 and C2.

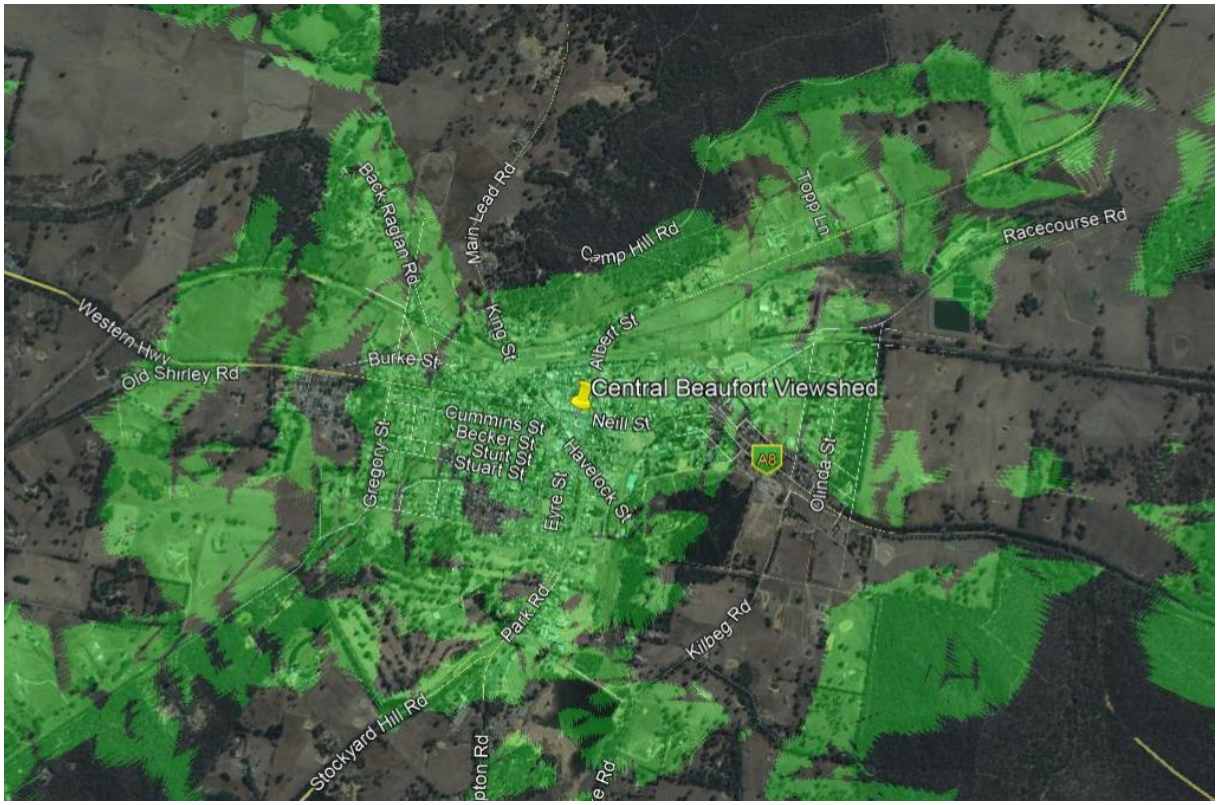

Figure 211. Indicative viewshed from Beaufort to Camp Hill – (Google Earth Pro, does not consider vegetation and built form).

No views of the alignments will be visible from this location (obscured by buildings and vegetation).

Table 40: Summary of Segment 6 impacts on key views and viewsheds.

Key view and viewshed	Level of sensitivity	Impact score
Camp Hill Lookout	High	Very low
Beaufort to Camp Hill	High	Very low – Low
Overall key views and viewsheds impact = Very low		

Adjacent residential dwellings impact assessment

There are six main groupings of residential properties:

- Beaufort–Lexton Road (1)
- Beaufort north (2)
- Main Lead Road cluster (3)
- Back Raglan Road (near Trotting Track) (4)
- Back Raglan Road south (5)
- Back Raglan Road north (6).

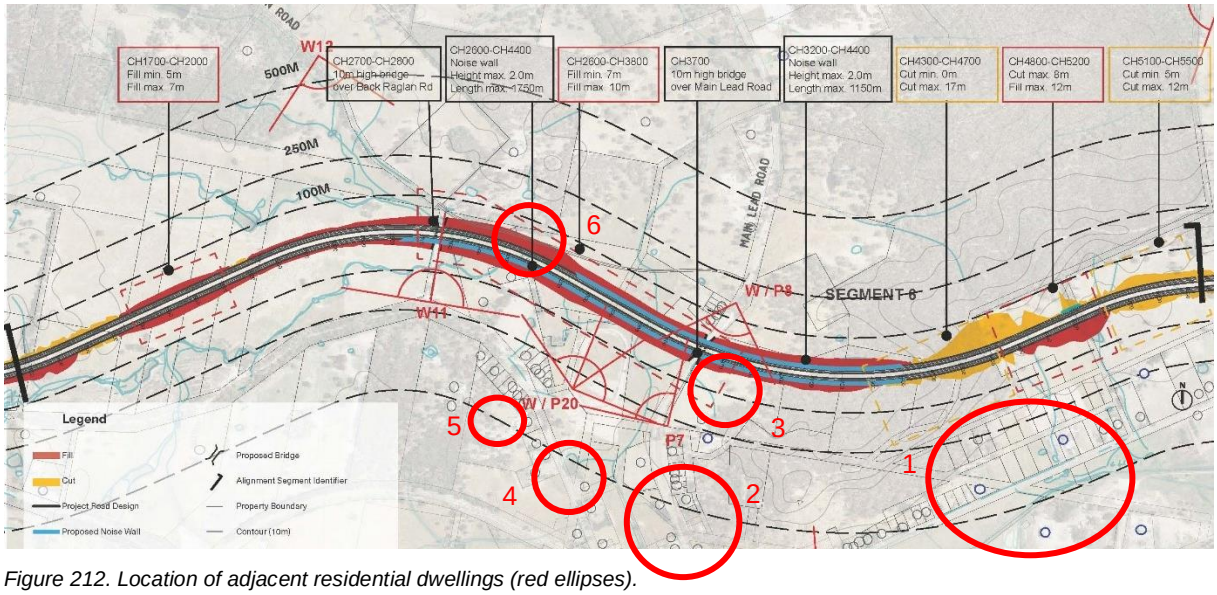

Figure 212. Location of adjacent residential dwellings (red ellipses).

BEAUFORT–LEXTON ROAD (1)

Figure 213. View (Virtual Model WSP), looking north-west, showing Alignment A0.

Figure 214. View (Virtual Model WSP) looking north-west, showing Alignments C0 and C2.

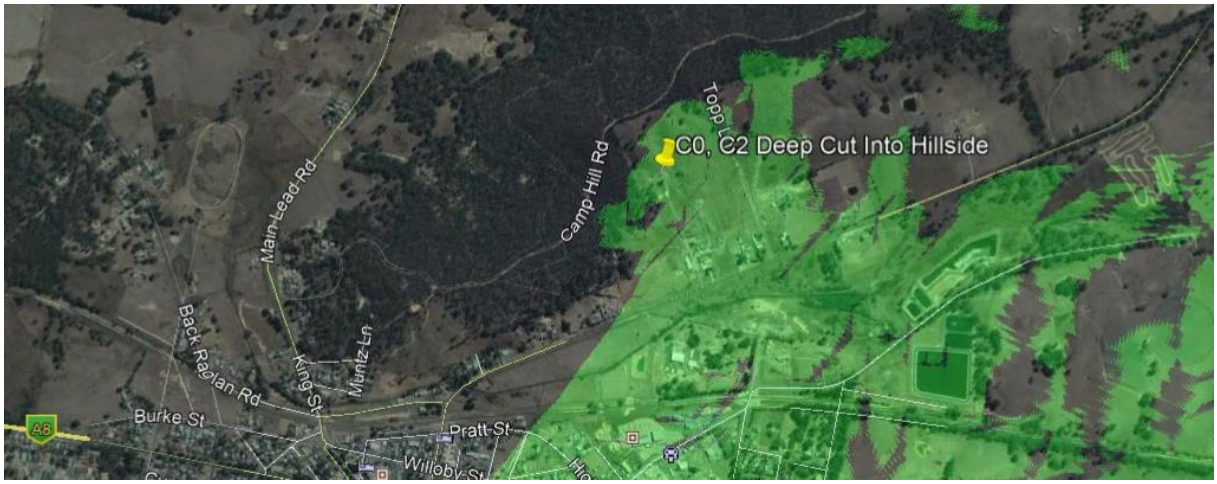

Figure 215. Indicative visibility areas of deep cut into hillside and fill (Google Earth Pro, does not consider vegetation and built form).

These residents are around 100m away from Alignments C0 and C2. They will have some views of the alignment, particularly through the deep cuts and hillside fill that will be visible.

BEAUFORT NORTH (2)

Refer to Beaufort Fringe – north-west – Landscape Character Type for images.

MAIN LEAD ROAD CLUSTER (3)

Figure 216. View of residential dwellings along Main Lead Road, looking south, showing existing conditions.

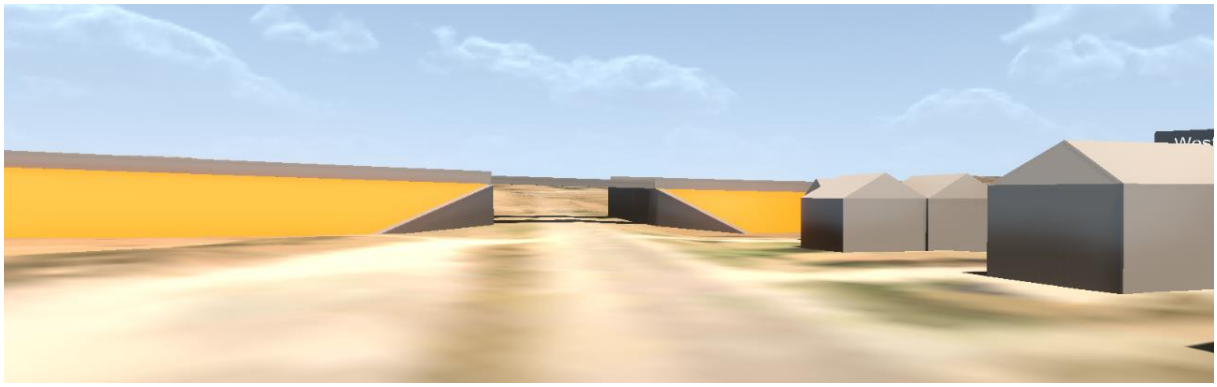

Figure 217. View (Virtual Model WSP) of residential dwellings along Main Lead Road, looking south, showing Alignments C0 and C2.

The residential dwellings are around 100m from the alignment. They will have significant views of Alignments C0 and C2 to the south and west.

BACK RAGLAN ROAD (NEAR TROTTING TRACK) (4)

Figure 218. View of residential dwelling close to Alignments C0 and C2, showing existing conditions.

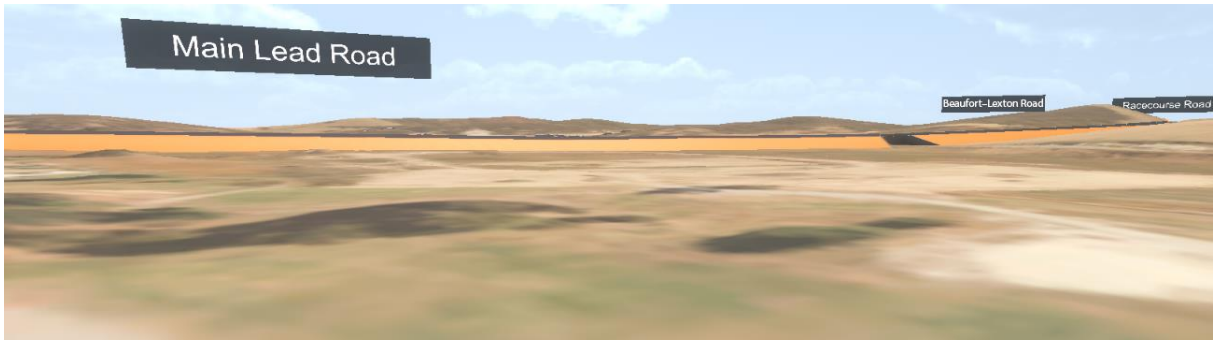

Figure 219. View (Virtual Model WSP) from Beaufort Trotting Track, looking north (Viewpoint 20a), showing Alignments C0 and C2.

BACK RAGLAN ROAD SOUTH (5)

Figure 220. View (Virtual Model WSP) of residential dwelling (estimated to be in red circle) close to Alignments C0 and C2.

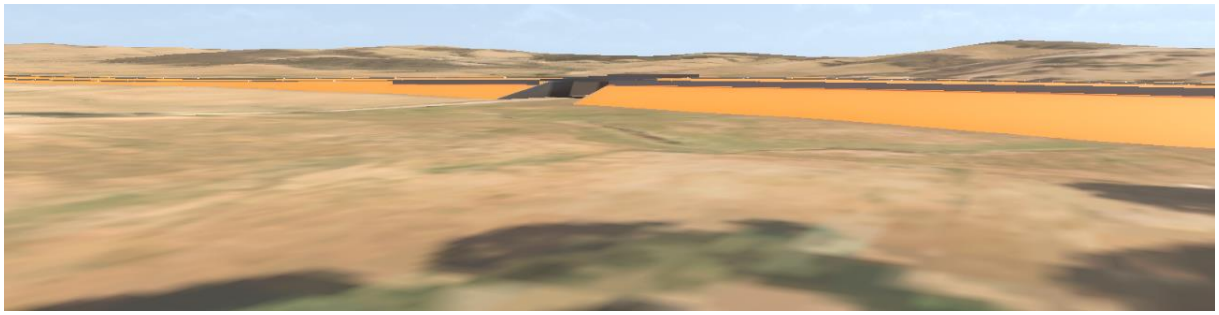

Figure 221. View (Virtual Model WSP) from residential dwelling, looking west, showing Alignments C0 andC2.

BACK RAGLAN ROAD NORTH (6)

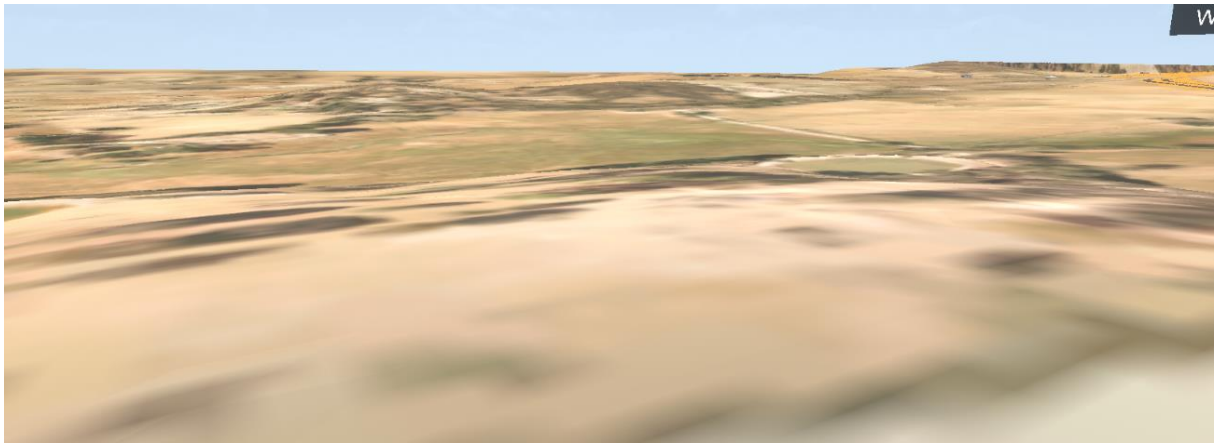

Figure 222. View (Virtual Model WSP) from residential dwelling, looking south.

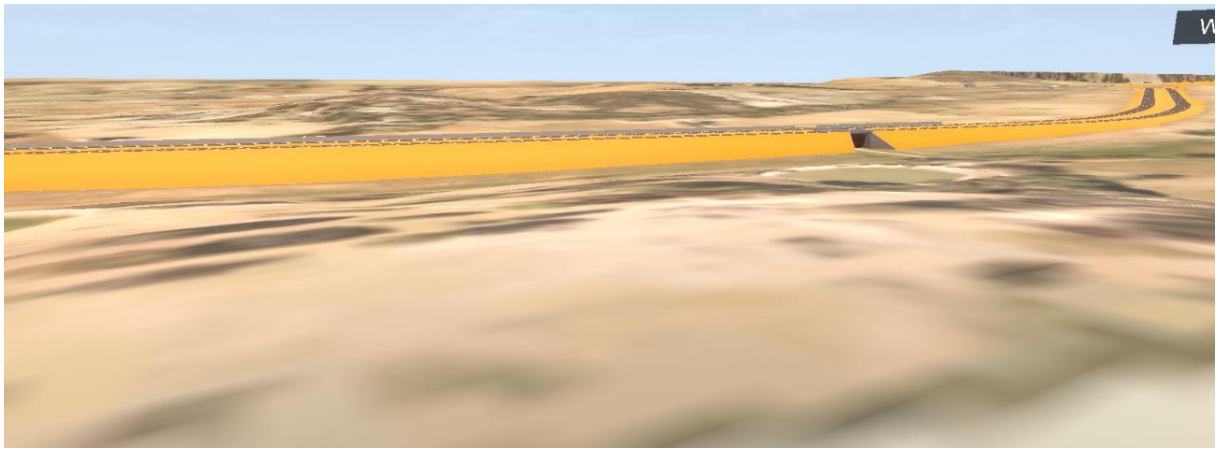

Figure 223. View (Virtual Model WSP) from residential dwelling, looking south, showing Alignments C0 and C2.

Table 41: Summary of Segment 6 impacts on residential dwellings.

Location	**Adjacent residential dwellings**	**Impact score**
Beaufort–Lexton Road (1)	Approx. 7 within 500m	Moderately low
Beaufort north (2)	8 within 500m	High
Main Lead Road cluster (3)	4 within 170m	Very high
Back Raglan Road (Near Trotting Track) (4)	8 within 500m	Moderate
Back Raglan Road south (5)	1 within 250m	Very high
Back Raglan Road north (6)	1 within 300m	Moderate
Overall adjacent residential dwellings impact = Moderately high		

7.1.8 Segment 7 – Beaufort–Lexton Road to Camp Hill State Forest

Segment details

Table 42: Segment 7 characteristics.

Segment elements	Description
Length of segment	4100m o A1: CH5400–CH1300
Key alignment features	• Dual Carriageway – Cut and Fill. Predominant topographic changes include: o Carriageway 600m in length where: Cut min: 0m Cut max: 15m o Carriageway 800m in length where: Fill min: 5m Fill max: 11m o Carriageway 200m in length where: Cut min: 6m Cut max: 14m • 2 bridges. Listing from east to west: o 10m high bridge over Main Lead Road o 8m high bridge over Back Raglan Rd • 2m high noise wall on top of 0–10m fill (1200m in length) o CH 4500– CH3300 (Outbound) • 2m high noise wall on top of 0–10m fill (1100m in length) o CH 4500–CH3400 (Inbound)
Landscape character types	Ecological Conservation Reserve (930m, 23%) Enclosed Rural Valley (1170m, 28%) Dense Bushland (190m, 5%) Western Semi-Enclosed Rural Valley (1810m, 44%)
Anticipated vegetation loss	A significant amount of vegetation is lost through The Camp Hill State Forest, then scattered trees in the valleys and an area of Dense Bushland to the west.
Watercourses impacted	–Several small waterways are crossed. These are small waterways and do not inform significantly the overall landscape and visual character, and thus the impact is not significant. The Main Lead Road waterway is crossed multiple times and this impact detrimentally on its character and value.
No. of adjacent dwellings or businesses within 100m of the outer carriageway edge of the road	2 dwellings
No. of adjacent dwellings or businesses between 101 and 500m of the outer carriageway edge of the road	7
No. of sensitive sites within 500m	2: Main Lead Road waterway Camp Hill State Forest
No. of key views and Viewsheds	0

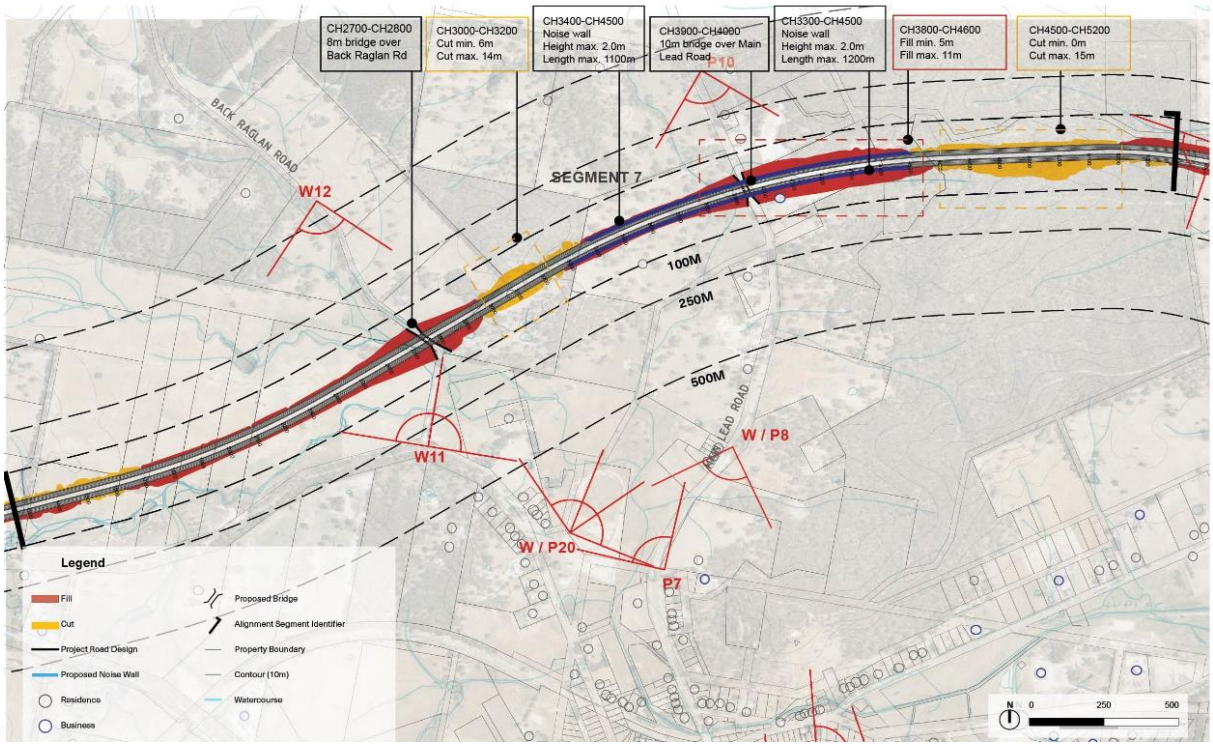

Figure 224. Summary plan of alignment features

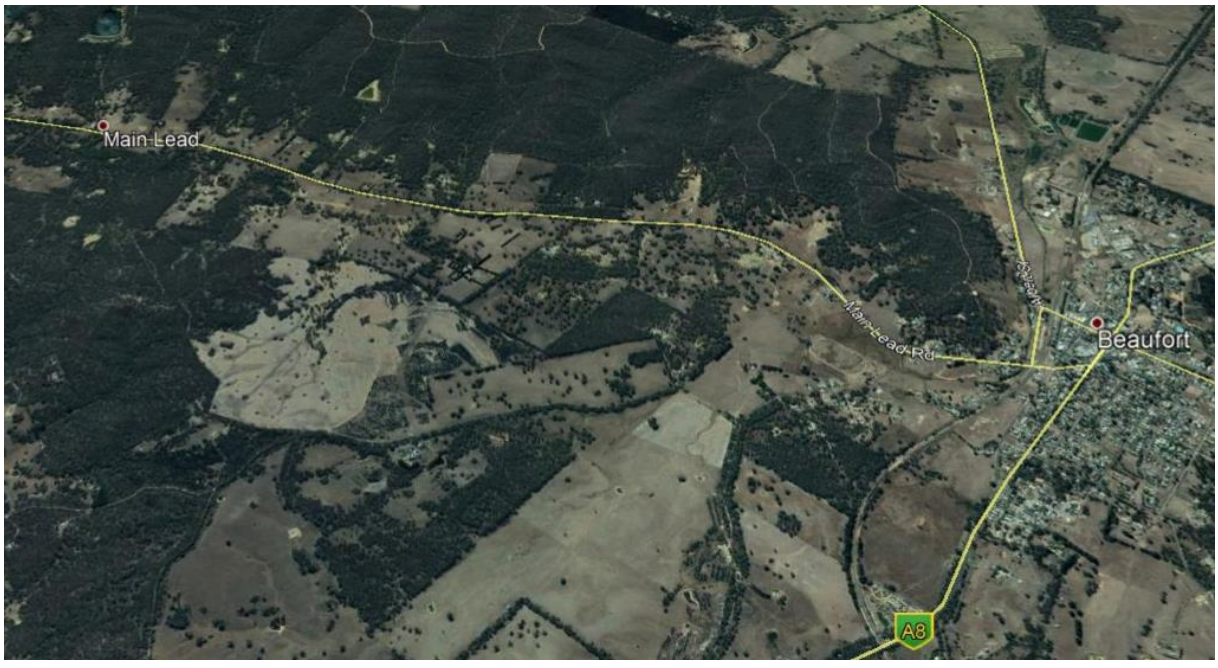

Figure 225. Aerial view (Google Earth).

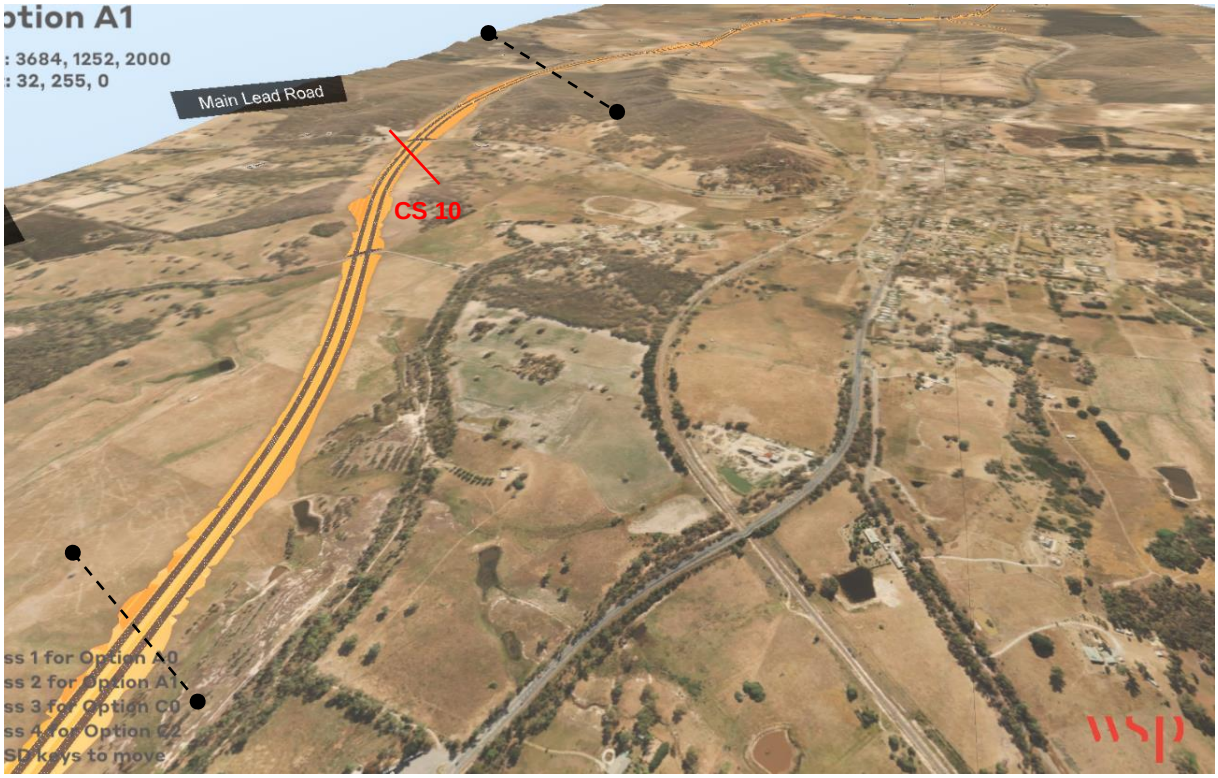

Figure 226. Segment 7 – View (Virtual Model WSP) showing Alignment A1.

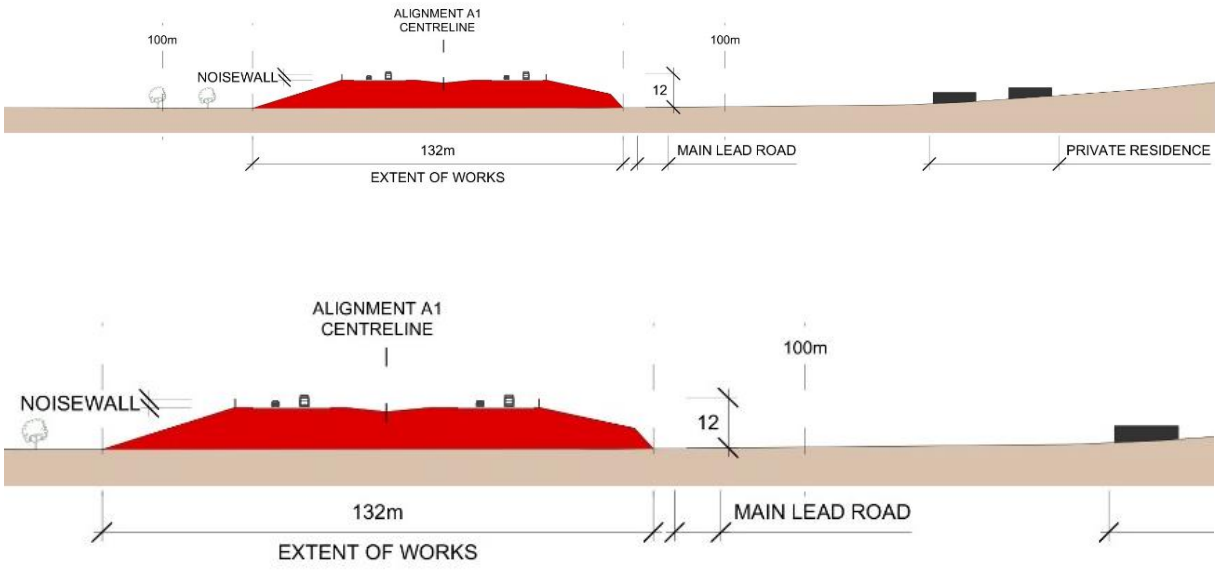

Figure 227. Cross Section 10 – Alignment A1 (and close-up section)

Landscape character impact assessment

WESTERN SEMI-ENCLOSED RURAL VALLEY

Figure 228. View from Back Raglan Road (Viewpoint 12), looking east, showing existing conditions.

Figure 229. Wireframe view from Back Raglan Road (Viewpoint 12), looking east, showing Alignment A1.

Figure 230. View from Back Raglan Road (Viewpoint 12), looking south-east, showing existing conditions.

Figure 231. Wireframe view from Back Raglan Road (Viewpoint 12), looking south-east, showing Alignment A1.

Figure 232. Indicative visibility areas of proposed 8m high bridge and associated fill areas (Google Earth Pro, does not consider vegetation and built form).

DENSE BUSHLAND

Figure 233. View (Virtual Model WSP) showing Alignment C2.

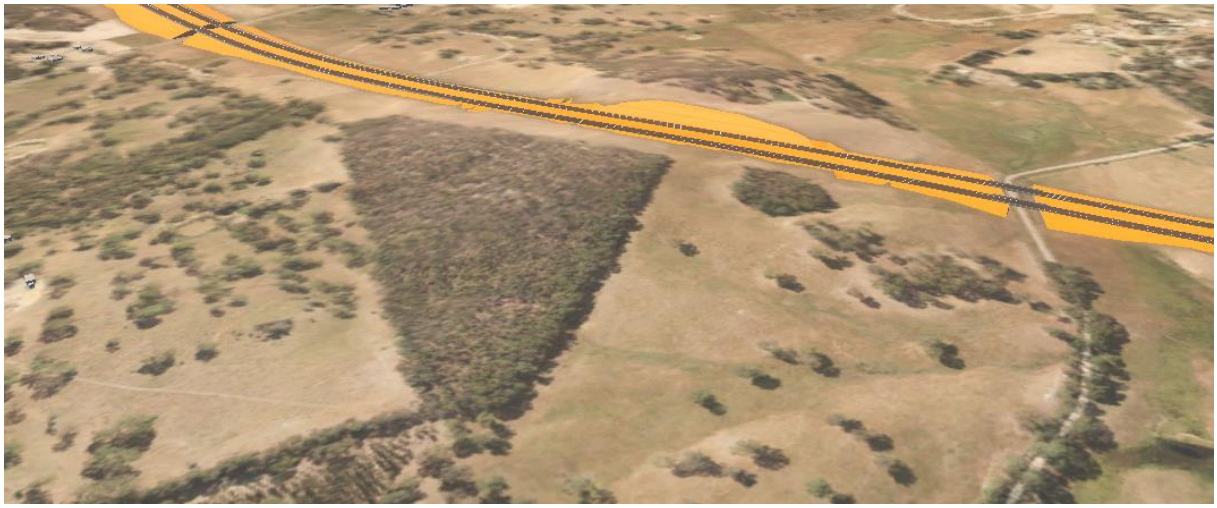

Figure 234. View (Virtual Model WSP) showing Alignment A1.

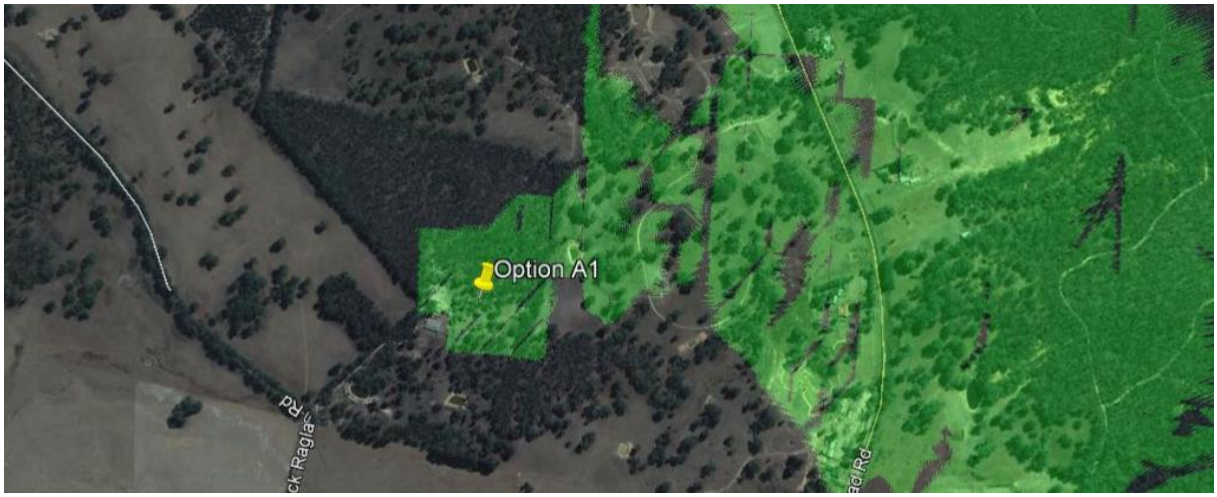

Figure 235. Indicative visibility areas of proposed 14m maximum cut into hillside, observable from the north and east (Google Earth Pro, does not consider vegetation and built form)..

ENCLOSED RURAL VALLEY (VIEWPOINT 10)

Figure 236. View from Main Lead Road, looking south, showing existing conditions.

Figure 237. View from Main Lead Road, looking south, showing Alignment A1.

Figure 238. Indicative viewshed of proposed 10m high bridge, 2m high noise walls and associated fill areas (Google Earth Pro, does not consider vegetation and built form).

ECOLOGICAL CONSERVATION RESERVE

Significant change occurs to this character type, because of large loss of bushland and the severing of the site into two parts. The visibility of the areas of deep cut and fill vary across the area, but are contained with local areas, because of the topography and remaining bushland.

Figure 239. View Near camp Hill Road and Slaughterhouse Lane intersection, looking west, showing existing conditions.

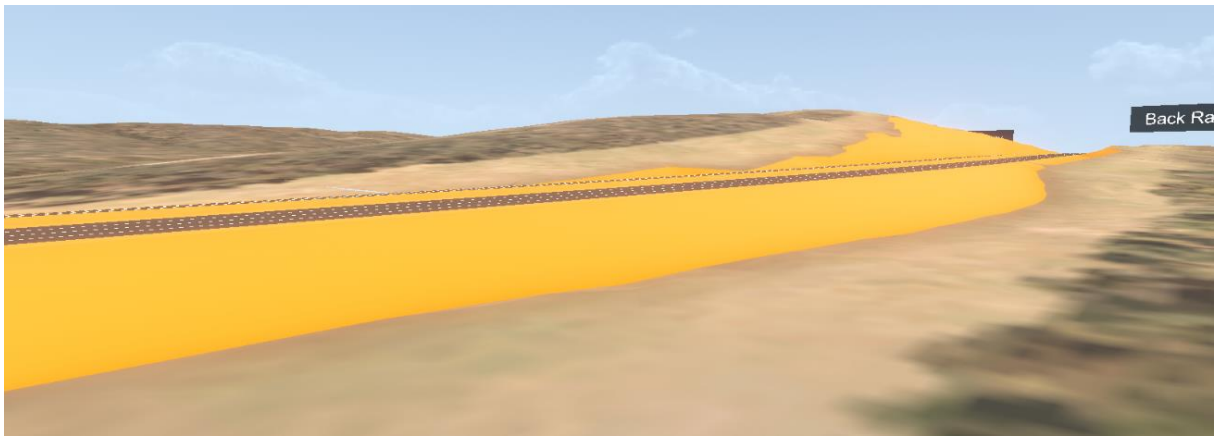

Figure 240. View (Virtual Model WSP) overlooking the valley, looking north, showing Alignment A0 and A1.

Figure 241. View at the intersection of Camp Hill Road and Slaughterhouse Lane, looking west, showing existing conditions.

Figure 242. Wireframe view at the intersection of Camp Hill Road and Slaughterhouse Lane intersection, looking west.

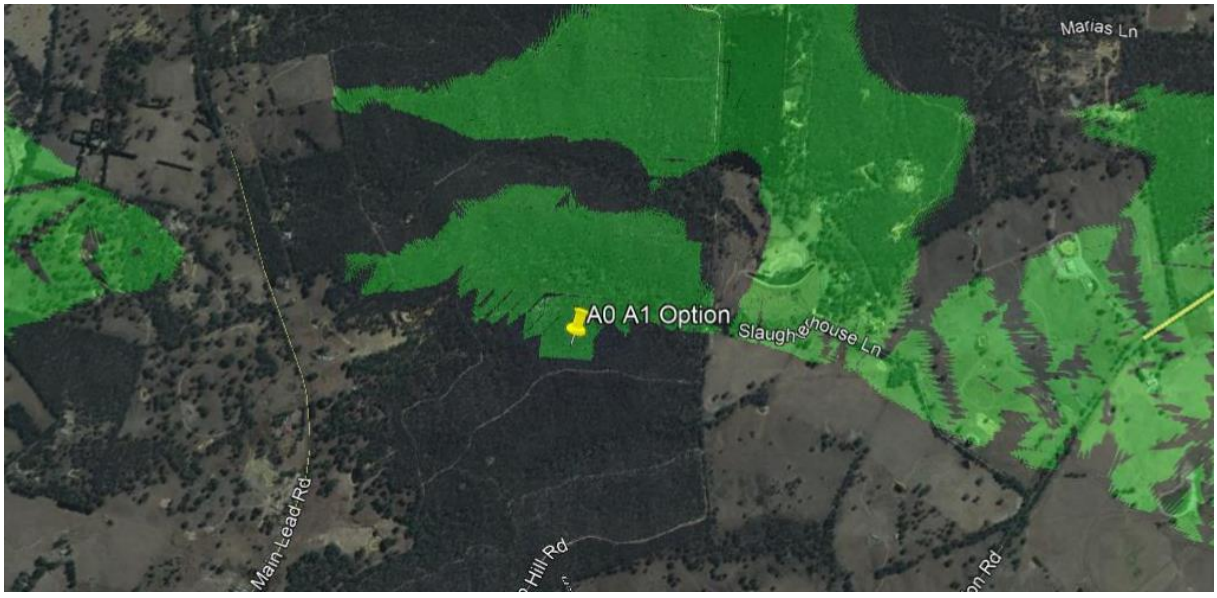

Figure 243. Indicative visibility areas of proposed Alignments A0 and A1 from east end of Camp Hill Forest (Google Earth Pro, does not consider vegetation and built form).

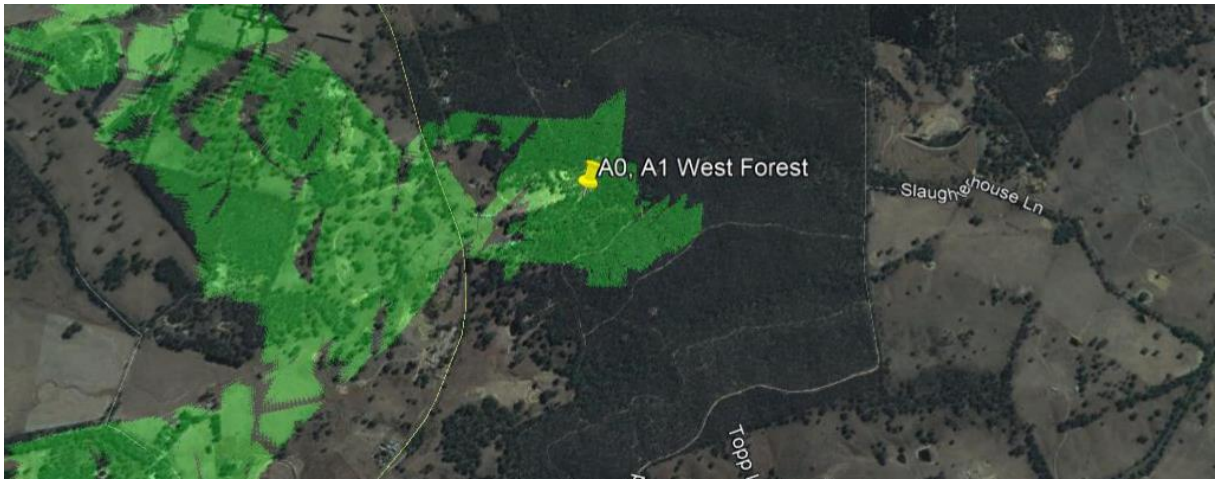

Figure 244. Indicative visibility areas of proposed Alignments A0 and A1 from west end of Camp Hill Forest (Google Earth Pro, does not consider vegetation and built form).

Table 43: Summary of Segment 7 impacts on landscape character.

Landscape character	Value	Ability to absorb change	Level of change in landscape by bypass	Final landscape character Impact score
Ecological Conservation Reserve	Very high	Very low	Very high	Very high
Enclosed Rural Valley	High	Low	Very high	Very high
Dense Bushland	High	Low	Moderate	Moderate
Western Semi-Enclosed Rural Valley	Moderate	Moderately low	Moderate	Moderate
Overall landscape character impact = High				

Sensitive sites impact assessment

Identified sensitive local sites in the segment are:

- Beaufort Trotting Track
- Main Lead Road waterway
- Camp Hill State Forest.

BEAUFORT TROTTING TRACK (VIEWPOINT 20)

Figure 245. View of Beaufort Trotting Track looking north, showing existing conditions.

Figure 246. Wireframe view of Beaufort Trotting Track, looking north, showing Alignment A1.

MAIN LEAD ROAD WATERWAY

Figure 247. View (Virtual Model WSP) overlooking the valley, looking south, showing Alignment A1.

Figure 248. View from Main Lead Road, looking north, showing existing conditions.

Figure 249. View (Virtual Model WSP) overlooking the valley, looking north, showing Alignment A1 with 2m high noise walls on top.

Table 44: Summary of Segment 7 impacts on sensitive sites.

Site	Level of Sensitivity	Impact score
Beaufort Trotting Track	Low	Very low
Main Lead Road waterway	High	High
Camp Hill Forrest	Very high	Very high
Overall impact = High		

Key views and viewsheds impact assessment

No identified key views and viewsheds are in the segment.

Adjacent residential dwellings impact assessment

There are five main groupings of residential properties:

- Main Lead Road south of Alignment (1)
- Off Main Lead Road south of Alignment (2)
- Main Lead Road immediately north of Alignment (3)
- Main Lead Road north of Alignment (4)
- Back Raglan Road south of Alignment (5).

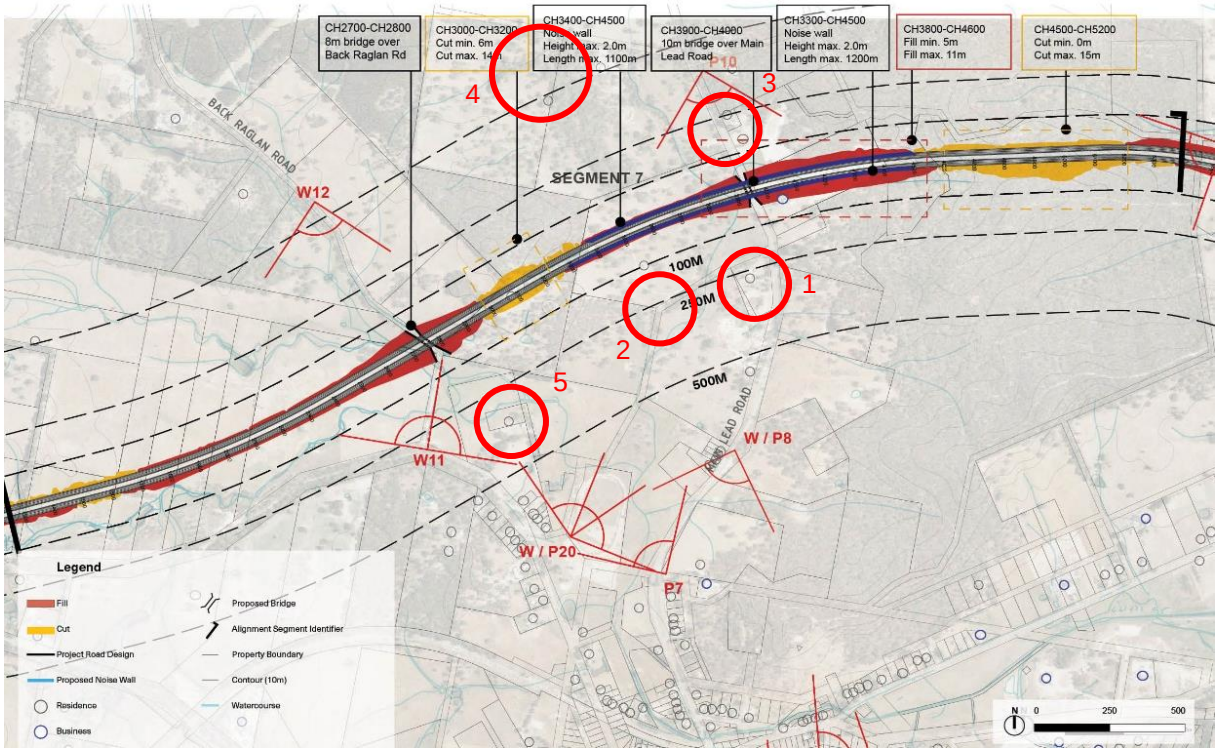

Figure 250. Location of adjacent residential dwellings (red ellipses).

MAIN LEAD ROAD SOUTH OF ALIGNMENT A1 (1)

Figure 251. View of residential dwelling along Main Lead Road, looking north, showing existing conditions.

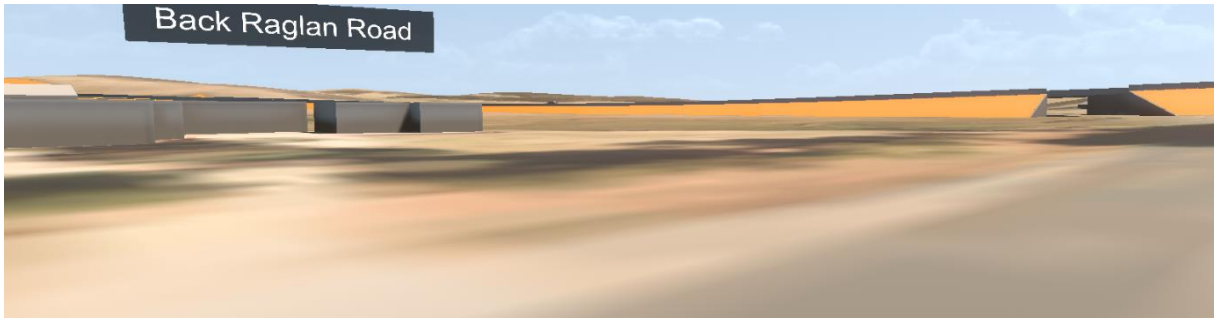

Figure 252. View (Virtual Model WSP) of residential dwelling along Main Lead Road, looking north, showing Alignment A1.

Off Main Lead Road south of Alignment A1 (2)

Figure 253. View (Virtual Model WSP) of residential dwelling south of alignment looking north.

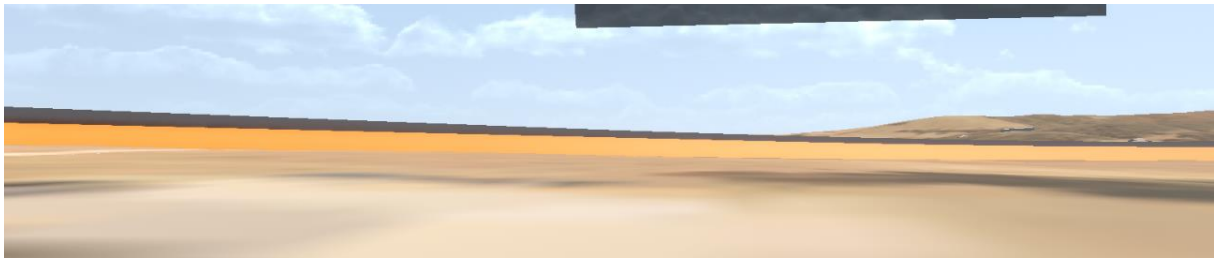

Figure 254. View (Virtual Model WSP) of residential dwelling south of alignment looking north, showing Alignment A1 with 2m high noise walls.

MAIN LEAD ROAD IMMEDIATELY NORTH OF ALIGNMENT A1 (3)

Figure 255. View of residential dwelling on Main Lead Road, looking south, immediately north of Alignment A1, showing existing conditions.

Figure 256. View (Virtual Model WSP) of residential dwelling on Main Lead Road, looking south, immediately north of Alignment A1.

The residential dwelling is around 130m from Alignment A1. They will have good views of the alignment and in particularly bridge and noise walls. The scale of the dwelling is quite small in comparison to the landform.

MAIN LEAD ROAD NORTH OF ALIGNMENT A1 (4)

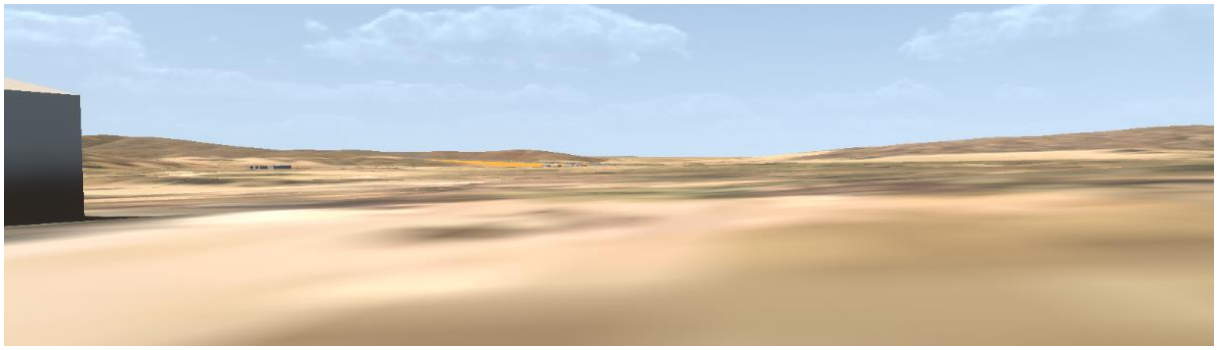

Figure 257. View (Virtual Model WSP) of residential dwelling on Main Lead Road, looking north, with Alignment C0 in the background.

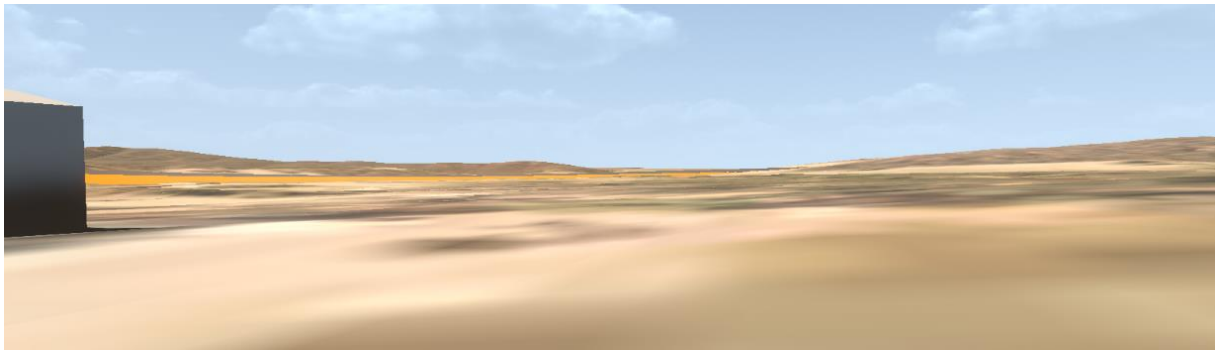

Figure 258. View (Virtual Model WSP) from residential dwelling on Main Lead Road, looking north, showing Alignment A1.

This dwelling has limited views of Alignment A1 because it is approximately 500m from the alignment and the alignment is approximately 5m at most above grade here, with a 2m high noise wall. There is also a constant scattering of mature trees between the dwelling and the alignment.

BACK RAGLAN ROAD SOUTH OF ALIGNMENT (5)

Figure 259. View (Virtual Model WSP) from residential dwelling within 320m of Alignment A1.

Table 45: Summary of Segment 7 impacts on residential dwellings.

Location	Adjacent residential dwellings	Impact score
Main Lead Road south of Alignment (1)	1 approx. 250m	Moderate
Off Main Lead Road south of Alignment (2)	1 within 100m	Very high
Main Lead Road immediately north of Alignment (3)	2 within 250m	Very high
Main Lead Road north of Alignment (4)	1–2 within 500m	Low
Back Raglan Road south of Alignment (5)	1 within 320 m	Moderately low
Overall adjacent residential dwellings impact = High		

7.1.9 Segment 8 – Beaufort–Lexton Road to Camp Hill State Forest

Segment details

Table 46: Segment 8 characteristics.

Segment elements	Description
Length of segment	4200m o A0: CH5500–CH1300
Key alignment features	• Dual Carriageway – Cut and Fill. Predominant topographic changes include: o Carriageway 600m in length where: Cut min: 0m Cut max: 15m o Carriageway 700m in length where: Fill min: 5m Fill max: 10m o Carriageway 400m in length where: Cut min: 1m Cut max: 10m • 2 bridges. Listing from east to west: o 10m high bridge over Main Lead Road o 8m high bridge over Back Raglan Rd • 3m high noise wall on top of 5–10m fill (1300m in length) o CH4400–CH3100 (outbound) • 2m high noise wall on top of 5–10m fill (1400m in length) o CH4300–CH2900 (inbound)
Landscape character types	Ecological Conservation Reserve (930m, 22%) Enclosed Rural Valley (1100m, 26%) Dense Bushland (320m, 8%) Western Semi-Enclosed Rural Valley (1850m, 44%)
Anticipated vegetation loss	A significant amount of vegetation is lost through The Camp Hill State Forest, then scattered trees in the valleys and an area of Dense Bushland to the west.
Watercourses impacted	Several small waterways are crossed. These are small waterways and do not inform significantly the overall landscape and visual character, and thus the impact is not significant. The Main Lead Road waterway is crossed in multiple locations and this impact detrimentally on its character and value.
No. of adjacent dwellings or businesses within 100m of the outer carriageway edge of the road	2 dwellings
No. of adjacent dwellings or businesses between 101 and 500m of the outer carriageway edge of the road	7 dwellings
No. of sensitive sites within 500m	2: • Main Lead Road waterway • Camp Hill State Forest
No. of key views and Viewsheds	0

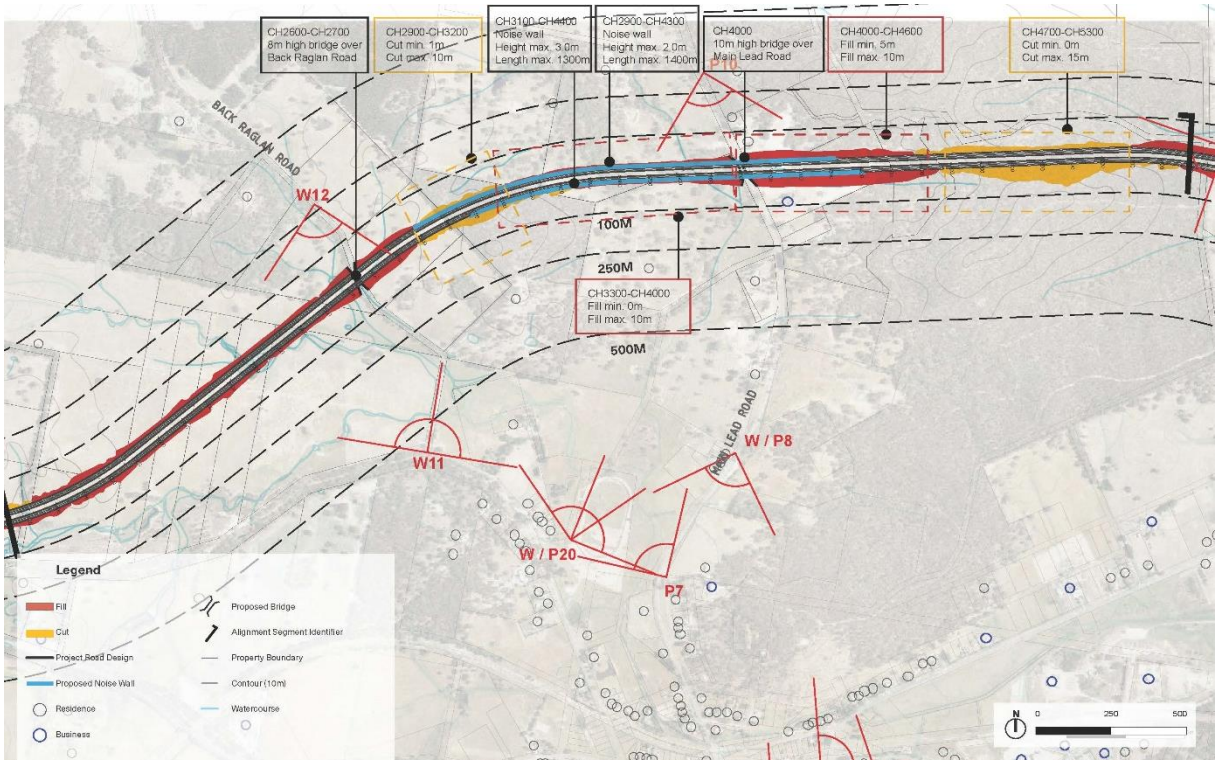

Figure 260. Summary plan of alignment features.

Figure 261. Aerial view (Google Earth).

Figure 262. Segment 8 – View (Virtual Model WSP) showing Alignment A0.

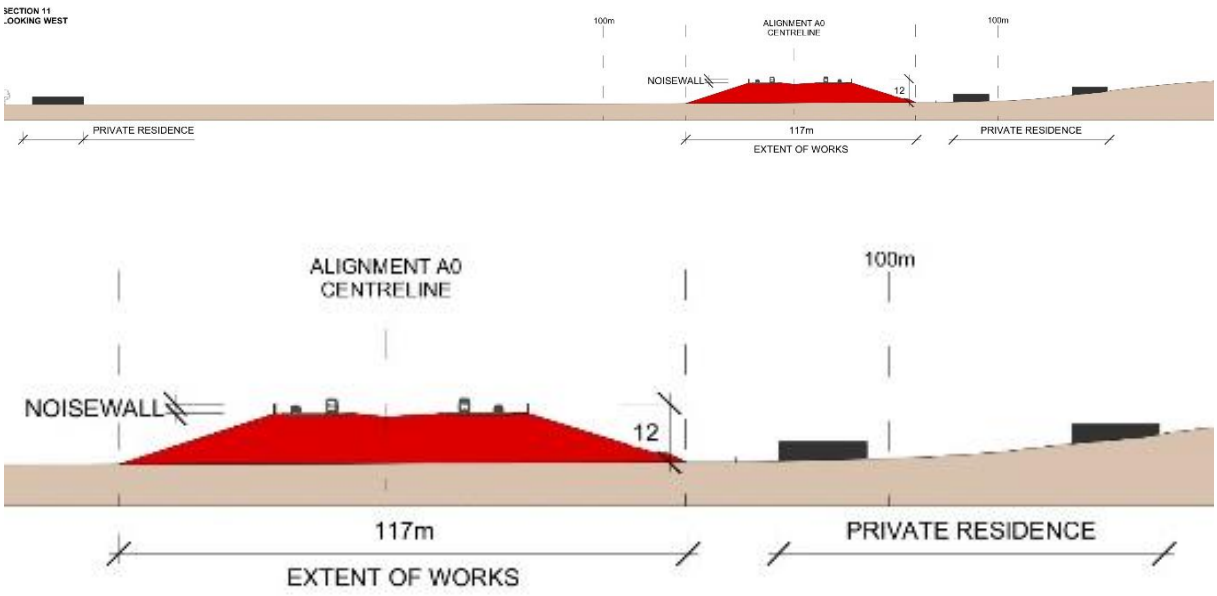

Figure 263. Cross Section 11 – Alignment A0 (and close-up section)

Landscape character impact assessment

INDICATIVE VIEWPOINT 12 – WESTERN SEMI-ENCLOSED RURAL VALLEY

Figure 264. View along Back Raglan Road, looking south, showing existing conditions.

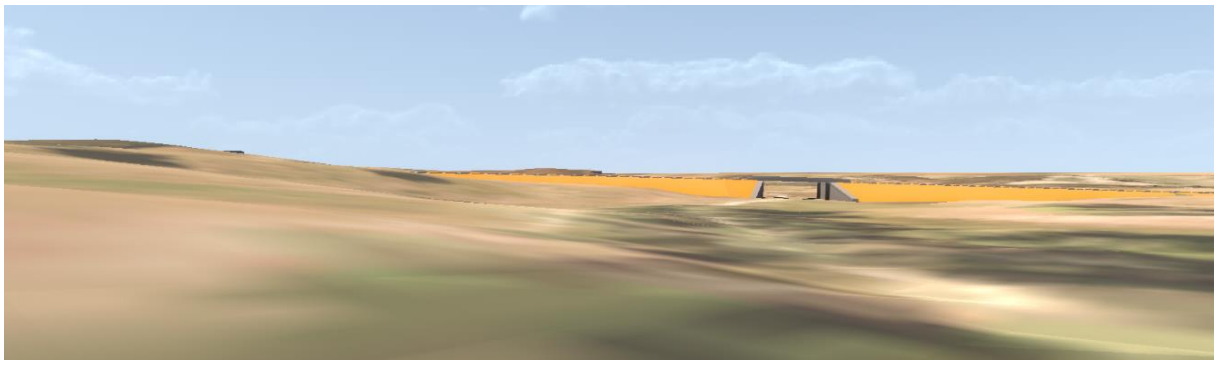

Figure 265. View (Virtual Model WSP) along Back Raglan Road, looking south, showing Alignment A0.

Figure 266. View along Back Raglan Road, looking north-west, showing existing conditions.

Figure 267. View (Virtual Model WSP) along Back Raglan Road, looking north-west, showing Alignment A0.

Figure 268. Indicative visibility areas of proposed 8m high bridge and associated fill areas (Google Earth Pro, does not consider vegetation and built form).

DENSE BUSHLAND

Figure 269. View (Virtual Model WSP) showing Alignment C2.

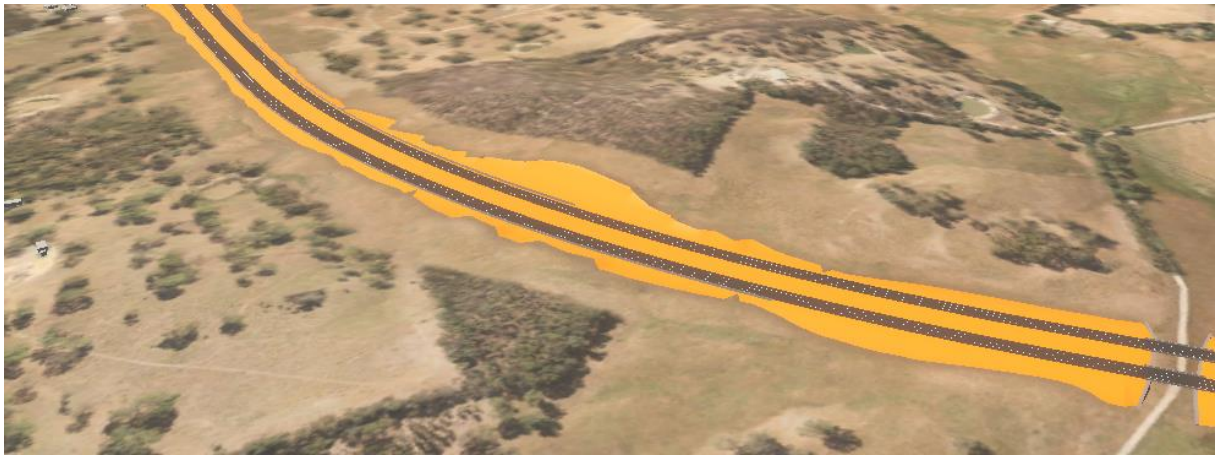

Figure 270. View (Virtual Model WSP) showing Alignment A0.

Figure 271. Indicative visibility areas of proposed 10m maximum cut into hillside, observable from the north (Google Earth Pro, does not consider vegetation and built form).

ENCLOSED RURAL VALLEY

Figure 272. View along Main Lead Road, looking south, showing existing conditions.

Figure 273. View (Virtual Model WSP) along Main Lead Road, looking south, showing Alignment A0.

Figure 274. Indicative visibility areas of proposed 10m high bridge, 2m high noise walls and associated fill areas (Google Earth Pro, does not consider vegetation and built form).

ECOLOGICAL CONSERVATION RESERVE

Significant change in this character type, through large loss of the bushland character and severance of the contiguous character into two parts. The visibility of the areas of deep cut and fill vary across the area, but are contained with local areas, because of the topography and remaining bushland.

Figure 275. View near Camp Hill Road and Slaughterhouse Lane intersection, looking west, showing existing conditions.

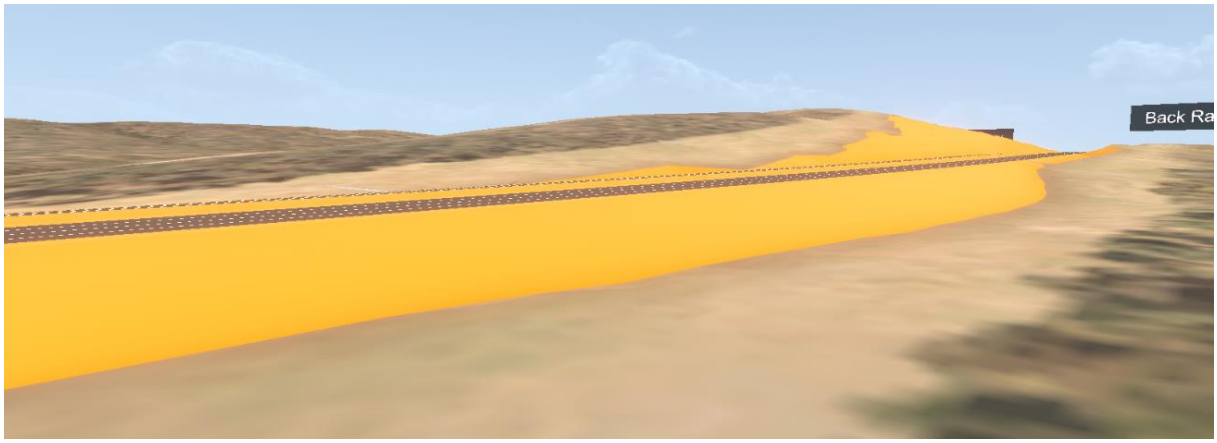

Figure 276. View (Virtual Model WSP) overlooking the valley, looking north, showing Alignment A0.

Figure 277. View at the intersection of Camp Hill Road and Slaughterhouse Lane, looking west, showing Alignment A0.

Figure 278. Wireframe view at the intersection of Camp Hill Road and Slaughterhouse Lane, looking west, showing Alignment A0.

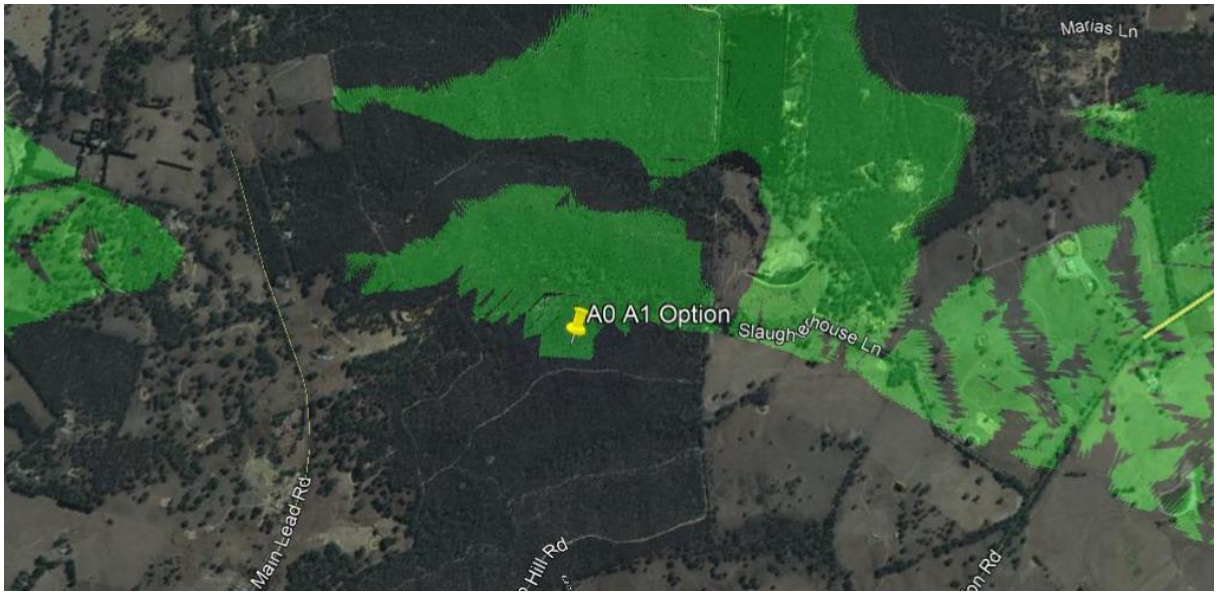

Figure 279. Indicative visibility areas of proposed Alignments A0 and A1 from east end of Camp Hill Forest (Google Earth Pro, does not consider vegetation and built form).

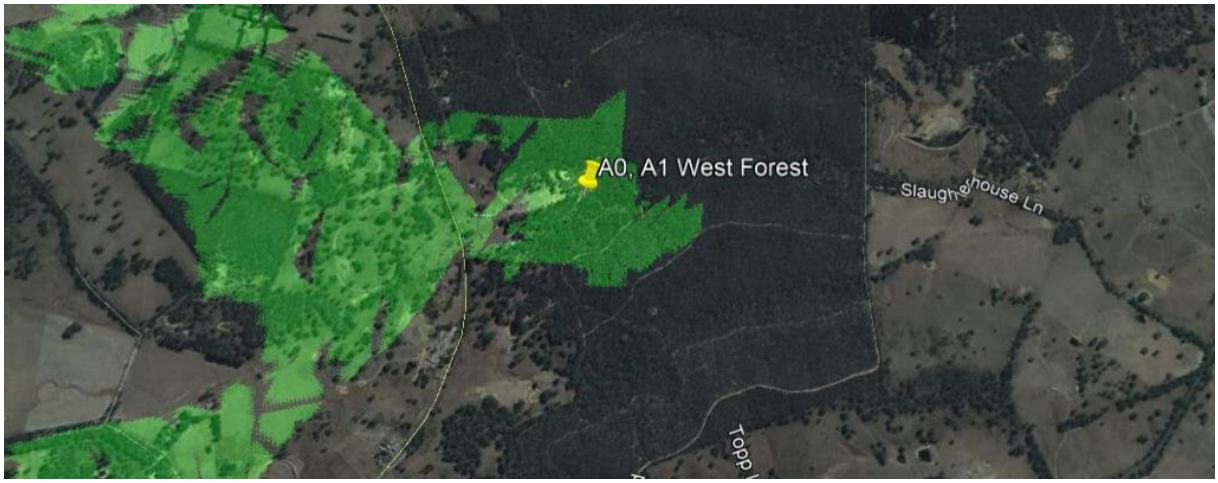

Figure 280. Indicative visibility areas of proposed Alignments A0 and A1 from west end of Camp Hill Forest (Google Earth Pro, does not consider vegetation and built form).

Table 47: Summary of Segment 8 impacts on landscape character.

Landscape character	Value	Ability to absorb change	Level of change in landscape by bypass	Final landscape character Impact score
Ecological Conservation Reserve	Very high	Very low	Very high	Very high
Enclosed Rural Valley	High	Low	Very high	Very high
Dense Bushland	High	Low	High	High
Western Semi-Enclosed Rural Valley	Moderate	Moderately low	Moderate	Moderate
Overall landscape character impact = High				

Sensitive local sites impact assessment

Identified sensitive local sites in the segment are:

- Beaufort Trotting Track
- Main Lead Road waterway
- Camp Hill State Forest (Refer to Landscape Character Assessment).

BEAUFORT TROTTING TRACK (VIEWPOINT 20A)

Figure 281. View from Beaufort Trotting Track, looking north, showing existing conditions.

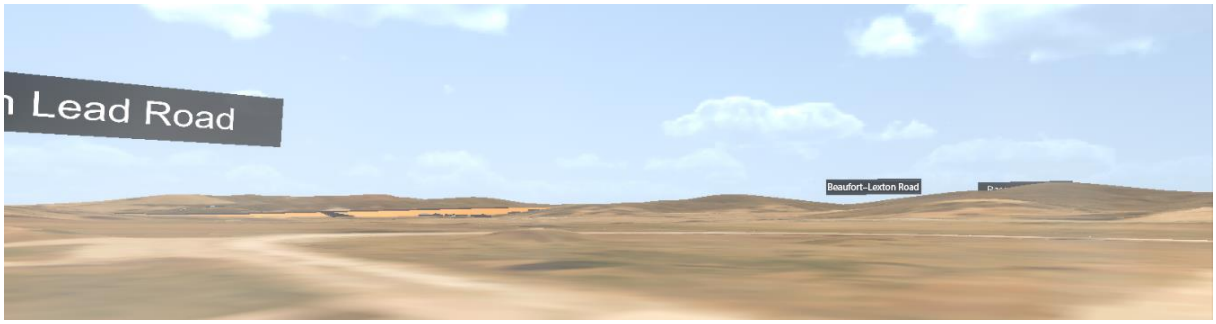

Figure 282. View (Virtual Model WSP) from Beaufort Trotting Track, looking north, showing Alignment A0.

MAIN LEAD ROAD WATERWAY

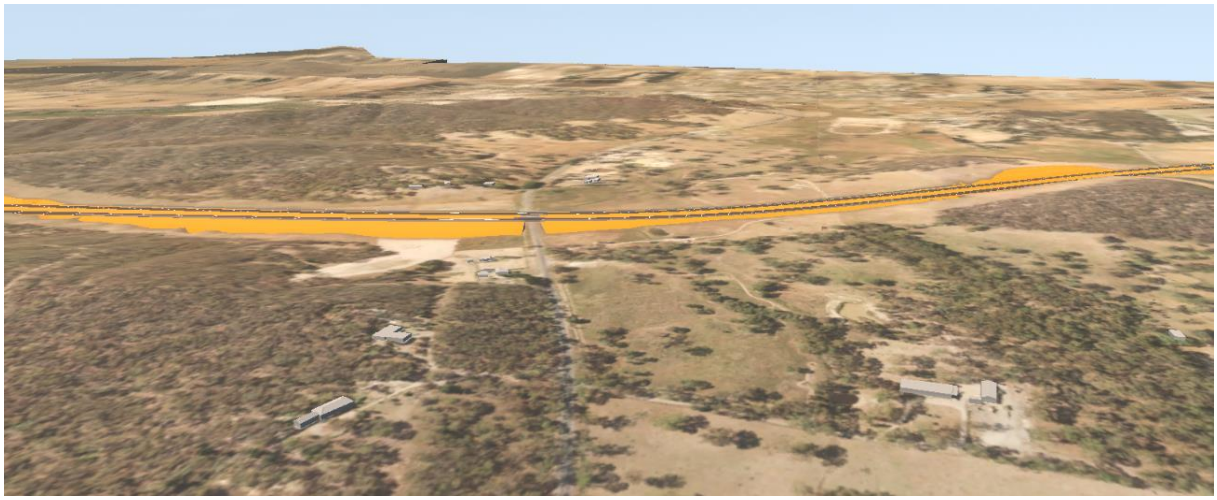

Figure 283. View (Virtual Model WSP) overlooking the valley, looking south, showing Alignment A0.

Figure 284. View from Main Lead Road, looking north, showing existing conditions.

Figure 285. View (Virtual Model WSP) from Main Lead Road, looking north, showing Alignment A0.

Figure 286. Indicative visibility areas of Alignments A0 (Google Earth Pro, does not consider vegetation and built form).

Table 48: Summary of Segment 8 impacts on sensitive sites.

Site	Level of Sensitivity	Impact score
Beaufort Trotting Track	Low	Very low
Main Lead Road waterway	High	High
Camp Hill Forrest	Very high	Very high
Overall impact = High		

Key views and viewsheds impact assessment

No identified Key Views and Viewsheds in the segment.

Adjacent residential dwellings impact assessment

There are six main groupings of residential properties:

- Main Lead Road south of Alignment (1)
- Main Lead Road immediately south of Alignment (2)
- Off Main Lead Road south of Alignment (3)
- Main Lead Road immediately north of Alignment (4)
- Main Lead Road north of Alignment (5)
- Back Raglan Road north of Alignment (6)

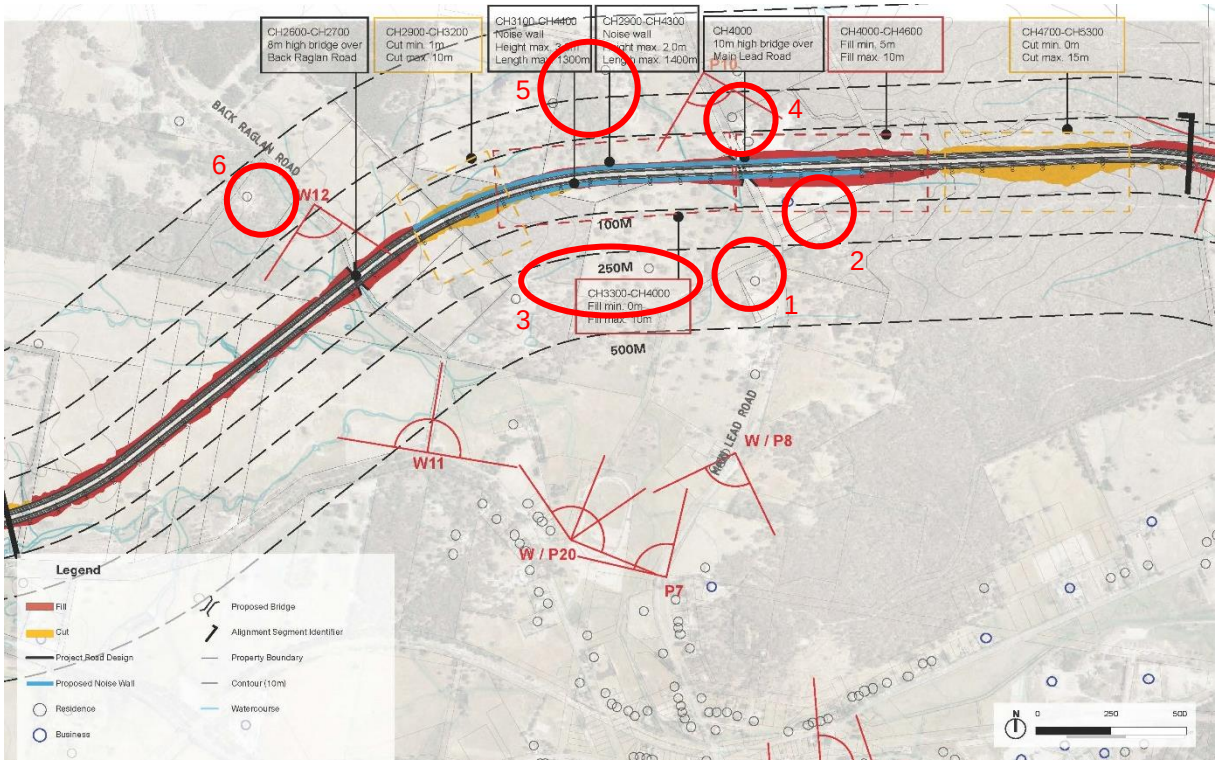

Figure 287. Location of adjacent residential dwellings (red ellipses).

MAIN LEAD ROAD SOUTH OF ALIGNMENT (1)

Figure 288. View of residential dwelling on Main Lead Road, looking north from south of Alignment A0, showing existing conditions.

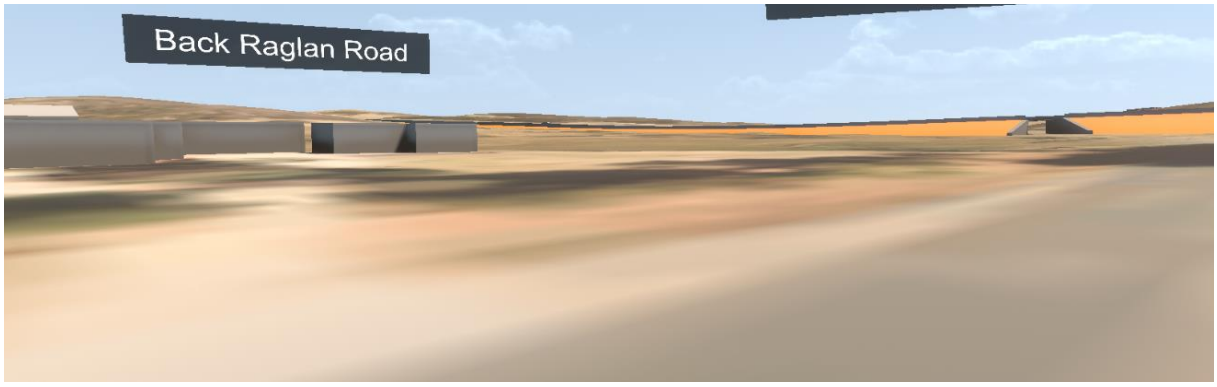

Figure 289. View (Virtual Model WSP) from Main Lead Road, looking north from south, showing Alignment A0.

MAIN LEAD ROAD IMMEDIATELY SOUTH OF ALIGNMENT (2)

Figure 290. View of residential dwelling on Main Lead Road, looking north from immediately south of Alignment A0, showing existing conditions.

Figure 291. View (Virtual Model WSP) of residential dwelling on Main Lead Road, looking north from immediately south of Alignment A0.

OFF MAIN LEAD ROAD SOUTH OF ALIGNMENT (3)

Figure 292. View (Virtual Model WSP) of residential dwelling looking north from south of Alignment.

Figure 293. View (Virtual Model WSP) of residential dwelling south of Alignment looking north, showing Alignment A0.

The second dwelling in this area sits atop a hilltop and predominantly looks south, with the hilltop obscuring views to the north and Alignment A0.

MAIN LEAD ROAD IMMEDIATELY NORTH OF ALIGNMENT (4)

Figure 294. View of residential dwelling on Main Lead Road, looking south from immediately north of Alignment A0, showing existing conditions.

Figure 295. View (Virtual Model WSP) of residential dwelling on Main Lead Road, looking south from immediately north of Alignment A0.

The residential dwelling is within 100m of the Alignment A0. They will have significant visibility of the alignment and in particularly the bridge and noise walls. Scale of dwelling is quite small in comparison to landform.

MAIN LEAD ROAD NORTH OF ALIGNMENT (5)

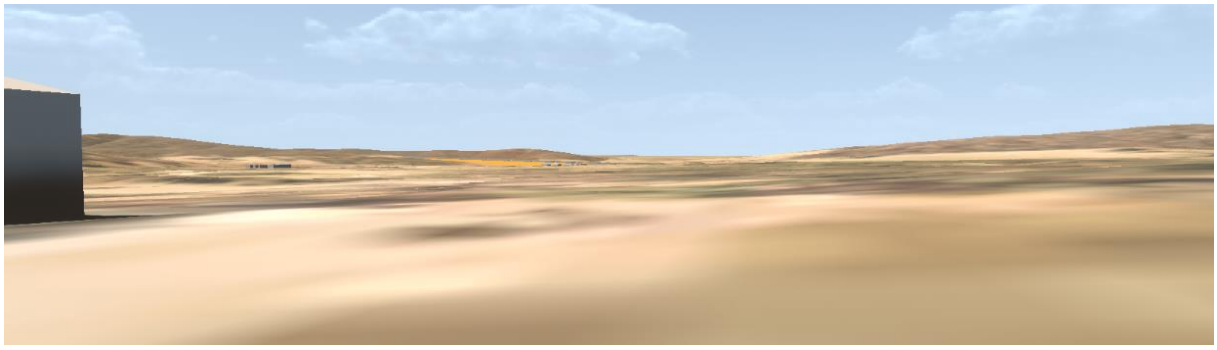

Figure 296. View (Virtual Model WSP) of residential dwelling on Main Lead Road, looking north, indicative of existing conditions.

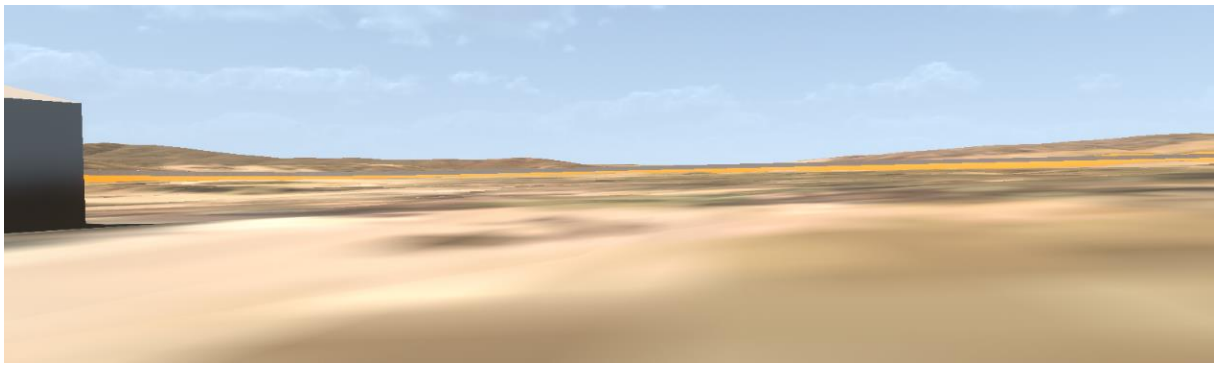

Figure 297. View (Virtual Model WSP) of residential dwelling on Main Lead Road, looking north, showing Alignment A0.

Limited visibility of Alignment A0 as the residential dwelling is approximately 300m from the alignment and here the alignment is approximately 5m above grade, with a 2 m high noise wall. There is also constant scattering of mature tree between the dwelling and the alignment.

BACK RAGLAN ROAD NORTH OF ALIGNMENT (6)

Figure 298. Aerial view of residential dwelling – looking north, showing existing conditions.

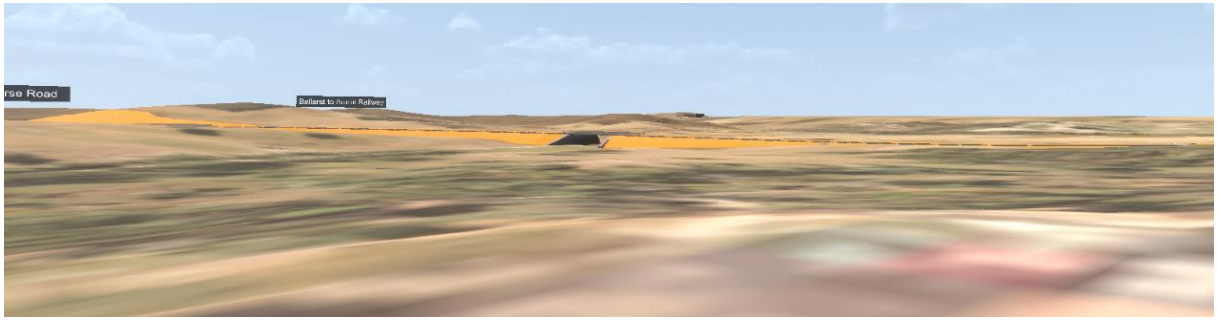

Figure 299. View (Virtual Model WSP) from residential dwelling, looking east, showing Alignment A0.

Table 49: Summary of Segment 8 impacts on residential dwellings.

Location	Adjacent residential dwellings	Impact score
Main Lead Road south of Alignment (1)	1 approx. 375m	Moderately low
Main Lead Road immediately south of Alignment (2)	1 within 100m	Very high
Off Main Lead Road south of Alignment (3)	2 within 300 m	Moderately low
Main Lead Road immediately north of Alignment (4)	1 within 100m 1 within 175m	Very high
Main Lead Road north of Alignment (5)	1 within 250m	Low
Back Raglan Road north of Alignment (6)	1 within 500 m	Very low
Overall adjacent residential dwellings impact = High		

7.1.10 Segment 9 – Western Highway, proposed western entrance and exit

Segment details

Table 50: Segment 9 characteristics.

Segment elements	Description
Length of segment	1300m o A0: CH1300–CH0 o A1: CH1300–CH0 o C0: CH1300–CH0 o C2: CH1300–CH0
Key alignment features	• Dual Carriageway – Cut and Fill. Predominant topographic changes include: o Carriageway 300m in length where: Cut max: 0m Fill max: 9m o Carriageway 400m in length where Fill min: 0m Fill max: 11m o Carriageway 600m in length where Cut min: 0m Cut max:10m • 10m high off ramp bridge over bypass • Five arterial on and off ramps (associated with bridge over bypass) • One bypass intersection (associated with bridge over bypass)
Landscape character types	Western Semi-Enclosed Rural Valley (470m, 37%) Highway Infrastructure (830m, 63%)
Anticipated vegetation loss	Loss of roadside vegetation along Martins Lane and scattered native trees on the hillside.
Watercourses impacted	small waterways are crossed. These are small waterways and do not inform significantly the overall landscape and visual character, and thus the impact is not significant.
No. of adjacent dwellings or businesses within 100m of the outer carriageway edge of the road	Approx. 0
No. of adjacent dwellings or businesses within 100-500m of the outer carriageway edge of the road	Approx. 6
No. of sensitive sites within 500m	0
No. of key views and Viewsheds	0

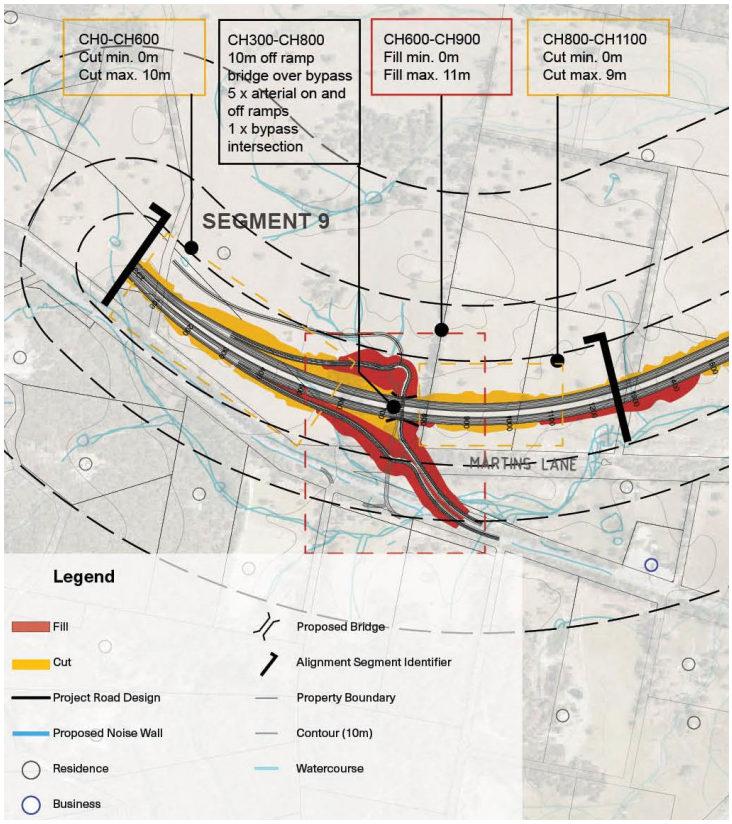

Figure 300. Summary plan of alignment features.

Figure 301. Aerial view (Google Earth).

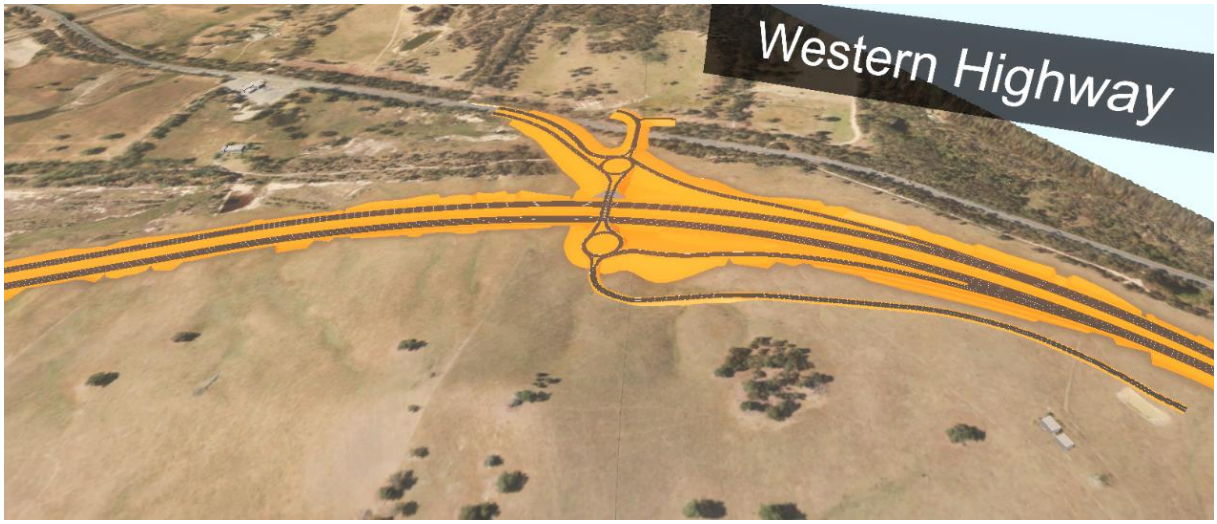

Figure 302. Segment 9 – View (Virtual Model WSP) showing all Alignments.

Landscape character impact assessment

Two Landscape Character Types in Segment 9:

- Western Semi-Enclosed Rural Valley (470m, 37%)
- Highway Infrastructure (830m, 63%)

INDICATIVE VIEW A – HIGHWAY INFRASTRUCTURE

Figure 303. View along Western Highway, looking west, showing existing conditions.

Figure 304. View (Virtual Model WSP) along Western Highway, looking west, showing all alignments.

INDICATIVE VIEW B– HIGHWAY INFRASTRUCTURE

Figure 305. View along Western Highway, looking east, showing existing conditions.

Figure 306. View (Virtual Model WSP) along Western Highway, looking west, showing all alignments.

Figure 307. Indicative visibility areas of proposed Interchange with 10m high bridge and associated fill and cut areas (Google Earth Pro, does not consider vegetation and built form).

These views and viewshed identify that the area has already undergone significant change through the previous recent Highway works. With additional loss of roadside vegetation and scattered paddock native trees and new large-scale road features in the landscape will extend the Highway character type sideways and will form a hard-line edge to the eastern character type of the Western Semi-Enclosed Rural Valley.

Table 51: Summary of Segment 9 impacts on landscape character.

Landscape character	Value	Ability to absorb change	Level of change in landscape by bypass	Final landscape character Impact score
Highway Infrastructure	Low	Very high	Moderate	Moderately low
Western Semi-Enclosed Rural Valley	Moderate	Moderately low	Moderately low	Moderately low
Overall landscape character impact = Moderately low				

Sensitive sites impact assessment

There are no sensitive local sites in this segment.

Key views and viewsheds impact assessment

No identified Key Views and Viewsheds in the segment.

Adjacent residential dwellings impact assessment

There are three main groupings of residential properties:

- Residential Dwelling on Martins Lane
- Residential Dwellings south of Alignment
- Residential Dwelling north of Alignment.

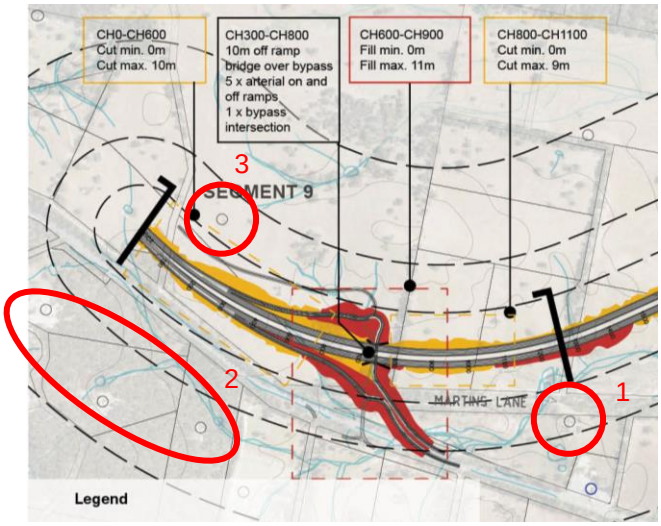

Figure 308. Location of adjacent residential dwellings (red ellipses).

RESIDENTIAL DWELLING ON MARTINS LANE

This residential dwelling is approximately 250m from the alignments. The existing roadside and property vegetation will filter and obscure views to the alignments to an extent.

Figure 309. View of Martins Lane residential dwelling, looking west, showing existing conditions.

Figure 310. View (Virtual Model WSP) from Martins Lane residential dwelling, looking west to Interchange.

Figure 311. View of Martins Lane residential dwelling, looking north-west, showing existing conditions.

Figure 312. View (Virtual Model WSP) from Martins Lane residential dwelling, looking north-west to Interchange.

RESIDENTIAL DWELLINGS SOUTH OF ALIGNMENT

There are 4 residential dwellings to the south of the alignment, between 250–500m from the alignment. Most of these are surrounded by bushland and this will obscure visibility of the Interchange. One dwelling has less native bushland coverage and is closer to the Interchange and it may well be able to see the Interchange, especially considering its height of 10m.

RESIDENTIAL DWELLING NORTH OF ALIGNMENT

There is one potential residential dwelling on the north side, over 100m from the alignment. It sits atop a hill and will have some visibility of the alignment, but most of the features will be block by the foreground of the hilltop.

Table 52: Summary of Segment 9 impacts on residential dwellings.

Location	Adjacent residential dwellings	Impact score
Residential Dwelling on Martins Lane	1 at approx. 250m	Moderate
Residential Dwellings south of Alignment	4 within 500 m	Very low
Residential Dwelling north of Alignment	1 within 250m	Low
Overall adjacent residential dwellings impact = Low		

7.2 Alignment landscape and visual impact assessment

7.2.1 Assessment process

The landscape and visual impacts for each alignment was assessed and then each alignment was assessed regarding how well they meet the EES objectives.

This assessment is based on using both qualitative and quantitative assessment techniques. The assessment was undertaken in two steps:

Step 1: Impact score

The landscape and visual impact assessment are undertaken by assessing detrimental effects and these are scored between Very high and Negligible and given a corresponding numerical score between 3 and -3.

Step 2: Rating to meet objectives

The score is converted to a rating, that answers the questions 'How well does each alignment minimise adverse effects on visual and landscape values as far as practicable, during construction and operation', as per the Scoping Requirements for Beaufort Bypass Project Environment Effects Statement (DELWP 2016).

Conversion of Impact score to LVIA Rating

Table 53: Conversion of impact scores to LVIA ratings.

Step 1		Step 2	
Impact score	**Numerical score**	**LVIA Rating**	**Colour code**
Very high	-3	Very poorly	
High	-2	Poorly	
Moderate	-1	Moderately poorly	
Moderately low	0	Neither well nor poorly	
Low	1	Moderately well	
Very low	2	Well	
Negligible	3	Very well	

To develop a more holistic assessment, additional assessment criteria were developed for each Sub-objective.

Sub-objective 1: To minimise the visual impact upon residents adjacent to the project

Assessment Criteria:

- Assess the level of impact on residential properties adjacent to the project within 500m.

Sub-objective 2: To minimise the impact upon publicly accessible places and places of cultural and natural value

Assessment Criteria:

- Assess the impact on significant local areas (i.e. Camp Hill State Forest, Snowgums Bushland Reserve, Yam Holes Creek, Main Lead Road waterway, Central Beaufort, Apex Park).

Sub-objective 3: To minimise impact upon existing landscape character

Assessment Criteria:

- Assess the impact on high to Very high sensitive landscape character areas
- Assess the magnitude of change by the proposed alignments (cut and fill, scale of physical impact, quantity of trees and other vegetation removed, topography) on the landscape
- Assess the impact on key and significant views and viewsheds of the wider landscape.

7.2.2 Summary assessment of visual impact upon residents adjacent to the project

Table 54: Number of residential dwellings per Alignment option (as measured from the outer carriageway of the Alignment).

	A0	A1	C0	C2
No of residential properties within 0–100m of the Alignment	2	2	4	5
No of residential properties within 101–250m of the Alignment	8	8	8	9
No of residential properties within 251–500m of the Alignment	30	27	49	52
Total no of residential properties within 0–500m of Alignment	40	37	61	66

Table 55: Assessment of ability to minimise impact on adjacent residential dwellings by alignment.

Impact Level	Very high (0–100m)	High (101–250m)	Moderate (250–500m)	Total dwellings	Impact score	LVIA Rating
AO	2	8	30	40	52	**Moderately poorly**
A1	2	8	27	37	49	**Moderately poorly**
CO	4	8	49	61	77	**Poorly**
C2	5	9	52	66	85	**Very poorly**
Weighting Factor	x3	x 2	x1			

Table 56: Summary of Alignment ability to minimise impacts.

Objective / sub-objective	Assessment criteria	Bypass alignment			
		A0	A1	C0	C2
EES Evaluation Objective: Landscape and visual To minimise adverse effects on visual and landscape values as far as practicable, during construction and operation					
Sub-objective 1: To minimise the visual impact upon residents adjacent to the project	Assess the level of impact on residential properties adjacent to the project within 500m	**Moderately poorly**	**Moderately poorly**	**Poorly**	**Very poorly**

7.2.3 Summary evaluation of the impact upon publicly accessible places and places of cultural and natural value

Several places of cultural and natural value for the community were identified through local government policy and strategies, site visits and the Scoping Requirements for Beaufort Bypass Project Environment Effects Statement (DELWP 2016).

There are several moderate to high sensitive sites of community and cultural value, including:

- Camp Hill State Forest,
- Camp Hill Picnic Area
- Camp Hill Lookout
- Snowgums Bushland Reserve,
- Racecourse Road Mullock Heap
- Main Lead Road waterway
- Yam Holes Creek
- Beaufort train station and Beaufort Hotel
- Bicentennial Park
- Beaufort Main Street
- Apex Park and skatepark.

Sensitivity and level of impact assessment framework

This assessment framework identified the relative impact of the landscape when the level of sensitivity is considered. For example a place of high sensitively will not be able to absorb change as well as one with a low sensitivity.

Table 57: Conversion between level of sensitivity and level of impact.

Level of Sensitivity	Very high	High	Moderate	Moderately low	Low	Very low	Negligible
Level of Impact							
Very high							
High							
Moderate							
Moderately low							
Low							
Very low							
Negligible							

Assessment of impact on publicly accessible places and places of cultural and natural value – by place and alignment

Table 58: Conversion of Impact Score to Final LVIA Rating

Level of Impact Score (the level of impact)	Numerical score	How well does each Alignment minimise adverse effects on visual and landscape values as far as practicable, during construction and operation	Colour code
Very High	-3	Very Poor	
High	-2	Poor	
Moderate	-1	Moderately Poor	
Moderately Low	0	Neither Well nor Poor	
Low	1	Moderately Well	
Very Low	2	Well	
Negligible	3	Very Well	

Table 59: Alignment impact on sensitive sites.

Site	**Snowgums Bushland Reserve**		**Yam Holes Creek**		**Motorcycle Track**		**Camp Hill Lookout**		**Camp Hill State Forest**		**Main Lead Road waterway**		**Trotting Track**	
Level of Sensitivity	**Very high**		**High**		**Low**		**High**		**Very high**		**High**		**Low**	
	Impact score	Rating	Impact score	Rating	Impact score	Rating	Impact score	Rating	Impact score	Rating	Impact score	Rating	Impact score	Rating
AO	VL	W	H	P	N	VW	N	VW	VH	VP	H	P	VL	W
A1	VL	W	H	P	N	VW	N	VW	VH	VP	H	P	VL	W
CO	M	P	H	P	L	V VW	VL	W	VH	VP	H	P r	M	MW
C2	ML	MP	H	P	M	W	VL	W	VH	VP	H	P	M	MW

Site	**Bicentennial Park / Main Street**		**Apex Park and skatepark**		**Camp Hill Picnic Area**		**Beaufort Train Station / Hotel**		**Racecourse Road Mullock Heap**	
Level of Sensitivity	**High**		**High**		**Moderate**		**High**		**Moderate**	
	Impact score	Rating	Impact score	Rating	Impact score	Rating	Impact score	Rating	Impact score	Rating
AO	N	VW	N	VW	N	VW	N	VW	M	MP
A1	N	VW	N	VW	N	VW	N	VW	M	MP
CO	N	VW	L	MW	ML	NWNP	L	MW	N	VW
C2	N	VW	L	MW	ML	NWNP	L	MW	M	MP

Table 60: Summary of Alignment impact on sensitive sites.

Alignment	Very poorly	Poorly	Moderately poorly	Negligible	Moderately well	Well	Very well	Impact score	Impact score	Rating	LVIA Rating
AO	1	2	1	0	1	1	6	13	Low	1.3	Moderately well
A1	1	2	1	0	1	1	6	13	Low	1.3	Moderately well
CO	1	3	0	1	1	1	3	3	Moderately low	0.3	Negligible
C2	1	2	2	1	3	2	1	1	Moderately low	0.1	Negligible

Table 61: Summary of Alignment ability to minimise impact on sensitive sites.

Objective / sub-objective	Assessment criteria	Bypass alignment			
		A0	A1	C0	C2
EES Evaluation Objective: Landscape and visual To minimise adverse effects on visual and landscape values as far as practicable, during construction and operation					
Sub-objective 2: To minimise the impact upon publicly accessible places and places of cultural and natural value	Minimises impact on significant local areas (e.g., Camp Hill State Forest, Snowgums Bushland Reserve, Beaufort Trotting Track, Main Lead Road waterway, Beaufort Motorcycle Track Yam Holes Creek, Central Beaufort, Apex Park)	**Moderately well**	**Moderately well**	**Neither well nor poorly**	**Neither well nor poorly**

7.2.4 Summary assessment of the impact on existing landscape character

There are three sub-assessment criteria that were assessed to determine the impact on the existing landscape character. They include the:

- Magnitude of change by the proposed alignments (cut and fill, scale of physical impact, quantity of trees and other vegetation removed, topography) on the existing landscape
- Impact on high to Very high sensitive landscape character areas
- Impact on key and significant views and viewsheds of the wider landscape.

Existing landscape character

Legislation, policy, site visits and desktop analyses have all been utilised in combination to assess the existing conditions and values of the study area.

The project has identified that eight of the nine landscape character areas in the study area will be affected. These include:

- Open Rural Plains
- Eastern Semi-Enclosed Rural Valley
- Western Semi-Enclosed Rural Valley
- Ecological Conservation Reserve
- Enclosed Rural Valley
- Dense Bushland
- Highway Infrastructure
- Beaufort Fringe.

In this assessment each landscape character is assessed by the magnitude of detrimental change (impact) on it by each alignment.

The LVIA is firstly undertaken by segment, and then these segment assessments are recompiled to provide an overview of each alignment.

- Alignment A0 – Incudes segments 1, 3, 5, 8, 9
- Alignment A1 – Incudes segments 1 3, 5, 7, 9
- Alignment C0 – Incudes segments, 2, 6, 9
- Alignment C2 – Incudes segments, 1, 3, 4, 6, 9

Table 62: Impact on landscape character by Segment (Segments 1–5). HI = Highway Infrastructure; ESERV = Eastern Semi-Enclosed Rural Valley; ORP = Open Rural Plains; BF = Beaufort Fringe.

Segments	**1**	**2**	**3**	**4**	**5**
Landscape character type	HI	HI	HI	ESERV	ESERV
% of type	100	20	22	62	100
Value	L	L	L	M	M–L
Ability to absorb change / sensitivity	VH	VH	VH	M–L	M–L
Level of change in the landscape	L	H	H	H	VH
Impact score	VL	ML	ML	M	H
Landscape character type		ESERV	ORP	BF	
% of type		57	22	38	
Value		M	ML	M	
Ability to absorb change / sensitivity		M	M	M–L	
Level of change in the landscape		H	H	VH	
Impact score		M	ML	H	

Landscape character type		BF	ESERV		
% of type		23	56		
Value		M	M		
Ability to absorb change / sensitivity		M–L	M–L		
Level of change in the landscape		VH	M		
Impact score		H	M		
Segment Impact score	Very low	Moderate	Moderately low	High	Moderately high

Table 63: Impact on landscape character by Segment (Segments 6–9). BF = Beaufort Fringe; ECR = Ecological Conservation Reserve; WSERV = Western Semi-Enclosed Valley; ERV = Enclosed Rural Valley; HI = Highway Infrastructure; DB = Dense Bushland.

Segments	**6**	**7**	**8**	**9**
Landscape character type	BF	ECR	ECR	WSERV
% of type	25	23	22	37
Value	M	VH	VH	M
Ability to absorb change / sensitivity	M–L	VL	VL	M–L
Level of change in the landscape	VH	VH	VH	M–L
Impact score	H	VH	VH	ML
Landscape character type	ECR	ERV	ERV	HI
% of type	21	28	26	63
Value	VH	H	H	L
Ability to absorb change / sensitivity	VL	L	L	VH
Level of change in the landscape	VH	VH	VH	M
Impact score	VH	VH	VH	ML
Landscape character type	ERV	DB	DB	
% of type	10	5	8	
Value	H	H	H	
Ability to absorb change / sensitivity	L	L	L	
Level of change in the landscape	H	M	H	
Impact score	H	M	H	

Landscape character type	WSERV	WSERV	WSERV	
% of type	44	44	44	
Value	M	M–H	M	
Ability to absorb change / sensitivity	M–L	M–L	M–L	
Level of change in the landscape	M	VH	M	
Impact score	M	H	M	
Segment Impact score	High	High	High	Moderately low

Table 64:Summary of Alignment capacity to minimise impact on landscape character. Impact score is derived from a weighted sum of Alignment segment lengths and impacts.

Alignment	Total Length of segments	Total value	Impact Score Numerical	Impact Score	LVIA Rating
AO	11100	-8800	-0.79	Moderate	Moderately poorly
A1	11000	-8600	-0.78	Moderate	Moderately poorly
CO	10400	-8500	-0.82	Moderate	Moderately poorly
C2	10900	-8400	-0.77	Moderate	Moderately poorly

Table 65: Summary of Alignment ability (LVIA rating) to minimise impact on landscape character areas rated as of Very high or High sensitivity.

Character Areas Sensitivity	**Very high**		**High**		**Very high + High**			
Alignment	Length (m)	Score (Length x Weighting factor)	Length (m)	Score (Length x Weighting factor)	Score (sum of scores for Very high and High)	Ranking by most impact to least	Impact Score	LVIA Rating
AO	1100	4400	300	900	5300	1	Very high	Very poorly
A1	1100	4400	250	750	5150	2	Very high	Very poorly
CO	700	2800			2800	3	Moderate	Moderately poorly
C2	700	2800			2800	3	Moderate	Moderately poorly
Weighting factor	x4		x3					

Table 66: Summary of Alignment ability (LVIA Rating) to minimise impacts on sensitive views and viewsheds.

	Camp Hill Lookout	**Camp Hill range**	**Eastern Range**	
Alignment	**Rating**	**Rating**	**Rating**	**LVIA Rating**
AO	Well	Well	Neither well nor poorly	**Well**
A1	Well	Well	Neither well nor poorly	**Well**
CO	Moderately well	Poorly	Neither well nor poorly	**Neither well nor poorly**
C2	Moderately poorly	Poorly	Very well	**Neither well nor poorly**

Table 67: Summary of Alignment ability to meet EES objective of minimising impact on landscape character (LVIA Rating).

	Assessment criteria	Alignment			
		A0	A1	C0	C2
EES Evaluation Objective: Landscape and visual To minimise adverse effects on visual and landscape values as far as practicable, during construction and operation					
Sub-objective 3: To minimise impact upon existing landscape character	Minimises impact on High to Very high sensitive landscape character areas	Very poorly	Very poorly	Moderately poorly	Moderately poorly
	Minimises the magnitude of change by the proposed Alignments (cut and fill, scale of physical impact, quantity of trees and other vegetation removed, topography)	Moderately poorly	Moderately poorly	Moderately poorly	Moderately poorly
	Minimise impact on key and significant views and viewsheds of the wider landscape	Well	Well	Neither well nor poorly	Neither well nor poorly

Landscape and Visual Impact Assessment – Four Alignment Options

A holistic landscape assessment was undertaken to ascertain the different types and magnitudes of impacts on the landscape and visual character. Firstly, an assessment was undertaken, where the level of impact was given a numerical value, and these were averaged to provide an overall rating for each sub objective.

In addition, a more qualitative assessment was undertaken to complement the more numerical one. The qualitative assessment provides a more high-level perspective of the relative differences of the alignments.

How well each alignment meets the EES objectives

Table 68: Rating of Alignments to meet EES objectives

Objective / sub-objective	Assessment criteria	Bypass alignment			
		A0	A1	C0	C2
EES Evaluation Objective: Landscape and visual To minimise adverse effects on visual and landscape values as far as practicable, during construction and operation					
		Neither well nor poorly – Moderately poorly	Neither well nor poorly – Moderately poorly	Moderately poorly	Moderately poorly

In the above assessment the differences between Alignments AO and A1 and Alignments CO and C2 are relatively modest, and as such no alignment option stands out significantly as a preferred alignment to minimise visual and landscape character impact on Beaufort and surrounding landscape.

An additional more qualitative holistic assessment was undertaken, to complement the more numerical one.

The rating differences between the alignment are quite slim, while the types of impacts are quite different for Alignments A0 and A1 compared to Alignments C0 and C2.

Summary Assessment Notes:

- Alignments A0 and A1 perform overall better in the assessment. However, they will have a considerable detrimental impact on the rural, natural and vegetated character landscape, because bringing a large infrastructure element into a more naturalistic environment is difficult to accommodate and even more difficult to mitigate or screen from view.
- The Alignments C0 and C2 perform worse in the assessment (but not by a large margin), and their impact on the landscape character of Beaufort and the number of residents and properties will be significantly larger than Alignments A0 and A1.
- Consequently, Alignments A0 and A1 have more impact on natural and vegetated landscapes, and Alignments C0 and C2 have more impact on Beaufort and residential dwellings.
- Alignments AO and A1 move the impacts further away from Beaufort but create a new infrastructure / urban line through the landscape. Alignments C0 and C2 create impacts closer to Beaufort and new infrastructure / urban line closer to the town, which is more consistent with the town's more urban character than the imposition of an urban structure within the rural/farming environment.
- Alignment C2 has more impact on residential dwellings than Alignment C0.

No alignment, therefore, stands out as a preferred alignment because:

- Alignments C0 and C2 perform marginally poorer within the numerical assessment. This is largely due to their impact on a greater number of residents and properties and proximity to Beaufort resulting in an impact to the town’s existing character.
- However, the imposition of an urban structure within the A0 and A1 alignment areas is more inconsistent with the existing rural/valley environment than the impact of the imposition of the bypass structure on the existing urban environment of Beaufort.
- Neither Beaufort nor the rural/valley landscapes are protected by Significant Landscape Overlays or other similar overlays. Nevertheless, both areas are of high value to the Beaufort community and therefore it is difficult to assign one alignment comparatively greater impact from this perspective.

8. Alignments assessment outcomes and Preferred Alignment selection

The options assessment completed for the project assessed alignment options A0, A1, C0 and C2 against the customised set of criteria summarised in section 4.5. The results of the options assessment and sensitivity testing are detailed in Table 69. As well as the score for each alignment under each scenario, a colour coding has been applied to rank the performance of the options under each scenario as follows:

- Best performing alignment option: Green
- Second performing alignment option: Yellow
- Third performing alignment option: Orange
- Worst performing alignment option: Red.

Table 69: Combined Alignment Option Scenario Scoring

SCENARIO	ALIGNMENT A0	ALIGNMENT A1	ALIGNMENT C0	ALIGNMENT C2
Scenario 1	128	123	126	111
Scenario 2	18	22	20	27
Scenario 3	45.85	44.89	50.01	43.95
Scenario 4	81.03	77.59	93.98	74.12
Scenario 5	24.16	22.70	27.03	19.44
Scenario 6	47.74	42.69	56.16	35.49
Sensitivity Scenario 1	-6	-3	-5	9
Sensitivity Scenario 2	-3	2	-4	11
Sensitivity Scenario 3	-11	-6	-9	5

The alignment scoring scenarios outlined in Table 69 show that the best performing option is the C2 Alignment, while the worst performing options are the A0 and C0 Alignments. The primary drivers for this outcome were due to the C2 Alignment having:

- The lowest amount of total native vegetation clearance
- The least impact on threatened vegetation communities identified under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Flora and Fauna Guarantee Act 1988* (FFG Act).
- The least impact on wildlife corridors, particularly the core habitat areas
- The lowest amount of native vegetation with high conditions to be removed by Ecological Vegetation Class (EVC) Conservation Status
- The lowest potential impacts on known or registered sites of Aboriginal and historic heritage significance
- The smallest number of dwellings within 100m, 200m and 300m of the alignment corridor.

A full report of the options assessment can be found in EES Attachment IV: *Options assessment* (RRV 2019).

9. Impact assessment of the Preferred Alignment

The assessed impacts of the Preferred Alignment C2 have been outlined in previous chapters. In this chapter the assessed impacts are brought together in summary.

Table 70: Rating of Preferred Alignment to meet EES objectives and assessment criteria.

Sub-objective	Criteria	LVIA Rating
Sub-objective 1: To minimise the visual impact upon residents adjacent to the project	Assess the level of impact on residential properties adjacent to the project within 500m	Very poorly
Sub-objective 2: To minimise the impact upon publicly accessible places and places of cultural and natural value	Minimises impact on significant local areas (e.g. Camp Hill State Forest, Snowgums Bushland Reserve, Beaufort Trotting Track, Main Lead Road waterway, Beaufort Motorcycle Track Yam Holes Creek, Central Beaufort, Apex Park)	Neither well nor poorly
Sub-objective 3: To minimise impact upon existing landscape character	Minimises impact on High to Very high sensitive landscape character areas	Moderately poorly
	Minimises the magnitude of change by the proposed Alignments (cut and fill, scale of physical impact, quantity of trees and other vegetation removed, topography)	Moderately poorly
	Minimise impact on key and significant views and viewsheds of the wider landscape	Neither well nor poorly

The most significant landscape and visual impacts of the C2 Alignment are shown in the Figure 312:

- Impacts on nearby dwellings
- Areas of fill and noise walls
- Areas of significant visual cut
- The Bypass interchanges common to all alignments
- Impacts on sensitive sites.

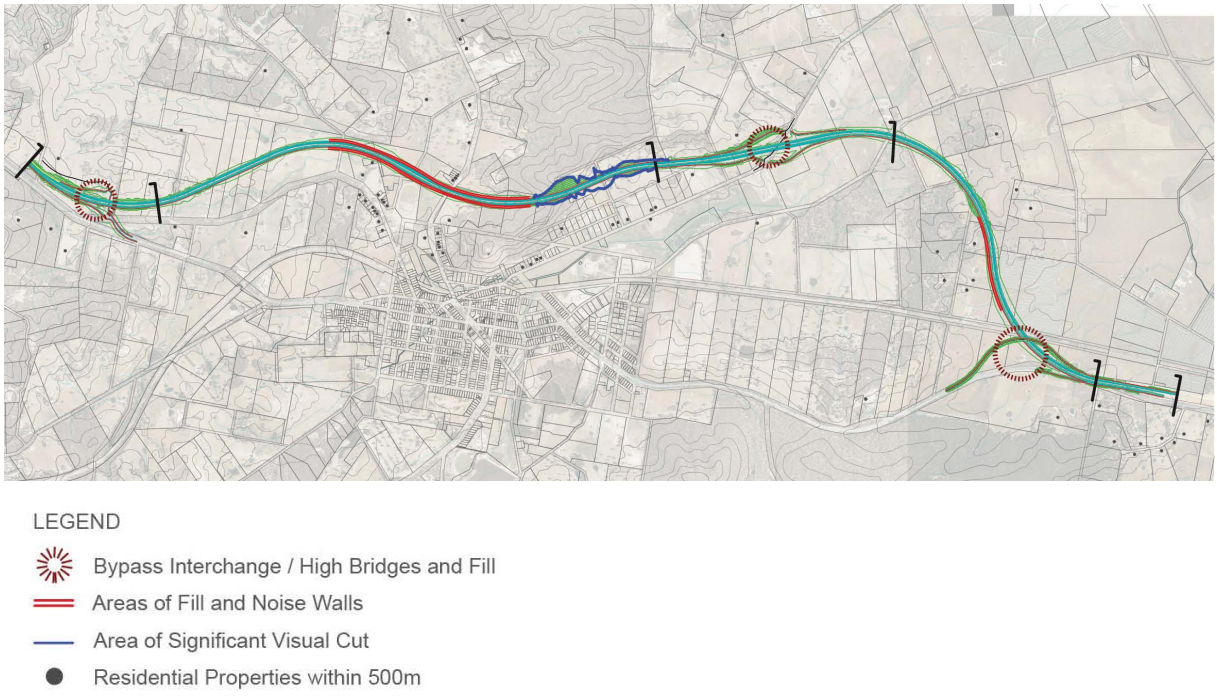

Figure 313. Alignment C2. Overview of the most significant Landscape impacts

9.1 Impacts of Preferred Alignment on landscape character

Alignment C2 is made of five segments. Each segment was assessed for impact on landscape character and then assessed against the LVIA objectives (rating). Overall the alignment rated Moderately–Poorly in achieving minimising impact on landscape character. Key impacts include:

- Significant cut into the Camp Hill hillside with visibility of this for some distance and from within Beaufort.
- Lengths of elevated embankment and bridge structures within low wide waterway areas.

Table 71: Length by segment of Alignment C2 impacting on areas of Very High and High landscape character. Note Alignment C2 does not include Segments 2, 5, 7 and 8.

Segment	Segment Length	Overall impact on landscape character	LVIA Rating
1	700m	Very low	Well
3	4300m	Moderate	Moderately Poorly
4	2100m	Moderate	Moderately Poorly
6	4100m	Moderate-High	Moderately Poorly – Poorly
9	1300m	Moderately Low	Negligible (neither well nor poorly)
Overall impact on landscape character			Moderately Poorly

9.2 Impacts on nearby dwellings

Overall the alignment rated Very Poorly in minimising impact on existing dwellings. Alignment C2 has the highest number of residential properties within 500m of the alignment when compared to all alignments. The majority of the dwellings – 52 out of the 66 – are within the 251–500m zone and as such there is opportunity for design mitigation of the alignment to reduce the visual impact of the dwellings, through earth mounding, vegetation and well-designed noise walls, bridges and other large-scale visible elements.

Table 72: Dwellings impacted by Alignment C2 by distance from the outer carriageway of the Alignment (Total dwellings impacted = 66).

Distance	Number of dwellings	Impact level	LVIA Rating
0–100m	5	Very high	Very Poorly
101–250m	9	High	Poorly
251–500m	52	Moderate	Moderately Poorly
Overall impact on nearby dwellings			Very Poorly

9.3 Impacts on sensitive sites

Alignment C2 has seven sites of Moderate to High sensitivity within 500m. They are

- Snowgums Bushland Reserve
- Yam Holes Creek
- Racecourse Road Mullock Heap
- Camp Hill Lookout
- Camp Hill Picnic Area
- Camp Hill State Forest
- Main Lead Road waterway.

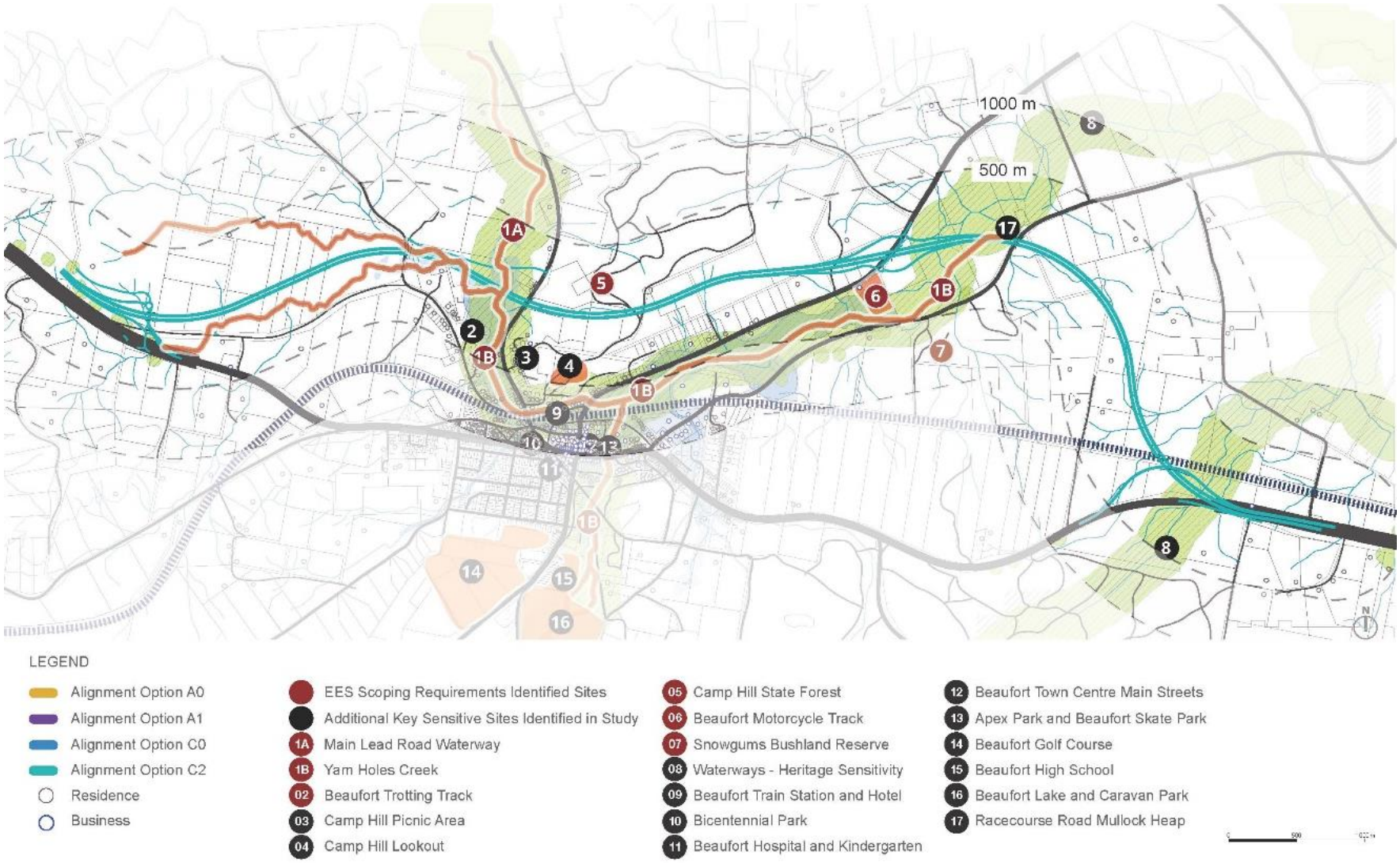

Figure 314. Alignment C2, highlighting sensitive sites within 500m of alignment.

The sites most affected include Camp Hill Forest, Yam Holes Creek and Main Lead Road waterway. Camp Hill is affected because of its high level of sensitivity and the significant reduction in its overall extent. Yam Holes Creek and Main Lead Road waterway are also affected primarily because the alignment will be quite visible from these entities.

Table 73: Ability of Alignment C2 to minimise impact on sensitive sites.

Sensitive site	Level of sensitivity	LVIA Rating
Snowgums Bushland Reserve	Very high	Moderately poorly
Yam Holes Creek	High	Poorly
Motorcycle Track	Low	Well
Camp Hill Lookout	High	Well
Camp Hill State Forest	Very high	Very poorly
Main Lead Road waterway	High	Poorly
Trotting Track	Low	Moderately well
Bicentennial Park / Main Street	Very high	Moderately poorly
Apex Park and skatepark	High	Moderately well
Camp Hill Picnic Area	Moderate	Neither well nor poorly
Beaufort Train Station / Hotel	High	Moderately well
Racecourse Road Mullock Heap	Moderate	Moderately poorly

9.4 Impact of Preferred Alignment on sensitive views and viewsheds

Alignment C2 is close to three sensitive viewsheds, primarily the Camp Hill area and the Eastern Range. The Eastern Range is quite some distance from the alignment, and as such will not detrimentally affect the significance of the site. The Camp Hill viewshed is both to and from the hill. Camp Hill and the overall mountain range will be affected by large-scale cut on its southern side and overall disturbance by the alignment.

Table 74: Ability of Alignment C2 to minimise impact on sensitive viewsheds and views.

Sensitive viewshed	LVIA Rating
Camp Hill Lookout	Moderately poorly
Camp Hill Range	Poorly
Eastern Range	Very well

9.5 Impact of Lighting and Construction

Operational and Construction Lighting

There is currently no lighting design for the preferred alignment. However, it is understood that there will be typical road lighting at the three interchanges along the Alignment. These interchanges are located outside the main town area in more regional landscapes, and will change the overall night-time character of these areas. There would need to be future assessment of these interchange designs to reduce specific impacts during the detailed design phase.

Construction lighting will be required for discrete periods when tie-ins to existing roads are required at the three interchanges. Lighting of site offices at night will not be required.

Any future impacts would be reduced via implementation of the relevant standards, including the AS 4282-1997 Control of the obtrusive effects of outdoor lighting, and the UK Guidance Note 1 for the reduction of obtrusive light 2020.

Typical measures to manage light spill impacts include:

- Restriction of night lighting to the minimum required for operation and safety requirements
- Use of directional lighting techniques to direct light away from sensitive view points
- Use of light shields to limit light spill
- Use of tree planting and earth mounding to reduce light spill
- Additional mitigation measures for affected residences such as screening, which would be developed in consultation with individual landholders
- Hoardings around construction areas where discrete night works are required to reduce light spill.

Construction Visual Impacts

During construction and commissioning there would be works that cause temporary disruption and impacts to surrounding areas, especially at construction compounds, areas of high fill, embankment areas and large cuts. These works may have a high visual impact temporarily, but after the completion of construction the impacts will only be that of the designed landscape.

The visual impact of construction compounds can be mitigated through specially designed hoardings that improve appearance and reduce light spill.

10. Mitigation for the Preferred Alignment

10.1 Construction and operation

RRV would require the construction contractor to develop and implement a Construction Environmental Management Plan (CEMP) for the project. RRV's standard environmental protection measures and some additional project specific controls identified below would be incorporated into the Environmental Management Framework for the project. RRV would require the construction contractor to incorporate all of these measures into the CEMP.

Standard environmental protection measures are the type of landscape and design mitigation which RRV will undertake, as far as practical, as part of any major road project. These are described in VicRoads Contract Shell DC1: Design and Construct, April 2012, hereafter referred to as the 'RRV standard environmental protection measures'. These have been developed by RRV and provide a level of mitigation appropriate to minimise typical physical impacts on the environment and the community.

Table 75: Urban design and landscape mitigation measures and their relevant project phases

Urban Design and Landscape Mitigation Measures	Project phase
Crime prevention through environmental design • Landscape design plans must protect and, where practicable, improve access to, and amenity for, potentially affected residents, open spaces, pedestrian and cyclist networks, social and community infrastructure and commercial facilities. This includes implementing the principles and guidelines of Crime Prevention Through Environmental Design (CPTED) and Urban Design Guidelines for Victoria (DELWP 2017) and maximising passive surveillance levels as far as practicable.	All
Reinstatement works • Within 12 months of the commencement of operation, the public open spaces, vegetation cover and facilities disturbed by temporary works must be reinstated to the reasonable satisfaction of the relevant land manager.	Operation

Lighting
• All lighting of permanent structures must be designed to minimise light spillage and protect the amenity of adjacent land uses to the extent practicable.
• **Lighting must meet the typical** recommendations (e.g. use of diffusers, shields) put forward in the **following guidelines**, policies and standards:
  ○ **VicRoads lighting standards**
  ○ **VicRoads Lighting of Declared Roads Policy**
  ○ **VicRoads Guidelines to Street Lighting Design**
  ○ **AS/NZS 1158 Lighting of Roads and Public Spaces**
  ○ **Austroads Guide to Road Design, Part 6B: Roadside Environment [2009]**
  ○ **VicRoads Standard Specification 3100: Street Lighting**
  ○ **VicRoads Fauna Sensitive Road Design Guidelines**
	Operation

Light spillage • All lighting during construction must be managed in such a way as to minimise light spill to surrounding residential land uses and sensitive areas. • Construction hoarding will be opaque to reduce light spill and visual impacts from construction compunds in cases where they are lcoated adajcent or close to sensitive areas.	Construction
Tree removal • During detailed design, optimisation and siting will occur to minimise the removal of mature trees, particularly large amenity trees and significant trees as identified through design optimisation measures such as increasing batter angles to reduce the construction footprint.	Construction

Urban Design and Landscape Mitigation Measures	Project phase
Landscape management strategy • A landscape management strategy must be developed and implemented to ensure healthy growth of planted vegetation. The strategy will include weed management.	Construction, Operation
Fauna sensitive road design guidelines, RRV • Prepare and implement an Environment Management Plan; and • Prepare an Offset Management Strategy in accordance with the permitted clearing of native vegetation and Biodiversity assessment guidelines and RRV standard environmental protection measures.	All
Site managment • Embody RRV environmental site management principles; and • Implement an Environment Management Plan and screen planting in accordance with RRV Roadside Management Strategy.	Construction
Landscape areas • Enhancement of existing woodland, wetland and habitat reserve elsewhere to provide similar character and public access. This should be placed strategically and if possible, further mitigate visual impacts of the project alignment. Integrate habitat corridors and culverts into freeway design to reduce impact upon flora and fauna connections and increase public access.	All
Colours and materials • Utilise colours and materials for structural elements which blend in with or complement surrounding landscape character. Avoid reflective, bright and bold colours.	All
Cuttings • Where possible retain natural material/geology/earth in cuttings.	
Trees and vegetation planting • **RRV will manage and monitor effectiveness of landscape works through their performance requirements within VicRoads standard specifications, Section 720 – Landscape Works, which includes regular auditing to ensure contractors meet specified revegetation targets within the defects liability period. Trees not meeting the growth performance requirements will be replaced to achieve the specified planting numbers.** • Planting within the Right of Way (ROW), to focus on ecological appropriate species and local endemic/native species. • Encourage indigenous planting within the freeway reservation boundary to strengthen the extent of landscape character where relevant. • Use local planting themes where possible to identify ‘gateways’ within interchange reservation boundaries, in the design of rest areas or to identify other significant landscape elements. • Planting of trees and vegetation to screen elevated carriageway from key viewpoints in landscape. • Provide appropriate planting in front of noise walls or as a part of noise wall design where practicable to minimise visual impacts. • Plant and mulch unstable batters to reduce the risk of erosion. • Use of advanced trees at varying installation sizes to provide immediate screening affect and rapid tree growth. • Strategic location of advanced tree installation to maximise screening potential of vegetation.	All

Urban Design and Landscape Mitigation Measures	Project phase
Structures and bridges • Bridges and culverts to be located and designed to complement and accommodate wildlife links, revegetation, and creek systems. • Minimise structural thicknesses of bridges. • Where practicable, elevated carriageway infrastructure to be of quality design and to blend in with existing context and colours of the surrounding landscape. • Ensure bridge design minimises visual and landscape impacts and enhance amenity, public use, passive surveillance levels and recreational offer to the extents practicable. This includes all aspects of the bridge design including, materials, noise walls, abutments and embankments. • Bridge design must respond to sensitive areas, existing character and/or key gateway sites.	All
Waterways • Creek realignments to be minimised where practicable and stabilised through revegetation with appropriate riparian species. • Locate and design watercourse crossings to minimise loss of riparian vegetation and to accommodate erosion control methods.	All
Landform • Utilise landscaped berms to conceal freeway from township and residential viewpoints. • Plant and/or landform between the freeway and the right of way boundary to screen adjacent access roads and dwellings. • Embankment treatments with maximum 1 in 3 grade to allow for mechanical mowing.	All
Noise mitigation and wall treatments • Where noise attenuation is required consider noise attenuation mounds, as a first option, followed by noise wall and other attenuation techniques. • Wall treatments to be a material that is recessive in texture and colour, to neither highlight the vertical or horizontal form of the wall and be relative to a scale of its visibility on the non roadside. • Incorporate architectural detail into noise wall design and patterns to improve amenity of noise walls and blend in with or complement surrounding landscape character where appropriate. • Noise walls and bridge structures to be considered and designed together as one structure, rather than two separate structures/elements.	All
Overshadowing Minimise visual impact and overshadowing of bridges, noise walls and associated fill as far as practicable by considering the following; • Reduce visual bulk and scale of the structure. • Consider integrated bridge design and key elements such as span, height, deck depth and crossheads. • Minimise bridge piers. • Separate bridge decks or incorporate light wells to increase natural light filtration to associated underpasses. • Incorporate recessive vertical abutments.	All
Underpasses and under bridges • Enhance usability in bridge underpasses for recreation and leisure, to encourage use and increase safety under bridges. • Any pedestrain underpassses to be 4m wide minmuium and 2.5m height minimum.	All

Urban Design and Landscape Mitigation Measures	Project phase
Professional design • **Ensure professional designers (landscape architects, architects and urban designers) are involved in the design of the overpass support piers, gateway and landscape elements.** • **Landscape and architectural elements will be developed in consultation with the Registered Aboriginal Party and consider the application of Indigenous design elements to the project**	All

It is acknowledged that the recommended mitigation actions are subject to existing site conditions and infrastructure such as the location of existing services, and as such are subject to further detailed design.

10.2 Additional mitigation measures to reduce impact on reputation, value add and improve upon project's reception and residual effects of Alignment C2

Additional strategic mitigation measures may reduce potential impacts and add value to the project or improve upon the project's reception. These measures may not be strictly related to visual and landscape impacts and offer broader mitigation measures to other types of impacts also, e.g. economical, ecological or social.

These could be undertaken by stakeholders, other government authorities or as part of this project.

- Introduce native or indigenous fire-retardant plant species to offer fire break benefits as well as screening where required or applicable.
- Develop strategic partnerships with other state bodies, interested industry organisations and Council to invest in strategic development of the project. To utilise the projects construction and development to integrate and provide more usable public open spaces, improved built form outcomes and greater urban design outcomes along the whole site length where required or applicable.
- Building on the direction set in the Pyrenees Tourism Strategy and Beaufort's Walkability Plan, Beaufort's main street (Neill Street/Western Highway) could be improved upon in terms of aesthetic, urban design and pedestrian priority. This can be done by converting excess road space, typically required for freeway traffic, to pedestrianised public space and more tree planting. This would attract business, markets and events opportunity and more public use to this strip of the town.

11. Residual impacts of the Preferred Alignment

The insertion of large infrastructure such as the Beaufort Bypass Alignment C2 into a predominantly rural and township landscape will inevitably lead to a range of impacts that will remain despite careful alignment selection and extensive mitigation measures.

Short Lived Residual Impacts

Key short-term impacts – i.e. those impacts that will remain for some time, but eventually be significantly reduced include:

- Vegetation and earth mound screening adjacent to the alignment that will reduce the visual impacts over time. For the initial 5 years the infrastructure and landscape forms will be highly visible and bare.
- General planting with the ROW will take up to 5 years to start having a considerable impact on reducing visibility or direct views of the elevated embankment or freeway itself.

Figure 315. Example of noise wall, where the vegetation is still relatively young, and the wall is highly visible (visibly of the wall would be lesser if colour more recessive). Right hand image example of noise wall, where the vegetation is mature, and the wall is less visible or less dominant on the landscape.

Figure 316. Example of large cutting (Calder Freeway) where significant benching, soil preparation, planting and mulching has been done. Immediate impact reduces over time through vegetation growth. Construction occurred in2001 (left hand image) and is shown in 2019 (right hand image) after significant vegetation growth.

Permanent Residual Impacts

Key long-term permanent impacts – i.e. those impacts that will remain even with advised mitigation measures include:

- Noise walls will remain permanently visible, and while vegetation planting in front of them will reduce their impact, they will remain a long term physical presence in the landscape.
- The Bypass bridges, raised elevated lengths and interchanges will remain permanently visible and have ongoing residual impact, primarily due to their height and location in flat areas or their proximity to township areas.
- The significant cut into Camp Hill will remain partially visible for some time, and even with significant tree growth would still be permanently visible from certain viewpoints.

Figure 317. Example of freeway bridge and noise walls, which will have permanent impacts on some landscape areas, in this instance a country road. Planted vegetation over time can lessen the impact, and ageing can dull materials.

12. Conclusion

The most significant landscape and visual impacts of the C2 Alignment are:

- Impacts on nearby dwellings (especially within the 500m of the alignment)
- Areas of fill and noise walls (especially to the north of the township where there are a number of residential dwellings and a wide waterway valley)
- Areas of significant visual cut along the southern face of Camp Hill, directly north of the township
- Large scale Bypass interchanges, with the Beaufort-Lexton Road interchange forming a new landscape edge or intrusion to the north east of the township
- Impacts on sensitive and public sites, primarily Camp Hill.

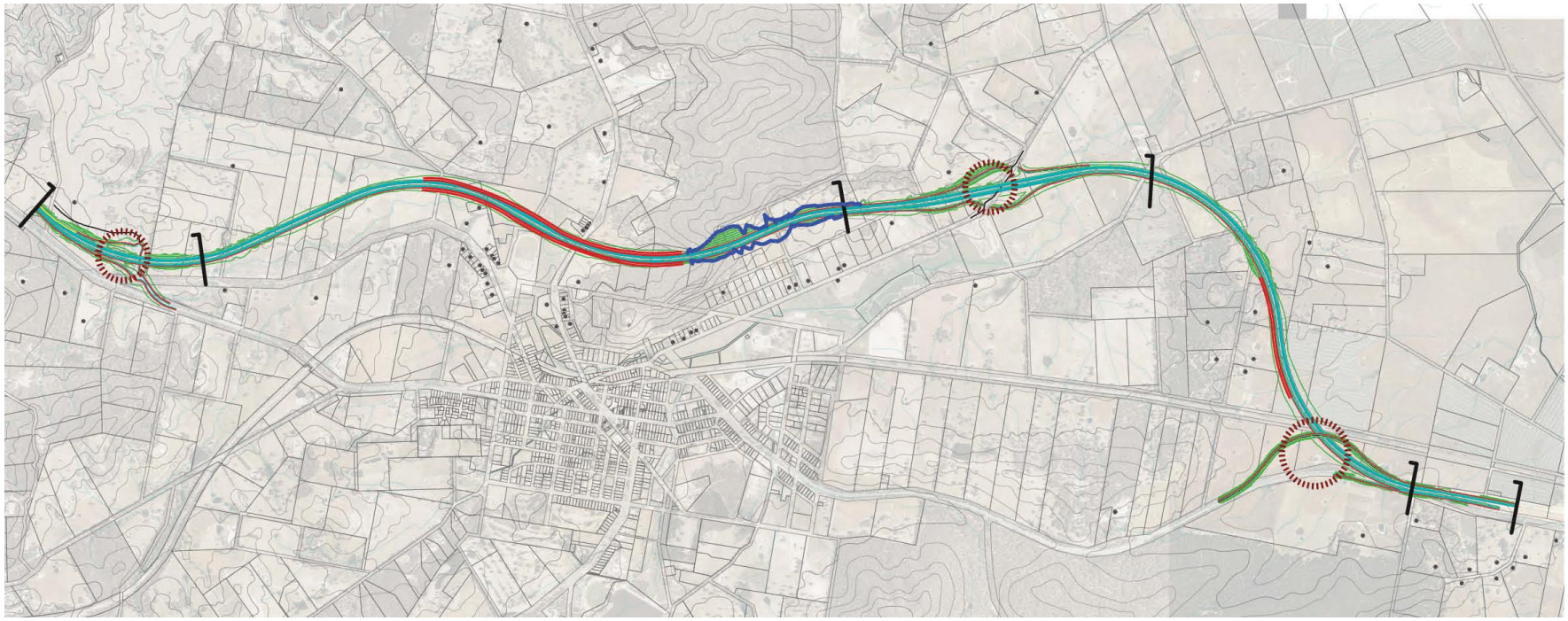

Figure 318. Alignment C2. Overview of the most significant Landscape impact

Rating of C2 Alignment in meeting the EES objectives and assessment criteria

Table 76: Rating of Preferred Alignment to meet EES objectives and assessment criteria.

Sub-objective	Criteria	LVIA Rating
Sub-objective 1: To minimise the visual impact upon residents adjacent to the project	Assess the level of impact on residential properties adjacent to the project within 500m	Very poorly
Sub-objective 2: To minimise the impact upon publicly accessible places and places of cultural and natural value	Minimises impact on significant local areas (e.g. Camp Hill State Forest, Snowgums Bushland Reserve, Beaufort Trotting Track, Main Lead Road waterway, Beaufort Motorcycle Track Yam Holes Creek, Central Beaufort, Apex Park)	Neither well nor poorly
Sub-objective 3: To minimise impact upon existing landscape character	Minimises impact on High to Very high sensitive landscape character areas	Moderately poorly
	Minimises the magnitude of change by the proposed Alignments (cut and fill, scale of physical impact, quantity of trees and other vegetation removed, topography)	Moderately poorly
	Minimise impact on key and significant views and viewsheds of the wider landscape	Neither well nor poorly

Sub-objective 1: To minimise the visual impact upon residents adjacent to the project

Overall the alignment rated Very Poorly in minimising impact on existing dwellings. Alignment C2 has the highest number of residential properties with the 500m of the alignment when compared to all alignments. The majority of the dwellings – 52 out of the 66 – are within the 251–500m zone and such there is opportunity for design mitigation of the alignment to reduce the visual impact of the dwellings, though earth mounding, vegetation and well-designed noise walls, bridges and other large-scale visible elements.

Sub-objective 2: To minimise the impact upon publicly accessible places and places of cultural and natural value

Alignment C2 has seven sites of moderate to high sensitivity within 500m. They are

- Snowgums Bushland Reserve
- Yam Holes Creek
- Racecourse Road Mullock Heap
- Camp Hill Lookout
- Camp Hill Picnic Area
- Camp Hill State Forest
- Main Lead Road waterway

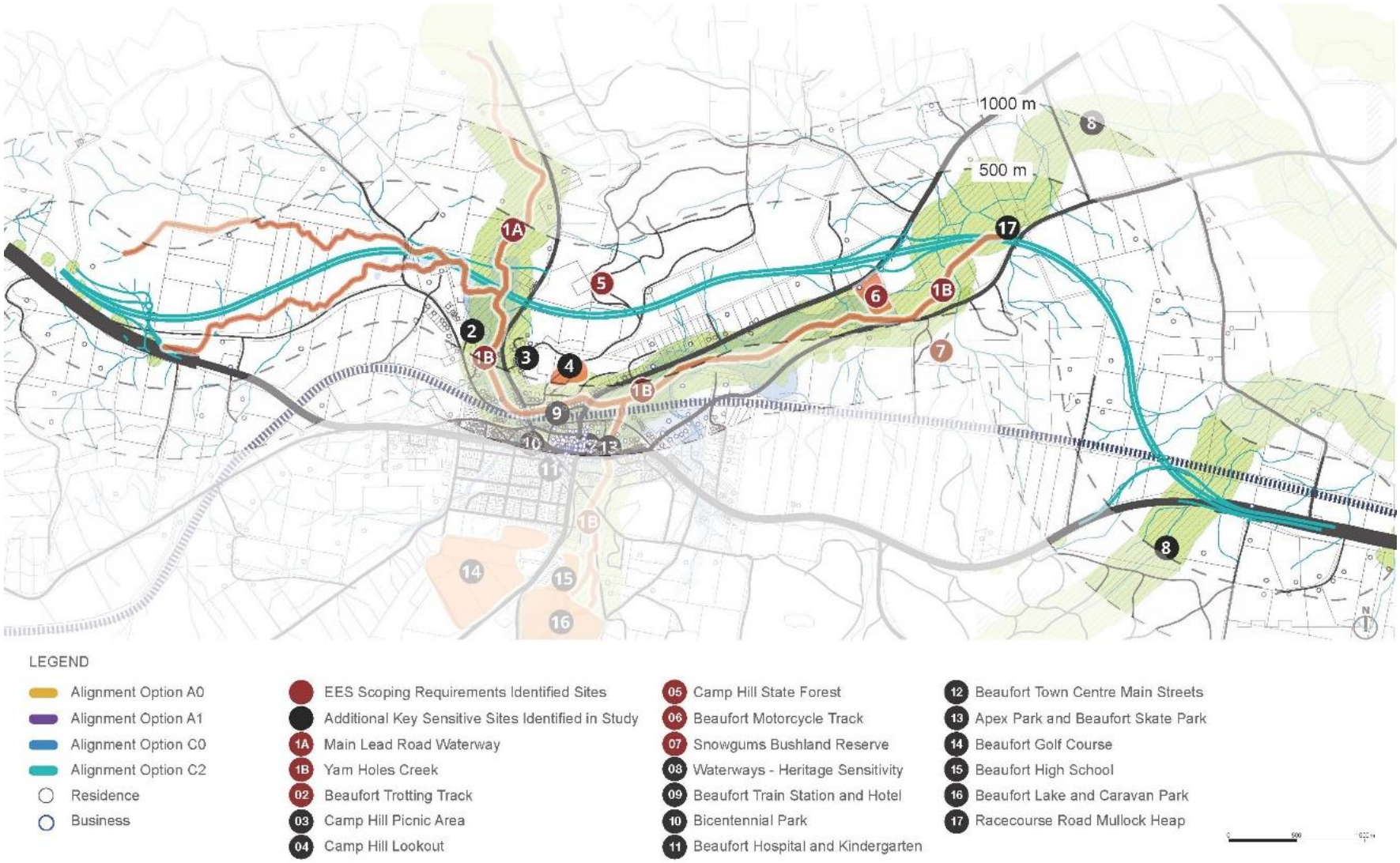

Figure 319. Alignment C2, highlighting sensitive sites within 500m of alignment.

The sites most affected include Camp Hill Forest, Yam Holes Creek and Main Lead Road waterway. Camp Hill is affected because of its high level of sensitivity and significant reduction in its overall extent. Yam Holes Creek and Main Lead Road waterway are also affected primarily because the alignment will be quite visible from these entities.

Impact of Preferred Alignment on sensitive views and viewsheds

Alignment C2 is close to three sensitive viewsheds, primarily Camp Hill area and the Eastern Range. The Eastern Range is quite some distance from the alignment, and as such will not detrimentally affect the significance of the site. The Camp Hill viewshed is both to and from the hill. Camp Hill and the overall mountain range will be affected by large-scale cut on its southern side and overall disturbance by the alignment.

Sub-objective 3: To minimise impact upon existing landscape character

Alignment C2 is made of five segments. Each segment was assessed for impact on landscape character and then assessed against the LVIA objectives (rating). Overall the alignment rated Moderately Poorly in minimising impact on landscape character. Key landscape character impacts include:

- Significant cut into the Camp Hill hillside with visibility of this for some distance and from within the Beaufort township.
- Lengths of elevated embankment and bridge structures within low, wide waterway areas.

13. Appendix: Landscape and visual impact risk assessment for the Preferred Alignment

Impacts to Landscape and Visual can be summarised into 4 categories:

- Impacts on landscape character types
- Impact on viewsheds
- Impact on adjacent residential dwellings within 500m
- Impact on sensitive sites

The following table shows the risk assessment outcomes for the Preferred Alignment, undertaken by ASPECT Studios.

Table 77: Risk assessment for the Preferred Alignment C2.

			Initial risk						**Residual risk**				
Primary Environmental Impact	Description of risk and impact	Standard Controls (see notes)	Consequence	Consequence ##	Likelihood	Likelihood ##	Risk Rating	Additional Controls (see notes)	Consequence	Consequence ##	Likelihood	Likelihood ##	Risk Rating
Impacts upon landscape character types	Direct loss of woodland and waterway landscapes that are critical to the regional landscape character and quality	A	Minor	3	Almost Certain	E	Medium	C	Minor	3	Possible	C	Low
Visual or physical impact upon key Views	Impact or disconnection between residents and established landscape views (e.g. Camp Hill, Rural valley views etc.)	B	Minor	2	Possible	D	Low	D	Minor	1	Unlikely	B	Low
	Impacts on key sensitive public sites.	B	Minor	3	Likely	D	Medium	D	Minor	2	Possible	C	Low
	Impact on adjacent residential dwellings within 500m.	B	Moderate	3	Likely	C	High	D	Moderate	2	Unlikely	B	Medium

Note Standard controls A: Fauna sensitive road design guidelines, RRV. Prepare and implement an Environment Management Plan. Prepare an Offset Management Strategy. Permitted clearing of native vegetation Biodiversity assessment guidelines. RRV standard environmental protection measures.

Note Standard controls B: Embody RRV Environmental site management principles and implement an Environment Management Plan. Screen planting. Roadside Management Strategy, RRV.

Note Additional controls C: Expansion of existing woodland, wetland and habitat reserve elsewhere to provide similar character and public access. This should be placed strategically and in if possible, further mitigate visual impacts of the project alignment. Integrate habitat corridors and culverts into freeway design to reduce impact upon flora and fauna connections and increase public access.

Note Additional controls D: Planting of trees and vegetation to screen elevated carriageway from key viewpoints in landscape. Where practicable, elevated carriageway infrastructure to be of quality design and to blend in with existing context and colours of the surrounding landscape. Utilise landscaped berms to conceal freeway from township and residential viewpoints.

14. Appendix: Landscape and visual environmental risk assessment register

Table 78: Risk assessment for all Alignments.

				Initial risk						Residual risk				
Alignment	Primary Environmental Impact	Description of risk and impact	Standard Controls (see notes)	Consequence	Consequence ##	Likelihood	Likelihood ##	Risk Rating	Additional Controls recommended to further reduce risk	Consequence	Consequence ##	Likelihood	Likelihood ##	Risk Rating
A0	Impacts upon landscape character types	Direct loss of woodland and waterway landscapes that are critical to the regional landscape character and quality	A	Moderate	3	Almost Certain	E	High	C	Moderate	3	Possible	C	Medium
A1				Moderate	3	Almost Certain	E	High		Moderate	3	Possible	C	Medium
C0				Minor	3	Almost Certain	E	Medium		Minor	3	Possible	C	Low
C2				Minor	3	Almost Certain	E	Medium		Minor	3	Possible	C	Low
A0	Visual or physical impact upon key Views	Impact or disconnection between residents and established landscape views (e.g. Camp Hill, Rural valley views etc.)	B	Minor	2	Likely	D	Medium	D	Minor	1	Unlikely	B	Low
A1				Minor	2	Likely	D	Medium		Minor	1	Unlikely	B	Low
C0				Minor	2	Possible	D	Low		Minor	1	Unlikely	B	Low
C2				Minor	2	Possible	D	Low		Minor	1	Unlikely	B	Low
A0		Impacts on key sensitive public sites.	B	Minor	2	Possible	C	Low	D	Minor	2	Unlikely	B	Low
A1				Minor	2	Possible	C	Low		Minor	2	Unlikely	B	Low
C0				Minor	3	Likely	D	Medium		Minor	2	Possible	C	Low
C2				Minor	3	Likely	D	Medium		Minor	2	Possible	C	Low
A0		Impact on adjacent residential dwellings within 500m.	B	Moderate	2	Possible	C	Medium	D	Minor	2	Unlikely	B	Low
A1				Moderate	2	Possible	C	Medium		Minor	2	Unlikely	B	Low
C0				Moderate	3	Likely	C	High		Moderate	2	Unlikely	B	Medium
C2				Moderate	3	Likely	C	High		Moderate	2	Unlikely	B	Medium

Note Standard controls A: Fauna sensitive road design guidelines, RRV. Prepare and implement an Environment Management Plan. Prepare an Offset Management Strategy. Permitted clearing of native vegetation Biodiversity assessment guidelines. RRV standard environmental protection measures.

Note Standard controls B: Embody Regional Roads Victoria Environmental site management principles and implement an Environment Management Plan. Screen planting. Roadside Management Strategy, RRV.

Note Additional controls C: Expansion of existing woodland, wetland and habitat reserve elsewhere to provide similar character and public access. This should be placed strategically and in if possible, further mitigate visual impacts of the project alignment. Integrate habitat corridors and culverts into freeway design to reduce impact upon flora and fauna connections and increase public access.

Note Additional controls D: Planting of trees and vegetation to screen elevated carriageway from key viewpoints in landscape. Where practicable, elevated carriageway infrastructure to be of quality design and to blend in with existing context and colours of the surrounding landscape. Utilise landscaped berms to conceal freeway from township and residential viewpoints.

15. Appendix: Alignment segment maps

Figure 320. Alignment A0 – Plan of Bypass segments.

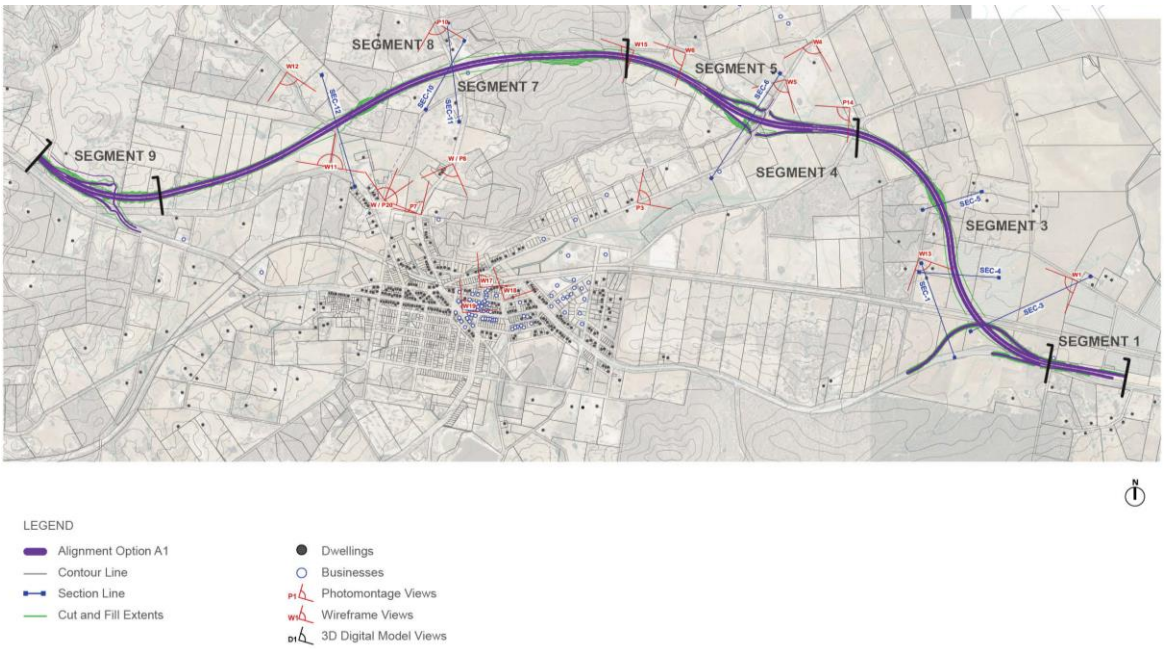

Figure 321. Alignment A1 - Plan of Bypass segments.

Figure 322. Alignment CO – Plan of Bypass segments.

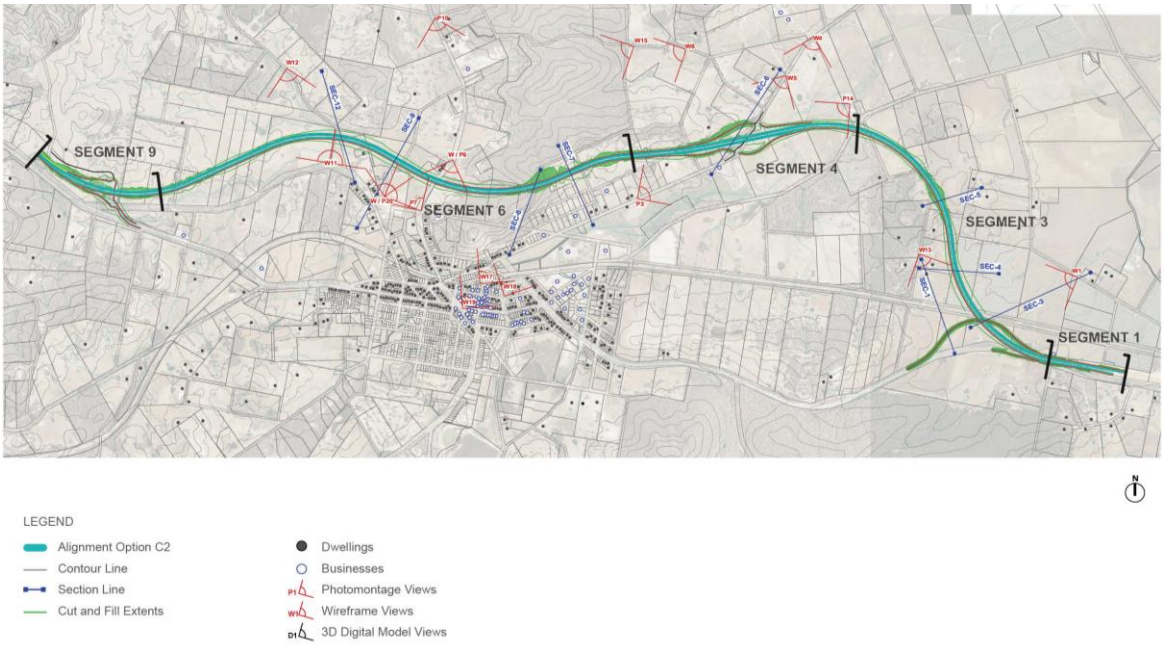

Figure 323. Alignment C2 – Plan of Bypass segments.

16. Appendix: Photomontages

Photomontage Location 3 Option C0 AFTER

Photomontage Location 3 Option C0 BEFORE

Photomontage Location 3 Option C2 AFTER

Photomontage Location 3 Option C2 BEFORE

Photomontage Location 7 AFTER

Photomontage Location 7 BEFORE

Photomontage Location 8A AFTER

Photomontage Location 8A BEFORE

Photomontage Location 10 AFTER

Photomontage Location 10 BEFORE

Photomontage Location 20B AFTER

Photomontage Location 20B BEFORE

Photomontage Location 20A AFTER

Photomontage Location 20A BEFORE

Photomontage Location 14A Option A0 and A1 AFTER

Photomontage Location 14A Option A0 and A1 BEFORE

Photomontage Location 14A Option C2 AFTER

Photomontage Location 14A Option C2 BEFORE

Photomontage Location 14B Option A0 and A1 AFTER

Photomontage Location 14B Option A0 and A1 BEFORE

Wireframe Location 1 Option A0 and A1 AFTER

Wireframe Location 1 Option A0 and A1 BEFORE

Wireframe Location 1 Option C2 AFTER

Wireframe Location 1 Option C2 BEFORE

Wireframe Location 4 Option A0 and A1 AFTER

Wireframe Location 4 Option A0 and A1 BEFORE

Wireframe Location 5 Option A0 and A1 AFTER

Wireframe Location 5 Option A0 and A1 BEFORE

Wireframe Location 5 Option C2 AFTER

Wireframe Location 5 Option C2 BEFORE

Wireframe Location 6 Option A0 and A1 AFTER

Wireframe Location 6 Option A0 and A1 BEFORE

Wireframe Location 8B Option A1 AFTER

Wireframe Location 8B Option A1 BEFORE

Wireframe Location 11A Option C0 and C2 AFTER

Wireframe Location 11A Option C0 and C2 BEFORE

Wireframe Location 11B Option C0 and C2 AFTER

Wireframe Location 11B Option C0 and C2 BEFORE

Wireframe Location 11C Option C0 and C2 AFTER

Wireframe Location 11C Option C0 and C2 BEFORE

Wireframe Location 12A Option A1 AFTER

Wireframe Location 12A Option A1 BEFORE

Wireframe Location 12B Option A1 AFTER

Wireframe Location 12B Option A1 BEFORE

Wireframe Location 13A Option C2 AFTER

Wireframe Location 13A Option C2 BEFORE

Wireframe Location 13B Option A0, A1 and C2 AFTER

Wireframe Location 13B Option A0, A1 and C2 BEFORE

Wireframe Location 15 Option A0 and A1 AFTER

Wireframe Location 15 Option A0 and A1 BEFORE

Wireframe Location 17 Option C0 and C2 AFTER

Wireframe Location 17 Option C0 and C2 BEFORE

Wireframe Location 18 Option C2 AFTER

Wireframe Location 18 Option C2 BEFORE

Wireframe Location 19 Option C0 and C2 AFTER

Wireframe Location 19 Option C0 and C2 BEFORE

Wireframe Location 20 Option A1 AFTER

Wireframe Location 20 Option A1 BEFORE