

BORR Southern Section Landscape and Visual Impact Assessment (BORR IPT, 2020k)

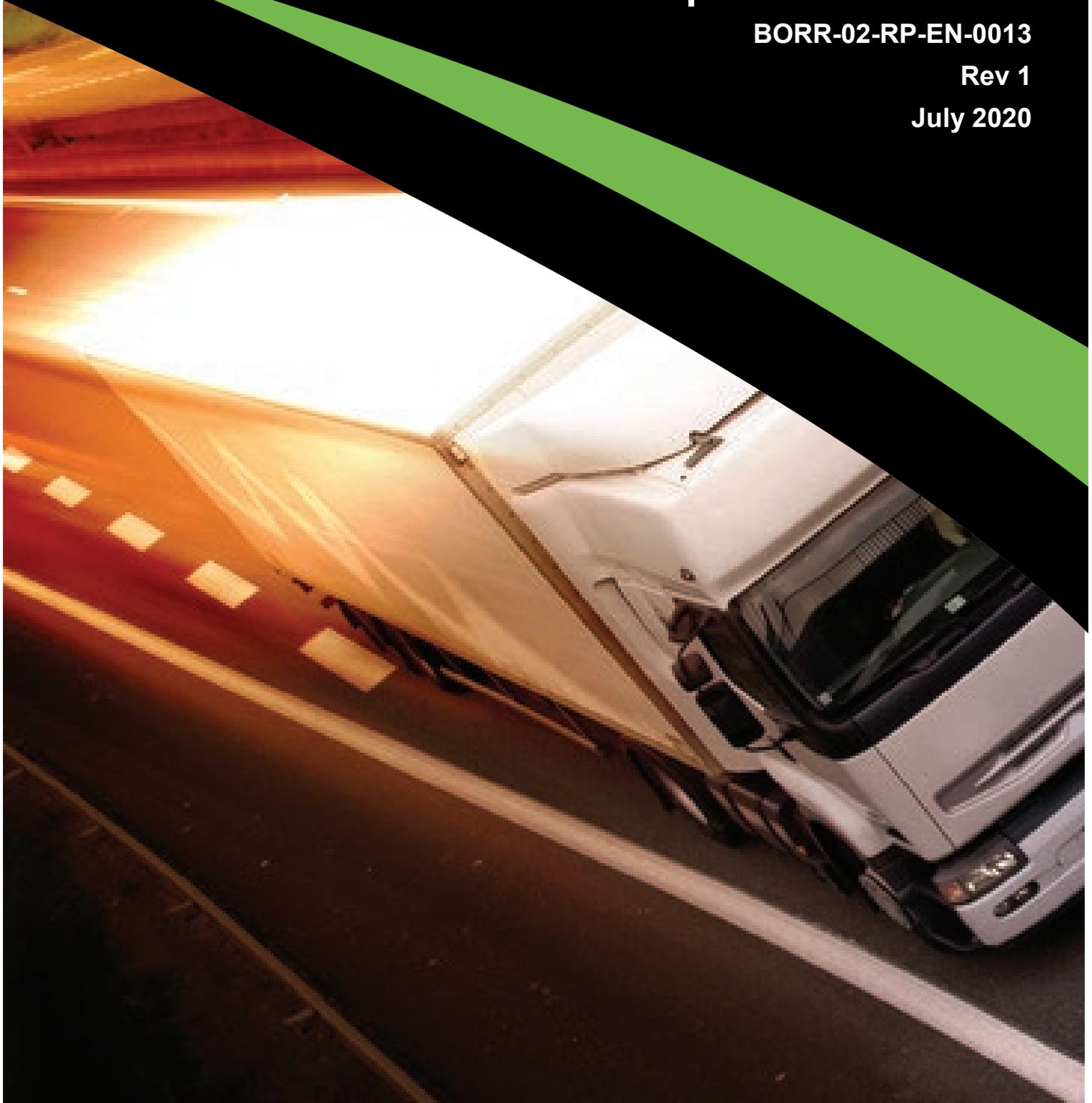


BORR Southern Section Landscape and Visual Impact Assessment

BORR-02-RP-EN-0013

Rev 1

July 2020



EXECUTIVE SUMMARY

This technical report has been prepared to determine the potential landscape and visual impacts of the Bunbury Outer Ring Road (BORR) Southern Section (the Proposal), as part of the Environmental Impact Assessment for the Proposal and in response to the Environmental Protection Authority's (EPA) notice for additional information request to Main Roads Western Australia (Main Roads), dated 21 October 2019.

Background

BORR is a planned Controlled Access Highway linking the Forrest Highway and Bussell Highway. The completed project will provide a high standard route for access to the Bunbury Port, improve road user safety and facilitate proposed development to the east of the City of Bunbury. The land requirement for BORR was identified in the draft Greater Bunbury Region Scheme (GBRS), with the route advertised to the broader community as part of the GBRS assessment. BORR comprises three sections and this report assesses the BORR Southern Section (the Proposal) only.

The Proposal is located approximately 200 kilometres (km) south of Perth and includes the construction and operation of eight km of freeway standard, dual carriageway between South Western Highway south-west to Bussell Highway, and a three km regional distributor from Bussell Highway at Centenary Road south-east, to a grade separated interchange at the western end of Lillydale Road.

In September 2019, Main Roads referred the Proposal to the EPA for assessment under Section 38(1) of the Environmental Protection Act 1986 (WA) (EP Act) (Main Roads 2019). In October 2019, the EPA determined that the Proposal would be subject to an environmental assessment under the EP Act at the level of 'Referral Information'. In October 2019, the EPA requested Main Roads provide additional information on a range of issues, including the impacts on visual amenity as a result of the construction and operation of BORR.

Landscape and visual impact context

This report considers the landscape and visual impacts of the Proposal in response to the request for additional information. This landscape and visual impact assessment includes the following considerations:

- Impacts to the visual landscape character
- Visual impact to sensitive receptor locations
- Mitigation and management measures

The assessment includes a review of relevant legislation and policy, consideration of the existing conditions, development of visual management objectives, and an impact assessment to determine the significance of impact as a direct result of the Proposal. The report identifies the impacts of the Proposal and outlines mitigation and management measures to further reduce the negative impacts of the Proposal, in addition to those already provided within the Urban and Landscape Design Framework (ULDF) prepared by the BORR Integrated Planning (IPT) Team for this Proposal.

Methodology and existing conditions

The landscape and visual impact assessment (LVIA) has been prepared, where practicable, in accordance with advice provided in national and state recognised guidelines, as outlined in Section 2.1.

A Visual Study Area (VSA) for the LVIA was established, and determined as approximately 800 metres from either side of the proposed road corridor (refer to Section 2.3.1).

State, regional and local legislation and policies relevant to the protection of landscape character and visual amenity within the VSA were reviewed in this assessment. Key landscape values and features for the VSA as reflected in relevant legislation and policy include the remnant vegetation, remnant tuart forest, and the character of rural areas. Refer to Section 3.1 for more detail.

These key values, along with a comprehensive desktop analysis and site inspection have informed the existing landscape context for the impact assessment. This information in conjunction with a review of the ULDF resulted in the refinement of the landscape character units (LCU) from the ULDF that were used in this assessment. The five landscape character units defined within the VSA are:

- Landscape Character Unit 1: Forest
- Landscape Character Unit 2: Peri-Urban
- Landscape Character Unit 3: Rural
- Landscape Character Unit 4: Quarry
- Landscape Character Units 5: Highway

These landscape character units are described in Section 4.1 of this report.

A visual analysis was undertaken to identify sensitive visual receptors, viewing locations, and to provide a description of visual features and experiences within the VSA. Due to the quantity and extent of native vegetation present combined with the low-lying nature of the topography, no key views of note were identified within the VSA. Refer to Section 4.2.

The above existing conditions assessment, policy review, definition of landscape character units and the visual analysis informed the development of visual management objectives. These visual management objectives are developed to manage the visual character of the landscape within the VSA.

Impact assessment findings

To address the EPA's request for additional information, the assessment of the potential impacts on landscape character and visual amenity was undertaken on the five landscape character units and 14 public and private viewpoints, refer to Section 7.

The impact assessment on landscape character found that the Proposal would have a high to moderate significance of impact on LCU2 and LCU3, a moderate impact on LCU1 and LCU5 and a low impact on LCU4. The most significant landscape impacts were due to the loss of existing valued landscape character elements associated with remnant vegetation, as well as the low-lying landform having a low capacity to accommodate the type of change associated with the bridges at Yalinda Drive and Five Mile Brook, the grade separated changes at the interchanges with Lillydale Road and Bussell Highway, and sections of road in cut and on batters. Refer to Section 7.1 for more detail.

The visual impact assessment was undertaken from 14 viewpoints, with photomontages created for VP02, VP06, VP11 and VP12, to illustrate the Proposal (refer to Appendix B for photomontages). The visual impacts of the Proposal range from high to negligible (refer to Section 7.2 for more detail). The most significant impacts were found to be from residential properties along Woods Road within the vicinity of VP12 due to their proximity to the Proposal, receptor type and magnitude of proposed change associated with the removal of existing vegetation and the introduction of noise walls into a view where there is currently no built form. Refer to Section 7.2.14 for more detail.

High to moderate impacts would be experienced by residential properties within close proximity to the Proposal along the corridor including around the northern interchange with Bussell Highway, Sleaford Drive where the connection to Jules Road occurs, along Lillydale Road where the realigned road would be elevated above the surrounding ground level, and where the Proposal intersects Ducane Road. The high to moderate impacts are generally associated with the removal of existing established vegetation and the introduction of new elements such as elevated sections of road, bridges, roundabouts, and noise walls, where the views are currently to established vegetation or a rural landscape with little to no road infrastructure visible.

Additional high level assessments of three viewing locations in Gelorup were conducted as the location have high potential visual sensitivity due to the proximity of residential receptors to the Proposal. Two locations were visited during the site inspection, and one location was not visited due to access constraints.

Two cross sections were provided from this location for assessment. Potential impacts from other viewing locations are expected to be minor due to intervening vegetation established between the residence and the Proposal. Refer to Section 7.2.17 for further detail.

The construction impacts of the Proposal were addressed through a general discussion as at the time of writing the location of construction compounds and associated infrastructure was unknown, refer to Section 7.2.18 for further detail. Visual impacts associated with the construction of the Proposal would be greater than those identified during the operation phase due to the presence of construction compounds, machinery and site stockpiles, but these would be temporary in nature.

The Proposal was reviewed against the visual management objectives and a response provided as to whether the objectives could be achieved for the Proposal, refer to Section 8.1. Relevant mitigation and management measures within the ULDF were summarised and additional recommendations were provided in response to the impacts identified, refer to Section 8.2. These additional recommendations should be taken into consideration as the design progresses.

With the implementation of the recommended mitigation and management measures outline in Section 8 of this report, together with the ULDF, the landscape and visual impacts identified in Section 7 have potential to be reduced and the Proposal would not likely have a significant adverse effect on the surrounding landscape and visual environment.

CONTENTS

1	INTRODUCTION	1
1.1	Background	1
1.2	Project objectives	1
1.3	Proposal Summary	2
1.4	Document Purpose and Scope	2
1.5	Document Structure	3
2	METHODOLOGY	4
2.1	Applicable Guidelines	4
2.2	Methodology Process	4
2.3	Assessment of Existing Landscape Evaluation and Visual Environment	5
2.4	Visual Management Objectives	7
2.5	Proposal Description	7
2.6	Landscape and Visual Impact Assessment	7
2.7	Mitigation and Management Measures	11
2.8	Assumptions and Limitations	12
3	CONTEXT ANALYSIS	13
3.1	Legislation and Policy Context	13
3.2	Landscape Context	17
4	LANDSCAPE CHARACTER AND VISUAL ANALYSIS	19
4.1	Landscape Character Units	19
4.2	Visual Analysis	29
5	VISUAL MANAGEMENT OBJECTIVES	31
5.1	Visual Management Objectives	31
5.2	Community and Stakeholder Engagement	31
6	PROPOSAL DESCRIPTION	33
6.1	Summary of the Proposal	33
6.2	Main visual components of the Proposal	34
6.3	Property Acquisition	37
6.4	Construction	37
7	LANDSCAPE AND VISUAL IMPACT ASSESSMENT	38
7.1	Impacts to Landscape Character	38
7.2	Visual Impacts	44
8	MITIGATION AND MANAGEMENT MEASURES	65

8.1	Response to visual management objectives	66
8.2	Landscape and visual mitigation measures	67
9	CONCLUSION	70
9.1	Summary of Landscape and Visual Impacts	70
9.2	Summary of mitigation and management measures	72
10	REFERENCES	73

TABLE INDEX

Table 1	Landscape character value criteria	6
Table 2	Sensitive receptor level of significance	7
Table 3	Capacity to accommodate change (landscape character)	8
Table 4	Magnitude of change criteria (landscape character)	9
Table 5	Sensitivity criteria (visual)	10
Table 6	Magnitude of change criteria (visual)	10
Table 7	Significance of impact matrix	11
Table 8	Sensitive Receptors and level of significance	29
Table 9	Key Proposal characteristics	33
Table 10	Landscape Character Unit 1 Assessment	38
Table 11	Landscape Character Unit 2 Assessment	39
Table 12	Landscape Character Unit 3 Assessment	41
Table 13	Landscape Character Unit 4 Assessment	42
Table 14	Landscape Character Unit 5 Assessment	43
Table 15	Viewpoint Locations	44
Table 16	Other viewing locations	45
Table 17	Summary of Impacts to Landscape Character	70
Table 18	Summary of Visual Impacts	71

FIGURES INDEX

Figure 1	Visual Landscape Planning process	4
Appendix A	Figure 1 Proposal Area	75
Appendix A	Figure 2 Landscape Context	75
Appendix A	Figure 3 Landscape Character Units	75
Appendix A	Figure 4 Visual Analysis	75
Appendix A	Figure 5 Concept Design	75
Appendix A	Figure 6 Viewpoint Locations	75
Appendix A	Figure 7 Viewing location 17 Yalinda Drive sections	75

PHOTO INDEX

Photo 1 Maintenance track within Banksia Woodland, near Bussell Highway	20
Photo 2 Banksia Woodland, near Bussell Highway	20
Photo 3 Jules Road, Gelorup.	21
Photo 4 Woods Road, Gelorup.	21
Photo 5 Bunbury Regional Prison frontage, Centenary Road.	21
Photo 6 Eucalyptus Drive with dense bushland, Gelorup.	21
Photo 7 Rural fence line and mixed vegetation, Ken Bell Road.	23
Photo 8 Open paddock with internal gravel road spatially defined by trees, Gelorup.	23
Photo 9 Gravel road character with dense vegetation, Ken Bell Road.	23
Photo 10 Farm sheds and machinery with clumps of vegetation behind, Ducane Road.	23
Photo 11 Vegetated bund to the perimeter of the Basalt quarry, Jules Road.	25
Photo 12 Vegetation on perimeter bund, Hasties Road.	25
Photo 13 Road interface with quarry, Hasties Road.	25
Photo 14 Quarry entrance, Lillydale Road.	25
Photo 15 Rotary Park rest area, Bussell Highway.	27
Photo 16 Shared path adjacent to Bussell Highway, near Centenary Road.	27
Photo 17 Residential property interface, Bussell Highway near Jaymon Road.	27
Photo 18 Dense vegetation within median, Bussell Highway near Woods Road.	27
Photo 19 Bussell Highway viewed from Banksia Woodland Reserve maintenance track.	30
Photo 20 Sleaford Park playground	30
Photo 21 View towards Proposal from lawn adjacent to house	61
Photo 22 View towards Proposal from southern extent of orchard	61
Photo 23 View towards Proposal from front garden	62
Photo 24 View towards Proposal from rear driveway	62

APPENDICES

Appendix A Figures

Appendix B Photomontages

Appendix C Landscape Concept Design Drawings

Document Control						
Revision	Date	Description	Prepared	Reviewed	Approved	
A	26/02/2020	Draft for TA Review	V Wheatley	E. Davis L. Farrell	FH	
B	21/04/2020	Draft for Main Roads Review	V Wheatley E. Davis	L Farrell	FH	
0	08/05/2020	Final for Main Roads	V Wheatley E. Davis	L Farrell	FH	
1	10/07/2020	Final for Main Roads	V Wheatley E. Davis	L Farrell	FH	

TERMINOLOGY AND ABBREVIATIONS

Terminology

TERMINOLOGY	DEFINITION
Batter	The uniform side slope of a cut or fill.
Cut	Excavation below the natural surface level.
Fill	The compacted embankment placed above natural surface level.
Key View	An area, especially a broad landscape or panorama that is in constant sight from the observer's viewpoint either in motion or standing still, that is of high value.
Landscape character	The combined quality of built, natural and cultural aspects that make up an area and provide its unique sense of place.
Landscape Character Unit	Areas of homogenous (similar) patterns of visual characteristics such as landform, vegetation, water form and land use as well as individual features.
Landscape impacts	Changes in the character and quality of the landscape that occur as a result of development, while <i>visual impacts</i> relate to the appearance of these changes.
Proposal	The Bunbury Outer Ring Road Southern section.
Proposal Area	The development envelope/extent of works for the Proposal; the area referred by Main Roads.
Vegetation complex	Broad-scale vegetation units mostly defined in relation to geomorphology, soils and climatic conditions defined by Heddle et al.
View	Comprises a portion of a landscape seen by an observer.
Viewpoint	The point from which a view is observed.
Visual amenity	The overall quality of views that people enjoy of their surroundings.
Visual Impact Assessment	The analysis of changes in the appearance of the landscape as a result of development. Impacts may be either negative or positive.
Visual receptor	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Visual Study Area	Consists of land in the vicinity of, and including, the Proposal Area. The Visual Study Area or VSA is a wider area surrounding the Proposal Area as defined in this assessment, including land that has the potential to be indirectly impacted by the Proposal.

Abbreviations

ABBREVIATION	DEFINITION
BORR	Bunbury Outer Ring Road
DEM	Digital Elevation Model
GBRS	Greater Bunbury Regional Scheme
GPS	Global Positioning System
ha	Hectares
IPT	Integrated Planning Team
km	Kilometres
LCU	Landscape Character Unit
LVIA	Landscape and visual impact assessment
m	Metres
MSE	Mechanically Stabilised Earth
ULDF	Urban and Landscape Design Framework
VP	Viewpoint
VSA	Visual Study Area

Disclaimer

This document is and shall remain the property of BORR Team. The document may only be used for the purposes for which it was commissioned and in accordance with the Terms of Engagement for BORR Team. Unauthorised use of this document in any form whatsoever is prohibited.

© BORR Team 2020

1 INTRODUCTION

1.1 Background

The Commissioner of Main Roads Western Australia (Main Roads) is proposing to construct and operate the Bunbury Outer Ring Road (BORR) project. BORR is a planned Controlled Access Highway linking the Forrest Highway and Bussell Highway. The completed project will provide a high standard route for access to the Bunbury Port, improve road user safety and facilitate proposed development to the east of the City of Bunbury. BORR will also provide an effective bypass of Bunbury for inter-regional traffic. BORR forms a major component of the planned regional road network for the Greater Bunbury area. The land requirement for BORR was identified in the draft Greater Bunbury Region Scheme (GBRS), with the route advertised to the broader community as part of the GBRS assessment.

In late 2016, Main Roads commenced a planning review for a future South West Freeway (Forrest Highway, BORR and Bussell Highway between Mandurah to Busselton) spanning the Forrest and Bussell Highways. This network forms the primary connection of Perth with Bunbury, Busselton and the broader South West Region including the Ports of Fremantle, Bunbury and the proposed Outer Harbour at Kwinana. This planning review resulted in a revised alignment for the northern section of BORR that joins Forrest Highway near Australind, which is now located further east than previously proposed. This revised alignment is therefore not identified in the GBRS.

The proposed BORR comprises three sections:

- 'BORR Northern Section' – Forrest Highway to Boyanup-Picton Road
- 'BORR Central Section' – Boyanup-Picton Road to South Western Highway, an existing four km section which was completed in May 2013, along with a three km extension of Willinge Drive southwards to South Western Highway
- 'BORR Southern Section' – South Western Highway (near Bunbury Airport) to Bussell Highway.

This document assesses the impacts on landscape character and visual amenity as a result of the construction and operation of the BORR Southern Section (the Proposal) only.

1.2 Project objectives

The primary objectives of the BORR are to:

- Reduce local congestion through increasing efficiency for freight and regional traffic
- Improve long term access for the Bunbury Port
- Support socio-economic growth and facilitate integrated development in Greater Bunbury and the South West Region
- Enhance amenity on local roads by reducing freight and regional traffic
- Minimise impacts on affected communities and stakeholders
- Create a safer road system for our community
- Respect and enhance our environment and heritage.

1.3 Proposal Summary

The Proposal is located approximately 200 km south of Perth, mainly within the Shire of Capel, including the localities of Gelorup, North Boyanup and Statham, with some overlap into neighbouring localities (College Grove, Usher and Dalyellup). A small section of the Proposal occurs within the City of Bunbury.

The Proposal includes construction and operation of eight km of freeway standard, dual carriageway between South Western Highway (south of Bunbury Airport) south-west to Bussell Highway and a three km regional distributor from Bussell Highway at Centenary Road south-east to a grade separated interchange at the western end of Lillydale Road plus associated bridges, interchanges, local road modifications and other infrastructure including, but not limited to, drainage basins, drains, culverts, lighting, noise barriers, fencing, landscaping, road safety barriers and signs. The area referred to as the Proposal Area covers approximately 200 hectares (ha) and is referred to as the Proposal Area. The Proposal Area connects the northern and central sections of the BORR (from Forrest Highway) through to Bussell Highway.

The north-east end of the Proposal will join the south-west end of the BORR Central section near South Western Highway, approximately eight km southeast of Bunbury CBD. The north-west end of the Proposal (regional distributor) at Bussell Highway is approximately seven km south of Bunbury and the southern-most point of the Proposal Area (on Bussell Highway adjacent Capel Golf Course), is approximately 15 km south of Bunbury CBD.

Almost 60 % of the land within the Proposal Area is cleared and highly modified and includes previously constructed roads. Approximately 40 % of the land within the Proposal Area is native vegetation including revegetation and scattered vegetation in road reserves or as isolated patches on agricultural land. The Proposal Area has been appropriately sized to accommodate construction and operation of the dual carriageway, regional distributor and associated infrastructure. The Proposal Area is illustrated in Appendix A Figure 1.

1.4 Document Purpose and Scope

In September 2019, Main Roads referred the Proposal to the Environmental Protection Authority (EPA) for assessment under Section 38(1) of the *Environmental Protection Act 1986 (WA)* (EP Act) (Main Roads 2019). The Proposal information submitted included an Environmental Referral Supporting Document (BORR IPT 2019a) which described the Proposal, the local environmental values present, the potential environmental impacts of the Proposal, and the management and mitigation strategies to address the identified impacts. In October 2019, the EPA (2019a) determined that the Proposal would be subject to an environmental assessment under the EP Act at the level of 'Referral Information'.

In October 2019, in accordance with s40(2)(a) of the EP Act, the EPA (2019b) requested Main Roads provide additional information to inform the environmental assessment of the Proposal. The request for additional information required Main Roads to provide information on a range of issues including the impacts on visual amenity as a result of the construction and operation of the Proposal.

The purpose of this report is to determine the landscape and visual impact of the Proposal in response to this request.

The scope of work includes the preparation of a landscape and visual impact assessment report, including the following considerations:

- Impacts to the visual landscape character
- Visual impact to sensitive receptor locations
- Mitigation and management measures

1.5 Document Structure

This report is comprised of the following sections:

Section 1 - Introduction: provides background information and an overview of the Proposal and assessment.

Section 2 - Methodology: describes the methodology used for the purposes of this report.

Section 3 - Context Analysis: provides an analysis of the existing conditions in the context of the Proposal, as well as the legislation and policy context.

Section 4 - Landscape Character and Visual Analysis: Landscape character units are defined and described. A visual analysis is provided.

Section 5 – Visual Management Objectives: identifies general and Proposal-specific visual management objectives.

Section 6 – Proposal Description: provides a description of key Proposal components relevant to this assessment.

Section 7 – Landscape and Visual Impact Assessment: An assessment is provided for impacts to landscape character. Representative viewpoint locations are identified and an assessment provided.

Section 8 - Mitigation and Management Measures: Mitigation and management measures are recommended in response to issues arising in the assessment during construction and operation phases of the Proposal.

Section 9 - Conclusion: provides a summary of the landscape and visual impact assessment.

2 METHODOLOGY

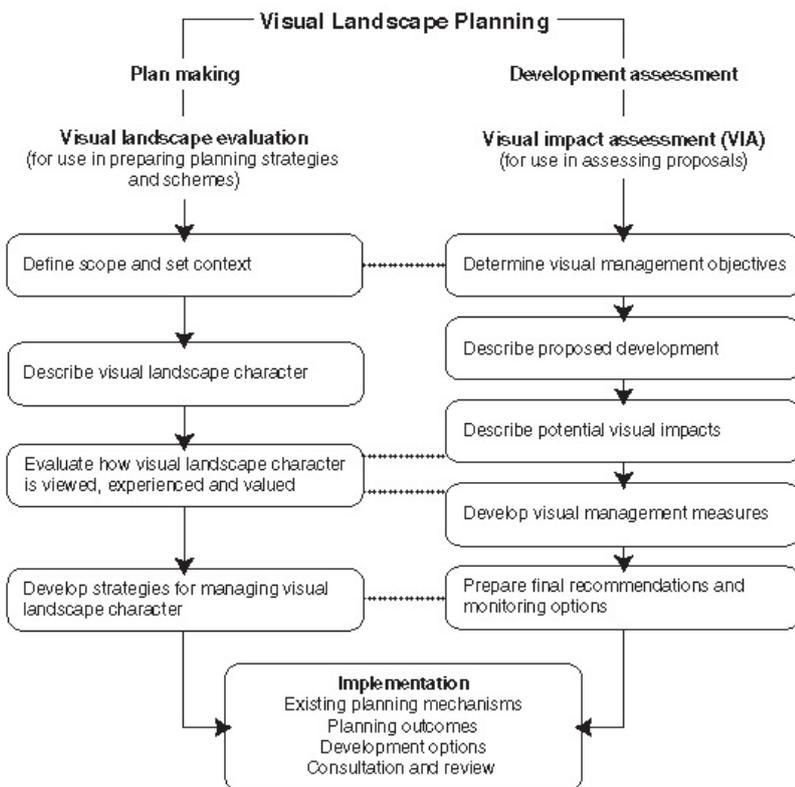
2.1 Applicable Guidelines

Where practicable, the landscape and visual impacts associated with the project have been assessed in accordance with the advice provided in national and state recognised resource documents and in accordance with all relevant legislation. These include but are not limited to the following:

- *Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design* (Western Australian Planning Commission, 2007)
- *Environmental Standard Brief: Visual Impact Assessment* (Main Roads Western Australia, 2003)
- *Environmental Factor Guideline: Social Surroundings* (Environmental Protection Authority, 2016)
- *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition* (Landscape Institute and Institute of Environmental Management & Assessment, 2013).

2.2 Methodology Process

The following assessment process, outlined in Figure 1, has been followed for this assessment.



(Western Australian Planning Commission, 2007)

Figure 1 Visual Landscape Planning process

2.3 Assessment of Existing Landscape Evaluation and Visual Environment

2.3.1 Visual Study Area (VSA)

The VSA for this report is generally confined to the likely extent of visibility of the Proposal within the surrounding context. This has resulted in an indicative VSA of approximately 800 metres from either side of the proposed road corridor, based on an understanding of the Proposal, a desktop review and site inspection of the existing landscape context, and previous studies of a similar type and/or within a similar landscape context.

2.3.2 Context Analysis

Relevant background information relating to the Proposal and VSA was reviewed and summarised, refer to Section 3. This included planning designations, policies and guidance, existing landscape and visual environment information such as:

- Topography and hydrology data
- Land use zoning and cadastral data
- Transportation infrastructure data
- Vegetation maps
- Google aerial and street view imagery

Proposal design and background information was also reviewed, including the *Urban and Landscape Design Framework* (ULDF) report (BORR Team, 2020a). The emphasis of this review was to establish the landscape context and relevant values.

2.3.3 Landscape Character and Visual Analysis

2.3.3.1 Site Inspection

A site inspection was undertaken by two Landscape Architects from the 28th - 31st of January 2020. The purpose of the inspection was to ground-truth the landscape character units and visual analysis undertaken within the ULDF; appreciate general views within the VSA and those to and from sensitive receptor locations; and undertake site photography for visual assessment and the preparation of photomontages. The coordinates of each viewpoint and photograph were recorded during the site inspection.

2.3.3.2 Landscape Character Units

Landscape Character Units generally comprise homogenous patterns of characteristics such as landform, vegetation, water form and land use as well as individual features, as identified during the context analysis and site inspection.

Landscape Character Units established within the ULDF, relevant to the VSA, were reviewed and refined. Resulting Landscape Character Units have been described and mapped, including a description of their key characteristics and valued features. Refer to Section 4.1.

Values associated with the landscape have also been identified for each Landscape Character Unit. Landscape value considers designated and undesignated landscapes and all elements such as the environmental, cultural, historical and visual elements that form the landscape. When defining landscape value, considerations include landscape quality, scenic quality, rarity, representativeness, conservation value, recreation value, and associations.

Refer to Table 1 for criteria used to determine landscape character value.

Table 1 Landscape character value criteria

RATING	CRITERIA
High	Landscape character elements in good or above average condition and/or that make a strong positive contribution to the landscape character. May include nationally important features.
Moderate	Landscape character elements in reasonably good condition and/or that make an average contribution to the local character, which may include locally important features.
Low	Landscape character elements in average condition and/or that are not particularly distinctive local features.
Negligible	Elements in below average condition and/or that are not distinctive local features.

2.3.3.3 Visual Analysis

How a landscape is viewed is of critical importance in understanding changes in the landscape and how people perceive them. Visual landscapes are related to peoples’ sense of place and quality of life. How people view, perceive, experience and interact with landscape can be varied and diverse.

Visual analysis of the existing conditions involves identifying existing viewing location, identifying who viewers are and how they experience the landscape, identifying key views, and determining visibility. This assists in the understanding as to how the proposed changes may impact the existing viewing experience and values.

A visual analysis of the VSA was mapped, including identification of viewing locations. Sensitive visual receptors (sensitive receptors) were identified and their level of significance given, in line with guidance provided within the *Visual Landscape Planning in Western Australia* guidelines (WAPC, 2007) (refer to Table 2 for criteria). Level of significance generally increases with the importance of the view, the degree of sensitivity of the viewers, the degree to which experiencing the landscape is integral to the enjoyment of a travel route or site, and the length of duration of a view. These criteria were used to assist in determining which sensitive receptor locations to consider for assessment. Refer to Section 4.2.

Table 2 Sensitive receptor level of significance

RATING	CRITERIA
Level 1: national / state significance	State highways and other main roads (sealed or unsealed) with high levels of vehicle usage; designated tourist routes, scenic drives; recreation, conservation, cultural or scenic sites, areas, viewpoints and lookouts of state or national significance, including their access routes; walking, cycle or bridle tracks of national or state significance; towns, settlements or residential areas; passenger rail lines; navigable waterways of national or state recreation importance; ocean sites of national or state recreation importance, e.g. surf breaks; and views of national or state importance.
Level 2: regional significance	Main roads with moderate levels of vehicle usage (sealed or unsealed); recreation, conservation, cultural or scenic sites, areas, viewpoint, and lookouts of regional or high local significance (including their access routes); navigable waterways of regional recreation significance; walking, cycle or bridle paths of regional significance; and views of regional importance.
Level 3: local significance	All remaining roads with low levels of vehicle usage; locally significant roads or tracks; recreation and other use areas of local significance; navigable waterways of local recreational significance; walking, cycle or bridle paths of local significance; and views of local importance.

2.4 Visual Management Objectives

The purpose of visual management objectives is to manage the visual character of the landscape within the VSA. The legislation and policy review, context analysis, landscape character units and visual analysis form a basis for the development of appropriate management objectives and strategies, refer to Section 5.

Visual management objectives are generally categorised as follows:

- Best practice siting and design
- Protection and maintenance of visual landscape character
- Restoration of degraded character or enhancement of opportunities, for example, for viewing.

2.5 Proposal Description

The main visual components of the Proposal were identified and described, for both the construction and operation phases of the Proposal, refer to Section 6.

2.6 Landscape and Visual Impact Assessment

This section includes an assessment of impacts to landscape character, with an assessment provided for each landscape character unit defined within the VSA. Following this, an assessment of visual impacts was undertaken from key viewpoint location.

2.6.1 Assessment of impacts to landscape character

Assessment of impacts to landscape character deals with the effect of change and development on landscape as a resource. The assessment focuses on how the development would affect the elements that make up the landscape, including the aesthetic and perceptual aspects of the landscape and its distinctive characteristics.

The consideration of potential impacts to landscape character is determined based on the sensitivity of the existing landscape to the proposed change, and the magnitude of change that is likely to occur. The sensitivity of a landscape is determined on the capacity of the landscape to accommodate the change of a particular type and scale, without adverse effects on existing landscape character; and the value of the existing landscape.

The magnitude of change to landscape character depends on the nature, scale and duration of the change expected to occur. It also depends on the loss, change or addition of any feature to the existing landscape.

The sensitivity and magnitude of landscape effects address the following specific criteria:

- Sensitivity of landscape to proposed change, is based on the capacity to accommodate change, and the value of the landscape (refer to Table 1 for landscape value criteria and Table 3 for capacity to accommodate change criteria)
- Magnitude of landscape effect, based on the size, scale of change, the geographical extent of effects, and the duration and reversibility of effects (refer to Table 4)

Refer to Section 7.1 for the assessment of impacts to landscape character.

Table 3 Capacity to accommodate change (landscape character)

RATING	CRITERIA
Low capacity to accommodate change	The landscape character has a low capacity to accommodate the type of development proposed which could have a detrimental effect on the landscape character, condition or value. Mitigation measures are unlikely to reduce the impacts of the change.
Moderate capacity to accommodate change	The landscape character has a moderate capacity to accommodate the type of development proposed. Any change caused by the proposed development would be unlikely to have a significant adverse effect on the landscape character, condition or value that could not be mitigated.
High capacity to accommodate change	The landscape character would have a high capacity to accommodate this type of development and few constraints imposed by landscape elements. Development of this type is unlikely to have an adverse effect on the landscape character, condition or value. Mitigation measures would be effective in neutralising adverse effects.
Negligible	Development of this type is very unlikely to have an adverse effect on the landscape character, condition or value. Mitigation measures would be effective in neutralising adverse effects and/or improve the landscape character.

NOTE: A low capacity to accommodate change would result in a high impact to landscape character.

Table 4 Magnitude of change criteria (landscape character)

RATING	CRITERIA
High	A substantial/obvious change to the landscape character due to total loss of, or change to, elements, features or characteristics of the landscape. Would cause a landscape to be permanently changed and its quality diminished.
Moderate	Discernible changes in the landscape character due to partial loss of, or change to elements, features or characteristics of the landscape, however has potential to be partly mitigated. The change would be out of scale with the landscape character, and at odds with the local pattern and landform, and would leave an adverse impact on the landscape character.
Low	Minor loss or alteration to one or more key landscape character elements, features or characteristics, or the introduction of components that may be new but may not be uncharacteristic within the existing landscape character.
Negligible	Almost imperceptible or no change in the landscape character as there is little or no loss of/or change to the elements, features or characteristics of the landscape.

2.6.2 Assessment of Visual Impacts

The assessment of visual impact involves an understanding of the sensitivity of viewing locations, the likely changes to the views, and an evaluation of the significance of the likely changes. Visual receptors have been considered in terms of the view they are likely to obtain from within the VSA including consideration of any key vantage points such as lookouts, where there is particular interest in the view. Visual receptors are identified based on proximity of the receptor to the Proposal, as the most affected visual receptors are anticipated to be located closest to the Proposal unless located at an elevated vantage point. The type of receptor is also considered, as different viewer types would have different perceptions of the change.

A series of 14 representative viewpoint locations were selected for assessment based on the visual analysis of the VSA and understanding of the Proposal (refer to Appendix A Figure 6). Existing views were represented using a panorama technique (refer section 2.6.2.2). An assessment of each viewpoint is provided which includes assessment of the sensitivity of the viewpoint to change, identification and description of the likely changes to the view, assessment of the magnitude of change that is likely to occur, and overall level of significance of the visual effect.

The sensitivity of each viewpoint is considered to be dependent on the importance of the view, its existing scenic qualities, the presence of other existing built elements in the view; and the type of visual receptor and their likely interest in the view. The magnitude of change to views and visual amenity depends on the nature, scale and duration of the change that is expected to occur. This depends on the loss, change or addition of any feature in the field of view of the receptor including an assessment of the level to which the change contrasts with the existing view or expected view of the landscape.

The assessment considers the likely impacts of the Proposal, refer to Section 7.2. The level of effect on a view depends on factors such as the extent of visibility, degree of obstruction of existing features, degree of contrast with the existing view, angle and duration of the view, and the distance from the Proposal.

The sensitivity and magnitude of visual effects address the following specific criteria:

- Sensitivity of visual receptor to proposed change, based on susceptibility of visual receptors to change, and value attached to the view (refer to Table 5)
- Magnitude of change, based on the size or scale of the change, geographical extent of effects, and duration and reversibility of effect (refer to Table 6).

2.6.2.1 Significance of Impacts

The combination of sensitivity and magnitude determines the significance of impact on the visual environment or representative viewpoint. Refer to Table 7 which illustrates the matrix used to determine the significance of impacts.

Table 5 Sensitivity criteria (visual)

RATING	CRITERIA
High	Occupiers of residential properties, at home or going to or from, with long viewing periods, within close proximity to the proposed development; Communities that place value upon the urban landscape and enjoyment of views of their setting.
Moderate	Outdoor workers who have a key focus on their work who may also have intermittent views of the VSA; Viewers at schools, or similar, when outdoor play and recreation areas are located within close proximity but viewing periods are limited; Occupiers of residential properties with long viewing periods, at a distance from or screened from the VSA.
Low	Road users in motor vehicles, trains or on transport routes that are passing through or adjacent to the VSA and therefore have short term views; Viewers indoor at their place of work, schools or similar.
Negligible	Viewers from locations where there is screening by vegetation or structures where only occasional screened views are available and viewing times are short; Road users in motor vehicles, trains or on transport routes that are passing through/adjacent to the VSA and have partially screened views and short viewing times.

Table 6 Magnitude of change criteria (visual)

RATING	CRITERIA
High	A substantial/obvious change to the existing view due to total loss of, or change to, elements, features or characteristics of the view. Would cause a view to be permanently changed and its quality diminished.
Moderate	Discernible changes in the existing view due to partial loss of, or change to elements, features or characteristics of the view, however has potential to be partly mitigated. The change would be out of scale with the existing view, and would leave an adverse impact on the view.
Low	Minor loss or alteration to one or more key view elements, features or characteristics, or the introduction of components that may be visible but may not be uncharacteristic within the existing view.
Negligible	Almost imperceptible or no change in the view as there is little or no loss of/or change to the elements, features or characteristics of the view.

Table 7 Significance of impact matrix

		MAGNITUDE OF IMPACT			
		High	Moderate	Low	Negligible
SENSITIVITY	High	High Impact	High-Moderate	Moderate	Negligible
	Moderate	High-Moderate	Moderate	Moderate-Low	Negligible
	Low	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

2.6.2.2 Panorama and Photomontage

All photographic images were captured using a 50 millimetre fixed focal length lens on a 35 millimetre full frame format camera at a camera height of 1.6 metres. All photograph GPS locations were recorded and mapped.

A series of 14 viewpoint locations were chosen and existing views represented using a panorama technique. This technique involves the stitching together of a number of adjoining images using the Adobe Photoshop software program representing an 80 degree horizontal field of view.

Of the 14 viewpoint locations, four viewpoints were selected for the production of photomontage images to represent proposed views following the completion of the Proposal. The software used to model and render the photomontages was Autodesk 3D Studio Max. In order to achieve an accurate photomontage of the Proposal and surrounding landscape, a digital terrain model to a resolution of five metres was used to model the surrounding landform.

Once the 3D model incorporating both the landscape and new Proposal elements was created, a virtual camera was placed in the software at the same location the photographs were taken. The film, focal lens and height of the virtual camera matches the real camera utilised to take the photographs. The photographs of the Proposal Area were used in 3D Studio Max as a background to accurately match the 3D model with the Proposal elements to the perspective of the photographs. From the camera view, rendered images of the Proposal were produced to match the daylight exposure of the photographs. The rendered images were imported into Adobe Photoshop for post-production editing and collation of the photomontages. The final result is the 3D model of the Proposal shown in the correct 3D location in the photographs. The final images were produced to a high resolution, suitable for printing.

The panorama and photomontage methodology is guided by industry accepted techniques recommended in the following:

- *Visual Representation of Development Proposals: Technical Guidance Note 06/19* (Landscape Institute, 2019).

2.7 Mitigation and Management Measures

This process involved determining whether the visual management objectives identified can be achieved, and provision of mitigation and management measures to reduce negative impacts identified through the assessment. The mitigation and management measures relate to both the landscape character units as well as views.

The ULDF was reviewed and relevant mitigation and management measures summarised in section 8. Where relevant, additional visual management measures have been defined.

2.8 Assumptions and Limitations

This methodology includes the following assumptions and limitations:

- There is no national guidance on the assessment of landscape and visual impacts specific to Australia. However, in Western Australia, the industry typically refers to *Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design* (Western Australian Planning Commission, 2007). This assessment has also made reference to *Guidelines for Landscape and Visual Impact Assessment, Third Edition* (Landscape Institute, 2013).
- The assessment aims to be objective and describe any changes factually. While potential changes resulting from the Proposal are defined, the significance of these changes requires qualitative (subjective) judgements. This assessment's conclusion therefore combines objective measurement and professional interpretation. While this assessment aims to be objective, it is recognised that landscape and visual impact assessment can be subjective and individuals are likely to associate different visual experiences to the VSA.
- The scope of this assessment does not include consideration of landscape and visual impacts from lighting or during night time conditions.
- Existing conditions were assessed during the site inspection on 28th- 31st of January 2020.
- Due to access constraints, all potentially affected private property was not able to be accessed during the site inspection.
- A number of properties would require partial or full acquisition, and possible demolition, to allow for the construction of the Proposal works. As this process is currently ongoing, it is not clear what implications this would have in relation to landscape character and visual impact, and sensitive receptor locations.

3 CONTEXT ANALYSIS

3.1 Legislation and Policy Context

The following section provides an overview of relevant legislation and policy objectives within the VSA. Landscape and visual values and objectives identified have been used to inform the assessment and mitigation recommendations.

3.1.1 State Legislation and Policy

3.1.1.1 Statement of Planning Policy: Environment and Natural Resources Policy (2003).

This policy applies throughout the state of Western Australia, and includes specific objectives for the protection of landscapes.

Policy measure 5.9 Landscape highlights Western Australia's diversity of high value landscapes and scenic areas. It recognises that as the State grows, it will be increasingly important to ensure that landscapes valued by the community are protected. To do this, it is necessary to identify the landscape types and features requiring special attention and develop appropriate management and planning policies that can positively contribute to their maintenance and enhancement. To achieve this, planning strategies, schemes and decision-making should:

- a) Identify and safeguard landscapes with high geological, geomorphological or ecological values, as well as those of aesthetic, cultural or historical value to the community, and encourage the restoration of those that are degraded.*
- b) In areas identified in 5.9 (i) above, consider the level or capacity of the landscape to absorb new activities and incorporate appropriate planning and building design and siting criteria to ensure that new development is consistent and sensitive to the character and quality of the landscape.*
- c) Consider the need for a landscape, cultural or visual impact assessment for land use or development proposals that may have a significant impact on sensitive landscapes.*

3.1.2 Region and Sub-Region Legislation and Policy

3.1.2.1 Greater Bunbury Region Scheme (2014)

The *Greater Bunbury Regional Scheme* applies to the Greater Bunbury area. The land is categorized into regional-scale zones and reserve. Relevant objectives within the VSA include:

Reserves

- a) Regional open Space – to protect the natural environment, provide recreational opportunities, safeguard important landscapes and provide for public access;*

Zones

- e) Rural – to provide for the sustainable use of land for agriculture, assist in the conservation and wise use of natural resources including water, flora, fauna and minerals, provide a distinctive rural landscape setting for the urban areas and accommodate carefully planned rural developments;*

3.1.2.2 Greater Bunbury Strategy (2013)

The *Greater Bunbury Strategy* provides land use planning for the sub-region to accommodate population growth. The strategy focuses on compact and connected growth in order to achieve this.

Relevant objectives include:

- *Ensure high-quality urban design that recognises local character and amenity, promotes walking and cycling, responds to climate change, and addresses community safety.*
- *Ensure that development occurs in a way that safeguards and enhances the existing environmental, biodiversity and scenic assets.*
- *Ensure the sustainable management of natural resources and the protection of rural landscape, particularly when viewed from public areas such as regional roads.*

The Greater Bunbury Structure Plan forms part of this strategy. This plan is considered to '*protect and enhance waterways, heritage areas, remnant vegetation, and the majority of agricultural land and landscape views, which aims to result in an increased community wellbeing*'. It also reflects that development should occur in a way that safeguards and enhances the existing environmental, biodiversity and scenic assets of the area. The rural characteristics that define rural land are also recommended to be retained.

3.1.2.3 Preston River to Ocean Regional Park (2011)

The Preston to Ocean Regional Park is located to the northern part of the VSA. This 893 ha regional park has been developed to provide a continuous connected east-west open space corridor from the western bank of the Preston River to the ocean. Consisting of predominantly remnant vegetation, the area was recognised as having attractive and important features such as *The Maidens* and important stands of tuart. This document provides a framework and vision for the regional park network.

The Manea Park portion of the park network is located closest to the Proposal. The Park is primarily bushland, and managed for its conservation and nature based recreation. Facilities are currently limited to a pedestrian walk trail, a bridle path, and vehicular access for management.

3.1.3 Local Legislation and Policy

3.1.3.1 City of Bunbury Local Planning Scheme No. 8. (2018)

The *City of Bunbury Local Planning Scheme No. 8* establishes the vision, aims and objectives for the municipality. The suburbs of Usher, College Grove and Davenport are within this and located to the north of the VSA.

Relevant objectives include:

Zones

Residential:

- *To facilitate and encourage high quality design, built form and streetscapes throughout residential areas.*
- *To preserve and enhance residential amenity in relation to competing land uses and urban design issues within residential neighbourhoods through appropriate housing types, forms and densities, and provision of private and public open spaces that contribute to the city's landscape character.*

Rural:

- *To provide for the maintenance or enhancement of specific local rural character.*
- *To maintain and enhance the environmental qualities of the landscape, vegetation, soils and water bodies, to protect sensitive areas especially the natural valley and watercourse systems from damage.*

3.1.3.2 Shire of Capel Local Planning Scheme No. 7 (2018)

Shire of Capel Local Planning Scheme No. 7 establishes the shire's vision, aims and objectives. The suburbs of Dalyellup, Gelorup and North Boyanup are within the Shire of Capel.

Relevant objectives include:

Zones

Residential Zone:

- *Promote and safeguard the health, safety, convenience, general welfare and the amenities of residential areas and their inhabitants.*

Special Rural:

- *...to identify land within the Scheme Area which is suitable for closer subdivision to provide for such uses as hobby farms, rural-residential retreats, intensive agriculture including market gardens and viticulture, the keeping of horses in such a manner as to make provision for retention of the rural landscape and amenity in a manner consistent with the orderly and proper planning of such areas.*

Rural Zone:

- *...to preserve the character of the rural area, discourage the removal of prime agricultural land from agricultural production and prevent adverse effects on the continuation of established or potential agricultural industries.*

Special Provisions

Highway Protection Area

- *Land bounded by the Highway Protection Lines defined on the Scheme Map as being 100 metres distant from either side of the centre line of the road reserve of Bussell Highway, South Western Highway, or by the boundary of the Railway Reserve, where such reserve adjoins the Highway, shall be a Highway Protection Area within which special conditions shall apply to uses allowable under the Scheme zoning provisions in order to protect the function, amenity and visual character of the Highway.*

In relation to amenity and visual character, this provision includes limitation on advertisement signage and building setbacks.

3.1.3.3 Shire of Capel Land Use Strategy (1999)

With a focus on rural land, the *Shire of Capel Land Use Strategy* sets a framework for land use planning whilst preserving the important social, economic and natural character of the region. Land systems are described and their rural land capability outlined, with key development pressures including urbanisation, rural subdivisions, and mineral / gravel extraction.

The strategy specifies objectives for particular Planning Units defined by water catchments, physical constraints or existing land use patterns such as the Bussell Highway. The relevant planning units description, issues and desired uses within the VSA outlined below.

(BU6) - Gelorup/ Dalyellup

Objective:

- *To provide for urban expansion whilst conserving significant areas of natural environmental value.*

Characteristics:

- *Remnant tuart forest; Coastal dune and wetland environments; Soils of the Quindalup, Spearwood and Bassendean Soil Systems; Basalt quarries; Special Rural and Rural Residential subdivision; Areas of wet sands in the Bassendean soils.*

Issues:

- *Preservation of the coastal dune and wetland environment; Preservation of remnant tuart forest; Ongoing excavation of basalt at Gelorup; Future use of rural land within the perimeter created by the Bunbury Outer Ring Road.*

Desirable Uses:

- *Basalt quarries with adequate buffers; Conservation of coastal dunes, wetlands and remnant Tuart forest.*

(BU8) – Beridup

Objective:

- *To provide for long term urban development envisaged by the State Planning Strategy and for a range of other land uses in balance of the Unit which will assist in conserving the rural character and natural environmental values such as remnant vegetation and wetlands.*

Characteristics:

- *Areas of remnant vegetation consisting of jarrah, marri and banksia; Wetland/lakes identified in the Swan Coastal Plain Lakes Protection Policy; Soils predominantly from the Bassendean System with some pockets of soils from the Pinjarra System; Grazing on the cleared and pastured areas of the unit.*

Issues:

- *Conservation of remnant vegetation; Conservation of wetlands and lakes; High water table occurring in areas subject to pressure for change of land use; Low nutrient retention qualities of the Bassendean soil system; Maintenance of a buffer between Rural Residential areas and good quality broad acre farmland; Conservation of the Gelorup Hill; Buffer zone associated with basalt quarrying.*

3.1.3.4 Shire of Capel Urban Landscape Strategy (2011)

This Strategy applies to the urban areas of Dalyellup and Gelorup, among others.

The principle aim of the strategy is to:

- *Enhance amenity, environmental, sustainability and cultural outcomes in relation to the landscaping of public spaces and development sites in urban areas.*

Relevant objectives are to:

- (1) Retain existing native vegetation for its environmental, landscape amenity and cultural heritage values.
- (2) Use indigenous species in the landscape to reflect a sense of place and enhance ecological outcomes.

(5) Encourage the use of landscaping outcomes that reinforce public health, social interaction, cultural heritage and Shire character.

3.1.4 Other Relevant Policy

3.1.5 Visual Screens within the Road Reserve (2013)

This policy outlines the approach to visual screens within road reserves managed by Main Roads.

Visual screens may be used for certain projects to avoid visual impacts on the surrounding area, where the privacy of and / or amenity of views from adjoining property / residences is reduced; there are potential visual distractions to road users; or screening of the view from the road is considered a requirement. Visual screens may also be appropriate where particular views from the road into adjoining land may be considered aesthetically unpleasant or intrusive.

Visual privacy screens may be required where, as a result of road works, visual privacy has been reduced in the adjoining private land, including for example, unwanted views into private property (from buildings or outdoor living areas), and unwanted views from the road reserve (roadways, bridges, shared paths or footbridges).

Visual screens may be either permanent or temporary in the form of built walls or fences, earth bunds, vegetation, combinations of the former, temporary visual screens, acoustic barriers or noise walls, and vegetation.

Assessment criteria typically includes the distance from the road, path or structure; the visible building wall height; any windows that are visible and; the extent of (side and rear) private living areas that are visible as a result of the new works. Screen walls are typically not required where the residence is located more than 100 m from the viewing source.

The community and relevant stakeholders should be consulted with regard to the location and design of visual screens.

3.2 Landscape Context

The following section provides a general overview of the landscape context of the VSA. Refer to Appendix A Figure 2 for landscape characteristics.

3.2.1 Topography and Hydrology

The Proposal is located on the Swan Coastal Plain, which is characterised as a low-lying, gently undulating to flat plain formed on Quaternary marine, alluvial and Aeolian sediments.

The north-eastern portion of the VSA is relatively flat and low-lying, with an elevation of 20 – 30 m. The geology is a combination of Bassendean Sand characterised by low rounded dunes, and Guilford formation, comprising of mainly alluvial sandy clay. This area is predominantly rural, however a basalt quarry is present with some engineered topographic changes.

The south-western portion of the VSA is more undulating, particularly on the eastern side of the Bussell Highway at Gelorup, where a series of rises are present following the coastal alignment. The geology is this location is Sand associated with Tamala Limestone, which is characterised as high dunes. Elevations range from 20 – 55 m. This area is associated with the peri-urban edge of Bunbury.

The main watercourse is Five Mile Brook located on the eastern side of Gelorup, which discharges into Geographe Bay at Minnipup beach to the west. Minor drainage lines are present between dunal rises. The area has a perched water table which results in low lying areas being subject to seasonal water-logging.

3.2.2 Land Use and Built Form

The Proposal traverses through rural land to the north, comprising of cleared grazing land with residences, as well as the basalt quarry. Towards the south, it transitions through rural living areas of Gelorup, characterised by lifestyle/bush blocks with dense native vegetation and dwellings generally set back from the local roads. Where it connects into the Bussell Highway to the north there is some higher density residential growth underway in Dalyellup.

Residential built form is generally one to two storeys with a large garden area. Farming infrastructure is also a common feature. Primary transport infrastructure is the existing Bussell Highway.

3.2.3 Vegetation

A variety of vegetation is established within the VSA. In Manea Park and the Banksia Woodland Reserve on the western side of the Bussell Highway, dense native vegetation associated with Banksia Woodland and Tuart Forest is present. This filters through the residential areas of Gelorup, which have retained large amounts of dense native trees and shrubs, typically surrounding the residential blocks and houses. The rural areas include cleared areas of grasses interspersed with large clumps of native vegetation.

Pre-European vegetation complexes within the southern section include:

- Bassendean Complex - Central and South (44): Vegetation ranges from woodland of *Eucalyptus marginata*, *Casuarina fraserana*, and Banksia species to low woodland of Melaleuca species and sedge lands on the moister sites.
- Karrakatta Complex (49): Predominantly open forest of *Eucalyptus gomphocephala*, *Eucalyptus marginate*, *Eucalyptus calophylla* and woodland of *Eucalyptus marginata* and Banksia species.

Extensive native vegetation of varying quality was identified within and adjacent to the Proposal Area, including five conservation significance ecological communities. Refer to the *Bunbury Outer Ring Road Southern Section Vegetation and Flora Study* (BORR Team, 2020d) for detail.

4 LANDSCAPE CHARACTER AND VISUAL ANALYSIS

4.1 Landscape Character Units

4.1.1 ULDF Landscape Character Units

Within the ULDF, Landscape Character Units were defined and described for the BORR alignment, including BORR Northern Section, BORR Central Section and BORR Southern Section. Landscape Character Units relevant to the Proposal include:

- Landscape Character Unit 10: Preston River to Five Mile Brook
- Landscape Character Unit 11: Five Mile Brook to Bussell Highway
- Landscape Character Unit 12: Bussell Highway - Woods Road to Capel Golf Course

4.1.2 Redefined Landscape Character Units

The above units within the ULDF are based on a project-wide perspective of the corridor. However, as this report focuses on the BORR Southern Section only, a larger-scale analysis was undertaken focusing on the Southern Section only. This has resulted in five Landscape Character Units (LCU) being defined within the VSA as follows:

- Landscape Character Unit 1: Forest
- Landscape Character Unit 2: Peri-Urban
- Landscape Character Unit 3: Rural
- Landscape Character Unit 4: Quarry
- Landscape Character Units 5: Highway

Refer to Appendix A Figure 3 for location of Landscape Character Units.

4.1.3 Landscape Character Unit 1: Forest



Photo 1 Maintenance track within Banksia Woodland, near Bussell Highway



Photo 2 Banksia Woodland, near Bussell Highway

4.1.3.1 Description

LCU1 comprises of forested reserves located on the western side of Bussell Highway, and to the north of Centenary Road.

Key Characteristics include the following:

- Topography is flat to very gently undulating.
- Sandy soils are of the Spearwood and Bassendean dune systems.
- Vegetation associated with remnant Tuart Forest, including Banksia Woodland to the west of the Bussell Highway characterized as a dense coastal forest with medium sized Eucalypts and Banksias, with an understorey of grass and shrubs, to a height greater than 10 m.
- This LCU is primarily bushland, including Manea Park to the north forming part of the Preston River to Ocean Regional Park link. LCU1 is managed for conservation and nature based passive recreation, with facilities limited to a pedestrian walk trail, a bridle path, and vehicular access for management.

Photo 1 and Photo 2 illustrate characteristics of LCU1.

4.1.3.2 Landscape Character Values

Values associated with LCU 1 include vegetation of high ecological value. Preston River to Ocean Regional Park and Banksia Woodland Reserve contains large areas of remnant vegetation including Endangered and Critically Endangered Banksia Woodlands and Shrublands. These reserves also have scenic value associated with these vegetation communities, landscape connectivity value, and values associated with passive recreation. LCU1 therefore has a **High** landscape character value.

4.1.4 Landscape Character Unit 2: Peri-urban



Photo 3 Jules Road, Gelorup.



Photo 4 Woods Road, Gelorup.



Photo 5 Bunbury Regional Prison frontage, Centenary Road.



Photo 6 Eucalyptus Drive with dense bushland, Gelorup.

4.1.4.1 Description

LCU2 comprises of peri-urban residential area primarily located on the western side of the VSA.

Key Characteristics include the following:

- Gently undulating topography associated with dunal rises to the east of the Bussell Highway, with flatter areas to the west. The primary watercourse is Five Mile Brook which traverses through Gelorup. The embankments and surrounding low-lying land tend to flood in the wet season.
- Land use comprises predominantly of residential and rural residential areas of Gelorup and Stratham to the south-west, higher-density areas of Dalyellup to the north-west, and the Bunbury Regional Prison on Centenary Road. Gelorup and Stratham consist of bush blocks dominated by native woodland vegetation with single and double-storey houses set back from the street and nestled within the forest.
- Local roads are characterised as sealed, curvilinear and gently undulating, typically with dense bushland within a few metres of the road corridor. Fencing is varied, informal, and typically rural in character. No street lights or paths are present to local roads.

- LCU2 includes significant remnant areas of dense banksia eucalypt woodland. This woodland extends in and around the vast majority of residential blocks within Gelorup and Stratham. Some areas along the Bussell Highway have been cleared, however most contain large areas of bushland.
- Cultural features include Sleaford Park in Gelorup, containing trees and a small playground. The Capel Golf Course is located on the Bussell Highway. Horse-riding is also a common recreational activity in the area.
- Dense bushland within LCU2 creates an enclosed experience, with residential bush blocks and winding roads creating a sense of privacy.

Photo 3 to Photo 6 illustrate characteristics of LCU2.

4.1.4.2 Landscape Character Values

LCU2 landscape values include remnant vegetation of high ecological value (which may include Endangered Banksia Woodland), and habitat for the critically endangered Western Ring Tail Possum. The Five Mile Brook environment has ecological and habitat value, as well as functioning as an important pedestrian connection for the local community. A Significant Tuart tree is also present within LCU2 to the west of Five Mile Brook. The residential development type within the bushland setting is also relatively unique in its broad-scale retention of large amounts of native vegetation within private land. LCU2 therefore has **High** landscape character value.

4.1.5 Landscape Character Unit 3: Rural



Photo 7 Rural fence line and mixed vegetation, Ken Bell Road.



Photo 8 Open paddock with internal gravel road spatially defined by trees, Gelorup.



Photo 9 Gravel road character with dense vegetation, Ken Bell Road.



Photo 10 Farm sheds and machinery with clumps of vegetation behind, Ducane Road.

4.1.5.1 Description

LCU3 comprises of rural land generally to the north and central part of the VSA.

Key Characteristics include the following:

- Low-lying and generally flat to very gently undulating topography with a high water table and areas of standing water.
- Land use is rural, with grazing land, scattered residences of rural character, and other farming related infrastructure such as sheds. Residences are generally single-storey.
- Local roads are both sealed and unsealed, and generally alignment is in a grid pattern. Property access ways are typically long. No street lights or paths are present to local roads.
- Vegetation generally comprises of grazing pasture with clumps of canopy vegetation. Some remnant vegetation is present, including Marri, Agonis, and Jarrah species, as well as vegetation from the Southern River and Bassendean Complex.
- Cultural features include residences, farming infrastructure and horse-riding facilities on private land.

- LCU3 is relatively open, though dense clumps of connected vegetation define large enclosures on private farmland.

Photo 7 to Photo 10 illustrate characteristics of LCU3.

4.1.5.2 Landscape Character Values

Landscape values associated with LCU3 include remnant vegetation on private land, which may include endangered Banksia Woodland. Local policy objectives also aim to preserve the character of rural area, including the environmental qualities of the landscape, vegetation and watercourses. LCU3 therefore has a **High** landscape character value.

4.1.6 Landscape Character Unit 4: Quarry



Photo 11 Vegetated bund to the perimeter of the Basalt quarry, Jules Road.



Photo 12 Vegetation on perimeter bund, Hasties Road.



Photo 13 Road interface with quarry, Hasties Road.



Photo 14 Quarry entrance, Lillydale Road.

4.1.6.1 Description

LCU4 comprises the Basalt quarry to the east of Gelorup, situated on both sides of the road corridor.

Key Characteristics include the following:

- LCU4 is on a flat, low-lying part of the VSA. However, the topography within the quarry has changed over time as a result of mining activities. Therefore, excavation pits, stockpiles, engineered ponds, and a perimeter bund is present.
- Land use includes the quarry only, which is zoned as rural.
- Hastie's Road, Allenville Road, and Lillydale Road are local roads that zigzag between the two sides of the quarry. Quarry entrances are from Lillydale and Allenville Roads. Wire mesh fencing is present to the perimeter.
- Vegetation is confined primarily to the constructed perimeter earth bund, as well as native buffer vegetation along the eastern side of Jules Road, between the quarry and residential areas of Gelorup. Bund vegetation comprises of large shrub to small trees and grasses.

- The vegetated perimeter bund wraps around the quarry, spatially enclosing it and preventing views in from surrounding areas.

Photo 11 to Photo 14 illustrate characteristics of LCU4.

4.1.6.2 Landscape Character Values

There are no specific values associated with LCU4 identified as part of the policy review. A small patch of remnant vegetation is established on the outer edges of the quarry. LCU4 elements generally have limited contribution to the local character. LCU4 therefore has a **Low** landscape character value.

4.1.7 Landscape Character Unit 5: Highway



Photo 15 Rotary Park rest area, Bussell Highway.



Photo 16 Shared path adjacent to Bussell Highway, near Centenary Road.



Photo 17 Residential property interface, Bussell Highway near Jaymon Road.



Photo 18 Dense vegetation within median, Bussell Highway near Woods Road.

4.1.7.1 Description

LCU5 comprises of the Bussell Highway corridor.

Key Characteristics include the following:

- The Bussell Highway has a very gentle descent towards the south, however the topography is generally flat. The highway is located within a small gentle valley, therefore higher landforms are present on either side of the corridor. In the northern section, the landform slopes relatively steeply towards the reserve and rural areas on the eastern side of the road. A turf bund is present between the highway and new residential development within Dalyellup, which likely functions as noise attenuation.
- Storm water flows from the road surface to the roadside verges and adjacent landscape.

- The Bussell Highway is a State Highway and Primary Regional Road connecting Bunbury with Augusta in the south. The highway is a sealed dual carriageway road, often with planted median and large verges. There are two rest stops within the VSA, one at Rotary Park near Centenary Road, and another between Woods Road and Calinup Road. An overhead transmission line is present on the western side of the highway. A shared path is present on the western side of the highway near Centenary Road, Dalyellup. Interfaces with adjacent land uses vary, from rural style fences to dense native vegetation. A service station is present near Dalyellup.
- Dense native vegetation is present within much of the roadside verges and median, particularly in the vicinity of the two regional reserves (Banksia Woodland Reserve and a portion of the Preston to Ocean Regional Park). Cleared land is also present adjacent to rural residential properties and paddocks to the south. Some remnant vegetation is present within this LCU.
- The highway generally has an enclosed spatial quality due to the predominance of dense native vegetation along the roadsides and within the verge, with filtered views between vegetation in the southern section.

Photo 15 to Photo 18 illustrate characteristics of LCU5.

4.1.7.2 Landscape Character Values

Landscape value associated with LCU5 include some areas of remnant vegetation to the roadsides and verge. The highway is also locally protected under a Highway Protection Area within the planning scheme, however relevant sections relate to signage and building setbacks only. LCU5 therefore has a **Moderate** landscape character value.

4.2 Visual Analysis

The following section provides a visual analysis of the VSA. Sensitive receptors and visual features are identified and described. A visual analysis was undertaken as part of the ULDF report, identifying key views to and from the Proposal. This assessment has referred to this as well as undertaken further analysis. Refer to Appendix A Figure 4 for the visual analysis for the VSA as discussed below.

4.2.1.1 Sensitive Receptors

Sensitive receptors within the VSA are outlined in Table 8. Their level of significance has been given in accordance with the *Visual Landscape Planning in Western Australia* guidelines.

Table 8 Sensitive Receptors and level of significance

SENSITIVE RECEPTOR	LEVEL OF SIGNIFICANCE
Visitors to Banksia Woodlands Reserve, and Preston River to Ocean Regional Reserve.	Level 2: regional significance
Gelorup rural residential areas	Level 1: national/ state significance
Gelorup rural areas	Level 1: national/ state significance
Recreational users of Sleaford Park	Level 3: local significance
Local road users	Level 3: local significance
Road users of Bussell Highway	Level 1: national/ state significance

Refer to Appendix A Figure 6 for location of sensitive receptors within the VSA.

4.2.1.2 Visual features and experiences

Regional reserves

Sections of the Banksia Woodland Reserve and the Preston River to Ocean Regional Reserve within the VSA appear to have few or no designated walking paths present. A vehicular maintenance track is present within the Banksia Woodland Reserve adjacent to the road corridor. This is very densely vegetated, and only filtered views can be achieved from this location to the existing highway (refer to Photo 19). This track may not be popular for walking due to the proximity to the highway.

Gelorup rural residential areas

The rural residential areas within Gelorup are densely vegetated with native bushland, generally to a height of 10 m and above. This typically surrounds many of the residences, including to the front at the street interface, preventing distant views. Some properties are partially cleared, however typically have retained vegetation around the house. Some residences are situated on dunal high points (approximately 35 to 40 metres elevation), however these residences are still nestled within surrounding vegetation.

Much of the rural residential areas of Gelorup are visually protected by surrounding vegetation and therefore have limited views to adjacent land uses. Views to the quarry pits and beyond are prevented by the vegetated perimeter bund, and views to the adjacent rural areas are often screened by large areas of dense native vegetation. The Bussell Highway has a built form offset within the Shire of Capel planning scheme, therefore houses are set-back from the highway allowing intervening vegetation to provide a visual buffer.

The retention of extensive native vegetation within public and private land indicates residents place a value on these as a landscape and visual feature.

Local roads within this area are typically winding and at time undulating. Views from the roads are often framed by dense native vegetation, and relatively short, terminating where the road curves.

Sleaford Park

Sleaford Park comprises of grass and scattered native vegetation including large shrubs and medium sized trees, which has the most density to the north of the park and along the southern interface with Sleaford Drive. The Park appears to be in a relatively natural state, with facilities limited to a playground towards the south-west corner. This is sited on a low elevation, and a steep path connects the playground to Sleaford Road. From the playground, views are short due to surrounding screening vegetation. Refer to Photo 20 for playground context.

Gelorup rural areas

Within the rural areas of Gelorup, cleared areas for grazing open up views across the flat low-lying farmland, from local roads and residences. Areas of dense native vegetation are present which frame views and create a visual backdrop. Perimeter vegetated bunds prevent views of the quarry pits and beyond. Some residences have limited to no garden vegetation, therefore could experience open views from in and around the home. This also indicates residents may value open views to their properties.

Local roads in this area are typically linear, often lined with native roadside vegetation, framing views along the road corridor, however some gaps allow open filtered views to adjacent partially cleared paddocks.

Bussell Highway road users

Large portions of the Bussell Highway are enclosed by dense native vegetation to the roadside and within the verge. This creates long linear views along the highway corridor. More open sections are present to the south near Stratham adjacent to rural residential properties, and to the north near Dalyellup. In these locations, filtered views from the road are experienced through roadside vegetation to residences and small cleared paddocks with scattered trees. The highway traverses through a relatively flat landscape, however is within a gentle valley therefore some higher landforms are present to either side beyond the road corridor.

4.2.1.3 Key views

As the VSA is densely vegetated and comprising of predominantly low-lying rural residential land, there are no significant key views or viewsheds of note.



Photo 19 Bussell Highway viewed from Banksia Woodland Reserve maintenance track.



Photo 20 Sleaford Park playground

5 VISUAL MANAGEMENT OBJECTIVES

This section identifies any visual management objectives relevant to the VSA and Proposal. This section supplements the objectives identified in section 3.1 legislation and policy context.

5.1 Visual Management Objectives

The context analysis, landscape character units and visual analysis have been used to form the basis for establishing appropriate management objectives and strategies to manage the visual character of the landscape within the VSA.

5.1.1 Best practice siting and design

The road alignment and associated built form should be sited within the natural topographic context of the landscape. This would be relatively low-lying, with any earthworks being similar in grade to the slope gradients present within the surrounding natural landscape. Batter and other proposed vegetation to corridor edges should contain a similar vegetation cover, structure and density to what is present within the landscape character unit within which the road passes through. Natural drainage patterns should also be retained. The Proposal footprint should be minimised where possible to minimise impacts, without compromising space within the road corridor for tree planting. The Proposal corridor should be designed to be well integrated with the surrounding landscape character patterns, including the design of local road connections. The design of built form associated with the project, including finishes and materials selection, should respond to the surrounding landscape setting.

5.1.2 Protection and maintenance of landscape character

The valued elements that define the existing landscape character are recommended to be protected, where possible. This includes dense native vegetation along local road and highway edges, surrounding rural and rural residential areas, and within designated reserves. The natural low-lying and dunal topography should also be retained throughout the Proposal. Any proposed new landscape planting and revegetation should be of similar species and composition to the existing within the relevant character unit. Both enclosed linear, and open or filtered views to rural landscapes through native vegetation, should be the predominant visual experience from viewing locations. No obtrusive built form should be visible, particularly above the tree canopy and interrupting more open views. The enclosed visual character of the Bussell Highway, including dense native vegetation within the median, is recommended to be retained and protected where possible.

5.1.3 Restoration of degraded character or enhancement of opportunities

The character of the landscape appears to be in good condition. However, it is recommended that the Proposal creates positive outcomes for the community, where possible. High quality design outcomes should be provided that make a positive contribution to the local built and natural environment. Areas for improvement could include the quarry interface conditions, Sleaford Park amenity, and improvements to pedestrian connectivity.

5.2 Community and Stakeholder Engagement

As stated within the ULDF and *EPA Environmental Referral Supporting Document*, substantial engagement with the community and stakeholder groups has occurred. Key feedback relevant to this assessment includes the following:

- General concerns about the visual impact of vehicle headlights and street lights on residents

- Impacts to visual amenity from construction of roads, associated interchanges, bridges and overpasses
- Concerns about how flora and fauna will be managed
- Incorporation of viewing platforms along the path at high points such as at bridges
- Preference for no paths and no street lights in Gelorup to not change the current local character

Relevant values identified include the following:

- native wildflowers
- the Western Ring-tailed Possum
- rural and agricultural lifestyle
- Aboriginal history
- basalt
- Carnaby's Cockatoo
- frogs.

6 PROPOSAL DESCRIPTION

The following section provides a summary of the Proposal and includes additional detail relating to the main visual components that have potential to affect the landscape character and visual amenity of the VSA. Property acquisition and impacts during construction will also be discussed.

6.1 Summary of the Proposal

The Proposal Area is defined as a development envelope where infrastructure would be established; the development footprint is likely to be less than the Proposal Area and would be defined during detailed design. The Proposal Area covers approximately 200 ha, of which approximately 62 % has been located within cleared agricultural land. The remainder of the Proposal Area is located within native vegetation, which would be cleared for the Proposal.

Key Proposal characteristics are outlined in Table 9. Appendix A Figure 5 shows the Proposal Area and proposed road alignment.

Table 9 Key Proposal characteristics

ELEMENT	PROPOSED EXTENT
Overall Proposal footprint	Clearing or disturbance of up to 200 ha comprising approximately: <ul style="list-style-type: none"> • 76 ha native vegetation • 124 ha of cleared and highly modified land (agricultural land and existing built infrastructure).
Road constructions and associated infrastructure	The road construction and associated infrastructure for the Proposal includes the following components: <ul style="list-style-type: none"> • Approximately 10.5 km of new rural freeway standard, dual carriageway • Grade separation of Yalinda Drive across the highway • A grade separated interchange at Bussell Highway • Approximately 3 km of regional distributor (Centenary Road at Bussell Highway to Lillydale Road) • A grade separated interchange at the western end of Lillydale Road • Local road modifications • Utility modifications • A Principal Shared Path for the full length of the Proposal including grade separated crossings of local roads and Bussell Highway • Other road infrastructure and furniture including, but not limited to culverts, lighting, noise barriers, fencing, landscaping, road safety barriers, underpasses and signs.

Bridges and drainage infrastructure	Bridge construction and associated infrastructure for the Proposal includes the following components: <ul style="list-style-type: none">• New bridge, BORR over Centenary Road / Lillydale Road• New bridge, Yalinda Drive over BORR• New bridge, Bussell Highway southbound over BORR• New bridge, BORR over Five Mile Brook• Drainage basins, drains and other associated infrastructure.
-------------------------------------	---

6.2 Main visual components of the Proposal

The following section describes the main visual components of the Proposal in relation to earthworks, vegetation, bridges, barriers and walls, and other features such as fencing.

6.2.1 Earthworks

Due to the existing low-lying topography of the Proposal Area, raised earthworks above the existing landscape would be required to support the new road infrastructure. Where practicable, however, the Proposal has been designed to be as low as possible to minimise impacts on landscape and visual amenity.

Key areas of earthworks are:

- At bridge locations, raised earthworks would be required to facilitate grade separation between the highway and connecting roads
- North of Five Mile Brook, a clearance of 1.5 m from the groundwater level to the Proposal would be required where the Proposal traverses low-lying land
- In the Centenary Road area of the Proposal, significant cutting would be required to facilitate a link to the Bussell Highway.

Revegetation planting is proposed to all cut and fill batters, which would include canopy and understory species.

Refer to Appendix C for landscape concept design drawings, the ULDF report (BORR Team, 2020a) for proposed planting treatments.

6.2.2 Vegetation

The Proposal would require clearing of existing vegetation. Landscape concept design drawings have been prepared for proposed planting as part of the Proposal design.

Vegetation clearing

The extent of vegetation clearing would be confined to the Proposal Area. This would include extensive dense native vegetation.

The landscape concept design drawings have identified areas where existing vegetation is proposed to be retained between the development footprint and the Proposal Area. Refer to Appendix C for landscape concept design drawings.

Landscape concept design

The Proposal landscape design includes the following key features:

- Formal multi-row tree planting and feature planting mixes to interchanges
- Screen planting of native shrubs and trees to edges interfacing residential land uses
- Corridor amenity trees to either side of the proposed shared path
- Revegetation planting to much of the development footprint, comprising native canopy and understorey species
- Median planting of native shrubs and groundcovers

Refer to Appendix C for landscape concept design drawings, sections illustrating planting heights, and the ULDF report (BORR Team, 2020a) for the design intent and proposed species.

6.2.3 Bridges

Four bridges are proposed at locations as indicated on Appendix A Figure 5. Bridges are likely to comprise pre-cast concrete or steel, supported on concrete column piers and foundations, with mechanically stabilised earth (MSE) walls at abutments. The following provides a brief description of each bridge.

Lillydale Road / Centenary Road

A grade separated interchange is proposed at Lillydale / Centenary Road where the Proposal would pass under a new road bridge. To either side of the bridge, two elevated roundabouts are present, connecting the Proposal to Lillydale and Centenary Roads via on and off ramps. The bridge is proposed to have a clearance of approximately six metres above the road below. Vegetated batter slopes are proposed to either side of the bridge, roundabouts and on and off ramps. Trees are proposed within the roundabout, along the BORR corridor, and to either side of the shared path. Screen planting is proposed in various locations including residential interfaces, which would establish over time. Refer to landscape concept design drawing BORR-02-DG-LA-0102 in Appendix C for plan, drawing BORR-02-DG-LA-0302 in Appendix C for cross-section, and the *BORR South Project Case Structures Concept Design Report* (BORR Team, 2020c).

Five Mile Brook

A bridge is proposed where the Proposal would cross Five Mile Brook in Gelorup. The bridge would have a clearance of approximately 4.6 metres above the creek bank. Long retaining walls would be present to either side of the bridge along the Proposal corridor, supporting the road as it rises and falls on either side of the bridge. Noise barriers are proposed above the retaining walls along the roadside edge where adjacent to residences. Screen planting is proposed at the Proposal Area interface with residential properties, and amenity tree planting adjacent to the shared path, which would establish over time. Refer to landscape concept design drawing BORR-02-DG-LA-0106 in Appendix C for plan, and the *BORR South Project Case Structures Concept Design Report* (BORR Team, 2020c).

Yalinda Drive

A bridge is proposed where Yalinda Drive would cross above the Proposal, connecting to the south to Woods Road, in Gelorup. The bridge would have a clearance of approximately six metres above the road below. Cut and fill earthworks batters are proposed to either side of the interchange. Noise barriers are proposed in various locations where required. Screen planting is proposed at the Proposal Area interface with residential properties, and amenity tree planting adjacent to the shared path, which would establish over time. Refer to landscape concept design drawing BORR-02-DG-LA-0107 in Appendix C for plan, and the *BORR South Project Case Structures Concept Design Report* (BORR Team, 2020c).

Bussell Highway

Two bridges are proposed at the intersection of the Bussell Highway and the Proposal, on either side of a roundabout where the highway is elevated above the Proposal. A clearance of approximately six metres is proposed between the bridges and the road below. Retaining walls are proposed in certain locations within the interchange, as well as cut and fill batter to facilitate the grade separation. Noise walls are proposed to the east of the interchange, and headlight screen walls to the south. Earthworks are planted with native revegetation planting. Features and amenity trees are proposed on either side of the roundabout and shared path, and screen planting proposed to residential property interfaces at the Proposal Area boundary. Refer to landscape concept design drawing BORR-02-DG-LA-0108 in Appendix C for plan, drawing BORR-02-DG-LA-0304 in Appendix C for cross-section, and the *BORR South Project Case Structures Concept Design Report* (BORR Team, 2020c).

6.2.4 Barriers and walls

Noise barriers

Noise barriers are proposed to the southern end of the Proposal where the road corridor interfaces with rural residential areas of Gelorup. Noise barrier heights would range from 2.4 m to 5 m. The location of noise barriers are proposed in the following locations:

- Between the Bussell Highway and adjacent to the Calinup Road extension
- Along either side of the Proposal corridor to the east of the Bussell Highway interchange. Proposed locations are to the edge of the Gelorup rural residential area, to the edge of the Proposal Area, or adjacent to the road or shared path.

Refer to landscape concept design drawings in Appendix C for the location of noise walls, and *Bunbury Outer Ring Road (H058) Forrest Highway to Bussell Highway, Noise Wall and Screens* (Main Road Western Australia, 2019) drawings for location and proposed heights.

Retaining walls

Retaining walls are proposed along the Proposal corridor where required, in locations to minimise the extent of earthworks, and where space is constrained.

Screen walls

Screen walls are proposed (by others) as part of the Proposal at various locations for the purposes of providing visual privacy to nearby residences and protection from headlight glare. A headlight glare study was undertaken to assess potential glare issues on nearby residences. Visual mitigation recommendations were provided to the design team and headlight screen walls incorporated into the Proposal design. Refer to the *BORR South Project Case Design Report* (BORR Team, 2020b).

Refer to the ULDF report (BORR Team, 2020a) for design principles relating to barriers and walls.

6.2.5 Other features

Other urban design and landscape elements relevant to landscape and visual amenity include proposed underpasses, light poles, fencing, and signage.

For more detail, refer to *BORR South Project Case Design Report* (BORR Team, 2020b), *BORR South Project Case Structures Concept Design Report* (BORR Team, 2020c), and the ULDF report (BORR Team, 2020a).

6.3 Property Acquisition

A number of properties would require partial or full acquisition, and possible demolition, to allow for construction of the Proposal. This process is currently ongoing.

6.4 Construction

Construction is planned to commence in Quarter Two 2021 for a period of two to three years. The construction methodology for structures would depend on final design forms.

Construction would be undertaken using traditional earth-moving equipment and construction techniques. The road formation would be built using both fill materials sourced within the Proposal Area and, where necessary, imported fill.

High-level construction methodology for bridges typically comprise:

- Piling works for foundation construction
- Construction of concrete pier columns
- Construction and installation of MSE walls at abutments
- Construction of concrete topping slabs
- Completion of ancillary works such as landscaping.

Underpasses would be installed and comprise pre-cast concrete structures.

Materials for construction of the road and associated structures would be sourced according to the Materials Sourcing Strategy, which considers projects, nearby developments, potential areas of acquisition and commercial quarries as well as alternative recyclable material sources. The key basic raw materials required for construction of the road include sand, limestone, clay, lateritic gravel and crushed rock aggregate. The impacts associated with sourcing materials are not considered part of the Proposal.

Lay down areas for material would be established by the contractor in consultation with Main Roads and Local Government Authorities. Laydown areas are expected to be within the Proposal Area.

7 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

7.1 Impacts to Landscape Character

The following section includes an assessment of impacts to landscape character as a result of the Proposal. Refer to Section 4.1 for description of landscape character units.

7.1.1 Landscape Character Unit 1: Forest

Refer to Table 10 for LCU impact assessment.

Table 10 Landscape Character Unit 1 Assessment

CRITERIA	ASSESSMENT
Anticipated change to landscape character	<p>The Proposal would occur adjacent to LCU1 along the Bussell Highway to the south, and at the BORR – Bussell Highway interchange to the north-west.</p> <p>To the south alongside the Banksia Woodlands Reserve, all proposed works are within the designated road corridor. However, in some locations, the proposed shared path is situated on the reserve boundary. Therefore, the anticipated change may include a small amount of vegetation removal on the highway interface to accommodate the Proposal.</p> <p>To the north at the interface with the Preston River to Ocean Regional Park, the proposed works would require a portion of land along the edge of the designated open space reserve to accommodate a cutting within which the Proposal will be situated. In the location of the cutting, an existing clearing is present, however a group of trees would require removal, and earthworks would occur changing the slope of the landform. The new batter is proposed to be revegetated.</p>
Landscape value	High (refer to section 4.1.3)
Capacity to accommodate change	Moderate, as the anticipated change would be unlikely to have a significant adverse effect on the landscape character, condition or value that could not be mitigated.
Sensitivity to change	High , as although the capacity to accommodate change is moderate the vegetation communities, landscape connectivity and passive recreation have a high value.
Magnitude of change	Low , as the anticipated change would be a relatively minor. The new cutting introduced has potential to be mitigated through revegetation.
Significance of impact	Moderate

7.1.2 Landscape Character Unit 2: Peri-urban

Refer to Table 11 for LCU2 impact assessment.

Table 11 Landscape Character Unit 2 Assessment

CRITERIA	ASSESSMENT
<p>Anticipated change to landscape character</p>	<p>The Proposal would occur both within and alongside LCU2. In the northern section, a new local road connection would occur partially within Sleaford Park, with new roundabout connecting Sleaford Drive and Jules Road. In this location, the anticipated change would include the removal of some roadside vegetation, the realignment of a section of Sleaford Road toward the new roundabout, and some fill batters. Revegetation planting is proposed to new slopes, and screen planting to property boundaries on either side of the road.</p> <p>In the southern section, BORR is proposed to traverse through LCU2 within Gelorup. Local road connections are proposed at Yalinda and Eucalyptus Drives, Woods Road and Brockway Drive, and Calinup and Lakes Road near the Bussell Highway. Anticipated changes include large areas of vegetation removal within the Proposal footprint; a new road and shared path with an elevated section in the vicinity of the Five Mile Brook bridge with long retaining walls to either side; a grade-separated intersection at Yalinda Drive bridge, where BORR is lowered within a cutting with Yalinda Drive above connecting into a new roundabout; a new grade separation at the connection to the Bussell Highway where BORR is lowered within a cutting and an elevated roundabout above; and demolition of a number of existing residences. New noise walls are proposed across the extent of the Proposals interface with LCU2. New landscape treatment would include riparian and revegetation planting, screen planting to interfaces, and amenity trees.</p> <p>The Proposal occurs partially within private property, therefore requiring some partial or full property acquisition within Gelorup and at the interface with the Bussell Highway.</p>
<p>Landscape value</p>	<p>High (refer to section 4.1.4)</p>
<p>Capacity to accommodate change</p>	<p>Moderate, as the anticipated change would be unlikely to have a significant adverse effect on the landscape character, condition or value that could not be mitigated.</p>
<p>Sensitivity to change</p>	<p>High, as although the capacity to accommodate the proposed change is considered moderate, this LCU has a significant amount of high value remnant vegetation and habitat, with unique bush block development characteristics.</p>

<p>Magnitude of change</p>	<p>Moderate, as the anticipated changes would include some loss of existing valued character elements (native vegetation) and local road connection (Woods Road). Proposed built form features at an elevated or lowered height and long extent (new road, grade separations, retaining walls and noise walls) would be out of scale with the existing built form scale within the LCU, and are somewhat at odds with the natural dunal landform. Proposed design features such as roundabouts are new features that are not within the existing LCU characteristics. Although the changes would be discernible, they have the potential to be partially mitigated.</p>
<p>Significance of impact</p>	<p>High-Moderate</p>

7.1.3 Landscape Character Unit 3: Rural

Refer to Table 12 for LCU3 impact assessment.

Table 12 Landscape Character Unit 3 Assessment

CRITERIA	ASSESSMENT
Anticipated change to landscape character	<p>A section of the Proposal would occur within LCU3. To the north, this would include the proposed BORR and shared path. A proposed new road would also connect Centenary Road at the Bussell Highway, to Lillydale Road, grade-separated over BORR at an interchange. In the central section south of the quarry, BORR would traverse through LCU3, with local road connections into Ducane Road, Hastie’s Road, and Jilley Road.</p> <p>Anticipated changes would include vegetation removal within the Proposal footprint; the new road and shared path generally elevated above the low-lying landscape on fill; the grade-separated interchange including elevated roundabouts with larger batters, and a shared path underpass; and the loss of Allenville Road and change of alignment of Lillydale Road. New landscape treatment would include feature planting to new intersection, screen planting, revegetation planting, and amenity trees.</p> <p>The Proposal occurs within existing private land. Some partial or full property acquisition would be required in near the grade-separated interchange.</p>
Landscape value	High (refer to section 4.1.5)
Capacity to accommodate change	Moderate, as the anticipated change would be unlikely to have a significant adverse effect on the landscape character, condition or value that could not be mitigated.
Sensitivity to change	High , as although the capacity to accommodate the proposed change is considered moderate, LCU3 has high value characteristics (remnant vegetation) with policy objectives to preserve the character of the rural area.
Magnitude of change	Moderate , as the anticipated changes would include the loss of existing valued character elements (native vegetation). Proposed built form features at an elevated or lowered height and long extent (new road and grade separations) are not within the existing flat, low-lying landform characteristic of LCU3. Proposed design features such as roundabouts are new features that are not within the existing LCU characteristics. Although the changes would be discernible, they have the potential to be partially mitigated.
Significance of impact	High-Moderate

7.1.4 Landscape Character Unit 4: Quarry

Refer to Table 13 for LCU4 impact assessment.

Table 13 Landscape Character Unit 4 Assessment

CRITERIA	ASSESSMENT
Anticipated change to landscape character	<p>The Proposal would occur both within and alongside LCU4. BORR and the associated shared path are proposed to traverse between the two quarry sites in the location of Allenville Road, and to the east within the quarry site.</p> <p>Anticipated changes would include the removal of existing vegetation within the Proposal footprint along roadsides and within the quarry site, including the existing vegetated bund to the east; the proposed new roadway and shared path, elevated above the existing landform; and the change to local road patterns, including a new roundabout at Hastie’s Road. New landscape treatment would include screen planting, revegetation planting, and amenity trees.</p>
Landscape value	Low (refer to section 4.1.6)
Capacity to accommodate change	High, as the landscape character would have a high capacity to accommodate this type of development. Development of this type is unlikely to have an adverse effect on the landscape character, condition or value.
Sensitivity to change	Low , as although some valued remnant vegetation is present within this LCU, it has a high capacity to accommodate the proposed change.
Magnitude of change	Low , as the anticipated change is relatively minor and although new features are introduced, these are not uncharacteristic within the existing landscape, with perimeter bunds already present, and large-scale dynamic changes to the landscape already occurring.
Significance of impact	Low

7.1.5 Landscape Character Unit 5: Highway

Refer to Table 14 for LCU5 impact assessment.

Table 14 Landscape Character Unit 5 Assessment

CRITERIA	ASSESSMENT
Anticipated change to landscape character	<p>The Proposal would occur within LCU5. To the north, a new interchange is proposed where an extension of Centenary Road connects east towards BORR via the Bussell Highway. In this location, a new at-grade roundabout is proposed.</p> <p>To the south, a new grade-separated interchange is proposed connecting the Bussell Highway into BORR, including an elevated roundabout with BORR below in a cutting. Widening of the highway would occur to the south, including a separated service road extension of Calinup Road running adjacent to the highway.</p> <p>Anticipated changes include vegetation removal within the Proposal footprint; the widened road; new grade-separated interchange with associated batters, retaining walls and visual screens; and new shared path underpass. New landscape treatment would include screen and amenity planting, revegetation and riparian planting, and planting to medians.</p>
Landscape value	Moderate (refer to 4.1.7)
Capacity to accommodate change	Moderate, as any change caused by the proposed development would be unlikely to have a significant effect on the landscape character, condition or value that could not be mitigated.
Sensitivity to change	Moderate , as elements of the landscape character have a moderate value, and LCU5 has a moderate capacity to accommodate the proposed change.
Magnitude of change	Moderate , as changes to the landscape character would be discernible due to loss of existing native vegetation and the introduction of the grade-separated interchange, which would be out of scale within the existing landscape characteristics.
Significance of impact	Moderate

7.2 Visual Impacts

This section includes an identification of viewpoint locations, visual impact assessment from these locations, and an overview of construction impacts.

7.2.1 Viewpoint Locations

Based on the visual analysis combined with an understanding of the Proposal, viewpoint locations were selected for assessment of visual effects. Refer to Table 15 for more detail and Appendix A Figure 6 for locations. For each viewpoint, a panorama of the existing view is provided, together with a description of the existing view, anticipated changes, and impact assessment rating.

Table 15 Viewpoint Locations

VIEWPOINT	LOCATION	PUBLIC / PRIVATE	SENSITIVE RECEPTOR
VP01	Bussell Highway	Private	Residents
VP02	Bussell Highway	Private	Residents
VP03	Sleaford Drive	Public	Nearby residents, local road users, pedestrians.
VP04	Bussell Highway	Private	Residents / workers
VP05	Bunbury Regional Prison	Public	Workers / visitors
VP06	Lillydale Road	Private	Residents / workers
VP07	Ducane Road	Private	Residents
VP08	Marchetti Road	Private	Residents / workers
VP09	Yalinda Drive	Private	Residents
VP10	Yalinda Drive / Eucalyptus Drive	Public	Local road users / pedestrians
VP11	Woods Road	Public	Local road users / nearby residents
VP12	Woods Road	Private	Residents
VP13	Calinup Road	Private	Highway road users / pedestrians
VP14	Bussell Highway	Public	Residents

7.2.2 Other Viewing Locations

Two other viewing locations were considered, however a full assessment has not been provided due to the limited viewing opportunity from primary passive recreation locations within the property. An additional location could not be accessed during the site inspection, therefore a cross-section has been provided for discussion. Refer to Table 16 for a description of other viewing locations, and section 7.2.17 for a discussion of views from these locations.

Table 16 Other viewing locations

VIEWPOINT	LOCATION	PUBLIC / PRIVATE	SENSITIVE RECEPTOR
VP15	Eucalyptus Drive	Private	Residents
VP16	Woods Road	Private	Residents
VP17	Yalinda Drive	Private	Residents

7.2.3 Viewpoint Location 01: Bussell Highway



CRITERIA	COMMENTS
Location and View Direction	<p>GPS location: 33°23'13.578" S 115°38' 41.604" E; Elevation: 28.4 m.</p> <p>This viewpoint is located along the fence line within the garden at the front of the residence. The VP is approximately 100 m from the Proposal footprint, and is facing north-west towards the Bussell Highway. The residence is two-storey with windows facing in the direction of this view. This viewpoint is representative of views experienced by residents.</p>
Description of Existing View	<p>VP01 largely comprises of a view of the nearby trees within the paddock between the residential garden and the Bussell Highway. The foreground includes the lawn within the front yard meeting the post and wire fence. Beyond this, the terrain descends towards the existing highway, with multiple medium to large trees on the slope. These largely screen views of the highway, allowing only glimpses of the road pavement to the centre of the view. To the right, dense native vegetation can be seen which is located to the north of the driveway entry from the Bussell Highway.</p>
Anticipated Change to View	<p>Anticipated changes to this view include some tree removal to the centre of the view close to the Bussell Highway. Where the existing highway can be seen, part of a new roundabout may be seen in the short term, with road pavement, some raised vegetated batter, and new tree planting appearing a bit closer to the viewer than the existing road. However, screen planting of native shrubs and trees would, over time, likely screen views of the proposed roundabout from this location.</p> <p>The existing dense vegetation to the centre right would appear less dense, as a new road would be proposed in this location, partially screened by a smaller clump of existing trees to be retained alongside the existing driveway. At this stage of the design, it is unclear what changes would occur to the existing property access.</p>
Sensitivity to change	<p>High, as this view represents occupiers of a residential property with long viewing periods from the surroundings of the home, with value associated with enjoyment of views and their setting.</p>
Magnitude of Change	<p>Low, as the anticipated changes would be relatively minor, and would contain elements of scale and character present within the existing view.</p>
Significance of Impact	<p>Moderate</p>

7.2.4 Viewpoint Location 02: Bussell Highway



CRITERIA	COMMENTS
Location and View Direction	<p>GPS location: 33°23'15.300" S 115°38' 54.336" E; Elevation: 32 m</p> <p>VP02 is located adjacent to the front of a single-storey residence on rural land within the Jenour Farm property. VP02 is located approximately 120 m from the Proposal footprint, looking north-east towards a proposed new road and roundabout. VP02 is representative of views experienced by residents.</p>
Description of Existing View	<p>VP02 largely comprises of an open view across the paddock surrounding the residence, towards nearby surrounding dense vegetation. To the right, the green grass from the properties' front lawn can be seen, with a garden shade tree adjacent to the backyard fence. Beyond the lawn, the ground plain transitions to a gravel roadway and within an expanse of dry grass. To the background, two large trees to the left of the image sit in front of a small rise in the landscape, with the remaining landscape appearing relatively flat. A continuous row of dense native vegetation is present across the background of this view, located within this property.</p>
Anticipated Change to View	<p>A new road with footpath is proposed which would appear from left to right across the view, located to the centre between the flat grassland and dense vegetation. The road pavement, traffic, pedestrians and signage would initially be seen before intervening proposed vegetation matures. A new roundabout would appear to the centre right of view. The proposed roads would be slightly raised above the existing landform. Proposed planting would include trees to both sides of the road verge, and new trees to the roundabout. Native screen planting is proposed along the extent of the Proposal Area boundary, between the road and the viewer. Once mature, this would screen the new road and associated elements from view. Refer to photomontage in Appendix B.</p>
Sensitivity to change	<p>High, as this view represents occupiers of a residential property with long viewing periods from the home and surrounds. Value is placed on the landscape and enjoyment of views of their setting.</p>
Magnitude of Change	<p>Moderate, as the anticipated change would be discernible and would introduce new elements across the extent of the view which would be uncharacteristic within the existing setting. However, this change has potential to be partly mitigated.</p>
Significance of Impact	<p>High-Moderate</p>

7.2.5 Viewpoint Location 03: Sleaford Drive



CRITERIA	COMMENTS
Location and View Direction	<p>GPS location: 33°23' 32.064" S 115°38' 55.878" E; Elevation: 38.7 m</p> <p>VP03 is located on a pedestrian footpath at the corner of Sleaford Drive and Jules Road. This is on the edge of a residential area and rural land, approximately 15 m from the Proposal footprint, and looking north-east. Sleaford Road is a local road, and the residence to the south of this viewpoint are elevated above the roadway. This viewpoint is representative of nearby residences, road users, and pedestrians.</p>
Description of Existing View	<p>VP03 is looking towards the corner of Sleaford Drive and Jules Road, which forms a corner at the centre of the view. Rural private land is present to the middle ground, comprised of a clearing of dry grasses and clumps of native vegetation. A gravel road entrance and gate provide are present to the centre of the view, with directional signage and low shrubs to either side. Sleaford Park appears to the left of the view, with low fence, signage, and native shrubs and trees.</p>
Anticipated Change to View	<p>The anticipated change to this view include a new roundabout to the centre of the view in the location of the gate. Sleaford Drive would be realigned towards the roundabout therefore the existing corner would be demolished and new roads would appear, with Sleaford Drive located further from the viewing location and partially within Sleaford Park. All of the foreground features within the view would therefore be removed. A new roadway is also proposed to extend from the roundabout, into the distance away from the viewer. Some vegetation removal would occur in the background to allow for this new road corridor. The new roads and roundabout would be slightly elevated above the existing road. New planting is proposed to the centre of the roundabout, to either side of the new road, as well as screen planting to residential and parkland edges.</p>
Sensitivity to change.	<p>High, as the nearby residence is within close proximity and elevated above the roadway, oriented towards the direction of this view, and with a veranda. Pedestrians and local road users would experience this view regularly, however views would be short term and experienced when passing through this location.</p>
Magnitude of Change	<p>Moderate, as although the anticipated changes would introduce new permanent elements across the extent of the view, key elements remain in place and the new features are not uncharacteristic within the view.</p>

Significance of
Impact

High-Moderate

7.2.6 Viewpoint Location 04: Bussell Highway



CRITERIA	COMMENTS
Location and View Direction	<p>GPS location: 33°23' 32.568" S 115°39' 10.308" E; Elevation: 22.7 m</p> <p>VP04 is located within the front yard of a single-storey residential property within rural land on the Jenour Farm property. This viewpoint is situated approximately 380 m from the Proposal footprint, looking east. The viewpoint is representative of workers and occupiers of the residential property. At the time of the site inspection, this house did not appear to be used as a permanent residence.</p>
Description of Existing View	<p>VP04 comprises of open farmland surrounding the residence, as well as some features within the house yard. To the foreground, work equipment and pallets, are scattered within the yard within the post and wire fence that extends across the view. Two trees are present to the centre of the view, as well as the house and entry steps to the right. Beyond the fence, open paddocks of dry grass can be seen, and the undulating banks of a dam to the left. To the background, dense native vegetation forms a continuous backdrop to the view, which includes a dense Melaleuca forest.</p>
Anticipated Change to View	<p>Anticipated changes would include a new roadway to the front of the distant trees, extending across the view from left to right. A small number of existing trees would be removed. The proposed road would be slightly elevated above the existing landform. Proposed planting would include screen planting along the edge of the roadway between the road and the viewer, which would likely screen views of the new road and traffic, once mature.</p>
Sensitivity to change	<p>Moderate as residents would have long viewing periods however would experience views at a distance from the proposed change. Outdoor workers would be focused on their work, with intermittent views towards the Proposal.</p>
Magnitude of Change	<p>Low, as although the proposed change would be partially visible across the extent of the view through foreground elements, the scale of change would be relatively minor, and behind existing features. No key characteristic elements would be removed from this view. When the proposed screening vegetation is mature, visible changes would largely be characteristic of the existing view.</p>
Significance of Impact	<p>Moderate-Low</p>

7.2.7 Viewpoint Location 05: Bunbury Regional Prison



CRITERIA	COMMENTS
Location and View Direction	<p>GPS location: 33°23' 10.344" S 115°40' 15.528" E; Elevation: 16.2 m</p> <p>This viewpoint is located on the southern side of Centenary Road, adjacent to the on-street car park of the Bunbury Regional Prison. VP05 is located approximately 470 m from the Proposal footprint, and looking south. The southern side of Centenary Road typically has relatively dense vegetation, however some gaps exist such as at this location. This view is representative of visitors or workers travelling in and out of the regional prison, and utilising the sheds for work.</p>
Description of Existing View	<p>VP05 comprises of an open grassy paddock with dense native vegetation behind. The foreground includes a broken wire fence, sandy soil behind, framed by roadside vegetation. A corrugated iron shed is present to the left of the view, within private rural land. The middle-ground is dominated by the flat open paddock with dry grass and scattered shrubs. Beyond this, dense native vegetation is present extending across the background of the view.</p>
Anticipated Change to View	<p>The Proposal would include BORR and associated shared path situated mostly behind existing vegetation to the background. Any anticipated change would likely include a small reduction to the density of background vegetation. Some glimpses of the Proposal may be discernible through filtered canopy in the distance, however this would likely be mitigated by proposed vegetation over time, once established, which would include amenity tree planting on either side of the shared path between the viewpoint and the proposed road.</p>
Sensitivity to change	<p>Negligible, as this location is largely screened by vegetation along Centenary Road and within the rural land between the viewpoint and the Proposal. Views experienced would have short viewing times.</p>
Magnitude of Change	<p>Negligible, as the anticipated change would likely be imperceptible, with little to no change to features or characteristics within the view.</p>
Significance of Impact	<p>Negligible</p>

7.2.8 Viewpoint Location 06: Lillydale Road



CRITERIA	COMMENTS
Location and View Direction	<p>GPS location: 33°24' 2.742" S 115°40' 8.082" E; Elevation: 22.6 m</p> <p>This viewpoint is located adjacent to horse stables and a shed associated with a residential property on Lillydale Road, situated to the left of the view. VP06 is approximately 32 m from the Proposal footprint and looking south-west. The viewpoint is representative of residents and workers in and near the stables and paddocks.</p>
Description of Existing View	<p>VP06 comprises of a view over an enclosed paddock, with tall trees to the edges. To the foreground, the flat dry grassy paddock is present, with post and wire fence and drinking trough to the right. Tall trees can be seen to the left within another area used for parking horse floats. A number of equestrian jumping equipment can be seen along the fence line. Across the front of the view, some scattered trees are present along the interface to Lillydale Road. Across the road, dense small tall shrubs and small trees form a dense green backdrop to the extent of the view.</p>
Anticipated Change to View	<p>The proposed re-aligned and widened Lillydale Road would appear from left to right across the view, located mid-way within the foreground paddock and in the location of the horse floats. This road would be elevated above the existing landform. Associated elements would include traffic. All of the foreground trees within this view would be removed for the new road. Proposed new vegetation would include screen planting between the viewpoint and the proposed new road, to the edge of the Proposal Area boundary. Refer to photomontage in Appendix B .</p>
Sensitivity to change	<p>Moderate as this location is not close to the house however is within an active recreation area of their property where horse riding activities take place. Viewers in this location would be both focused their recreational activity as well as experiencing intermittent frequent views of the landscape setting.</p>
Magnitude of Change	<p>High, as the proposed change to the view would be substantial due to the loss of key characteristic features of the view. The change would cause the quality of the view to be diminished.</p>
Significance of Impact	<p>High- Moderate</p>

7.2.9 Viewpoint Location 07: Ducane Road



CRITERIA	COMMENTS
Location and View Direction	GPS location: 33°25' 2.568" S 115°39' 32.838" E; Elevation: 14.8 m VP07 is located adjacent to a single-storey residential dwelling and the driveway entry, next to the west facing windows. VP07 is situated approximately 200 m from the Proposal footprint, looking west. The viewpoint is representative of views experienced by residents.
Description of Existing View	VP07 largely comprises of views across the rural paddock within the property. To the foreground, the gravel entry driveway can be seen, with fence line behind. Dry grass is present to the middle ground within the paddock, beyond which groups of medium to tall native trees are present within the paddock. To the left, more distant views of dense vegetation can be seen.
Anticipated Change to View	Anticipated changes would include a new road behind the clump the native vegetation within the paddock. Part of the road and associated infrastructure would be visible in the short term, through the clearing to the left of the view, where some of the more distant trees in this location would be removed. The road may also be partially visible through the closer trees, as trees behind would be removed. The proposed road would be elevated above the existing landform. Proposed planting includes native screening vegetation to the Proposal Area boundary between the new road and viewer, therefore over time, this would likely screen views of the road from this location. However, infrastructure such as light poles may still be seen.
Sensitivity to change	High , as this view represents occupiers of a residential property with long viewing periods from the home and surrounds. Residential viewers place value on the landscape setting within which they live.
Magnitude of Change	Moderate , as the anticipated changes would be discernible due to a partial change to the distant view and changes the characteristics of the view, however impacts would diminish over time as vegetation matures.
Significance of Impact	High- Moderate

7.2.10 Viewpoint Location 08: Marchetti Road



CRITERIA	COMMENTS
Location and View Direction	<p>GPS location: 33°25' 27.702" S 115° 38' 56.142" E; Elevation: 18.2 m</p> <p>VP08 is located at the front of a single-storey residence within a rural property. The home is located off of Marchetti Road, and approximately 150 m from the Proposal footprint, looking north-west. In this location, there are a cluster of rural buildings including two houses and work sheds, to accommodate a working farm. During the site inspection, this residence did not appear to be occupied. This viewpoint is representative of views experienced by residents (when occupied) and workers.</p>
Description of Existing View	<p>VP08 largely comprises of views across the flat rural paddocks of the property towards some trees. To the foreground, the entry driveway can be seen curving between dry grassy fields contained by fences. To the background, scattered trees form a continuous dark green backdrop to the view.</p>
Anticipated Change to View	<p>Anticipated changes would include the proposed BORR roadway extending across the extent of the view in the location of the driveway and to the front of the background trees. A number of the closer trees to the left within the paddock would be removed. The new road would be elevated above the existing landform, therefore some vegetated fill batters, traffic and associated road infrastructure would be seen in the short term. Proposed planting includes native screening vegetation to the Proposal Area boundary between the new road and viewer, therefore over time, this would likely screen views of the road from this location. However, infrastructure such as light poles may still be seen.</p>
Sensitivity to change	<p>High, as residents (when the house is occupied) would have long viewing periods with value placed on the landscape setting, and are within close proximity to the proposed change. Outdoor workers would primarily be focused on their work, with intermittent views.</p>
Magnitude of Change	<p>Moderate, as there would be an obvious change to the view due to new features appearing across the extent of the view, changing the view characteristics and reducing the overall depth of the view. This new features could be somewhat screened over time with proposed new planting.</p>
Significance of Impact	<p>High-Moderate.</p>

7.2.11 Viewpoint Location 09: Yalinda Drive



CRITERIA	COMMENTS
Location and View Direction	<p>GPS location: 33°25' 34.158" S 115° 38' 14.232" E; Elevation: 56.9 m</p> <p>This viewpoint is located within the backyard of a residential property on Yalinda Drive, between the house and Five Mile Brook. VP09 is approximately 100 m from the Proposal footprint, looking south-east. This viewpoint is representative of views experienced by residents.</p>
Description of Existing View	<p>VP09 comprises of a filtered view across Five Mile Brook through linear native vegetation to dense bushland on the far bank. To the foreground, the edge of the backyard lawn can be seen, with dappled shadows cast over some tree stumps and logs and ferns. The creek appears to be dry at this time. The denser vegetation behind creates a strong backdrop to the view.</p>
Anticipated Change to View	<p>As the proposed retaining wall and noise wall is located approximately 100 m from this viewpoint, due to the amount of intervening vegetation, anticipated changes to this view may be limited to a reduction in density of background vegetation on the far side of the waterway. It is unlikely that the built form infrastructure would be visible from this location. Proposed planting includes native screening vegetation to the Proposal Area boundary between the new road and viewer.</p>
Sensitivity to change	<p>High, as this view represents occupiers of a residential property with long viewing periods from the home. Viewers would place value on the landscape setting, which is evident in the lack of boundary fencing between the property and the brook.</p>
Magnitude of Change	<p>Negligible, as any changes are likely to be difficult to detect due to intervening vegetation. The view would likely remain unchanged.</p>
Significance of Impact	<p>Negligible</p>

7.2.12 Viewpoint Location 10: Yalinda Drive / Eucalyptus Drive



CRITERIA	COMMENTS
Location and View Direction	<p>GPS location: 33°25' 39.798" S 115° 37' 52.338" E; Elevation: 28.7 m</p> <p>VP10 is located on the corner of Eucalyptus Drive and Yalinda Drive within a rural residential area of Gelorup, on an existing footpath. VP10 is located within the Proposal footprint, looking south, and approximately 120 m from the Yalinda Road bridge. This viewpoint is representative of road users and pedestrians.</p>
Description of Existing View	<p>VP10 consists of an existing road intersection surrounded by dense vegetation. To the foreground, the sealed road intersection and road signage can be seen, with large shrubs to the roadside. A gravel roadway extends from the intersection to a private property. To the middle ground, dense trees and shrubs are present within adjacent properties. As the topography descends away from the viewer, the tree canopy horizon dips in the centre of the view.</p>
Anticipated Change to View	<p>Anticipated changes would include the extension of Yalinda Drive through the trees to the centre of the view. The existing intersection would be re-formed to achieve the required grades towards a proposed bridge ahead, which would cross over the BORR corridor. Relatively large fill batter would be present on either side. The majority of vegetation within the view would be removed, including vegetation to either side of the road, and on the far side of the gravel driveway. A new access road connecting to Yalinda Drive may be visible to the left. Bridge infrastructure may include barriers and screens to either side of the bridge, which may be visible. Proposed new planting would include native revegetation to batters, screen planting to residential interfaces, and amenity corridor trees to the new access road off Yalinda Drive.</p>
Sensitivity to change	<p>Low, as road users are passing through or adjacent to this area and therefore have short term views.</p>
Magnitude of Change	<p>Moderate, as anticipated changes would be obvious due to the loss of key features such as mature vegetation, and introduction of new built form infrastructure. However, with mitigation, the longer term view would be within the characteristics of the existing view.</p>
Significance of Impact	<p>Moderate-Low</p>

7.2.13 Viewpoint Location 11: Woods Road



CRITERIA	COMMENTS
Location and View Direction	<p>GPS location: 33°25' 49.932" S 115° 37' 57.906" E; Elevation: 11.7 m</p> <p>VP11 is located on the northern side of Woods Road, within the Proposal Area boundary and approximately 140 metres from the proposed Yalinda Drive extension. VP11 is looking north-west. Woods Road is a local road within the rural residential area of Gelorup. This view is representative of road users and nearby residents.</p>
Description of Existing View	<p>VP11 is a view along Woods Road and towards the rural residential property to the right. Large shrubs, a fence and overhead power lines are to the centre, forming the boundary interface between the property and roadway. The landform is undulating in this location, rising towards the distance and to the right. A property access can be seen along the roadway to the left of the road, with dense vegetation behind. Trees are present to the background, forming a backdrop to the view beyond the paddock.</p>
Anticipated Change to View	<p>This would include the Yalinda Drive road extension which would appear beyond the paddock and to the right of the existing large shrubs at the road interface. This road would be elevated above the existing landform, with large fill batter slopes to the edges. Filtered views would be achieved through foreground trees to the elevated roadway. Woods Road to the left of the view would also be resurfaced and elevated slightly above the existing road levels. This new road alignment would curve around to the right rather than remain straight, therefore some vegetation would be removed to the background, reducing the existing density, as well as to the left side of the road. Proposed planting would include revegetation to steep batters, as well as screen planting along the interface between the Proposal Area and residential property to the right. Refer to photomontage in Appendix B.</p>
Sensitivity to change	<p>Moderate, as road users are passing through this area and therefore have short term views, however this viewpoint is close to a residential driveway, and residence would experience views frequently when entering and leaving their property.</p>
Magnitude of Change	<p>Low, as although the anticipated changes would be visible due to the realignment of existing road and new road to the right of the view, key vegetation would be retained and the changes would not be uncharacteristic within the existing view.</p>
Significance of Impact	<p>Moderate-Low</p>

7.2.14 Viewpoint Location 12: Woods Road



CRITERIA	COMMENTS
Location and View Direction	<p>GPS location: 33°25' 57.954" S 115° 37' 12.576" E; Elevation: 24.9 m</p> <p>This viewpoint is located on the driveway adjacent to a single-storey residence on shared access way off Woods Road. VP12 is located approximately 40 meters from the Proposal footprint and is facing south-east towards BORR. This view is representative of views experienced by residences from this location.</p>
Description of Existing View	<p>VP12 comprises of a view towards the residential entry to the property, including the front garden, driveway, and native vegetation within adjacent land. To the foreground, a tree trunk, fencing and small shrubs are present. Beyond the property access boundary to the centre of the view, a shared driveway can be seen, lined with formal thin trunked trees. To the right, some large shrubs and trees allowed filtered views beyond the road to adjacent bushland.</p>
Anticipated Change to View	<p>Anticipated changes to this view would include the new BORR road extending across the view just beyond the shared driveway. This would appear as a four metres high noise wall above a small fill batter. All vegetation beyond the rows of thin trunked trees would be removed to accommodate the new road. Some road infrastructure such as light poles may be visible above the noise wall. Proposed planting includes a revegetation mix to the batter slopes and, canopy tree planting on the other side of the noise wall. Refer to photomontage in Appendix B.</p>
Sensitivity to change	<p>High, as this view represents occupiers of a residential property with long viewing periods from the area surrounding the home. Residents would experience this view when at home and entering and leaving the property.</p>
Magnitude of Change	<p>High, as there is an obvious change to the view due to a total loss of background vegetation and introduction of new road infrastructure features including the noise wall and possible light poles. The change would be permanent with few opportunities for mitigation.</p>
Significance of Impact	<p>High</p>

7.2.15 Viewpoint Location 13: Calinup Road



CRITERIA	COMMENTS
Location and view direction	<p>GPS location: 33°26' 23.982" S 115° 36' 51.294" E; Elevation: 30.5 m</p> <p>VP13 is located on a footpath at the corner of Calinup Road and the Bussell Highway, within the Proposal footprint. VP13 is facing south-west towards the proposed widening of the Bussell Highway and extension of Calinup Road. This viewpoint is representative of views experienced by highway road users and pedestrians.</p>
Description of existing view	<p>VP13 comprises of an existing road intersection with areas of buffer vegetation to roadside interfaces. The foreground view is dominated by the Calinup Road pavement, median, signage and a transmission pole. To the right of the view, the Bussell Highway passes across the view towards the centre, disappearing behind vegetation. To the left, small trees and large shrubs are present behind a timber fence, with similar vegetation to the far side of the highway edge.</p>
Anticipated change to view	<p>Anticipated changes would include the widening of the existing Highway. This would result in widening to the left of the existing highway, with an additional parallel roadway further to the west, as an extension of Calinup Road. All roadside buffer vegetation to the left of the highway would be removed and replaced with roadway, and Calinup Road would no longer intersect the highway in this location. Some minor widening would also occur on the far side of the roadway, therefore some roadside buffer vegetation would be removed. The proposed widening would also require the road to be elevated approximately one metre above the existing levels. A new retaining wall would separate the highway with the Calinup Road extension. Proposed planting would include screening to the left of the new road between the highway and Calinup Road extension, and alongside the adjusted property boundary; screen planting is also proposed to the far side of the highway.</p>
Sensitivity to change	<p>Moderate, as road users and pedestrians are passing through this location and therefore have short term views. However, this is a state highway and therefore carries a higher level of significance.</p>
Magnitude of change	<p>Moderate, as there is an obvious change to the existing view due to the loss of existing vegetation and road corridor widening, however this change is not uncharacteristic within the existing view.</p>
Significance of impact	<p>Moderate</p>

7.2.16 Viewpoint Location 14: Bussell Highway



CRITERIA	COMMENTS
Location and view direction	<p>GPS location: 33°26' 37.746" S 115° 36' 40.530" E; Elevation: 8 m</p> <p>VP14 is located on the western side of the Bussell Highway near a residential property entrance. VP14 is located approximately four metres from the Proposal footprint and looking east towards the proposed road widening. This viewpoint is representative of views experienced by residents.</p>
Description of existing view	<p>VP14 is a view across the highway towards rural residential properties on the far side, with large setbacks. The highway can be seen to the foreground extending across the view, with concrete median, gravel verge and transmission poles. Dense large shrubs and trees are present to the far side of the highway, largely within private property. Some gaps in vegetation allow for filtered views through clearings.</p>
Anticipated change to view	<p>Anticipated changes would include the widening of the existing highway, within the foreground of the view and also to the far side of the highway. The road would be slightly elevated above the existing road level, therefore a batter slope would appear to the new roadside edge, closer to the viewpoint. On the far side, the Calinup Road extension would be present parallel to the widened highway. A small number of trees may be removed to the left of the view. More traffic would likely be seen travelling on the widened highway. Proposed planting would include low planting within a new median; and screen planting between the far side of the highway and the Calinup Road extension. Over time, this would likely prevent views to this local access road.</p>
Sensitivity to change	<p>Moderate, as occupiers of residential properties facing the highway would have long viewing periods, are within close proximity to the highway, however are partially screened from the Proposal.</p>
Magnitude of change	<p>Low, as the anticipated changes would be obvious but are relatively minor, and within the existing view characteristics.</p>
Significance of impact	<p>Moderate-Low</p>

7.2.17 Other Viewing Locations

7.2.17.1 Viewpoint Location 15: Eucalyptus Drive



Photo 21 View towards Proposal from lawn adjacent to house



Photo 22 View towards Proposal from southern extent of orchard

VP15 (Photo 21) is located within the side yard of a residential property on Eucalyptus Drive, on the eastern side of the house. VP15 is approximately 60 m from the Proposal footprint, looking south-east towards the Yalinda Drive bridge. Residents of this property have recently moved out due to property acquisition, however this viewpoint has been included as representative of potential views experienced from adjacent residential properties to the east along Eucalyptus Drive which could not be visited during the site inspection due to limitations relating to property access requirements.

VP15 comprises the lawn area of the garden to the foreground, with two trees to the centre of the view. Shrubs and groundcovers form an edge to the lawn on the left. The back of the house can be seen to the right of the view, as well as a garden shed beyond the foreground trees. Behind the house yard, an orchard is present stretching approximately 35 m from the garden shed. Beyond the garden to the left, and beyond the orchard, dense bushland is present with medium sized trees and tall shrubs, with limited understorey.

Views from the house and side yard towards the Proposal are currently screened by existing intervening vegetation within the bushland area surrounding the house, and the orchard. This location is likely to be the primary area of passive recreation. Any potential change to views from this location are therefore considered to be minor due to the extent of intervening vegetation between the viewer and the Proposal in this location.

An additional view has been included from the south-west corner of the orchard area (Photo 22). This location is approximately 25 m from the Proposal footprint, looking south-east. Approximately 20 m of existing vegetation is proposed to be retained between the fence line and Proposal. Beyond this, screen planting is proposed along the Proposal Area boundary, comprising of dense shrubs, trees and

groundcovers. Behind this would be a vegetated fill batter with a noise wall along the proposed shared path corridor edge to the top of the batter edge, and amenity tree planting providing screening. From this location, changes to the view may include removal of middle ground vegetation, a shortening of the view due to the addition of proposed screening vegetation, with possible filtered view of the vegetated batter behind. New fencing may also be present along the Proposal Area boundary.

7.2.17.2 Viewpoint Location 16: Woods Road



Photo 23 View towards Proposal from front garden



Photo 24 View towards Proposal from rear driveway

VP16 (Photo 23) is located within the side yard of a residential property on Woods Road, on the south-western side of the house. VP16 is approximately 110 m from the Proposal footprint, looking east towards the proposed roundabout of Yalinda Drive and Wood Road.

The house with veranda is oriented towards Woods Road to the south. On the western side of the house, scattered trees and a number of structures are present between the house and the Proposal. On the northern side of the house, a small partially-covered outdoor area is present surrounded by timber fencing. No views of the proposed new roundabout or Yalinda Drive bridge are likely to be achieved from the house, due to its orientation and intervening elements. The outdoor area as designed to be relatively inward-facing, with the presence of surrounding vegetation. Any views from this location would therefore be limited.

VP16 (Photo 23) is a view from near the driveway. The presence of intervening vegetation largely screens any potential views to the roundabout and roadworks behind. However, proposed new screening vegetation would be seen along the roadside edge to the left within the view. Photo 24 is a view from the back of the property on the driveway, near the outdoor area. Any changes to this view would be within the background of the view, behind foreground features and middle ground vegetation. The change would

include the removal of some background trees. Proposed screening vegetation along the Proposal boundary would be seen in the background of the view. Before this establishes, in the short term, some views to the vegetated fill batter may be seen, however this would largely be screened over time.

7.2.17.3 Viewing location 17: Yalinda Drive

Two cross sections have been provided to illustrate potential views of the Proposal from viewing location 17, a residential property on Yalinda Drive (refer to Appendix A Figure 7). This private residence was not visited during the site inspection, however it is located within close proximity to the Proposal; is sited at a higher elevation to others within the surrounding area; and is clear of vegetation in the area immediately surrounding the house. A desktop assessment has therefore been provided.

Section A

Section A is through the residential property and the Proposal to the north. As shown, the residence is situated at an elevation of approximately 39 m. The Proposal in this location is within a cutting, therefore lower than the existing ground surface, at an elevation of approximately 24 m. Between the residence and the Proposal, existing vegetation is present which would be retained. New screen planting, amenity corridor trees, and revegetation to batters is proposed within the Proposal Area.

During construction, some construction activities within the Proposal Area may be visually discernible through existing foreground vegetation to be retained between the residence and the Proposal, however this is not likely to be from within the house itself, but from the driveway and surrounds.

Similarly, once operation is complete, the Proposal may be visually discernible through existing foreground vegetation to be retained, primarily due to the extent of vegetation that would require removal within the Proposal Area. However, due to the Proposal's location within the cutting and the amount of proposed screen and revegetation planting, over time, any change to views from this location are likely to be mitigated.

Section B

Section B is through the residential property and the Proposal to the south-west, where the proposed Yalinda Drive bridge crosses over the highway. As shown, the bridge would be approximately eight metres lower than the residence, and approximately 215 m away. The highway would be located below the bridge, however above the existing ground levels. Between the residence and the Proposal, some existing dense vegetation would be retained on private property, as well as within the Proposal Area boundary. New amenity corridor trees and revegetation planting to batters is proposed within the Proposal Area on either side of the highway.

During construction, it is not likely that construction activities within the Proposal Area would be visually discernible from this residence through existing foreground vegetation to be retained. This is due to the height and extent of vegetation between the residence and the Proposal, and the location of the Proposal at a lower elevation when compared to the residence. However, machinery associated with bridge and highway construction may be visible if it extends beyond the canopy height of existing vegetation.

Similarly, once operation is complete, the Proposal is not likely to be visually discernible through existing foreground vegetation to be retained, between the residence and the Proposal. This is due to the height and extent of existing vegetation between the residence and the Proposal, and the location of the Proposal at a lower elevation when compared to the residence.

The above assessment is based on the assumption that the existing vegetation would be retained on the private property between the residence as shown on the cross section, and the Proposal.

7.2.18 Construction Impacts

Construction work associated with the Proposal would impose landscape and visual impacts which may extend beyond the Proposal Area boundary. Landscape and visual impacts associated with construction activities are generally of greater magnitude than those associated with operation, however are temporary in nature.

Visual impacts during construction would be associated with activities outlined in section 6.4, which may include the following:

- Temporary hoardings
- Clearance works, including the removal of vegetation
- Construction access
- The presence of construction traffic and workers
- Temporary parking areas
- Materials stockpiling
- Importation and storage of construction equipment and plant
- The presence of earth-moving equipment for road formation works, which would include excavation and filling works.
- Road construction activities including compaction and laying of road surface materials, and installation of associated infrastructure such as signage.
- Construction of bridges, walls and underpasses, including the construction of below-ground footings and above-ground concrete structures or MSE walls.
- The presence of incomplete structures
- Landscape planting to disturbed areas and to the roadside and medians.

Property acquisition and adjustment would result in the demolition of houses and the boundary fencing or walls of residential properties requiring adjustment. There is also potential for impact associated with utility adjustments such as work to overhead lines and underground adjustments.

Construction layout areas have not yet been designated, however are expected to be within the Proposal Area.

7.2.18.1 Vegetation removal

During construction, vegetation is proposed to be removed within the Proposal Area, aside from locations specifically indicated for retention as shown on the landscape concept design drawings (refer to Appendix C). These locations are typically between the Proposal footprint and the Proposal Area boundary, for example between the extent of proposed earthworks and the Proposal Area boundary.

During construction, the extent of vegetation removal would be extensive, particularly within areas of existing dense native vegetation, such as Gelorup. Although a large proportion of these areas are proposed to be revegetated with native vegetation similar in species composition and height to the existing, on either side of the highway, unlike other construction activities, the landscape and visual impact of vegetation removal would endure beyond the construction period. However, over time, these impacts would be somewhat mitigated by proposed urban and landscape design strategies, such as revegetation and screening to residential edges. The Proposal urban and landscape design specialists have indicated that proposed trees within native vegetation and screening mixes are likely to reach approximately eight metres in height within five years, as reflected on the Photomontages (refer to Appendix B).

8 MITIGATION AND MANAGEMENT MEASURES

The assessment of landscape and visual impacts was undertaken on the Proposal which was developed in line with the strategies and concept design within the ULDF. The ULDF outlines design strategies and recommendations around siting, location, scale and aesthetics which work to minimise and / or reduce the impacts of the design, and increase the ability of the project to integrate with the surrounding landscape character and visual amenity. Key recommendations within the ULDF relevant to this Proposal are summarised below:

- Soft visual screening treatment such as vegetation is preferred over hard treatment such as screen walls. Earth mounds could be used, but batters would need to be flatter than 1:8 to be in keeping with the surrounding context. A corridor should be allocated outside of the recovery / clear zone for tree planting.
- Planting and built form elements should respond to the existing character and conditions including topography, landform and natural systems. Incorporate a vegetated median where appropriate to tie the road into the character of the wider landscape along the road journey.
- The design, including form, finishes and materials, of the Proposal's structural and architectural elements must be carefully considered to enhance the visual quality and amenity of the project for road users and surrounding communities.
- Allow for open views to the surrounding landscape to retain a sense of place. Utilise a sense of openness and enclosure to frame desirable views and create a varied experience.
- Utilise box-type bridge abutments to maximise vegetation screening opportunity at the base, to reduce the visual impact of bridges.
- Walls facing adjoining land uses should be designed to be visually recessive, with consideration given to the type and finish of the wall. Where possible, planting is to be used to reduce visual scale and impact of the noise wall, as well as to discourage vandalism.
- Retaining walls must be designed to blend in with the surrounding landforms, for example the tops of walls must be smooth and avoid stepping. Retaining walls must have a visually similar treatment along the Proposal, complimenting aesthetic treatments and adjacent built form, for example through use of consistent materials and finishes to adjoining structures.
- The development of mounding and landforms around interchanges should be considered to create a more natural appearance.
- Provide visual amenity for the surrounding communities along proposed local roads in the form of street tree planting to roadways, medians and roundabouts, with appropriate species to enhance or provide visual connections to surrounding development.
- To ensure successful landscape outcomes and integration of the Proposal with the existing landscape character, planted batters are to be a maximum 1:3 slope, parkland planting or non-irrigated grass embankments must be a maximum of 1:6 slope, and basin batters must be a maximum of 1:6 slope.
- Maximise the retention of existing trees by adjusting the road geometry.
- Maximise seed collection of local provenance species for use in the revegetation.
- Consider screening planting between the Proposal and adjacent residents as part of early works.
- Maintain rural character of Lillydale Road, Ducane Road Link, Boyanup Road West and Calinup Road with open views to the surrounding landscape.

- Maintain rural living character of Yalinda Drive, Brockway Drive, Woods Road and Fishermans Road.

8.1 Response to visual management objectives

This section includes a discussion on how the Proposal responds to the visual management objectives identified in section 5.

8.1.1 Best practice siting and design

Due to the horizontal, linear nature of the Proposal, the proposed road network is generally sited at a similar elevation to the natural topography. However, due to the low-lying nature of the existing landform, proposed works are generally elevated slightly above the natural landform, for example within LCU3.

Proposed grade-separated interchanges would be in conflict with the natural landform, imposing cut and fill batters, retaining walls and new elevated structures to areas surrounding the interchange.

Proposed planting appears to be in keeping with the existing landscape characteristics, however, further recommendations below provide guidance on placement for better integration.

8.1.2 Protection and maintenance of landscape character

Due to the nature of the project, it would not be possible to retain much of the existing valued vegetation within the Proposal Area, due to proposed earthworks. However, the Significant Tuart tree will be retained.

The Proposal includes cut and fill batters and grade-separated interchanges within low-lying and dunal areas, which would be uncharacteristic within the existing landscape context. However, this could be partially mitigated with sensitive landscape and urban design in relation to planting, wall placement and batter slopes. Due to the extent of proposed screening vegetation, as planting matures over time, many built form elements associated with the Proposal would likely be visually mitigated.

Although the proposed landscape concept design is largely within the existing landscape characteristics of the Proposal Area, the extensive use of continuous screen planting within the rural areas of LCU3 could include more breaks to allow for open and filtered views. Proposed planting areas within the rural setting could also tie in to the existing patterns of clearings and dense vegetation.

Along the Bussell Highway, the proposed landscape treatment would contribute to re-establishing the existing enclosed visual character of the highway in the longer term.

8.1.3 Restoration of degraded character or enhancement of opportunities

High quality design outcomes could be achieved through detailed design, within the urban design and landscape components of the project, in co-ordination with the broader project team, as outlined in the ULDF.

Potential improvements to areas with enhancement opportunities not directly associated with the Proposal, for example Sleaford Park and quarry interfaces and improvements to local pedestrian connectivity, could provide additional benefits beyond the Proposal. Any strategies for proposed improvements works should be undertaken in consultation with relevant stakeholders and the community.

8.2 Landscape and visual mitigation measures

The following section outlines the key landscape and visual impacts of the Proposal identified in Section 7, and identifies mitigation measures to further reduce the negative impacts of the Proposal. These mitigation measures have been prepared to align with and build upon the ULDF and should be considered in the detailed design stage of the Proposal.

8.2.1 Landscape character mitigation measures

Impact	Proposed mitigation measure
<p>Introduction of new built form features such as long extents of road, grade separations, road in cutting, retaining walls, noise walls and roundabouts being out of scale with the existing landscape character and at odds with the natural landform.</p>	<p><i>Minimise</i></p> <p>Where the road corridor traverses through the cleared rural land within LCU3, consider reinstating batters with pasture grass of similar species to the existing, to maintain the landscape character and allow the new road infrastructure to sit within the surrounding context, where not within the viewshed of nearby residences.</p> <p>Within LCU4, re-establish the vegetated perimeter bund to the quarry and Proposal interface. Ensure the bund is similar in characteristics to the existing, however, consider improvements to the planting quality and perimeter fencing. Consider siting the bund and proposing vegetation at a height that would screen views from the Proposal into the quarry.</p> <p><i>Mitigate</i></p> <p>Ensure the design of proposed new local roads are within the context of the existing local road character within the relevant LCU. For example, the location and type of utilities, street lighting, paths, signage, surface materials, and planting should be similar in characteristics to the existing local roads.</p> <p>Consider improvements to the quality and amenity of Sleaford Park, by improving reinstated landscape and urban design elements such as accessible pathways and slopes, buffer planting, and re-establishing native vegetation.</p>
<p>Loss of existing valued landscape character elements such as native vegetation.</p>	<p><i>Avoid</i></p> <p>The amenity tree planting proposed within the road corridor is formal, evenly spaced, and linear in alignment. In certain locations, this would be sited within an elevated road corridor, and may therefore be visible at height from the surrounding area. Consideration should be given to less formal tree planting within LCU1, LCU2, and LCU3 to break down the linearity of the design and tie-in to the natural landscape patterns within the existing context. Proposed tree planting could filter into the existing dense trees within the adjoining landscape, for example clumps of dense vegetation within LCU3. Similarly, gaps in amenity tree planting could respond to clearings present within the existing landscape setting, allowing views to the rural landscape where appropriate.</p> <p><i>Minimise</i></p> <p>Consider an arborist assessment of all potential trees within the Proposal Area with potential to be retained, for their existing</p>

condition. Implement no-go-zones and tree protection fencing to areas of vegetation retention for the duration of the construction period.

Within the Proposal Area, in line with the Landscape Concept Design (refer to Appendix C), reinstate native vegetation where possible to replace a portion of that which would be removed, as well as to contributing to the restoration of the existing landscape character.

Consider a combination of low retaining walls and integrated batters in locations where large cut batters are proposed, to reduce the Proposal footprint and allow for the retention of native vegetation. For example, to cut batters along the Proposal corridor on either side of the Yalinda Road bridge; and cut batters at the Centenary Road extension adjacent to the Preston River to Ocean Regional Park.

8.2.2 Visual mitigation measures

Impact	Proposed mitigation measure
Views to uncharacteristic features such as new roads, footpaths, bridges and roundabouts elevated above existing ground line.	<p><i>Minimise</i></p> <p>Carefully integrate and transition noise walls and other infrastructure into the surrounding landscape setting through sensitive material selection, minimising wall heights, and installing screening vegetation between the wall and the residential interface.</p> <p>Built form interfaces to residential locations should be visually recessive, unobtrusive, non-reflective, with a muted colour palette responsive to the existing visual context.</p> <p>Minimise the height of any proposed vertical infrastructure elements such as light poles, noise walls and screen walls within the Proposal corridor.</p>
Loss of key vegetation from within views from residential properties.	<p><i>Avoid</i></p> <p>Throughout the Proposal Area, ensure construction activities, equipment and storage areas are located away from existing vegetation to be retained, the dripline of canopy trees, and other natural landscape features. Where possible, ensure construction compounds are designed to allow for the retention of existing vegetation between the compound, adjacent residential interfaces and public areas.</p> <p><i>Minimise</i></p> <p>Ensure areas of proposed screen planting, typically to the Proposal Area boundary, have enough diversity to respond to the existing visual character as seen from sensitive receptor locations along Ducane Road, Lillydale Road and Marchetti Road, rather than creating a visually uniform green wall. Consider planting of</p>

	<p>different types and scales and varying distances from the viewing locations to for best visual mitigation outcomes.</p> <p><i>Mitigate</i></p> <p>Within LCU3, reinstate vegetation or similar visual characteristics to existing vegetation between the residence and the Proposal, for example to residential interfaces along Lillydale Road, Ducane Road, and Marchetti Road. This could either be either within the Proposal Area boundary or within the residential property, in consultation with the owner.</p> <p>Incorporate larger-sized tree and shrub planting stock in locations where short term visual mitigation would be beneficial, for example at interfaces to residential areas along Lillydale Road, Ducane Road and Marchetti Road; to proposed noise and retaining wall locations within close proximity or within the viewshed of residences in Gelorup; in consultation with suitably qualified professionals.</p>
<p>Views to construction activities and associated construction infrastructure such as hoarding, machinery, construction compounds etc.</p>	<p><i>Minimise</i></p> <p>Take all practical measures to ensure construction equipment, stockpiles, and other visible elements are located away from key sensitive receptor views, including along Lillydale Road, Ducane Road, and Marchetti Road, and within Gelorup. Should any equipment or stockpiles be located in a visually prominent location for any reasonable period of time, incorporate screening measures such as hoarding and temporary shrub and tree planting, and practices to ensure the site is kept tidy and visibility reduced.</p>

9 CONCLUSION

This report has been prepared to determine the potential landscape and visual impacts of BORR Southern Section as part of the Environmental Impact Assessment for the Proposal.

The Proposal Area is located mainly within the Shire of Capel, within the suburbs of Gelorup, Stratham, and Dalyellup, forming a connection to the proposed BORR Central Section to the north-east near the South Western Highway, and tying into the Bussell Highway to the south-west. The landscape context is a rural and rural residential setting, including partially cleared low-lying land and bush blocks on gently undulating dunal landforms of Gelorup, where extensive remnant bushland surrounds rural residential properties. Gelorup has a visual character that is broadly enclosed in nature due to the abundance of dense vegetation, and the rural areas have more open views across clearings typically towards clumps of native vegetation.

Sensitive receptors of varying levels of significance were identified within the VSA, including residents, recreation area visitors and road users. Due to the quantity and extent of native vegetation present, no key views were identified.

Based on the context analysis, visual management objectives were defined for the VSA for the best practice siting and design of the Proposal, the protection and maintenance of landscape character, and the restoration of degraded character or enhancement of opportunities. Key objectives included siting of the Proposal within the natural topography of the landscape, integration of the Proposal within the existing landscape pattern and fabric, protection of the existing landscape character such as vegetation type and structure, and seeking opportunities for enhancement such as at Proposal interfaces with areas that could be improved but are not part of the Proposal.

9.1 Summary of Landscape and Visual Impacts

The ULDF was reviewed and the landscape character units within the VSA were refined into five units. An assessment was provided, and summary of impacts shown in Table 17. The assessment found that LCU2 and LCU3 have the most significant impacts due to the high sensitivity relating to the presence of valued remnant vegetation, and their lower capacity to accommodate the type of change associated with the bridges at Yalinda Drive and Five Mile Brook, the grade separated changes at the interchanges with Lillydale Road and Bussell Highway, the removal of vegetation between Jilley Road and Bussell Highway, and sections of road in cut and on batters.

Table 17 Summary of Impacts to Landscape Character

LANDSCAPE CHARACTER UNIT	NAME	SENSITIVITY	MAGNITUDE	SIGNIFICANCE OF IMPACT
LCU1	Forest	High	Low	Moderate
LCU2	Peri-urban	High	Moderate	High-Moderate
LCU3	Rural	High	Moderate	High-Moderate
LCU4	Quarry	Low	Low	Low
LCU5	Highway	Moderate	Moderate	Moderate

Fourteen viewpoint locations were chosen for visual assessment, to represent views from sensitive receptor locations. Photomontages were created for VP02, VP06, VP11, and VP12, to illustrate the

proposed view from these locations. The assessment found that visual impacts ranged from Negligible to High, as outlined in Table 18. The most significant impacts would be from residential properties along Woods Road within the vicinity of VP12 due to their proximity to the Proposal, receptor type and magnitude of proposed change associated with the removal of existing vegetation and the introduction of noise walls into a view where there is currently no built form.

High to moderate impacts would be experienced by residential properties within close proximity to the Proposal along the corridor including around the northern interchange with Bussell Highway, Sleaford Drive where the connection to Jules Road occurs, along Lillydale Road where the realigned road would be elevated above the surrounding ground level, and where the Proposal intersects Ducane Road. The high to moderate impacts are generally associated with the removal of existing established vegetation and the introduction of new elements such as elevated sections of road, bridges, roundabouts, and noise walls, where the views are currently to established vegetation or a rural landscape with little to no road infrastructure visible.

Additional high level assessments of three other viewing locations in Gelorup have been conducted due to the proximity of residential receptors to the Proposal. Two locations were visited during the site inspection, and one location was not visited due to access constraints. Two cross sections have therefore been provided from this location for discussion. Potential impacts from other viewing locations are expected to be minor due to the presence of intervening vegetation between the residence and the Proposal.

The construction impacts of the Proposal were addressed through a general discussion as at the time of writing the location of construction compounds and associated infrastructure was unknown. Visual impacts associated with the construction of the Proposal would be greater than those identified during the operation phase due to the presence of construction compounds, machinery and site stockpiles, but these would be temporary in nature.

Table 18 Summary of Visual Impacts

VIEWPOINT	LOCATION	SENSITIVITY	MAGNITUDE	SIGNIFICANCE OF IMPACT
VP01	Bussell Highway	High	Low	Moderate
VP02	Bussell Highway	High	Moderate	High-Moderate
VP03	Sleaford Drive	High	Moderate	High-Moderate
VP04	Bussell Highway	Moderate	Low	Moderate-Low
VP05	Bunbury Regional Prison	Negligible	Negligible	Negligible
VP06	Lillydale Road	Moderate	High	High-Moderate
VP07	Ducane Road	High	Moderate	High-Moderate
VP08	Marchetti Road	High	Moderate	High-Moderate
VP09	Yalinda Drive	High	Negligible	Negligible
VP10	Yalinda Drive / Eucalyptus Drive	Low	Moderate	Moderate-Low
VP11	Woods Road	Moderate	Low	Moderate-Low
VP12	Woods Road	High	High	High
VP13	Calinup Road	Moderate	Moderate	Moderate
VP14	Bussell Highway	Moderate	Low	Moderate-Low

9.2 Summary of mitigation and management measures

Relevant recommendations for mitigation and management measures within the ULDF and the landscape concept design drawings were summarised. These strategies were found to provide mitigation measures which have been integrated into the Proposal concept design relevant to this assessment. This includes screen planting, design strategies to mitigate built form elements of the Proposal, and use of local provenance species.

The Proposal was reviewed against visual management objectives established in Section 5, and a response was provided as to whether the visual management objectives could be achieved for the Proposal. Key issues identified were the proposed grade-separations and batters which would be in conflict with the existing landform, and the extent of existing native vegetation proposed to be removed would affect the existing landscape character. Some enhancement opportunities were identified for the Proposal, including at the interfaces of the Proposal with the quarry and Sleaford Park.

Recommendations were provided in relation to landscape and visual impacts identified in the assessment, which should be taken into consideration as the design progresses. Mitigation measures were categorised into a hierarchy of avoid, minimise, and mitigate. Proposed mitigation aligns with and builds upon strategies outlined in the ULDF and landscape concept drawings, and applies to the construction and operation of the Proposal. In addition to those identified in the ULDF, key landscape character recommendations include ensuring the design of new local roads fit within the context of the existing local road character; consideration for an arborist assessment of existing trees with potential to be retained for quality and to establish defined no-go zones; reinstating native vegetation where possible; re-establishing the perimeter bund to the quarry interface; and minimising the impact of large cut batters through the combination of low retaining walls with batters to allow for the retention of native vegetation. Key visual recommendations in addition to those identified in the ULDF include the integration of built form elements into the surrounding landscape through material selection and vegetation screening; ensuring proposed screen planting responds to the existing landscape and visual characteristics in rural areas; incorporating large tree and shrub stock sizes in locations where short term mitigation would be beneficial; and taking all practical measures to ensure construction compounds and storage areas are located away from sensitive receptor views.

This assessment provides an understanding of the landscape and visual impacts that would be experienced along the Proposal corridor during construction and operation. Although the impact assessment identified a number of high to moderate operational landscape and visual impacts as a result of the Proposal, these impacts are generally in isolated locations. The recommended mitigation and management measures together with implementation of the ULDF have potential to reduce the landscape and visual impacts of the Proposal, and the Proposal would not likely have a significant adverse effect on the surrounding landscape and visual environment.

10 REFERENCES

BORR Team, Bunbury Outer Ring Road Southern Section: EPA Environmental Referral Supporting Document, 2019.

BORR Team, Urban and Landscape Design Framework, 2020a.

BORR Team, BORR South Project Case Design Report, Rev B, 2020b.

BORR Team, BORR South Project Case Structures Concept Design Report, Rev C, 2020c.

BORR Team, Bunbury Outer Ring Road Southern Section, Vegetation and Flora Study, Rev D, 2020d.

City of Bunbury, City of Bunbury Local Planning Scheme No. 8, 2018.

City of Bunbury, Local Planning Strategy, 2018.

Environmental Protection Authority, Environmental Factor Guideline: Social Surroundings, 2016.

Landscape Institute and Institute of Environmental Management & Assessment, UK, *Guidelines for Landscape and Visual Impact Assessment, Third Edition*, 2013.

Landscape Institute, UK, *Visual Representation of Development Proposal: Technical Guidance Note 06/19*, 2019.

Main Roads Western Australia, Environmental Standard Brief: Visual Impact Assessment, 2003.

Main Roads Western Australia, Visual Screens within Road Reserves, 2013.

Main Road Western Australia, Bunbury Outer Ring Road (H058) Forrest Highway to Bussell Highway, Noise Wall and Screens, Rev. A, 2019.

Shire of Capel, Capel Shire Land Use Strategy, 1999.

Shire of Capel, Local Planning Scheme No. 7, 2018.

Western Australian Planning Commission, *Greater Bunbury Region Scheme*, 2014.

Western Australian Planning Commission, *Greater Bunbury Strategy*, 2013.

Western Australian Planning Commission, Preston River to Ocean Regional Park: Establishment Plan Proposal Final Report, Department of Planning, 2011.

Western Australian Planning Commission, Statement of Planning Policy No. 2: Environment and Natural Resources Policy, 2003.

Western Australia Planning Commission, *Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design*, 2007.

Appendix A Figures



Appendix A Figure 1 Proposal Area

Appendix A Figure 2 Landscape Context

Appendix A Figure 3 Landscape Character Units

Appendix A Figure 4 Visual Analysis

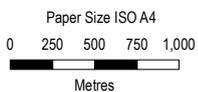
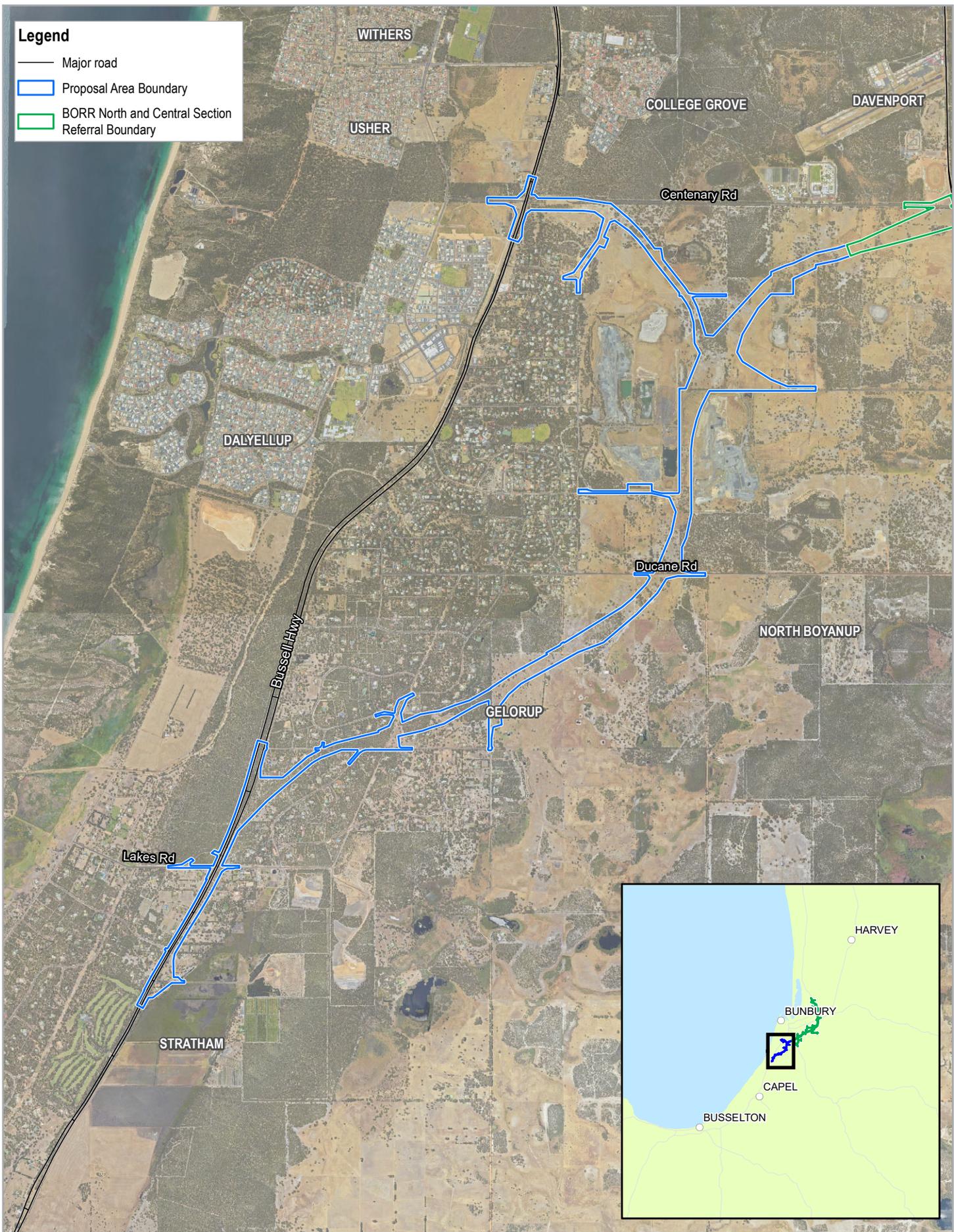
Appendix A Figure 5 Concept Design

Appendix A Figure 6 Viewpoint Locations

Appendix A Figure 7 Viewing location 17 Yalinda Drive sections

Legend

-  Major road
-  Proposal Area Boundary
-  BORR North and Central Section Referral Boundary



Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 Perth Coastal Grid 1994

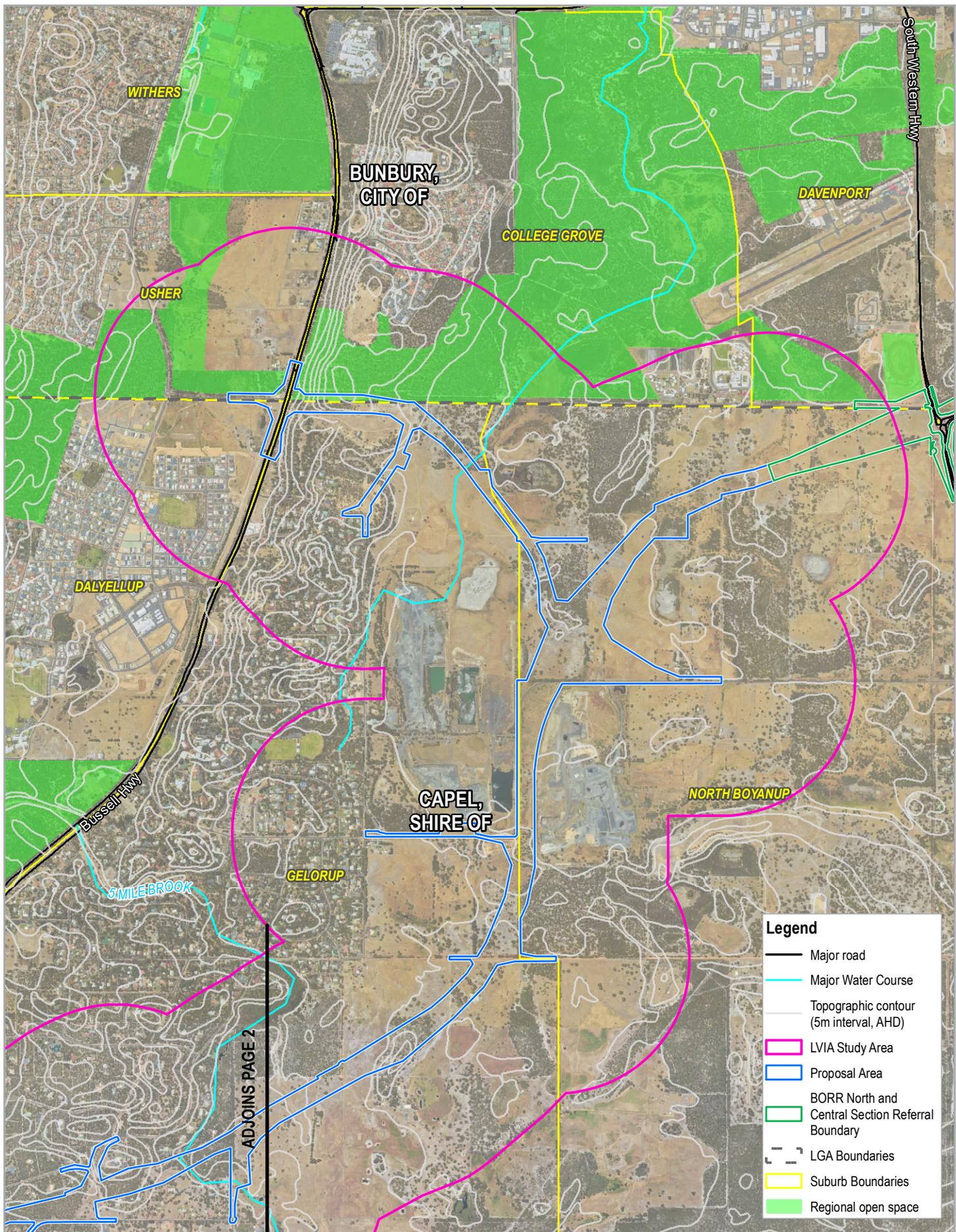


Main Roads Western Australia
Bunbury Outer Ring Road

Proposal Location

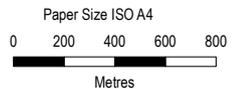
Project No. **61-37041**
 Revision No. **0**
 Date **02 Apr 2020**

APPENDIX A
FIGURE 1



Legend

- Major road
- Major Water Course
- Topographic contour (5m interval, AHD)
- LVIA Study Area
- Proposal Area
- BORR North and Central Section Referral Boundary
- LGA Boundaries
- Suburb Boundaries
- Regional open space



Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 Perth Coastal Grid 1994

BORR Team
 Australian Government
 BUILDING OUR FUTURE
 mainroads WESTERN AUSTRALIA
 BUNBURY OUTER RING ROAD | PLANNING AND DEVELOPMENT

**Main Roads Western Australia
 Bunbury Outer Ring Road**

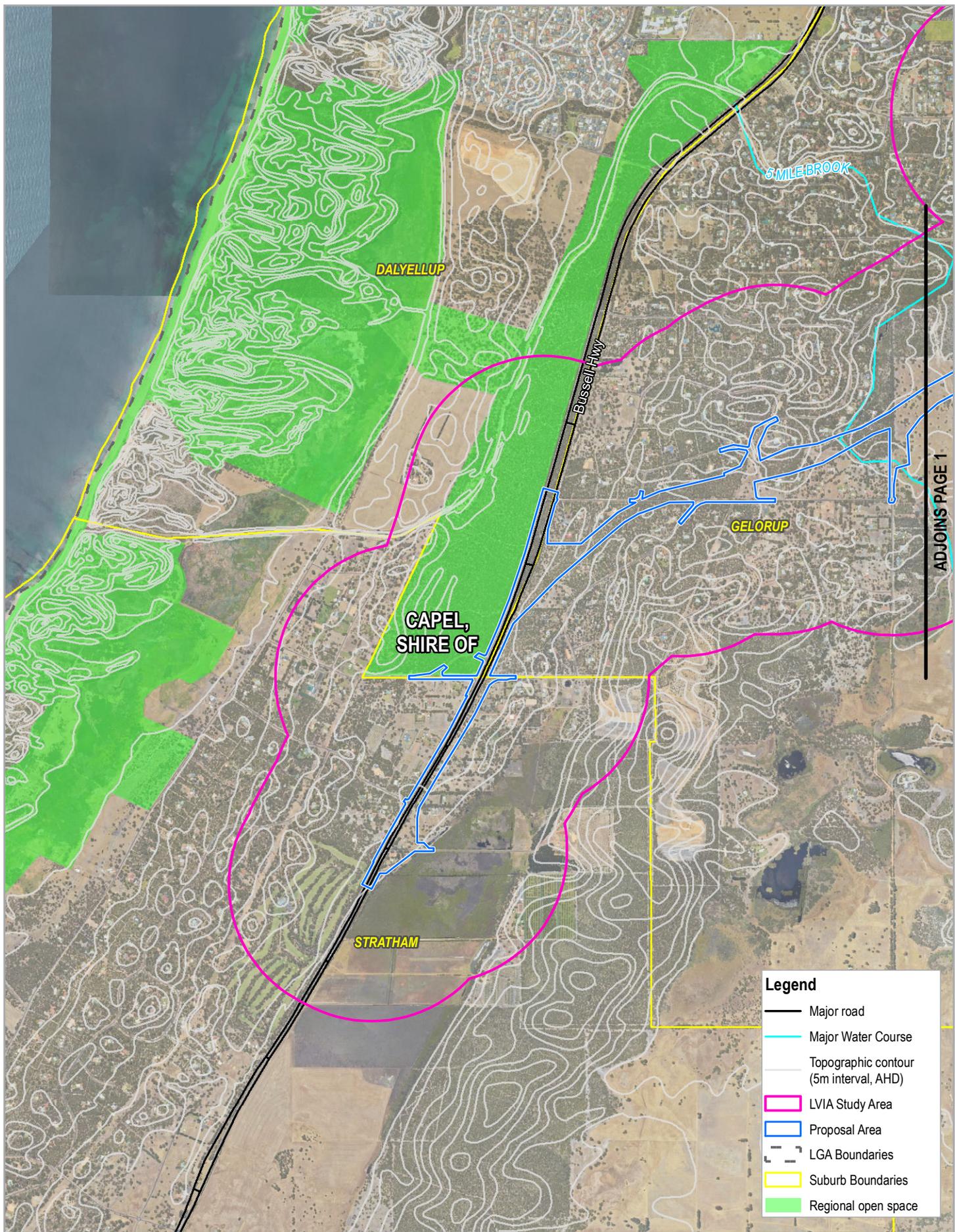
Landscape Context

Project No. **61-37041**
 Revision No. **0**
 Date **02 Apr 2020**

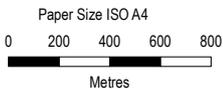
Page 1 of 2
 APPENDIX A
FIGURE 2

G:\613704119_0_GIS\Maps\Working\BORR South LVIA\6137041_002_LandscapeContext_Rev0.mxd
 Print date: 02 Apr 2020 - 17:18

Data source: BORR team: LVIA Study Area - 20200303, Proposal Area Boundary - 20191212, North Section Referral Boundary - 20191016; DPLH: Regional Open Space - 201811; Landgate: 5m Contours, Water course - 2018, Roads - 201805, Suburb Boundaries, LGA Boundaries - 20180319, Imagery - WA Now accessed: 20200402. Created by: sle



Legend	
	Major road
	Major Water Course
	Topographic contour (5m interval, AHD)
	LVIA Study Area
	Proposal Area
	LGA Boundaries
	Suburb Boundaries
	Regional open space



Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 Perth Coastal Grid 1994

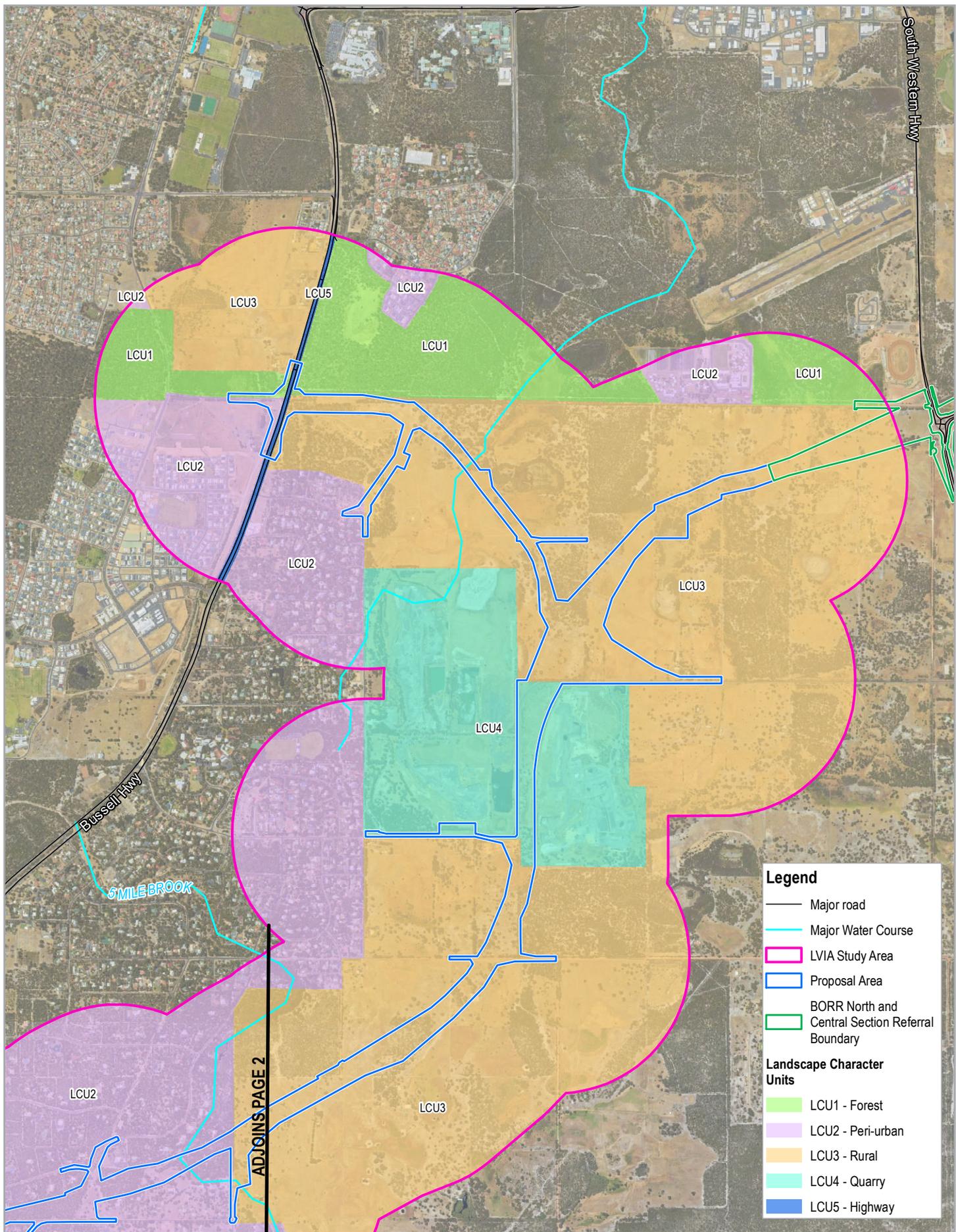


Main Roads Western Australia
 Bunbury Outer Ring Road

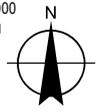
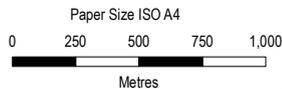
Landscape Context

Project No. 61-37041
 Revision No. 0
 Date 02 Apr 2020

Page 2 of 2
 APPENDIX A
FIGURE 2



ADJOINS PAGE 2



Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 Perth Coastal Grid 1994

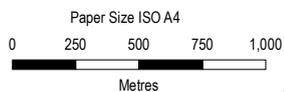
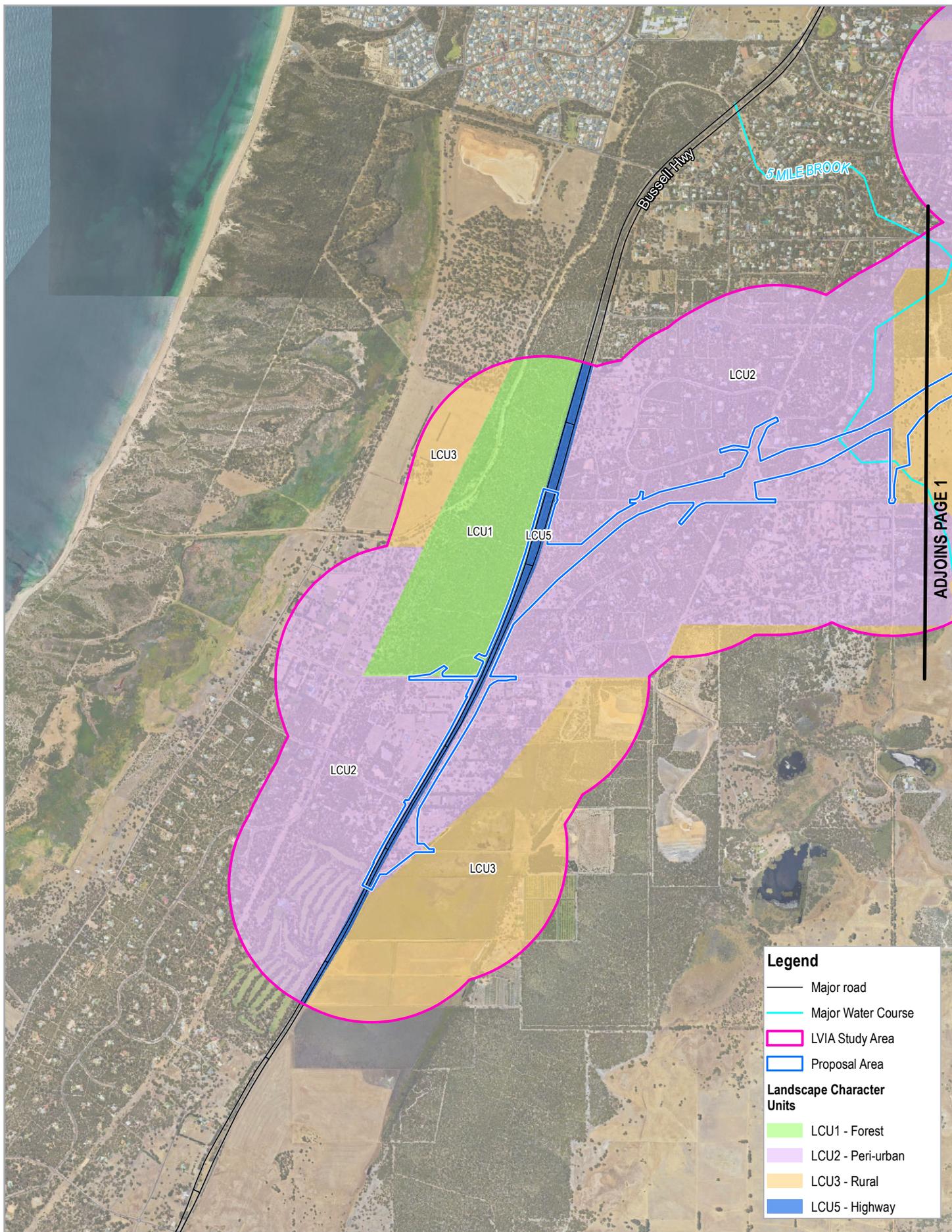


Main Roads Western Australia
Bunbury Outer Ring Road

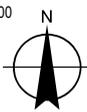
Landscape Character Units

Project No. 61-37041
Revision No. 0
Date 02 Apr 2020

Page 1 of 2
APPENDIX A
FIGURE 3



Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 Perth Coastal Grid 1994

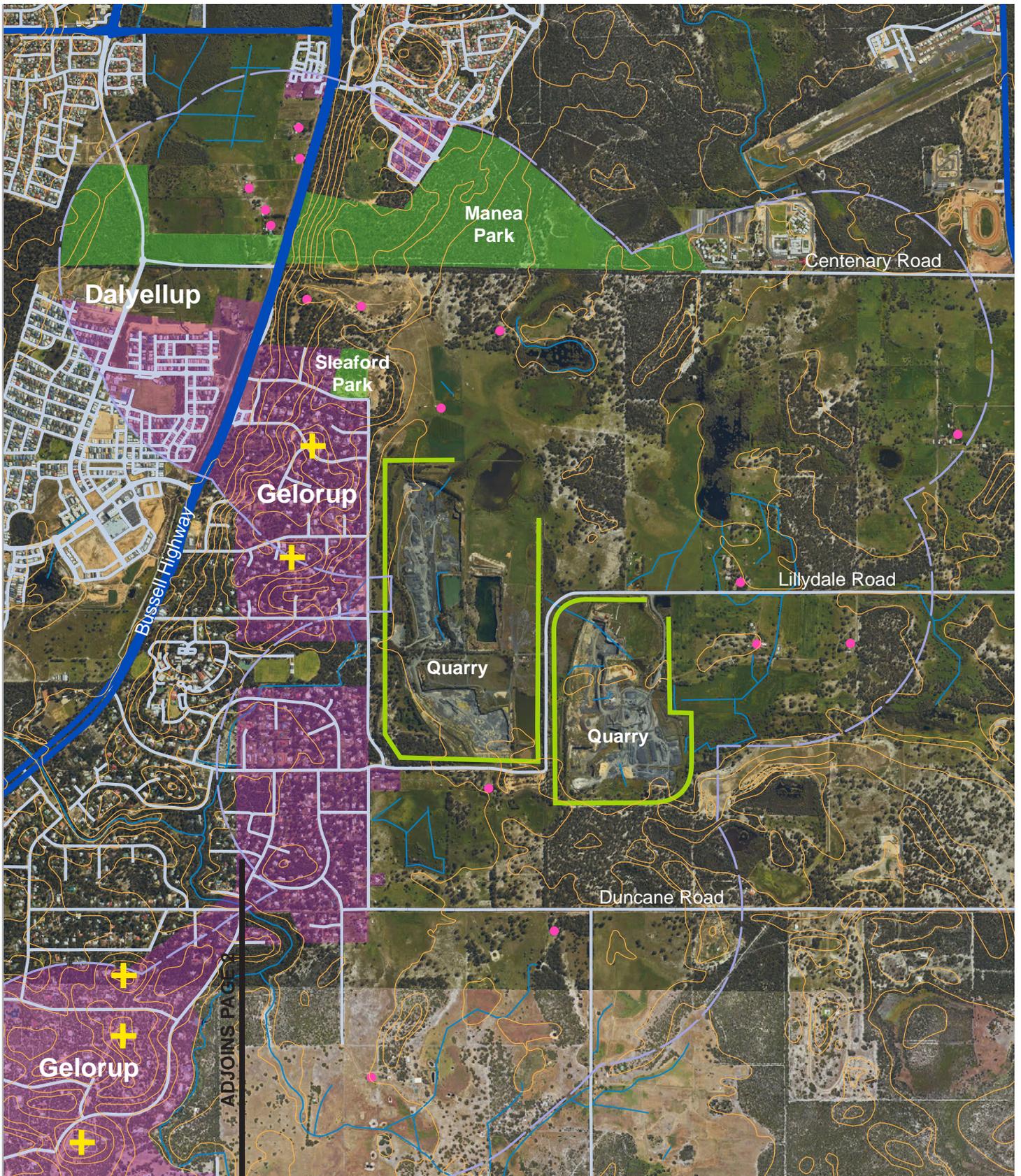


**Main Roads Western Australia
 Bunbury Outer Ring Road**

Landscape Character Units

Project No. 61-37041
 Revision No. 0
 Date 02 Apr 2020

Page 2 of 2
 APPENDIX A
FIGURE 3

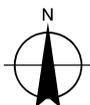


Legend

- | | | | | | |
|--|--------------------------------|--|----------------|--|--------------------|
| | High point | | Perimeter bund | | Major roads |
| | Rural residences | | Study area | | Major watercourses |
| | Gelorup rural residential area | | 5 m contour | | |
| | Parkland | | Local roads | | |

ADJOINS PAGE 3

Paper Size ISO A4
 0 250 500 750 1,000
 Metres



Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 Perth Coastal Grid 1994

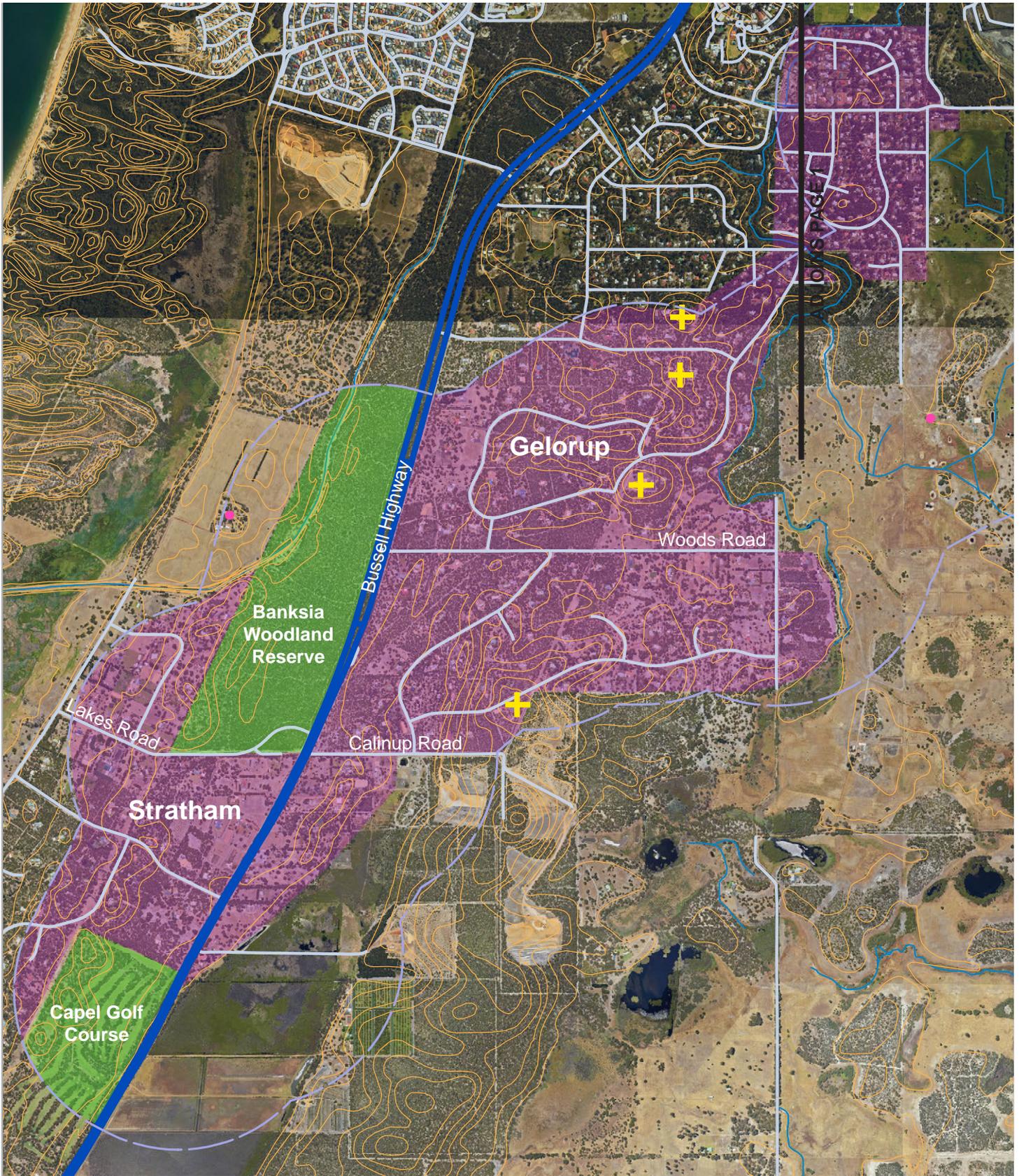


Main Roads Western Australia
 Bunbury Outer Ring Road

Visual Analysis

Project No. 61-37041
 Revision No. 0
 Date 06 Mar 2020

Page 1 of 2
 APPENDIX A
 FIGURE 4



Legend

- | | | | | | |
|--|--------------------------------|--|----------------|--|--------------------|
| | High point | | Perimeter bund | | Major roads |
| | Rural residences | | Study area | | Major watercourses |
| | Gelorup rural residential area | | 5 m contour | | |
| | Parkland | | Local roads | | |

Paper Size ISO A4
 0 250 500 750 1,000
 Metres



Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 Perth Coastal Grid 1994

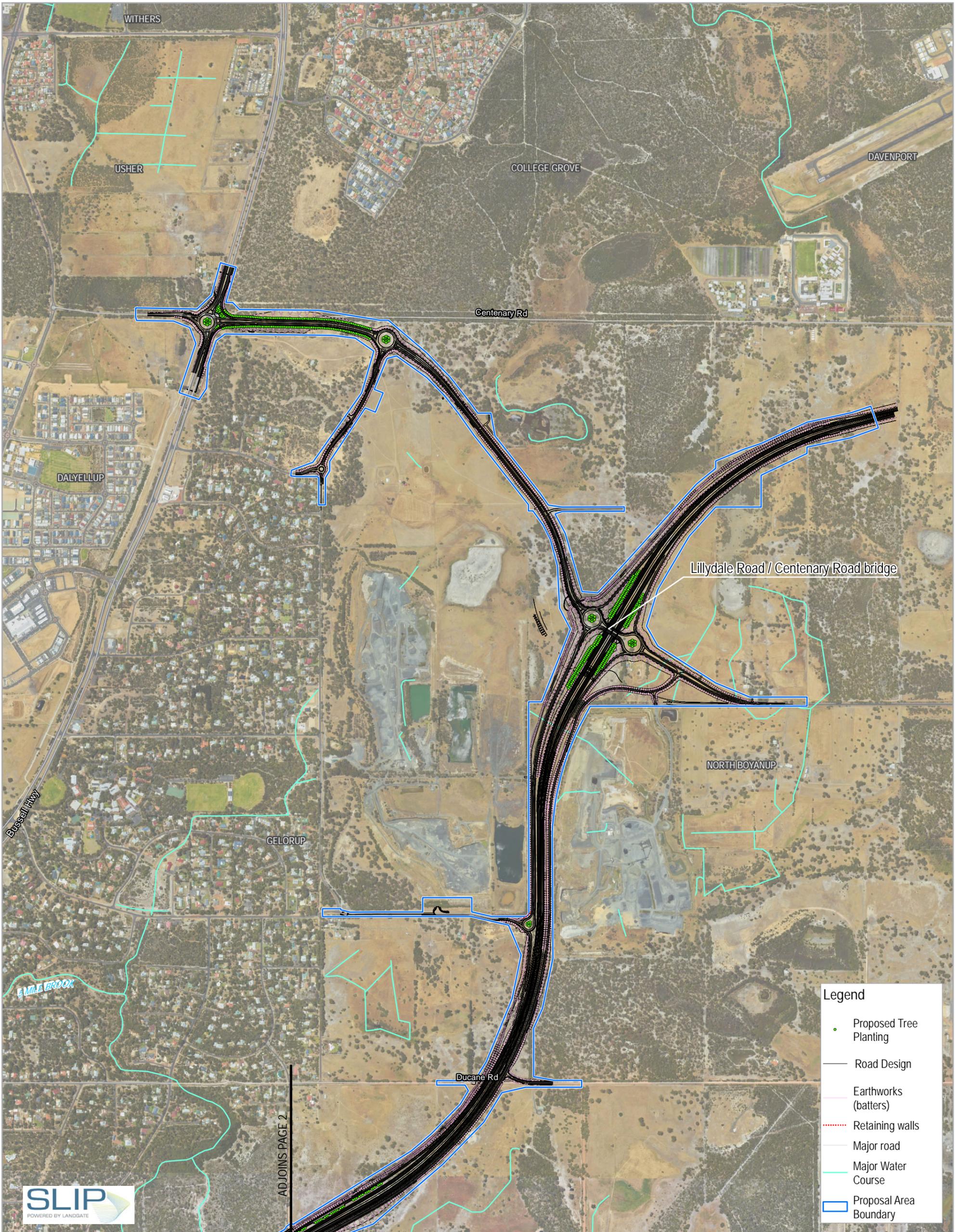


Main Roads Western Australia
 Bunbury Outer Ring Road

Project No. 61-37041
 Revision No. 0
 Date 06 Mar 2020

Visual Analysis

Page 2 of 2
 APPENDIX A
 FIGURE 4



Legend	
	Proposed Tree Planting
	Road Design
	Earthworks (batters)
	Retaining walls
	Major road
	Major Water Course
	Proposal Area Boundary



ADJOINS PAGE 2

Paper Size ISO A3
 0 100 200 300 400
 Metres
 Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 Perth Coastal Grid 1994



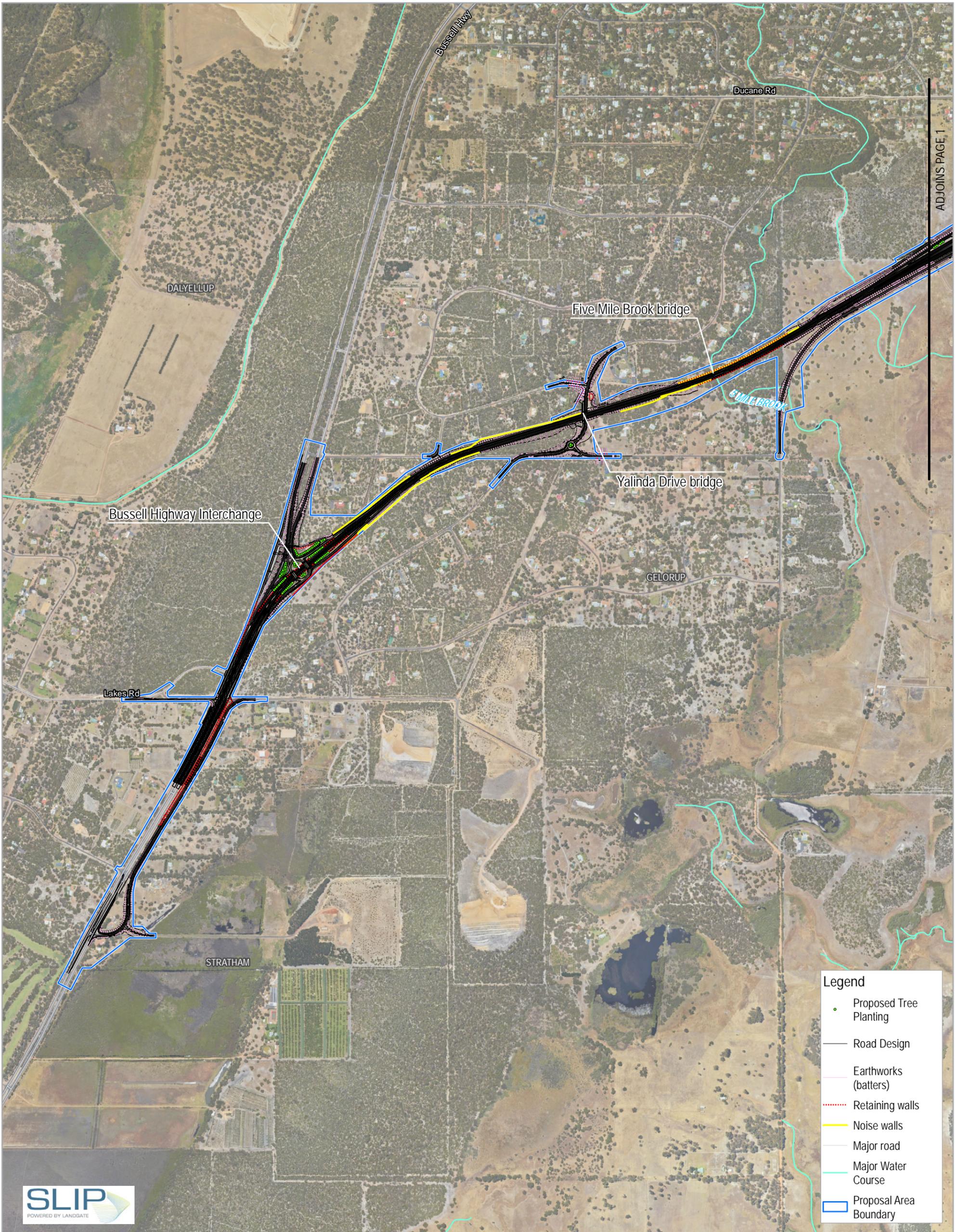
Main Roads Western Australia
 Bunbury Outer Ring Road
 Concept Design

Project No. 61-37041
 Revision No. 0
 Date 02 Apr 2020

Page 1 of 2
 APPENDIX A
 FIGURE 5

G:\6137041\19_0_GISMaps\Working\BORR South
 LVIA\6137041_005_ConceptDesign_Rev0.mxd
 Print date: 02 Apr 2020 - 22:04

Data source: BORR team: South Alignment, Earthworks (batters) - 20200213, Noise walls, Retaining Walls - 20200124, Proposal Area Boundary - 20191212; Landgate: Water course - 2018, Roads - 201805, LGA Boundaries - 20180319, Imagery - WA Now accessed: 20200402. Created by: slt



Paper Size ISO A3
 0 100 200 300 400
 Metres
 Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 Perth Coastal Grid 1994



Main Roads Western Australia
 Bunbury Outer Ring Road
 Concept Design

Project No. 61-37041
 Revision No. 0
 Date 02 Apr 2020
 Page 2 of 2
 APPENDIX A
 FIGURE 5

G:\6137041\19_0_GISMaps\Working\BORR South LVIA\6137041_005_ConceptDesign_Rev0.mxd Print date: 02 Apr 2020 - 22:09 Data source: BORR team: South Alignment, Earthworks (batters) - 20200213, Noise walls, Retaining Walls - 20200124, Proposal Area Boundary - 20191212; Landgate: Water course - 2018, Roads - 201805, LGA Boundaries - 20180319, Imagery - WA Now accessed: 20200402. Created by: sli