



# Landscape & Visual Impact Assessment

## Goschen Mineral Sands and Rare Earths Project



Prepared for: VHM EXPLORATION

Project No: 2146 Issue: F - updated for issue Date: 28th April 2023



DOCUMENT HISTORY AND STATUS

Project No: 2146

Project Name: Goschen Mineral Sands and Rare Earths Project | Landscape and Visual Impact Assessment

Issue	Submission	Date of Issue	Author	Approved by
A	Draft Landscape and Visual Impact Assessment for Review	29.04.2022	SB / AR	AR
B	Landscape and Visual Impact Assessment for Review	09.05.2022	SB / AR	AR
C	Updated for Review	08.08.2022	SB / AR	AR
D	Updated for Review	05.09.2022	SB	AR
E	Updated for Issue	23.09.2022	SB	DM
F	Updated for Review	28.04.2023	SB	-



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# Executive Summary

This Landscape and Visual Impact Assessment (LVIA) report is an attachment to VHM Limited's Goschen Rare Earth and Mineral Sands Project (the Project) Environment Effects Statement (EES). It has been used to inform the EES required for the Project.

## Existing environment

The first step of a LVIA is to determine the existing environment to understand the baseline against which the Project is to be assessed. An assessment of the existing environment was undertaken through a combination of desktop assessment and field work.

The desktop assessment identified the Study Area is generally characterised by flat cleared land for large scale cropping. Land within and around the site is characterised as FZ - Farming Zone. The nearest town is Lalbert, located approximately one kilometre to the south west of the Project.

The Study Area sits within the Murray Mallee Bioregion. The topography of the Study Area is also consistent with the Bioregion consisting of flat to slightly sloping topography. Although native vegetation has been extensively cleared for agricultural purposes, remnant vegetation identified in the study area is largely consistent with the Bioregion.

In addition to a desktop assessment, extensive field work was undertaken during March 2022 to provide detailed assessments from key viewpoint locations. During the field work, five (5) landscape character types were identified within the study area. The impact on each landscape character unit has been assessed in the LVIA.

## Overview of Impacts

An iterative assessment was undertaken within the Study Area to evaluate potential impacts of the Project and its associated construction, operational and decommissioning activities on the existing environment.

The assessment found the following key impacts:

- Due to the flat topography combined with existing roadside vegetation, visibility of the Project is generally limited.
- Views of the Project will be unavailable from populated areas within Lalbert and its associated recreation spaces due to distance and vegetation.
- Views from the main transport corridor Donald - Swan Hill Road will also be negligible.

- A total of seven (7) dwellings have been identified within two (2) kilometres of the Project Mining Area and 17 dwellings have been identified between two - five kilometres of the Project Mining Area. The majority of these dwellings have existing screening vegetation surrounding the dwelling, limiting views to the Project.
- The highest visibility is likely to be from low use roads immediately adjoining the Project.
- An assessment of the potential impacts of night lighting found opportunities for light pollution to be moderate to low due to limited visibility.
- Potential visual impacts of construction activities associated with the pipeline and pump station will be temporary. Existing vegetation along the proposed pipeline route will contribute towards screening views of the construction activity.

## Mitigation measures

Potential visual impacts on the landscape character due to the Project would be avoided or minimised and managed to required standards through the recommended mitigation measures. The proposed mitigation measures would assist in reducing negative impacts resulting from the majority of these dwellings.

The proposed mitigation measures would assist in reducing negative impacts resulting from the negative impacts of the Project and its associated activities on the majority of these dwellings. Key recommendations include:

- Material and colour selection is to be sensitive to the surrounding environment. Limit contrasting colours and ensure the use of non-reflective finishes.
- Where possible existing vegetation is to be retained and protected during the construction period.
- Provision of screen planting in keeping with the existing landscape character to reduce visibility of the project from nearby roads and dwellings.
- Ensure principles for night lighting are implemented to reduce light pollution.
- Establishment of on-site mitigation planting to improve visual amenity of surrounding sensitive receptors.
- Investigate monitoring and maintenance of landscape mitigation planting to reduce issues during the construction and operations phases of the Project.
- Landscape restoration and rehabilitation measures that could potentially help with the restoration of the existing landscape character.

With the implementation of the recommended mitigation measures, the Project could be undertaken whilst maintaining the core landscape character of the area, and have a minimal visual impact on the surrounding visual amenity.



# 1.0 Introduction

## 1.1 Requirement for an EES

The Project was referred to the Minister for Planning to seek advice on the need for an EES under the *Environment Effects Act 1978* (Vic) (EE Act).

On 10 October 2018, the Minister for Planning decided that an EES was required on the basis that the Project has the potential for a range of significant environmental effects.

On 19 December 2018 under delegated authority from the Minister for the Environment, the Department of Climate Change, Energy, the Environment and Water (DCCEEW) made a decision that the Project is a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and would require assessment and a decision about whether approval should be given under the EPBC Act. The EES is an accredited assessment process under the EPBC Act through a Bilateral Assessment Agreement that exists between the Commonwealth and State of Victoria, therefore these scoping requirements address the assessment requirements related to Matters of National Environmental Significance (MNES).

The EES allows stakeholders to understand the likely environmental impacts of the Project and how they are proposed to be managed. The Minister for Planning's assessment of the EES will also inform statutory decisions that need to be made on the Project. The Minister's assessment of the EES will also inform the Minister for DCCEEW with respect to a decision on MNES under the EPBC Act.

Preliminary consultation with the community and stakeholders was undertaken for the Project of the EES. An extensive engagement and consultation program is currently being undertaken to ensure that the community and interested stakeholders are involved in the preparation of the EES.



# 2.0 Project Description

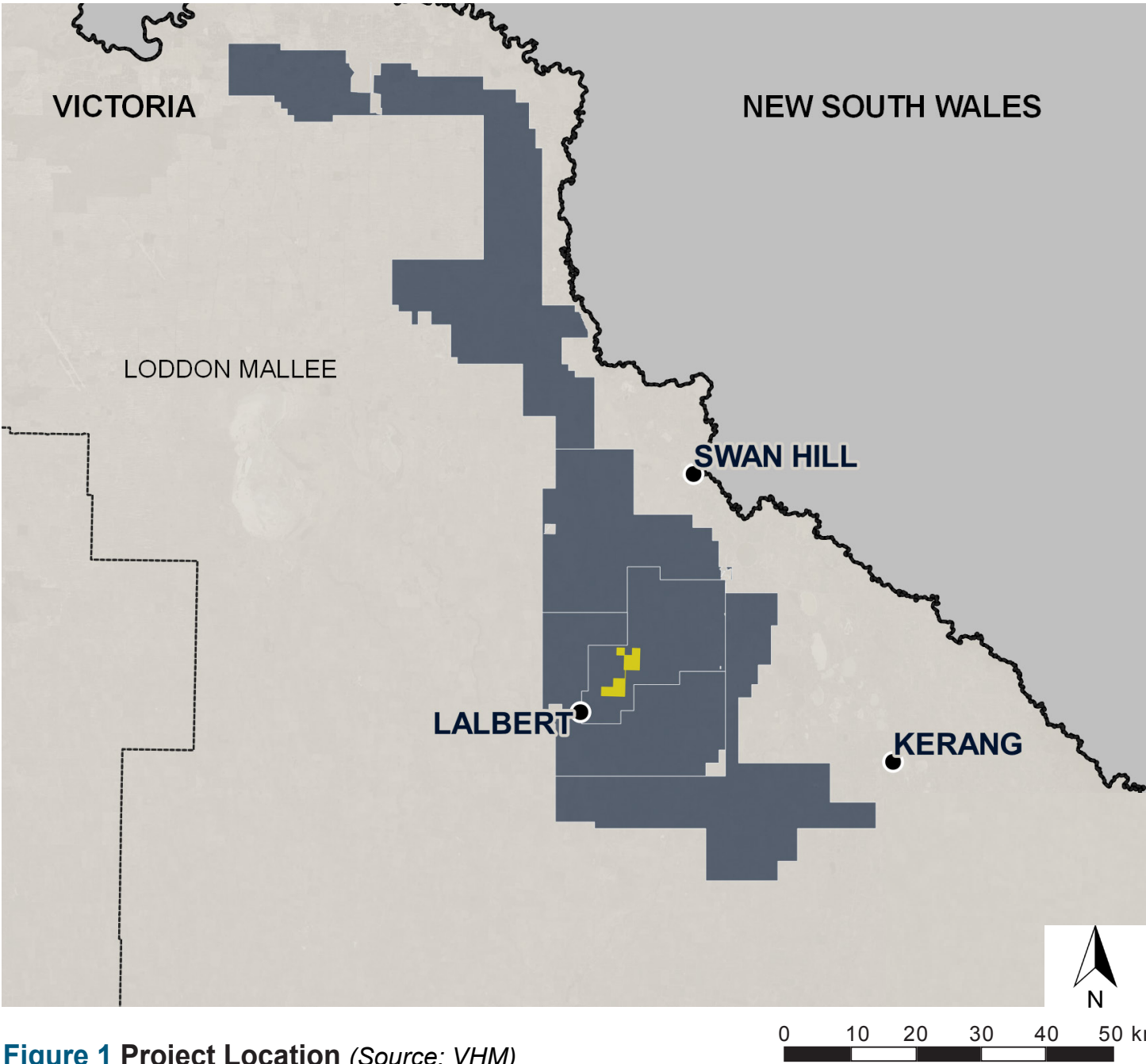
## 2.1 Project Overview

The Goschen Rare Earth and Mineral Sands Project (referred to hereafter as “the Project”) is an approximately 20-year rare earth and mineral sands mine and processing facility. VHM has been developing the Project in the context of a rapidly growing global demand for rare earths. One of the world’s largest, highest grade zircon, rutile and rare earth mineral deposits is in the Loddon Mallee region of Victoria in Australia. VHM intends to establish the Project to mine these deposits and process to produce and market a range of products to national and international consumers.

The mine footprint has been restricted to avoid intersection with groundwater and significant areas of remnant native vegetation. VHM will implement a staged development approach. Initially developing phase 1 consisting of a mining unit plant (MUP), wet concentrator plant (WCP), rare earth mineral concentrate (REMC) flotation plant and a hydrometallurgical plant that will further refine the REMC that is produced at Goschen. The product suite for phase 1 consists of a zircon/titania heavy mineral concentrate (HMC) and mixed rare earth carbonate (MREC).

Phase 2 will commence approximately 2 years post-production and consist of an additional mineral separation plant (MSP) and, subject to prevailing market circumstances at that time, hot acid leach (HAL) and chrome removal circuit, that will produce additional products such as premium zircon, zircon concentrate, HiTi rutile, HiTi leucoxene, LoTi leucoxene, low chromium ilmenite.

The Project is located approximately 4 hours’ drive (280 kilometres) northwest of Melbourne and 30 minutes (20 km) south of Swan Hill within Gannawarra Shire. The Project Mining Area is shown in **Figure 1**.



**Figure 1 Project Location** (Source: VHM)

- LEGEND**
- Project Mining Area
  - VHM Tenements
  - VHM Proposed Tenements
  - Victoria Government Region
  - New South Wales Government Region



# 2.0 Project Description

## 2.2 Project Development

It is recognised that there are opportunities to avoid and minimise environmental impacts during the many stages of project development. During project inception and early design development stages of the Project, decisions on the location of the Project, its design and construction techniques have enabled impacts to be significantly avoided and minimised in accordance with the hierarchy presented in **Figure 2**.

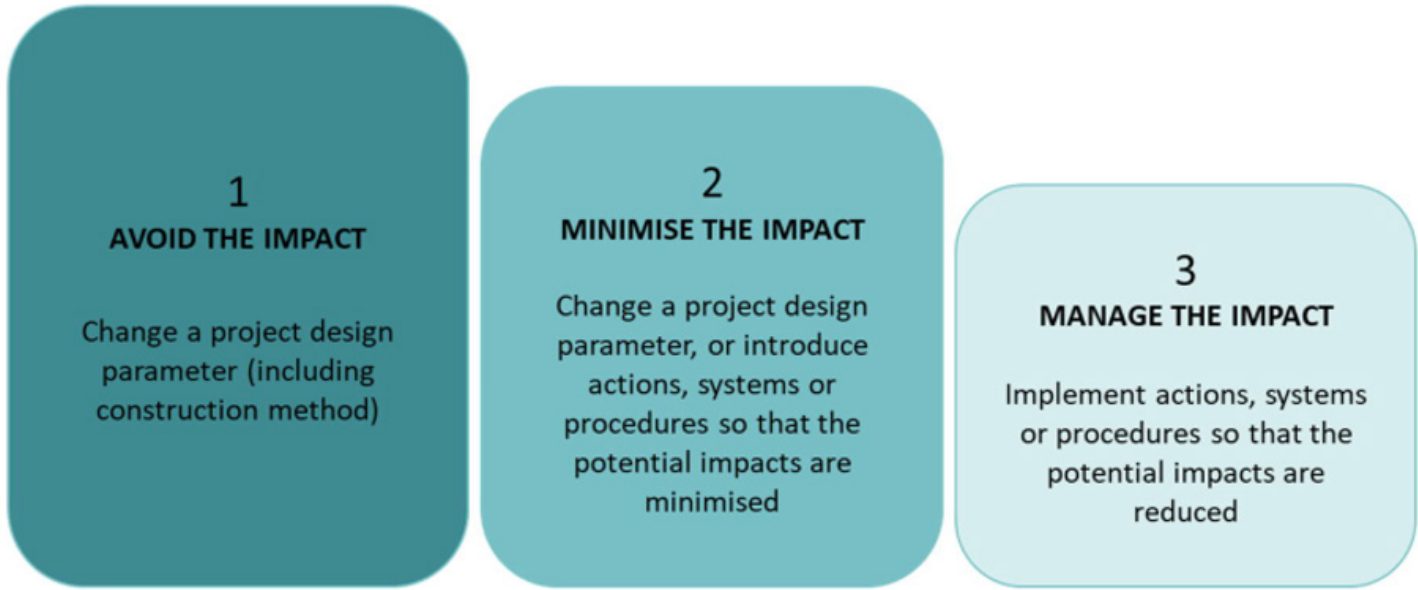
Avoidance and minimisation of social and environmental impacts is central to the Project’s decision making and as such, the project will continue to be refined in response to technical requirements and potential environmental and social impacts identified during the construction, operational, decommissioning (and post-closure) phases.

This was considered in the preparation of a project description which is found at Chapter 2: Project description. A description of how avoidance of impact has informed the design in relation to the Landscape and Visual Impact Assessment can be found in **Section 9.0** (Mitigation Measures).

Examples of this include the decision to create vegetation protection zones within the Project (mining area), restricting mining operations to daylight hours only to avoid noise related impacts to certain sensitive receptors, and restricting mining to depths above the water table to avoid impacts to the groundwater table.

After opportunities to avoid impact were incorporated into the project, minimisation and rehabilitation measures were developed. These are described in the construction and operation impact assessment sections below.

It is expected that the Processing Facility located in Area 1 will comprise of structures that have a minimum height of 6 m and maximum height of 36 m. All other areas within the Study Area will be utilised for mining and stockpile. The visual assessment, therefore, considers the potential impact of the Processing Facility on surrounding public locations.



**Figure 2 Mitigation Hierarchy** (Source: VHM)



# 2.0 Project Description

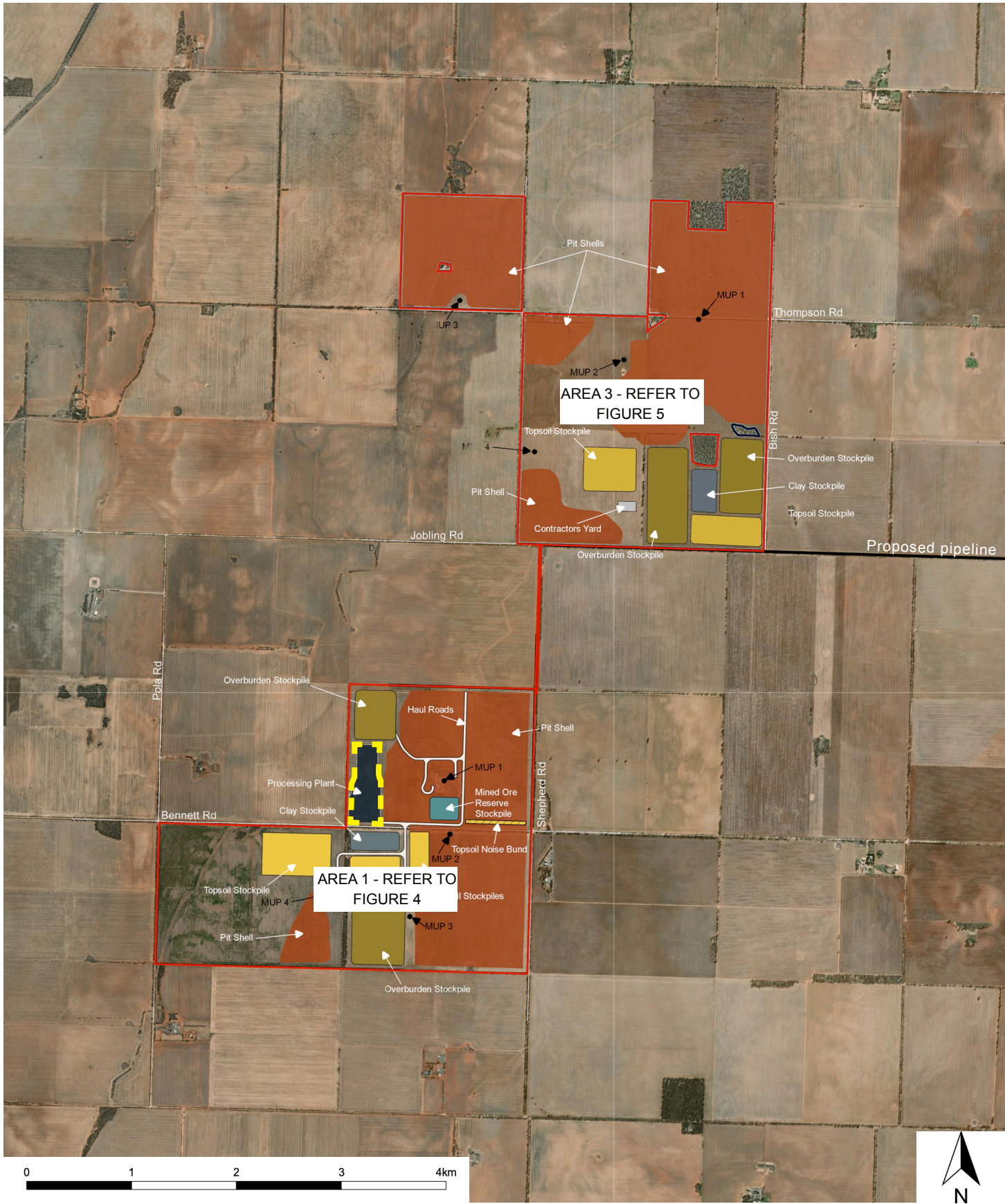


Figure 3 Project Layout (Source: ESRI Imagery, VHM)

## 2.3 Key Project Components

The Project consists of a heavy mineral sand mining and processing operation that will produce several heavy mineral concentrates (HMC) and a range of critical rare earth minerals across two defined mining areas known as Area 1 and Area 3 (**Figure 4** and **Figure 5**). Together the two areas define the “Project Mining Area”.

The key components that make up the Project Mining Area are described below.

**Mining** – Mining will take approximately 20 years at 5M tonnes of ore produced per year and will occur only above groundwater (no dewatering) across approximately 1,479 hectares of farmland using conventional open cut mining methods of excavation, load, and haul.

**Processing** – Heavy mineral sands and rare earths ore will be separated via an on-site WCP and MSP to generate a Rare Earth Mineral Concentrate (REMC). Refining of the REMC on-site is limited to hydrometallurgical extraction to produce a mixed rare earth carbonate. Tailings from the various mineral processes will be homogenised and placed back into the ore zone earlier mined.

**Rehabilitation** – The mined areas will be progressively backfilled in a staged manner, with tailings dewatered in-pit to allow overburden and topsoil placement in a profile that reinstates the background soil structure. This will result in the ability for a return to the current agricultural land uses within 3 years.

**Power** – Electrical power needed for mining and processing will be produced on-site from dual fuel diesel/LNG fired power generators, with a gradual evolution over the life of mine to renewables, hydrogen and/or battery as technologies and commercial viability increase. Heat energy for the on-site gas fired appliances shall be provided from an extension of the distribution network from the main LNG storage and regasification system.

**Transport** – Final products shall be containerised in 20 ft sealed sea containers on-site and exported via Melbourne Port (else Geelong, Portland, or Adelaide Ports) using road and/or rail-based land logistics solutions. Ultima will provide intermodal rail solution, to reach the shipping export ports.

**Water** - Water will be required for construction earthworks, processing, dust suppression and rehabilitation. Up to 4.5 GL a year will be needed for the start-up of the Project. Water will be sourced from Goulburn Murray Water (GMW) from a new pumpstation at Kangaroo Lake via the open water market. A 38 km underground pipeline is proposed beneath existing local road easements as shown in **Figure 5**.

The following sections of this report refer to the broader context of the Project Mining Area and the pump station and pipeline as the “Study Area” (refer to **Section 6.3**).



# 2.0 Project Description

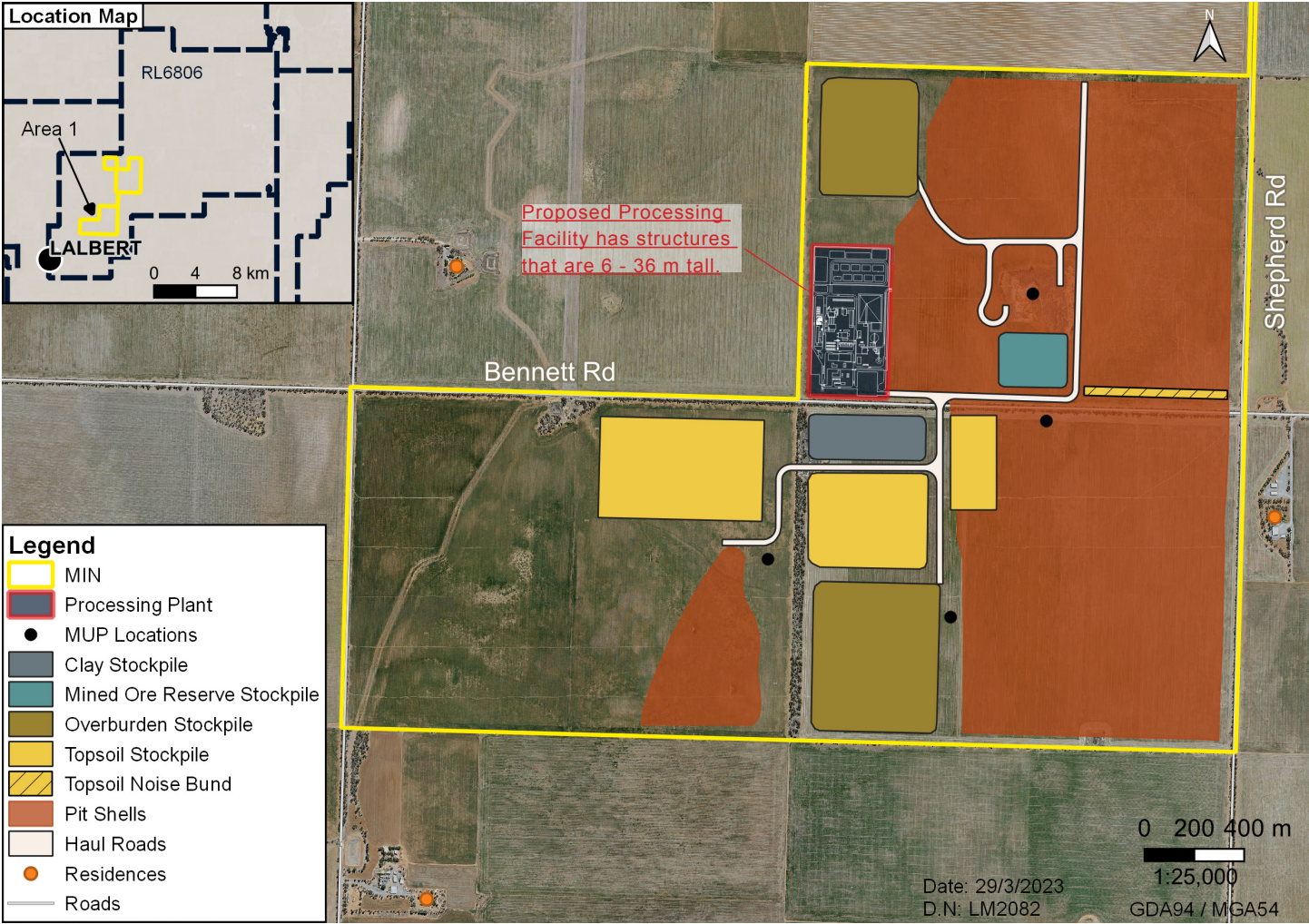


Figure 4 Goschen Project Mining Area 1 (Source: VHM)

## Project Mining Area 1 Goschen Mineral Sands and Rare Earths

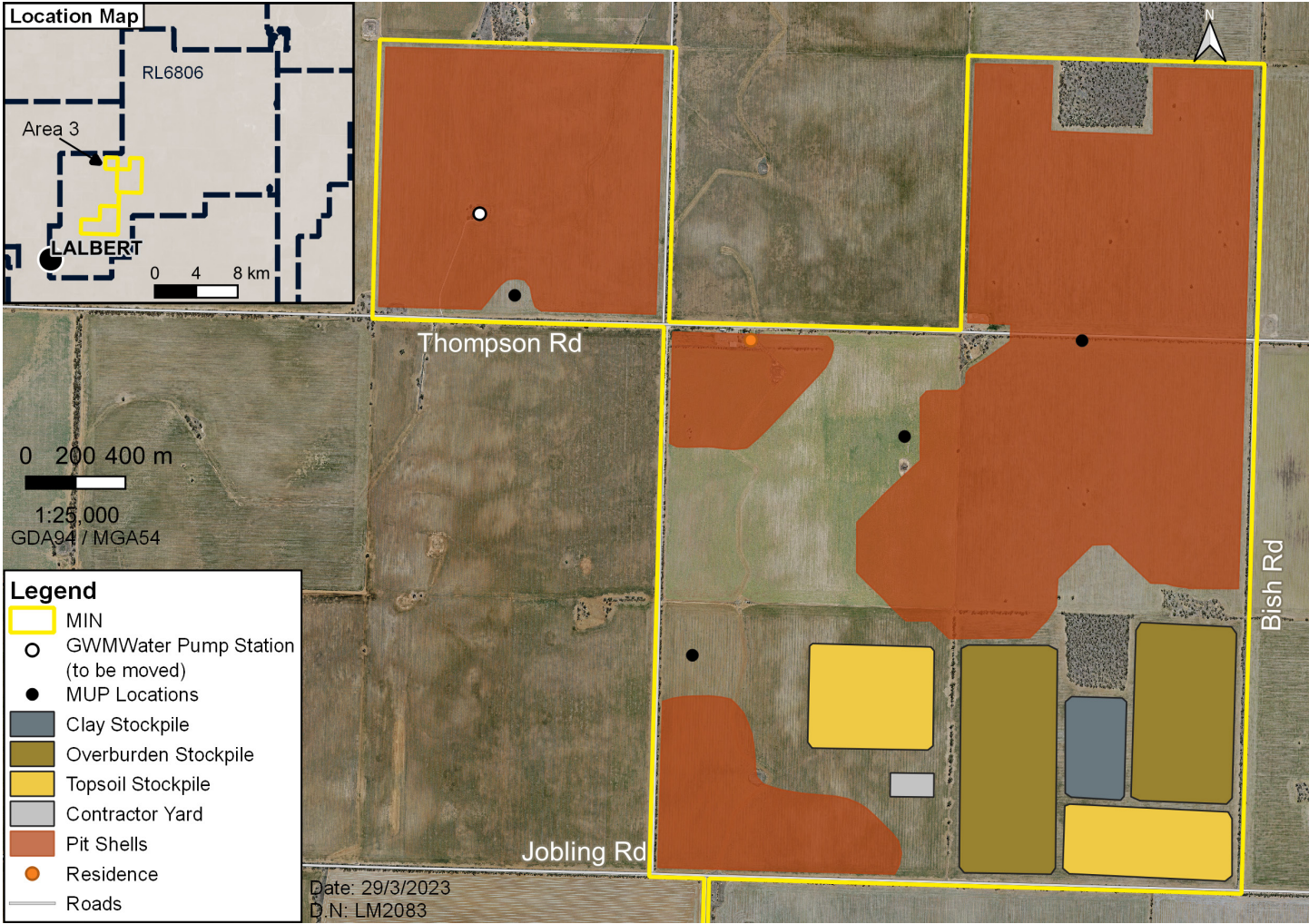
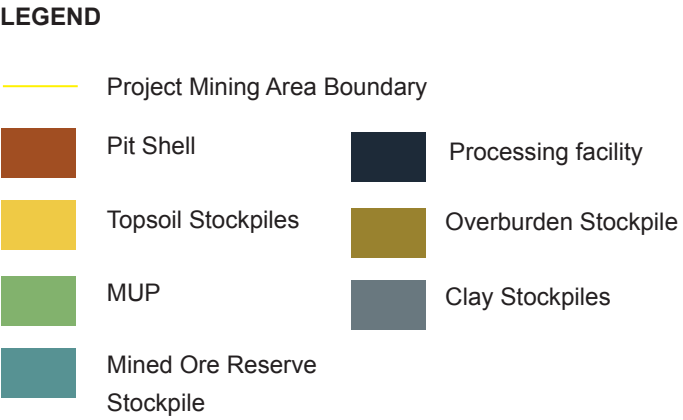
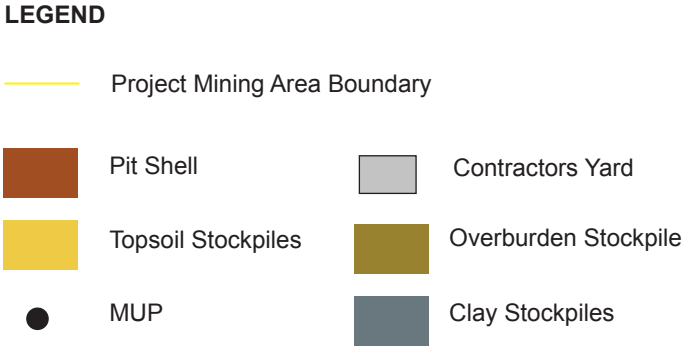


Figure 5 Goschen Project Mining Area 3 (Source: VHM)

## Project Mining Area 3 Goschen Mineral Sands and Rare Earths





# 2.0 Project Description

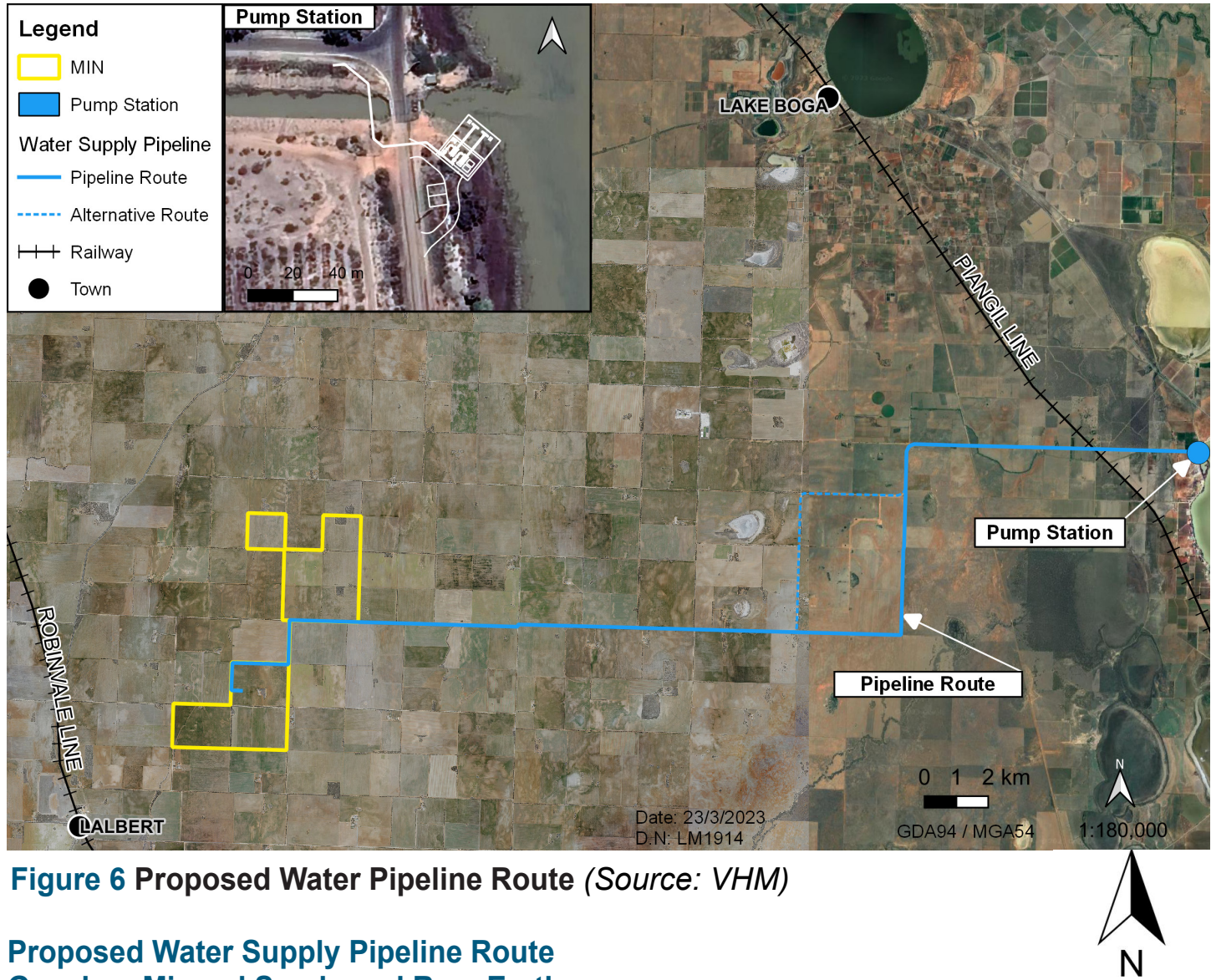


Image 1 Typical Mineral Separation Plant (MSP) arrangement (Source: VHM Exploration)



Image 2 Typical Mining Unit Plant (MUP) arrangement (Source: VHM Exploration)



Image 3 Typical Wet Concentrator Plant (WCP) arrangement (Source: VHM Exploration)



# 3.0 Scoping Requirements

## 3.1 EES Evaluation Objectives and Scoping Requirements

The scoping requirements for the Goschen Mineral Sands and Rare Earths Project Environment Effects Statement (‘scoping requirements’) by the Minister for Planning, set out the specific environmental matters the project must address in order to satisfy the Victorian assessment and approval requirements.

The scoping requirements include a set of evaluation objectives and require the environmental effects of all stages to be assessed. These objectives identify the desired outcomes to be achieved in managing the potential impacts of constructing and operating the Project in accordance with the Ministerial guidelines for assessment of environmental effects under the EE Act.

The following evaluation objective is relevant to the Landscape and Visual Impact Assessment:

*“To minimise adverse effects on landscape and visual amenity associated with the environs of the project site.”*

The aspects from the scoping requirements relevant to the evaluation objective are shown in *Table 1* as well as the location where these items have been addressed in this report.

Aspect	Scoping Requirement	Section Addressed
Key issues	<ul style="list-style-type: none"><li>• The potential for effects on the landscape values including Cannie Ridge, visual amenity and character of region from the project.</li></ul>	<b>Section 7.0 Existing Environment</b>
Existing environment	<ul style="list-style-type: none"><li>• Characterise the visual character and associated landscape values of the project site and surrounding area.</li><li>• Identify viewsheds in which the project site features, including from nearby residences (where permitted), public lookouts, roads and key vantage points in the vicinity.</li></ul>	<b>Section 7.0 Existing Environment, Section 8.0 Visual Impact Assessment</b>
Assessment of likely effects	<ul style="list-style-type: none"><li>• Assess the effects of the project and feasible alternatives on landscape and visual amenity values of the project site and surrounding area, including with respect to views from public vantage points and where possible representative local residences during construction, operation, decommissioning and post-closure.</li></ul>	<b>Section 8.0 Visual Impact Assessment, Appendix A - Viewpoint Analysis, Appendix B - Photomontages</b>
Design and mitigation measures	<ul style="list-style-type: none"><li>• Outline and evaluate the proposed mine design options, staging of works and management measures that could mitigate project effects on landscape and visual amenity during mining.</li><li>• Describe and evaluate the potential and proposed measures to restore and rehabilitate the landscape and visual amenity values of the project site after mining.</li></ul>	<b>Section 9.0 Mitigation Recommendations</b>  <b>Section 9.0 Mitigation Recommendations</b>
Approach to manage performance	<ul style="list-style-type: none"><li>• Describe proposed environmental management commitments to mitigate or manage effects on landscape and visual amenity values including in relation to the configuration and staging of works and progressive rehabilitation, including appropriate provision for post-closure planning.</li><li>• Describe the approach to monitor effects and develop contingency measures to be implemented in the event of adverse residual effects on landscape and visual values requiring further management.</li></ul>	<b>Section 9.0 Mitigation Recommendations, Appendix C - Preliminary Landscape Plan</b>  <b>Section 9.0 Mitigation Recommendations</b>

**Table 1** Scoping requirements relevant to Landscape and Visual Impact Assessment

# 4.0 Evaluation Framework

The assessment will consider legislation, policy and standards relevant to the Landscape and Visual Impact Assessment along with specific assessment criteria that have been derived for the purposes of the study.

## 4.1 Legislation, Policy, Guidelines and Standards

The legislation, policy, guidelines and standards relevant to this assessment are summarised in *Table 2*.

**Table 2** *Legislation, policy, guidelines and standards relevant to the assessment*

Document title	Summary	Relevance to the Project
Planning and Environment Act 1987	This Act provides a legal framework for preparing planning provisions for various government agencies in Victoria.	Objectives relevant to landscape and visual values include: <ul style="list-style-type: none"><li>• Protection of natural and man-made resources whilst maintaining ecological processes and genetic diversity.</li><li>• Conserve and enhance buildings, areas or places of scientific, architectural, aesthetic, cultural or historical interest.</li><li>• Facilitate development in accordance with all objectives whilst balancing the present and future interests of all Victorians.</li></ul>

Local Planning Schemes	The Project and parts of the extended Study Area are located within the extents of the Gannawarra Shire Council. Therefore, the Municipal Strategic Statement for this Council is valid for the Project.	<p>The Municipal Strategic Statement of the Gannawarra Planning Scheme provides the planning vision, objectives and land use planning strategies at the municipal level. It provides strategic justification for zones, overlays, local policies and controls laid out in the planning scheme. Clause 21.01 of the Planning Scheme states that the natural landscape of the Shire is characterised by the openness of irrigated and dryland farming areas. The Project is located on land zoned as Farming Zone (FZ). A few areas around the Project such as the White Gate Bush Reserve, Talgitcha Bushland Reserve, the Kangaroo Lake, Lake Cullen and Koorangie Wildlife Reserve have been classified as Public Conservation and Recreation Zone (PCRZ). Lalbert is the closest town which is categorised as Township Zone (TZ). Cannie Ridge, a significant grain production area, is located approximately 11 km south of the Project Mining Area. The Gannawarra Planning Scheme outlines the following objectives for Farming Zones relevant to visual impact assessment:</p> <ul style="list-style-type: none"><li>• <i>To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture.</i></li><li>• <i>To encourage the retention of employment and population to support rural communities.</i></li><li>• <i>To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision.</i></li></ul> <p>Policies applicable to Farming Zones are outlined in Clause 14.01-1L. The policy discourages fragmentation of agricultural land through subdivision of lots and supports consolidation of large parcels to better support the growth of agricultural activity.</p>
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# 4.0 Evaluation Framework

<b>Local Planning Schemes</b>	<p>No Overlays were identified within the extents of the Project Mining Area. The broader Study Area, however, showcases areas that have been assigned Environmental Significance Overlay (ESO) and Vegetation Protection Overlay (VPO). The VPO has been applied to stretches of roadside vegetation that run along Mystic Park - Beauchamp Road and Mitchell Road. The Overlay has also been applied to Tagitcha Bushland Reserve. Areas further to the east associated with Kangaroo Lake, Bael Bael Grassland Nature Reserve, Koorangie Wildlife Reserve and Yassom Swamp Flora and Fauna Reserve are managed under the requirements of the ESO. The Gannawarra Planning Scheme outlines the following objectives for the ESO:</p> <ul style="list-style-type: none"><li>• <i>To protect watercourse and lake environs.</i></li><li>• <i>To identify areas where the development of land may be affected by environmental constraints.</i></li><li>• <i>To ensure that development is compatible with identified environmental values.</i></li></ul> <p>The Gannawarra Planning Scheme outlines the following objectives for the VPO:</p> <ul style="list-style-type: none"><li>• <i>To protect and preserve indigenous vegetation and rare and endangered species.</i></li><li>• <i>To achieve high landscape quality and maintain and enhance roadside corridor habitats.</i></li><li>• <i>To promote and protect maintenance of ecological processes and genetic diversity and recognise catchment-wide land and water management benefits from vegetation retention.</i></li></ul>
<b>Guidelines for Environmental Management in Exploration and Mining</b>	<p>The Guidelines for Environmental Management in Exploration and Mining outlines the assessment and development process for large scale mineral resources extraction project in Victoria.</p> <p>These guidelines have been integrated into the mitigation methods and recommendations for this proposal.</p>



# 5.0 Consultation and Engagement

## 5.1 Consultation and Engagement

Understanding of the community perception towards a project is an intrinsic component of the Landscape and Visual Impact Assessment process. An extensive engagement and consultation program is currently being undertaken to ensure that the community and interested stakeholders are informed, involved and able to actively contribute to the development of the Project and preparation of the EES.

Community consultation is ongoing as a part of the TRG and EES process and to date, no specific landscape visual amenity concerns have been raised by the community. To date, the community have not expressed their views on any key features or viewpoints that are of concern. Where possible, key features have been identified through desktop study and have been mapped in **Section 7.0** of this report. Any community concerns or comments related to landscape and visual amenity will be addressed as they arise.

# 6.0 Methodology

## 6.1 Overview of Method

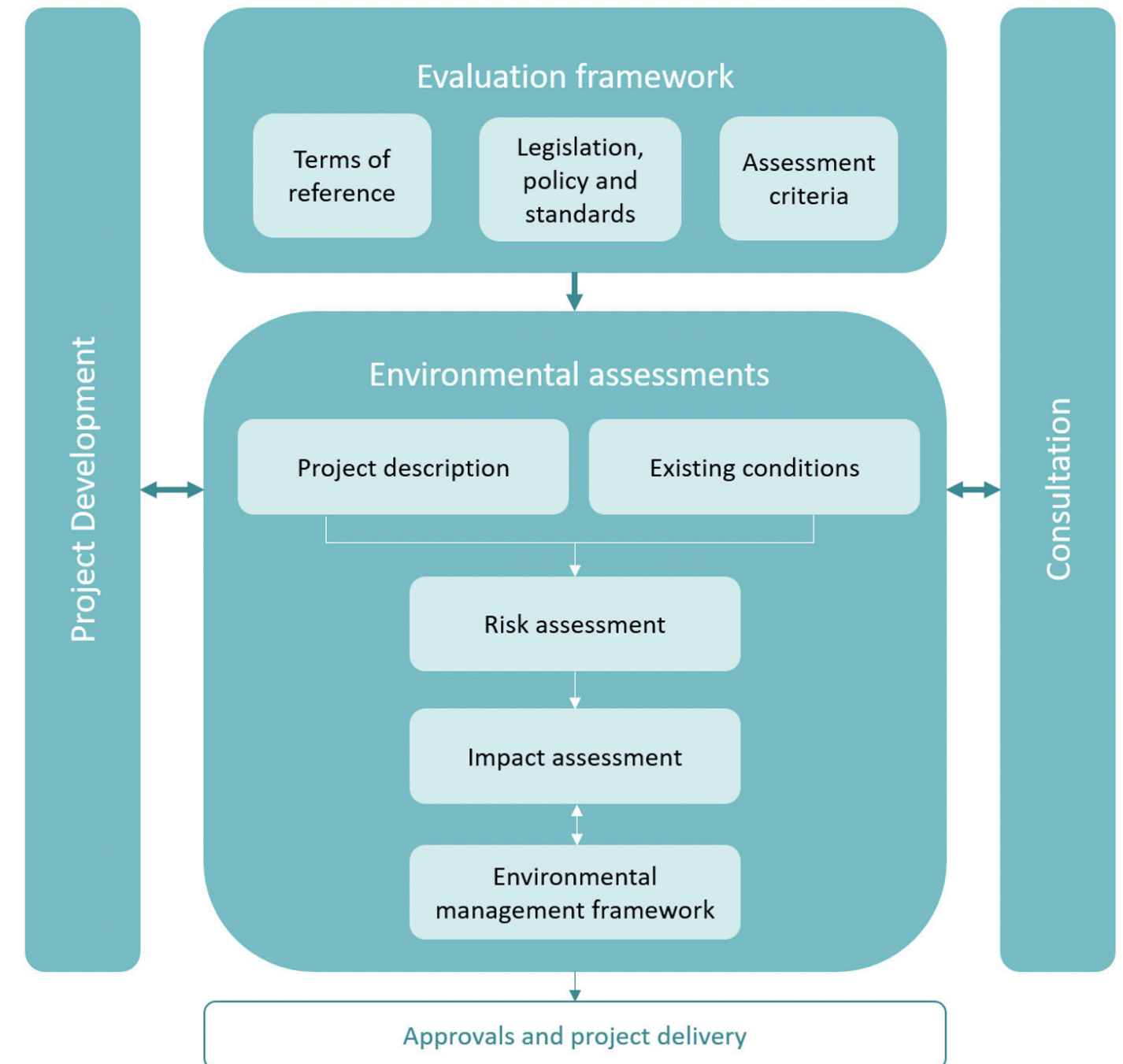
This section describes the method that was used to assess the potential impacts of the project.

**Figure 7** shows an overview of the assessment method. A risk-based approach was applied to prioritise the key issues for assessment and inform measures to avoid or minimise and manage and offset potential effects.

The approach used in the assessment has been guided by the evaluation framework that applies to the project comprising the regulatory framework (that is, applicable legislation and policy) as well as the scoping requirements set by the Victorian Minister for Planning.

The LVIA assessment has been undertaken according to the following steps:

- Establishment of a study area and characterisation of existing environment
  - Review of the project description, comprising the key project components (including locations and form), proposed construction and operation activities (in the context of existing environment) and decommissioning activities to determine the location, type, timing, intensity, duration and spatial distribution of potential project interactions with sensitive receptors
  - An initial risk based analysis to evaluate the potential effects of proposed project activities and their likelihood of occurring (considering initial mitigation measures) to determine the relative importance of environmental impacts associated with the project and therefore prioritise issues for attention in the subsequent assessment of impacts. Initial mitigation measures would include measures that are common industry practice or required to meet legislation.
  - An assessment of impacts that examines the severity, extent, and duration of the potential impacts and considers the sensitivity and significance of the sensitive receptors
  - Evaluation of predicted outcomes against benchmarks and criteria such as those described in applicable legislation, policy and standards
  - Evaluation of the potential for cumulative impacts (where relevant) caused by impacts of the project in combination with impacts of other existing and proposed projects that may have an overall significant impact on the same environmental asset
  - Identification of additional mitigation measures where necessary to address potentially significant environmental impacts
  - Evaluation and reporting of the residual environmental impacts including magnitude, duration and extent, taking into account the proposed mitigation measures and their likely effectiveness.
  - Based on the findings of the environmental assessments, an Environmental Management Framework (EMF) has been prepared to monitor and control environmental performance during project implementation. The EMF has specified the committed mitigation measures to avoid, minimise and manage impacts, proposed contingency measures and offset commitments, and describe the roles and responsibilities for implementation throughout project construction, operation and decommissioning.
- The specific methods adopted during the key steps are described in the sections below.



**Figure 7 Assessment Method**



# 6.0 Methodology

## 6.2 Project Mining Area

As mentioned in **Section 2.2** and **2.3**, the extents of Areas 1 and 3 that are located within the Project boundary define the term “Project Mining Area” as shown in **Figure 8**.

Land within the Project Mining Area currently includes:

- Large scale agricultural rural lots that are zoned as FZ - Farming Zone.
- Sections of low use roads such as Bennett Road, Shepherd Road, Jobling Road and Thompson Road.

## 6.3 The Processing Facility

**Section 2.3** outlines Project components such as the Processing Facility which comprises of structures that are 6 - 36m high. The term “Processing Facility” is defined by land located along the western boundary of Area 1 as shown in **Figure 8**. The Processing Facility is currently defined by a rural lot that can be accessed via Bennett Road.

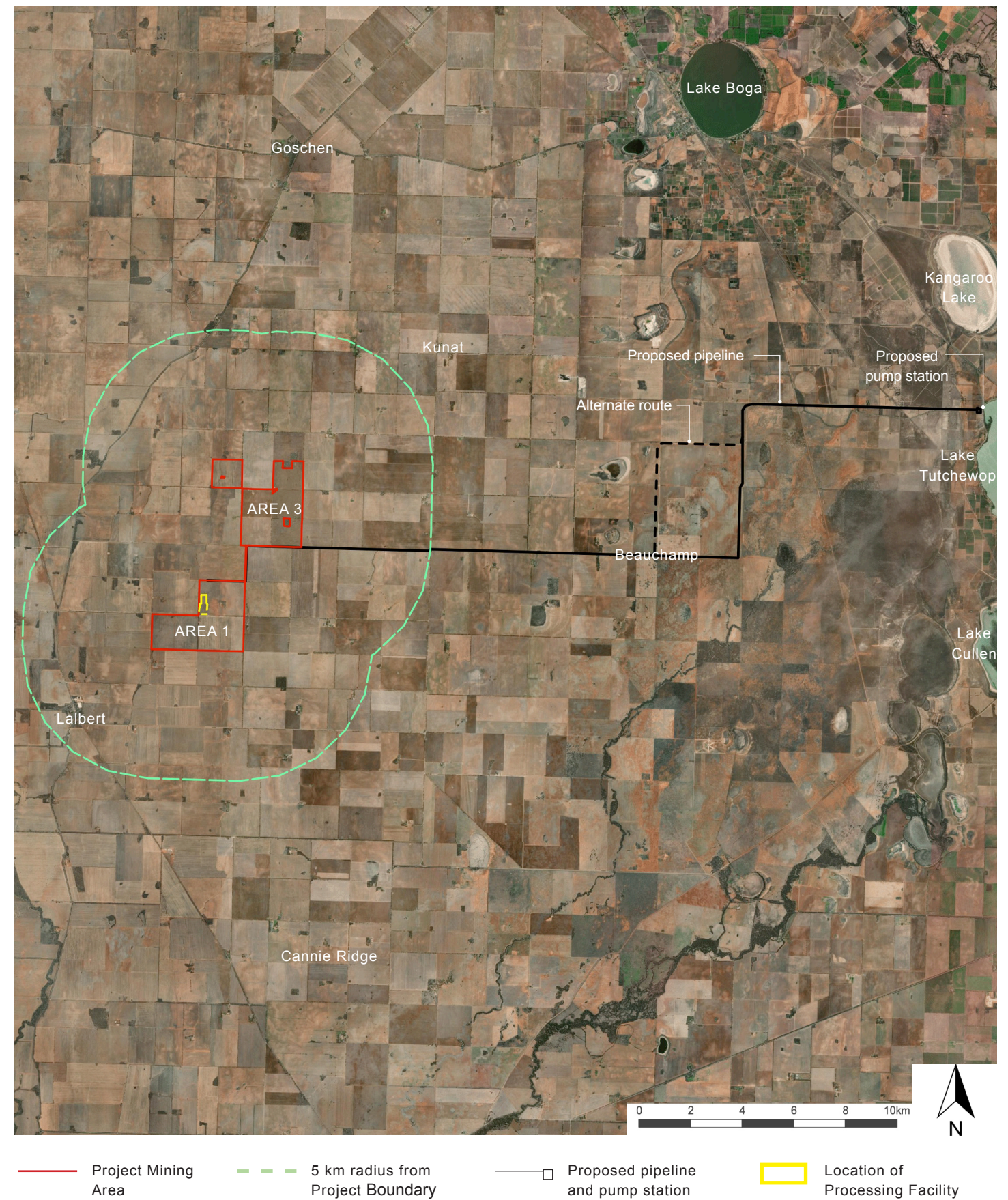
## 6.4 Study Area

For the purpose of this Landscape and Visual Impact Assessment, the “Study Area” is defined as the land within the extents of the Project Boundary and areas that extend up to 5 km from the Project Area Boundary as shown in **Figure 8**. It also includes the proposed pipeline and pump station at Kangaroo Lake.

Land within the Study Area includes:

- Large scale agricultural lots that have are used for broad-acre wheat cropping.
- Surrounding scattered dwellings, sheds and other farm infrastructure.
- Low use roads that provide access to these dwellings and farm lots.
- The town of Lalbert which is located approximately 3.8 km southwest of the Area 1.

**Figure 8** also shows the location of Cannie Ridge which is approximately 11 km south of the Project Mining Area. The impact of the Project is likely to reduce as the distance from the Project increases. **Section 7.0** of this report discusses the existing landscape character of the Study Area and also discusses the character of Cannie Ridge. **Section 8.0** of this report discusses the potential visual impacts on surrounding dwellings in the Study Area. For the purposes of this report, the surrounding dwellings are defined as sensitive receptors and this excludes temporary structures such as sheds.



**Figure 8 Overall Context and Study Area (Map Source: ESRI Imagery)**



# 6.0 Methodology

## 6.5 Existing environment

A comprehensive assessment was undertaken to understand the existing environment of the Study Area to inform the baseline against which the assessment for the works was undertaken (refer to **Section 7.0**).

This assessment incorporated:

### **Desktop Assessment:**

Comprehensive assessment of the existing landscape character to determine the baseline against which the Project will require assessment against. It also comprises of an assessment of dwellings within Study Area to understand potential visual impacts on surrounding sensitive receptors.

### **Review of Literature:**

Review of relevant literature to define a qualitative methodology for the assessment.

### **Field Assessment:**

Field assessment undertaken during March 2022 to ground truth findings of desktop assessment. Undertake assessments from key viewing locations identified within the Study Area to determine the impact of the Project. This includes an assessment from public viewing locations.

## 6.6 Avoidance and minimisation

Consideration of the baseline study (as above) resulted in proposed mitigations measures to reduce impacts to the existing environment. The following measures have been adopted in relation to the design, construction and operation of the Project to avoid and minimise impacts:

- Design principles to reduce contrast with the surrounding landscape (ie. material and colour selection)
- Landscape screening in keeping with the existing landscape character (as determined through field work and desktop assessments)
- Recommendations for lighting design to reduce impacts.

## 6.7 Impact assessment

A change to baseline conditions (or the no-project case) caused by project activities in any of the project phases (construction, operation or decommissioning) may give rise to impacts. The impact assessment involved identifying the severity, extent and duration of any impacts, positive or negative, that the project may have on the existing environment.

The significance of the impacts has been assessed in accordance with the evaluation framework, based on applicable legislation, policy and standards and the evaluation objectives and environmental significance guidelines arising from the government terms of reference established to guide the assessments.

The potential visual impact of the proposal is then assessed based on the relationship between the visual sensitivity (refer to **Section 6.3.1**) and visual effect (refer to **Section 6.3.2**).

### 6.7.1 Visual Sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape is viewed by people from different areas. The assessment is based on the number of people affected, land use, and the distance of the viewer from the proposal (EDAW, 2000). It is also defined as the capacity of a view or landscape character to absorb change in the visual character due to a proposal (RMS, 2018).

For example, a significant change that is not frequently seen may result in a low visual sensitivity although its impact on a landscape may be high. Generally the following principles apply:

- Visual sensitivity decreases as the viewing time decreases.
- Visual sensitivity decreases as the number of potential viewers decreases.
- Visual sensitivity can also be related to viewer activity (e.g. A person viewing an affected site whilst engaged in recreational activities will be more strongly affected by change than someone passing a scene in a car travelling to a desired destination).

Sensitivity ratings are defined as high, moderate or low and are shown in the *Table 4* below (adapted from Urbis, 2009).

# 6.0 Methodology

VISUAL SENSITIVITY RATING					
	DISTANCE FROM PROCESSING FACILITY				
LAND USE	0-1 km	1-2 km	2 - 4.5 km	4.5 -7 km	> 7 km
Townships	HIGH	HIGH	HIGH	MODERATE	LOW
Recreational Reserve	HIGH	HIGH	HIGH	MODERATE	LOW
Homestead	HIGH	HIGH	HIGH	MODERATE	LOW
Rural Township	HIGH	HIGH	MODERATE	LOW	NIL
Main Highway	MODERATE	MODERATE	LOW	LOW	NIL - LOW
Local Roads	MODERATE	MODERATE	LOW	LOW	NIL - LOW
Farm Road	LOW	LOW	NIL - LOW	NIL - LOW	NIL
Agricultural Land	LOW	LOW	NIL - LOW	NIL - LOW	NIL

Table 4 Visual Sensitivity Rating Table (Adapted from Urbis, 2009)

## 6.7.2 Visual Magnitude

Visual magnitude is defined as the interaction between a proposal and the existing visual environment. It is often expressed as the level of visual contrast of the proposal against its setting or background in which it is viewed. It is also defined as the measurement of scale, form and character of a proposal in comprison to the existing condition and the distance of a viewer from the proposal (RMS, 2018).

**Low level:** occurs when a proposal blends in with its existing viewed landscape due to a high level of integration of one or several of the following: form, shape, pattern, line, texture or colour. It can also result from the use of effective screening ie. Topography and vegetation.

**Moderate level:** occurs where a proposal is visible and contrasts with its viewed landscape however, there has been some degree of integration (e.g. Good siting principles employed, retention of significant existing vegetation, provision of screen landscaping, appropriate colour selection and/or suitably scaled development).

**High level:** results when a proposal has a high visual contrast to the surrounding landscape with little or no natural screening or integration created by vegetation or topography.

## 6.7.3 Visual Impact

Visual impact refers to the change in appearance of the landscape as a result of development (EPHC, 2010). Visual impact is the combined effect of visual sensitivity and visual effect. Various combinations of visual sensitivity and visual effect will result in high, moderate and low overall visual impacts as suggested in **Table 5** below (RMS, 2018).

VISUAL IMPACT RATING					
		VISUAL MAGNITUDE			
		HIGH	MODERATE	LOW	NEGLIGIBLE
VISUAL SENSITIVITY	HIGH	HIGH	HIGH-MODERATE	MODERATE	NEGLIGIBLE
	MODERATE	HIGH-MODERATE	MODERATE	MODERATE-LOW	NEGLIGIBLE
	LOW	MODERATE	MODERATE-LOW	LOW	NEGLIGIBLE
	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE

Table 5 Visual Impact Rating Table (Adapted from RMS, 2018)



# 6.0 Methodology

## 6.8 Assessment of Night lighting

The report provides an assessment of the visual impacts of potential night lighting of the Project. It is intended that the mine will operate 24 hours a day, 365 days per year and utilise two 12-hour shifts. Night lighting has the potential to result in the alteration of the night-time landscape character of the region. Potential light sources include:

- Floodlights to provide external area lighting (during both construction and operation phases).
- Bulkhead LED lighting which will be installed on each level of the buildings.
- Exit lighting with battery backup to allow for power outage.

The report provides design guidance for the reduction of light pollution, which can then inform proposed mitigation techniques (refer to **Section 9.0**). As there are no current guidelines for the assessment of nightlighting in Victoria, reference has been made to the *Australian Standard 4282 - Control of the obstructive effects of outdoor lighting* to reduce the possible impacts of outdoor lighting and prevent light pollution.

# 7.0 Existing Environment

## 7.1 Project Description

The subject land, referred to as “the Project” is associated with Goschen Mineral Sands and Rare Earth Project located on the granted tenement EL 5520. It covers area of high mineralisation and low mineralisation (Refer **Figure 6 and Figure 7**). The “Processing Facility” (as defined in **Section 6.3**) is located along the western boundary of Area 1 (refer **Figure 3 and Figure 4**) and comprises of a structures that are 6m - 36 m tall.

The overall Study Area (as defined in **Section 6.3**) sits within the Gannawarra Shire Council. It is located on the plains above flood level in the locality of Lalbert. Lalbert town is approximately 3.8 km south west of the Project Mining Area (refer **Section 6.2** for definition of Project Mining Area). Major centre of the region Swan Hill is located approximately 25 km to the north east of the Project Mining Area and the Robinvale rail line approximately 2 km to the west.

Majority of the Study Area has been used for large-scale cropping. With reference to Victorian Planning Provisions, land within the Project is zoned FZ (Farming Zone). Land is generally flat and cleared for agricultural purposes. Some remnant vegetation is located on the lot boundaries and roadsides.

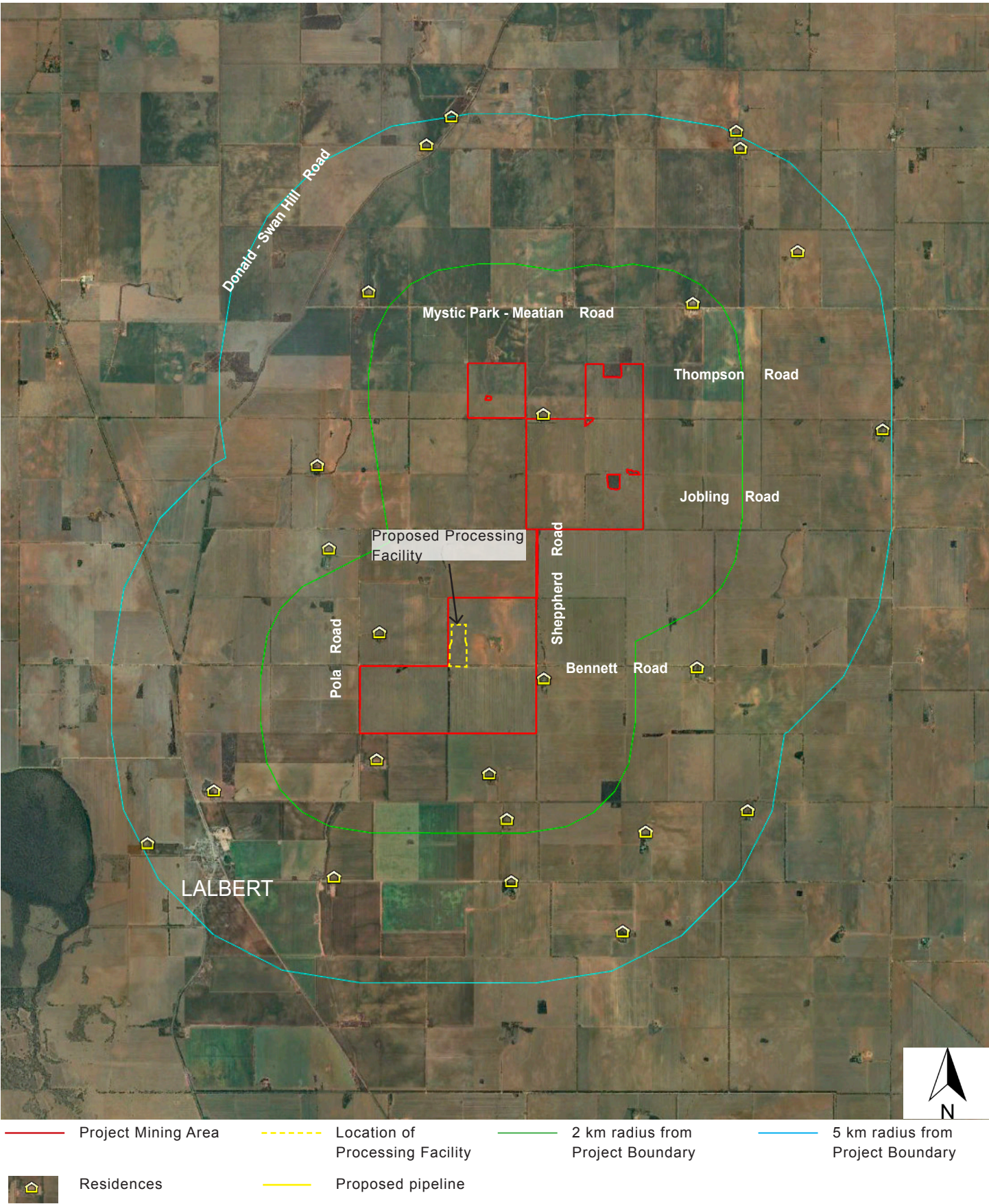


Figure 9 The Project Mining Area (Not to scale, Map Source: Google Earth)



# 7.0 Existing Environment

## 7.2 Existing Landscape Character

### 7.2.1 Land Use Zoning and Overlays

The landscape typical of the region is predominantly cleared for croplands, consistent with its historical land use as broadacre wheat growing. Under the Victoria Planning Provisions, land within and around the Study Area is categorised as FZ - Farming Zone. Cannie Ridge, which is located approximately 11 km south of the Project Mining Area and between Lalbert and Quambatook, has built its reputation as one of Victoria’s significant grain production regions (Gannawarra Shire Council, 2022). Since the Project is located at a significant distance from Cannie Ridge, the grain production and associated agricultural activities are not likely to be impacted.

Rural dwellings and agricultural structures intersperse the landscape within the Study Area. The rural dwellings are generally surrounded by vegetation for visual screening and wind break planting. The town of Lalbert is classified as TZ - Township Zone. White Gate Bushland Reserve, Talgitcha Bushland Reserve and areas around Kangaroo Lake in Mystic Park are classified as PCRZ - Public Conservation and Recreation Zone.

Vegetation Protection Overlay (VPO) has been applied to some stretches of roadside vegetation and the Talgitcha Bushland Reserve located south of the Project Mining Area. Bushfire Management Overlay (BMO) has also been applied to this reserve. Areas that fall under the PCRZ are also allocated under the Environmental Significance Overlay (ESO).

### 7.2.2 Roads

The Project can be accessed via Jobling Road, Bennett Road, Thompson Road and Pola Road and Quambatook - Swan Hill Road (Refer **Figure 10**). These local roads are mostly unsealed and provide access to the rural farming properties. Donald-Swan Hill Road is the major road linked with Murray Valley Highway south of Swan Hill township.

### 7.2.3 Towns

Lalbert is the only town present in close proximity of the Project and it has a population of 151 (ABS, 2016). Lalbert is 50 km west of Kerang and 45 km south of Swan Hill and 34.5 km from Quambatook, a small town to the south east. Lalbert has a few facilities including a recreational reserve and oval, school, hall, a general store, railway station and a rest stop equipped with public toilets, playground and picnic facilities. Large grain silos located within the town next to the railway line. Views from within the town are limited by the presence of large grain silos and sheds, grain stockpiles, railway lines and vegetation.

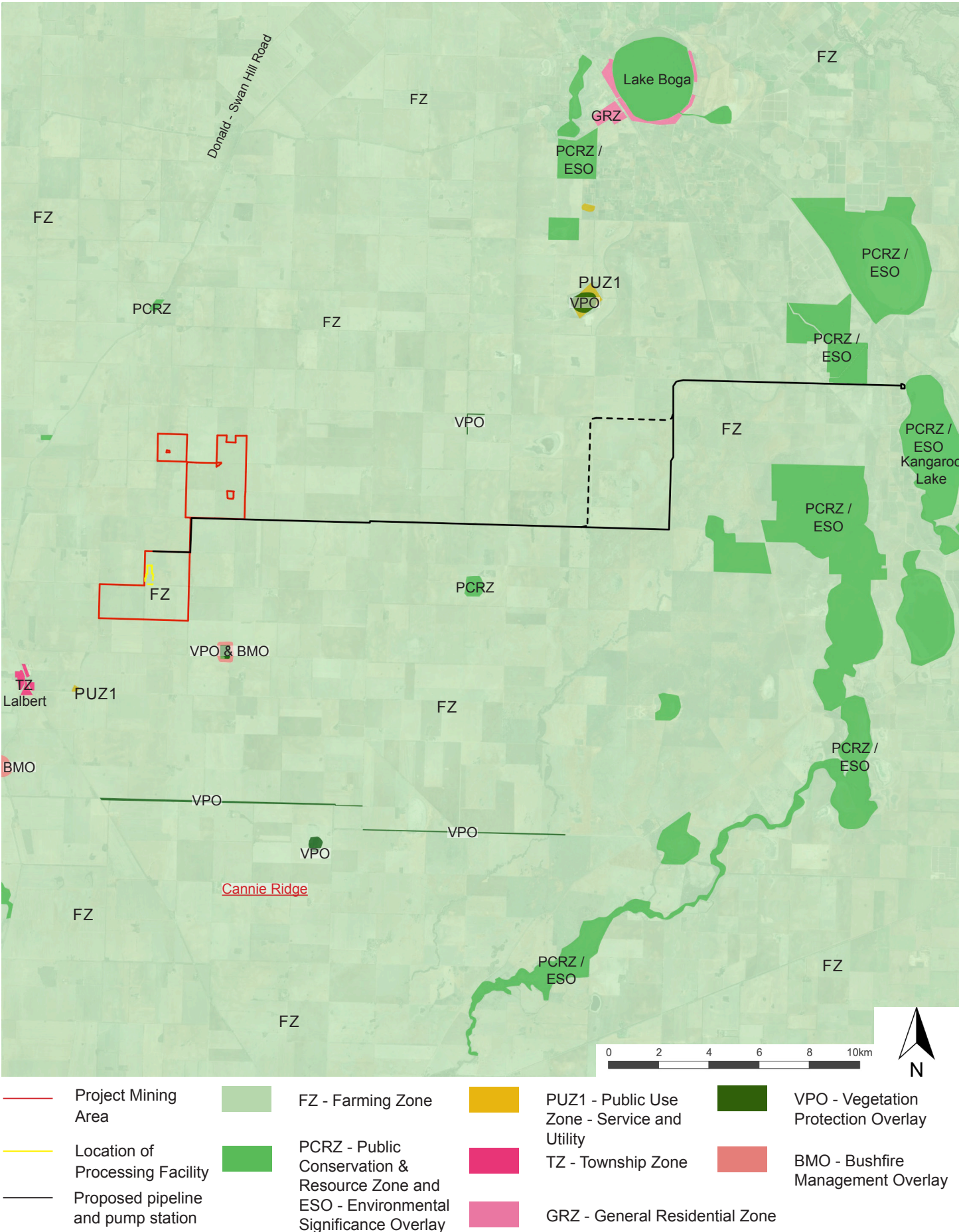


Figure 10 Land Use Zones and Overlays



# 7.0 Existing Environment

## 7.2.4 Infrastructure

Infrastructure in the area is generally limited to agricultural structures, railway lines, roads and power lines. Robinvale railway line is a freight only railway line which traverses through Lalbert town alongside Donald-Swan Hill Road and diverges from the road in the north west direction. The Kerang-Redcliffs electrical transmission lines are visible within the agricultural landscape setting contrasting with the rural landscape character.

## 7.2.5 Vegetation

The Study Area sits within Murray Mallee Bioregion. The native vegetation has been largely cleared for agricultural use. Remnant stands of native vegetation that are reminiscent of Ridged Plains Mallee Woodlands, Woorinen Woodlands and Plains Savannah remain and are generally located along roadsides and main watercourses, property boundaries and small pockets within private lots.

Area of intact vegetation is limited and largely along the Kerang Wetlands Ramsar site on the east and Mystic Park Bushland Reserve. The wetlands are derived from Plains Savannah, Lignum Swamp, Lignum Swampy Woodland and Riverine Grassy Woodlands.

The following vegetation communities as occurring within the Study Area have conservation status:

- Ridged Plains Mallee Woodland (EVC 96) - Endangered bioregion conservation status
- Woorinen Mallee Woodland (EVC 824) - Vulnerable bioregion conservation status

Private access track to rural properties are well vegetated with hedges and low trees that provide adequate visual screening to the rural residences. Plantings in the immediate surround of rural residential properties are mix of native and exotic species.

## 7.2.6 Topography

Topography of the region is flat with slightly sloping land consistent with Loddon Mallee Region. The Processing Facility is for the majority positioned on the low ridgeline with elevation ranging from approximately 85.5m to 120m above Australian Height Datum (AHD).

## 7.2.7 Water bodies

The Study Area sits within North Central Catchment Management Authority boundaries bordered by Donald-Swan Hill Road. Lake Lalbert is located 9 km south west from the Study Area. It is a deep freshwater marsh fed by floodwater from the Lalbert Creek.

Kangaroo Lake is another significant water body that has recreational and ecological associations. It is located approximately 30 km northeast of the Study Area. Kangaroo Lake serves as an important water source in the region. A number of channels that emerge from this lake are diverted towards agricultural lots for irrigation purposes (see **Image 9**).



*Image 5 Aerial view of Lalbert from the Recreation Oval*



*Image 6 Predominant farmland character of Project Mining Area - cleared, flat parcels and roadside vegetation*



# 7.0 Existing Environment

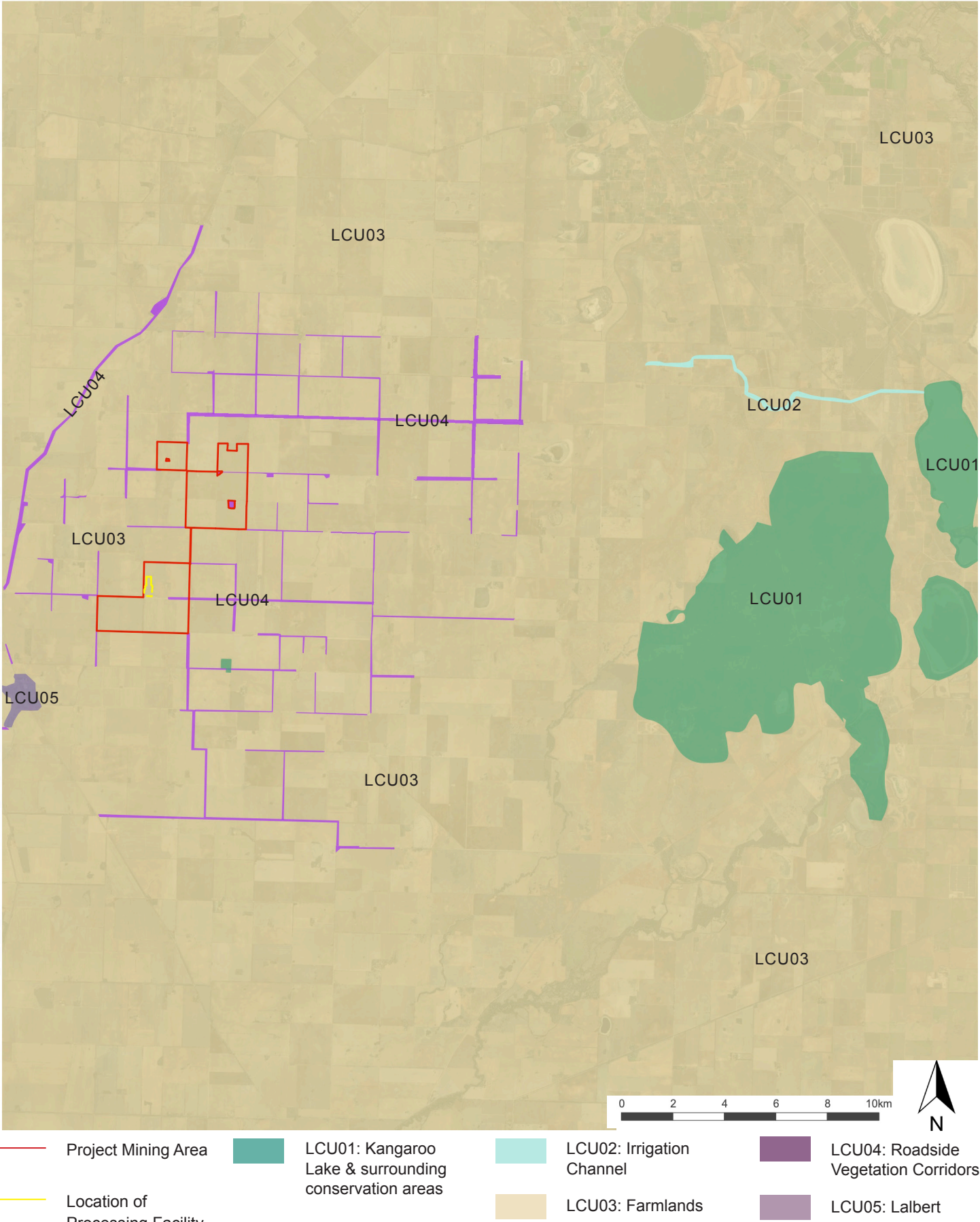
## 7.3 Landscape Character Units

A number of Landscape Character typologies exist within and around the Study Area (refer to **Figure 11**). As part of the Preliminary Landscape Character Assessment, a total of five (5) key landscape character units (LCUs) have been identified.

**Table 5** provides an overview of the LCUs.

Landscape Character Units		
LCU:	Name:	General Character:
LCU01	Kangaroo Lake and surrounding conservation areas	Extents of Kangaroo Lake and its surrounding areas that have recreational and ecological associations. Located to the east of the Project.
LCU02	Irrigation Channel	Constructed channels that support the agricultural activity prevalent in the region. Most channels feed into / out of Kangaroo Lake.
LCU03	Farmlands	Large, flat land parcels used for cropping and occasionally for grazing. Most prominent character of the Study Area and its surrounds.
LCU04	Roadside Vegetation Corridors	Grid layout of roads with dense and patchy plantations that support ecological well-being. Prominent characteristic in an otherwise agriculturally dominated landscape.
LCU05	Lalbert	Settlement of Lalbert comprising of residences, small scale commercial entities and agricultural elements.

**Table 6** Overview of Landscape Character Units



**Figure 11** Landscape Character Units (*Map Source: ESRI Imagery*)



# 7.0 Existing Environment

## LCU01: Kangaroo Lake and surrounding conservation areas

This LCU is defined by the extents of Kangaroo Lake and its immediate surrounds including Mystic Park settlements that are located on the lakefront. It also comprises of other reserves and ecologically significant areas located further to the west. The lake has strong recreational associations. The picnic area and boat ramp have significant recreational associations.

See Images 7 and 8.



Image 7  
Aerial view of Kangaroo Lake



Image 8  
Picnic area and boat shed at Kangaroo Lake

## LCU02: Irrigation Channel

This LCU comprises of constructed channels that emerge from Kangaroo Lake and supply water to the farmlands in the region. They play an important role in controlling the lake’s water levels. It is a modified landscape element. The canals form a significant infrastructure element in a landscape that is otherwise dry. Regulated and managed flows allows some channels to remain dry.

See Images 9 and 10.



Image 9  
Aerial view of Channel 5/7 as seen from Bailey Road.



Image 10  
No. 7 Main Channel canal diversion from Kangaroo Lake.



# 7.0 Existing Environment

## LCU03: Farmlands

The Farmlands LCU is defined by flat to gently sloping land parcels that have been extensively cleared to support agricultural activity. They are characterised by open, cleared lands with minimal tree cover on large lots used for cropping. This LCU dominates the character within and around the Project Mining Area. The landscape is highly modified to suit the needs of agricultural production and rural residences.

**See Images 11 and 12.**



**Image 11**

*Typical character within and around the Project - flat land parcels cleared for cropping*



**Image 12**

*Farmlands bordered by corridor vegetation typical of the region.*

## LCU04: Roadside Vegetation Corridors

The Roadside Vegetation Corridor LCU is defined by flat to gently sloping roads that provide accessibility within the region. The roadside vegetation is visually distinct from the rest of the landscape because the tree cover along roadsides is dense and diverse. The vegetation acts as a wildlife refuge and is, hence, a significant ecological entity. It also comprises of remnant Mallee Woodland species that are a characteristic of the region.

**See Images 13 and 14.**



**Image 13**

*Gently sloping to flat dirt roads with varying densities of tree cover.*



**Image 14**

*Character of roads closer to the Project Mining Area.*



# 7.0 Existing Environment

## LCU05: Lalbert

The town of Lalbert presents a unique character with a highly modified landscape. Residences, small scale commercial entities and amenities are located along the town's main street. A freight line also passes through the town. It has significant agricultural associations due to the surrounding land uses. The town has a small population that engages in agricultural activity.

**See Images 15 and 16.**



**Image 15**

*Lalbert town silos and recreation oval.*



**Image 16**

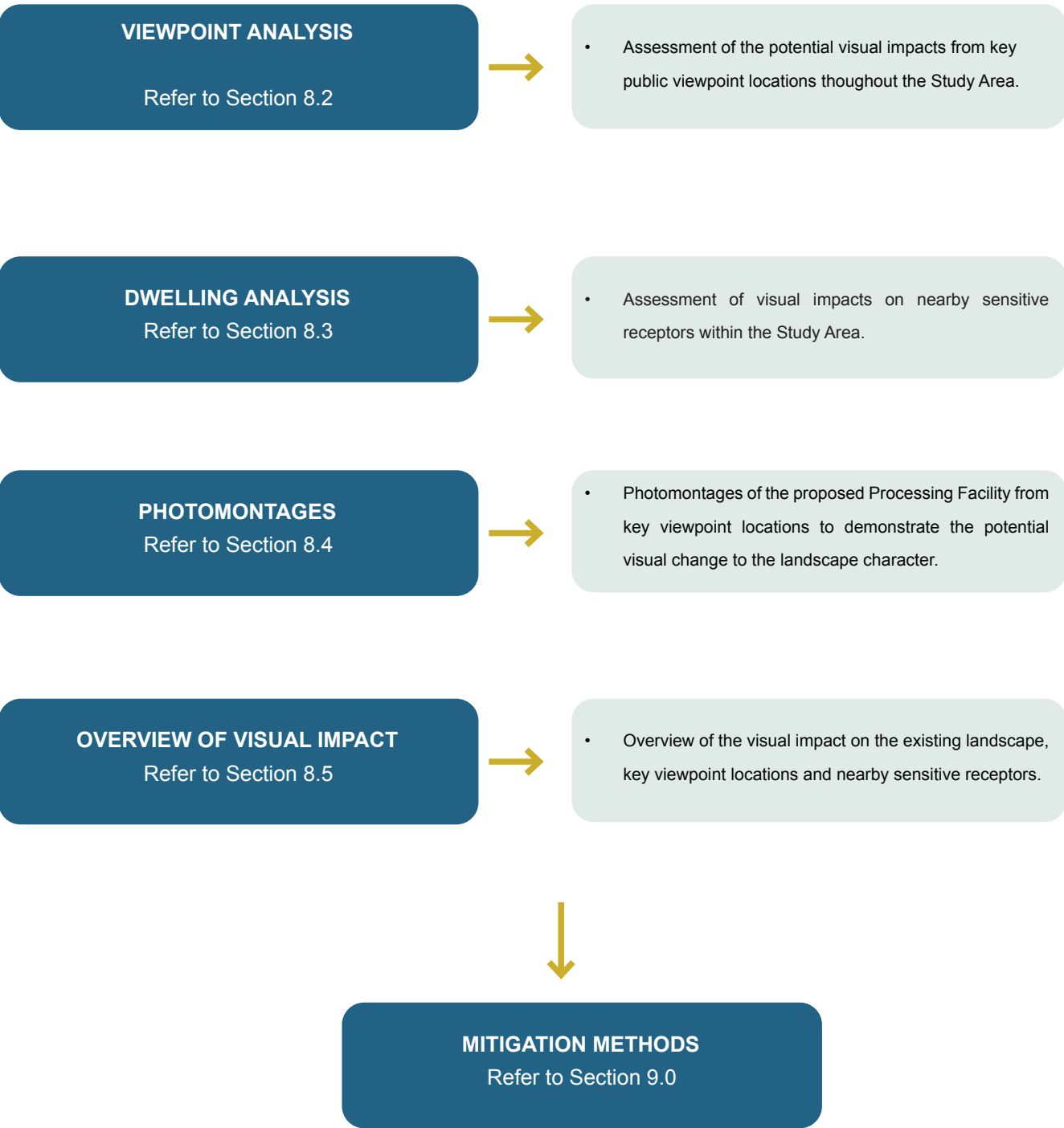
*Views of Lalbert Silo and train line from the town's main street.*



# 8.0 Visual Impact Assessment

## 8.1 Visual Impact Assessment Study Method

Based on the existing policies and framework and experience in large scale landscape and visual impact assessment, the following provides an overview of the study method utilised for undertaking the Landscape and Visual Impact Assessment (LVIA). The LVIA considers potential visual impacts, especially of the processing facility, on various public and private viewing locations. The LVIA was undertaken in the stages as noted below:





# 8.0 Visual Impact Assessment

## 8.2 Viewpoint Analysis

This part of the visual assessment considers the likely impact that the Processing Facility would have on the existing landscape character and visual amenity by selecting prominent sites, otherwise referred to as viewpoints. As outlined in the **Section 7.1**, the Processing Facility comprise of tall structures that have the potential to impact surrounding sensitive receptors. The Viewpoint Analysis, therefore, considers the visual impact of the Processing Facility on the chosen viewpoint locations.

### 8.2.1 Viewpoint Analysis Method

#### Viewpoint Selection Process

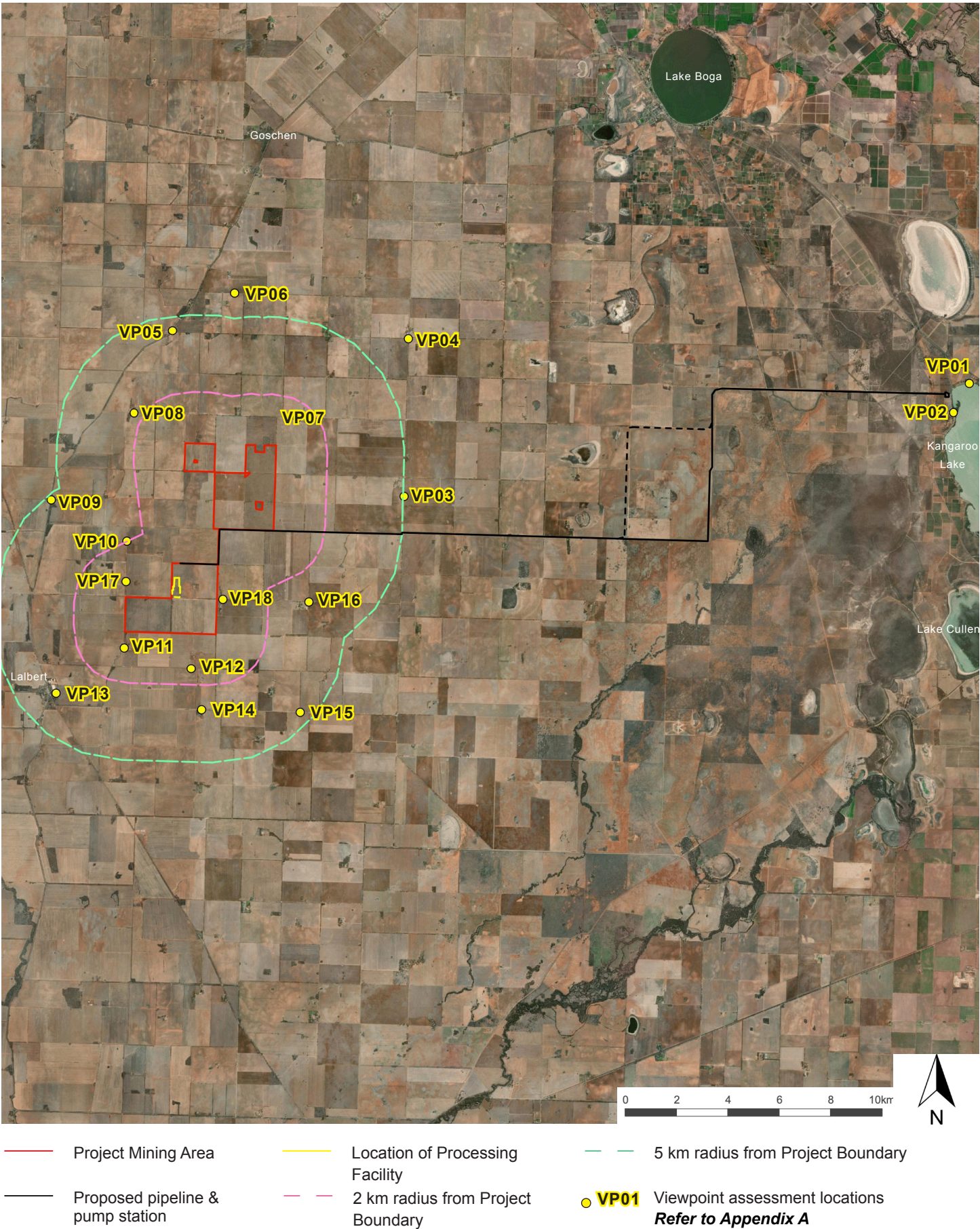
Viewpoints are selected to illustrate a combination of the following:

- Present landscape character types.
- Areas of high landscape or scenic value.
- Visual composition (e.g. focused or panoramic views, simple or complex landscape pattern).
- Range of distances.
- Varying aspects.
- Various elevations.
- Various extent of Processing Facility visibility (full and partial visibility).
- Sequential along specific routes.

Viewpoints have been carefully selected to be representative of the range of views within the Study Area including the proposed mining extraction locations and the proposed pump station near Kangaroo Lake. The selection of viewpoints is informed by topographical maps, field work observations and other relevant influences such as access and landscape character.

A total of 18 viewpoints were taken as part of the field work process to best represent views from areas that are likely to be impacted. These viewpoints were taken from publicly accessible roads surrounding the Study Area. The viewpoints represent the areas from where the Processing Facility would appear most prominent, either based on the degree of exposure or the number of people likely to be affected.

Desktop assessment for the Project identified that majority of the dwellings within 5 km of the Project are surrounded by dense vegetation. A detailed assessment of these dwellings has been provided in **Appendix D** and a summary of the assessments is provided in **Section 8.3**. Viewpoints for the study have been taken from accessible public land and the assessments for these have been included in **Appendix B** (refer to **Figure 12** for locations).





# 8.0 Visual Impact Assessment

## Viewpoint Photography Parameters

Once the viewpoints were selected, panoramic photographs were taken from a level tripod at a height of 150 cm (to represent eye level). Photographs have been captured with a Canon EOS 50D Mark IV Full Frame Digital SLR through a 50mm fixed focal lens which closely represent the central field of vision of the human eye.

## Viewpoint Assessment Process

The visual impact of the viewpoint has been assessed using the methodology outlined in **Section 6.0** using a combination of the visual sensitivity and visual magnitude. The assessment was made both on-site and with the topographic and aerial information to ensure accuracy. Viewpoint photographs and detailed analysis for each of the 18 viewpoint locations selected has been discussed in **Appendix A**. The findings of the viewpoint analysis have been summarised in **Table 6**.

### 8.2.2 Overview of Viewpoint Analysis

As discussed in the rationale for the viewpoint selection process, where possible these viewpoints have been selected to represent the worst case scenario. For each viewpoint, the potential visual impact was analysed through the use of a combination of topographic maps and on-site analysis.

***The viewpoint analysis sheets have been included in Appendix A and are summarised in Table 7.***

The visual sensitivity and visual magnitude of each viewpoint have been assessed which, when combined, result in an overall visual impact for the viewpoint.

Of the 18 viewpoints assessed as part of this LVIA, 13 of these have been assessed as having a ‘low’ visual impact, two (2) of these have been assessed as having a ‘low - moderate’ visual impact, three (3) of these have been assessed as having a moderate visual impact.

Generally, the viewpoints rated as having a moderate visual impact were taken in areas where the proposed Processing Facility is located within close proximity to a high or moderate sensitivity. The assessments have been made without the consideration of mitigation measures which would significantly reduce the potential visual impact from these locations. Further assessment has been undertaken from the viewpoint locations considered as potentially having a moderate visual impact.

# 8.0 Visual Impact Assessment

VIEWPOINT	LOCATION	VISUAL SENSITIVITY	VISUAL MAGNITUDE	POTENTIAL VISUAL IMPACT	RELEVANT PHOTOMONTAGE NUMBER	SUMMARY OF ASSESSMENT
VP01	Kangaroo Lake Picnic Area, Mystic Park	HIGH	LOW	MODERATE		Potential visual impact rating is dependent on the land use associated with this viewpoint. The visibility of the pump station, however, is low. Photomontage is not required.
VP02	Gorton Drive, Mystic Park	MODERATE	LOW	LOW - MODERATE		Potential visual impact rating is dependent on the land use associated with this viewpoint. The visibility of the pump station, however, is low. Photomontage is not required.
VP03	Quambatook-Swan Hill Road, Beauchamp	NIL - LOW	LOW	LOW		Viewpoint is located on a low use rural road at a significant distance from the Project.
VP04	Holmes Road,Kunat	NIL - LOW	LOW	LOW		Viewpoint is located on a low use rural road at a significant distance from the Project.
VP05	Donald-Swan Hill Road, Goschen	NIL - LOW	LOW	LOW		Viewpoint is located on a low use rural road at a significant distance from the Project.
VP06	Oppenlander Road, Goschen	NIL - LOW	LOW	LOW		Viewpoint is located on a low use rural road at a significant distance from the Project.
VP07	Mystic Park - Meatian Road, Kunat	NIL - LOW	LOW	LOW		Viewpoint is located on a low use rural road at a significant distance from the Project.
VP08	Mystic Park - Meatian Road, Meatian	LOW	LOW	LOW		Viewpoint is located on a low use rural road at a significant distance from the Project.
VP09	Donald-Swan Hill Road, Lalbert	LOW	LOW	LOW		Viewpoint is located on a major road but at a significant distance from the Project. The Project is not likely to be visible. Photomontage is not required.
VP10	Pola Road, Lalbert	LOW	LOW	LOW	Photomontage 01 (Appendix C)	Viewpoint is in proximity of the Project. Photomontage has been prepared to understand potential impact on the public location and nearby dwelling.
VP11	Pola Road, Lalbert	LOW	LOW	LOW	Photomontage 02 (Appendix C)	Viewpoint is in proximity of the Project. Photomontage has been prepared to understand potential impact on the public location and nearby dwelling.
VP12	Nlader Road, Lalbert	LOW	LOW	LOW	Photomontage 03 (Appendix C)	Project is likely to be visible in the distance. Photomontage has been prepared to understand potential impact on the public location and nearby dwelling.
VP13	Lalbert Recreation Reserve, Lalbert	MODERATE	LOW	LOW - MODERATE		Potential visual impact rating is dependent on the land use associated with this viewpoint. The visibility of the Project, however, is low. Photomontage is not required.
VP14	Lalbert - Kerang Road, Lalbert	LOW	LOW	LOW		Viewpoint is located on a low use rural road at a significant distance from the Project.
VP15	Old School Road and Lalbert-Kerang Road, Beauchamp	LOW	LOW	LOW		Viewpoint is located on a low use rural road at a significant distance from the Project.
VP16	Bennett Road and Old School Road, Beauchamp	LOW	LOW	LOW	Photomontage 04 (Appendix C)	Viewpoint is located on a low use rural road at a significant distance from the Project. Photomontage has been prepared to understand potential impact on nearby dwelling.
VP17	Pola Road, Lalbert	MODERATE	MODERATE	MODERATE	Photomontage 05 (Appendix C)	Potential visual impact rating is dependent on the distance of receptor and magnitude of change. The viewpoint is in close proximity of the Project. Photomontage has been prepared to understand potential impact on nearby dwelling.
VP18	Bennett Road, Lalbert	MODERATE	MODERATE	MODERATE	Photomontage 06 (Appendix C)	Potential visual impact rating is dependent on the distance of receptor and magnitude of change. The viewpoint is in close proximity of the Project. Photomontage has been prepared to understand potential impact on nearby dwelling.

**Table 7** Viewpoint Visual Impact Summary  
\*Please note the Viewpoint Visibility Assessment Summary is based on the visibility assessment criteria outlined in *Section 6.3* of this report.



# 8.0 Visual Impact Assessment

## 8.3 Dwelling Analysis

**Section 6.4** of this report defines the extents of the Study Area for this Project and identified that sensitive receptors are scattered within the Study Area. Due to the large scale of the Project and relatively flat topography around the Project Mining Area, an analysis of the potential visual impacts on surrounding dwellings within the Study Area has been carried out in this section of the report.

### 8.3.1 Study Method for Dwelling Analysis

Further detailed assessment identified a number of dwellings within the Study Area are likely to have limited or no views to the Processing Facility due to screening factors such as vegetation and/or existing structures in the dwelling’s foreground. **Figure 13** provides an overview of the existing screening factors around all dwellings within 5 km of the Project.

**Table 8** provides an overview of the study method for undertaking the dwelling analysis for each dwelling identified within the Study Area and **Table 9** provides a summary of the dwelling analysis. A detailed assessment of potential visual impacts on the three (3) dwellings identified in **Figure 13** has been provided in **Appendix D**. The three dwellings identified as having limited screening factors in their proximity include R0008, R0006 and R0012.

Study Method	Process
Step 1. 3D Assessment (based on topography alone)	Using 3D modelling, Moir LA identified the extents of the Processing Facility which will be visible from dwellings based on topography alone. Where the Processing Facility is likely to be visible, additional analysis has been undertaken to determine the potential visual impact.
Step 2. Aerial Imagery	Information on the extent of visibility extracted from the 3D model is overlaid onto a recent aerial image of the dwelling and its surrounds. This provides a detailed assessment of the direction and extent of potential visibility of the Processing Facility, and identifies any intervening elements (such as structures, wind break planting or vegetation) which may reduce the potential visibility.
Step 3. Consideration of mitigation methods	For sensitive receptors where the Processing Facility has the potential to cause visual impact, mitigation methods have been suggested. Refer to Section 9.0 and Appendix D.

Table 8 Dwelling Assessment Process

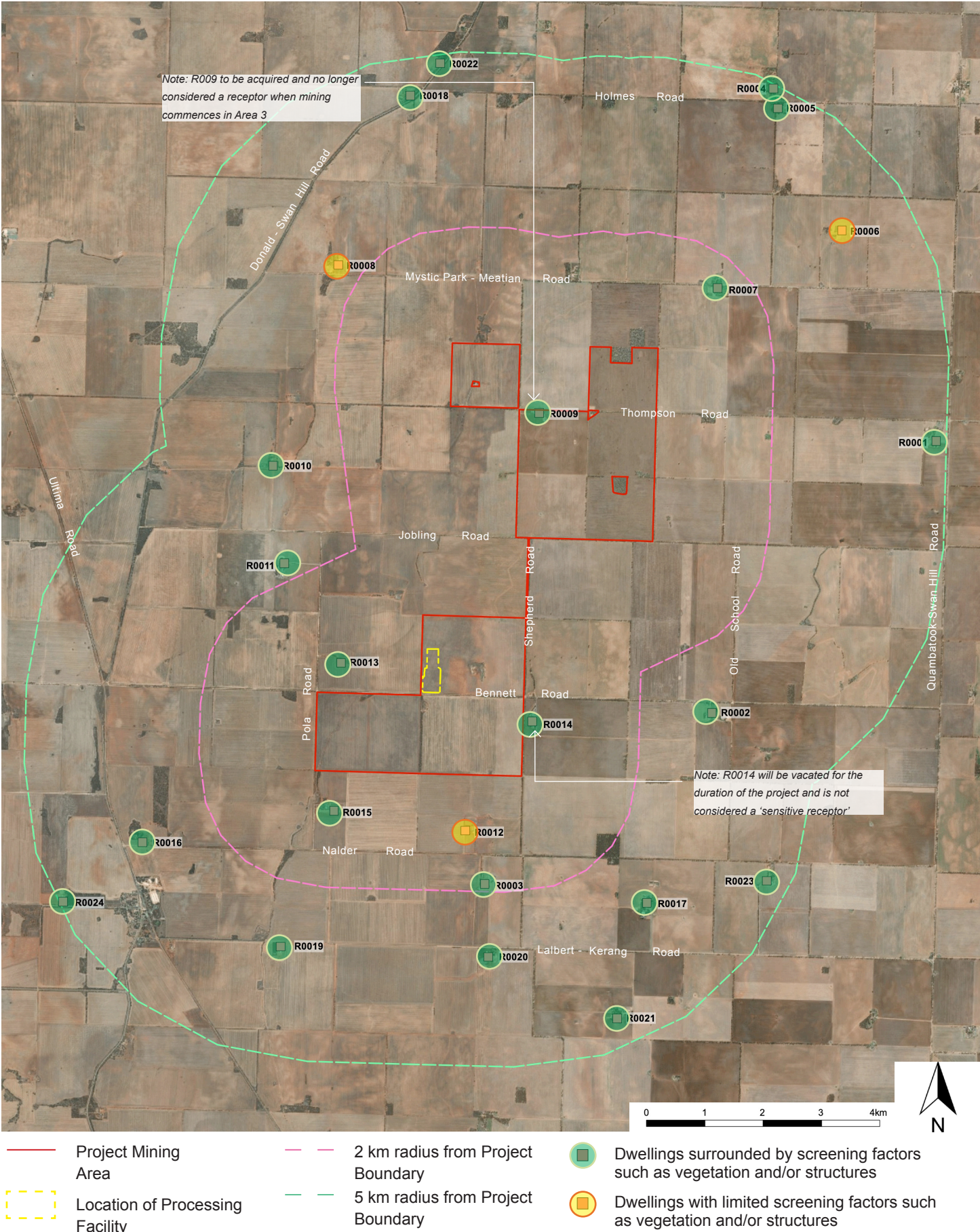


Figure 13 Character of Nearby Dwellings (Map Source: ESRI Imagery)



# 8.0 Visual Impact Assessment

## 8.3.2 Summary of Dwelling Analysis

The following dwellings have been assessed and included in **Appendix D**:

- One (1) dwelling within 2,000 m of the Processing Facility.
- Two (2) dwellings between 2,000 - 5,000 m of the Processing Facility.

Summary of Dwelling Analysis			
Dwelling ID:	Location	Approx distance to Processing Facility	Summary of analysis
Dwellings within 2 km of Project boundary			
R0003	Nalder Road	3.55 km	Views of Processing Facility likely to be available in the north. The dwelling is surrounded by dense vegetation which will limit views.
R0007	Mystic Park - Meatian Road	8.05 km	Views of Processing Facility likely to be available to the south west. The dwelling is surrounded by dense vegetation which will limit views.
R0009	Thompson Road	4.41 km	The dwelling is obscured by a row of sheds located on the southern side. These sheds and existing vegetation in dwelling's foreground will limit views to the Processing Facility. Dwelling to be acquired and no longer considered a receptor when mining commences in Area 3.
R0012	Nalder Road	2.57 km	Views of Processing Facility likely to be available in the north/northwest. Lack of screening elements may allow views of Processing Facility. Refer Appendix D.
R0013	Pola Road	1.4 km	Views of Processing Facility likely to be available in the east. The dwelling is surrounded by dense vegetation which will limit views.
R0014	Bennett Road	1.79 km	Views of Processing Facility likely to be available in the north west. The dwelling is surrounded by dense vegetation which will limit views. Note: R00014 will be vacated for the duration of the project and is not considered as a sensitive receptor.
R0015	Pola Road and Nalder Road	2.67 km	Views of Processing Facility likely to be available in the north east. The dwelling is surrounded by dense vegetation which will limit views.
Dwellings within 2 - 5 km of Project boundary			
R0001	Quambatook - Swan Hill Road	9.33 km	Views of Processing Facility likely to be available to the south west. The dwelling is surrounded by dense vegetation which will limit views.
R0002	Old School Road	4.70 km	Views of Processing Facility likely to be available to the west. The dwelling is surrounded by dense vegetation which will limit views.
R0004	Holmes Road	11.60 km	Views of Processing Facility likely to be available towards the south west. The Project is at a significant distance from the dwellings and they are surrounded by dense vegetation which will limit views.
R0005	Holmes Road	11.24 km	Views of Processing Facility likely to be available towards the south west. The Project is at a significant distance from the dwellings and they are surrounded by dense vegetation which will limit views.
R0006	Quambatook - Swan Hill Road	10.17 km	Views of Processing Facility are likely to be available in the south west. Lack of screening elements may allow views of Processing Facility. Refer Appendix D.
R0008	Mystic Park - Meatian Road	7.06 km	Views of Processing Facility likely to be available in the south / south east Lack of screening elements may allow views of Processing Facility. Refer Appendix D.
R0010	Thompson Road	4.41 km	Views of Processing Facility likely to be available to the south east. The dwelling is surrounded by dense vegetation which will limit views.

Table 9 Dwelling Analysis Summary

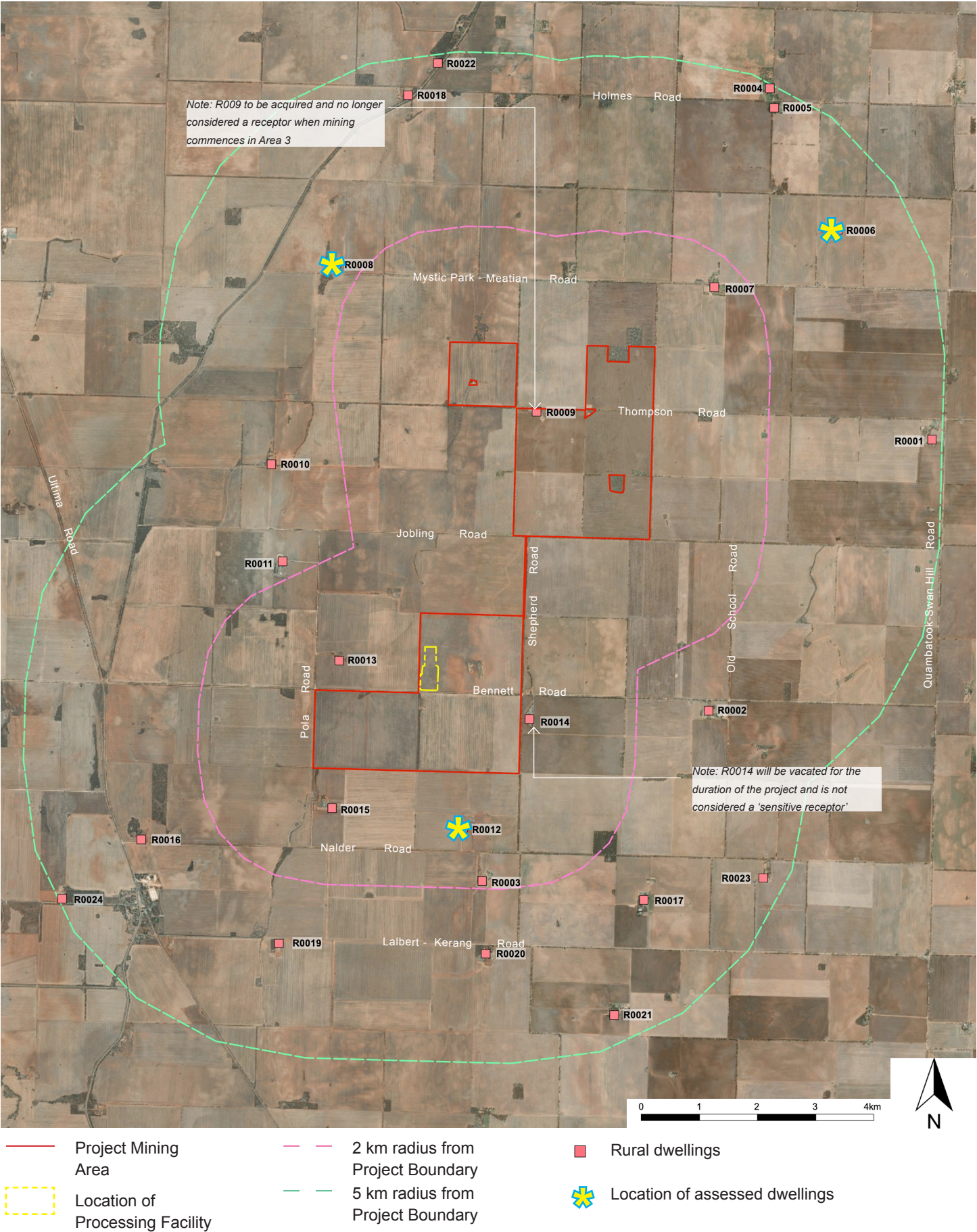


Figure 14 Dwelling Assessment Locations (Map Source: ESRI Imagery)



# 8.0 Visual Impact Assessment

Summary of Dwelling Analysis			
Dwelling ID:	Location	Approx distance to Processing Facility	Summary of analysis
Dwellings within 2 - 5km of Project boundary			
R0011	Pola Road and Jobling Road	2.95 km	Views of Processing Facility likely to be available in the south east. The dwelling is surrounded by dense vegetation which will limit views.
R0016	Nalder Road	5.58 km	Views of Processing Facility likely to be available to the north east. The dwelling is surrounded by dense vegetation which will limit views.
R0017	Lalbert - Kerang Road	5.08 km	Views of Processing Facility likely to be screened by existing vegetation and structures in the dwelling's foreground in the northwest.
R0018	Donald - Swan Hill Road	6.77 km	Views of Processing Facility likely to be screened by existing vegetation along Donald - Swan Hill Road in the dwelling's foreground in the south.
R0019	Lalbert - Kerang Road	5.01 km	Views of Processing Facility likely to be screened by existing vegetation in the dwelling's foreground in the north and windbreak vegetation in the east.
R0020	Lalbert - Kerang Road	4.66 km	Views of Processing Facility likely to be screened by existing vegetation and structures in the dwelling's foreground in the north.
R0021	Lalbert - Kerang Road	6.37 km	Views of Processing Facility likely to be screened by existing vegetation and structures in the dwelling's foreground in the north/northwest.
R0022	Donald - Swan Hill Road	10.07 km	Views of Processing Facility likely to be screened by existing vegetation along Donald - Swan Hill Road in the dwelling's foreground in the south.
R0023	Nalder Road	6.49 km	Views of Processing Facility likely to be screened by existing vegetation in the dwelling's foreground to the west/northwest.
R0024	View Street	7.16 km	Views of Processing Facility likely to be screened by existing dense vegetation in the dwelling's foreground to the east/northeast.

Table 9 Dwelling Analysis Summary (continued)



# 8.0 Visual Impact Assessment

## 8.4 Photomontage Development

A photomontage is a visualisation based on the superimposition of an image (ie. building, road, landscape addition etc.) onto a photograph for the purpose of creating a realistic representation of proposed or potential changes to a view (Horner and Maclellan et al, 2006). Photomontages have been utilised in this Landscape and Visual Impact Assessment to assist in the impact assessment of the proposed development.

### 8.4.1 Photomontage Preparation Method

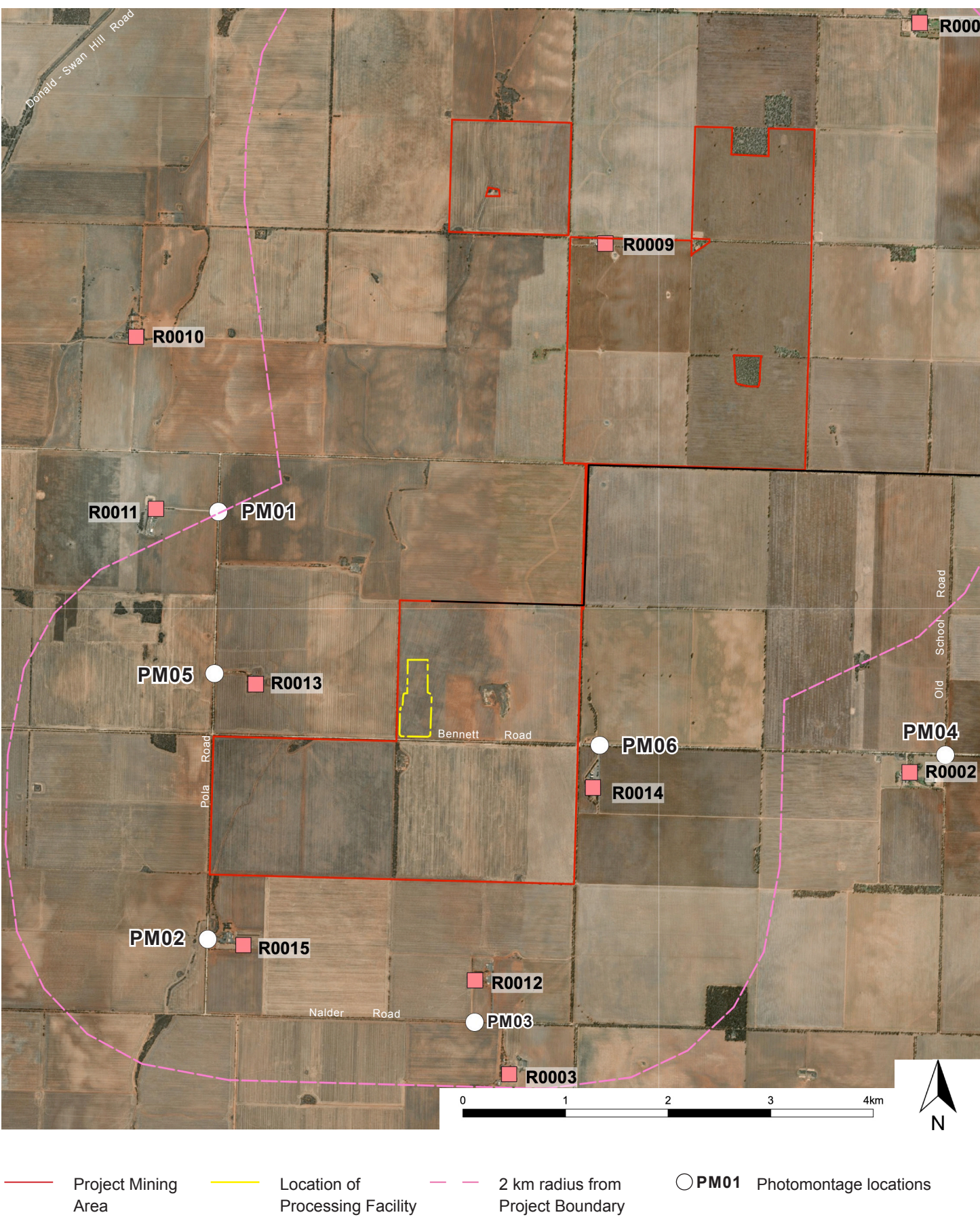
Photomontages are representations of the Processing Facility that are superimposed onto a photograph of the Study Area. The process for generating these images involves computer generation of a wire frame perspective view of Processing Facility.

*The photo simulations based on photography from typical sensitive viewpoints are included in Appendix B.*

### Photomontage Selection Process

Six (6) photomontages within the existing context were selected as key views to represent general visibility of the Processing Facility from public locations as a representation of the impact on surrounding dwellings. Photomontages have been prepared for Viewpoints VP10, VP11, VP12, VP16, VP17 and VP18 (refer to **Figure 13**).

When undertaking the LVIA, viewpoints selected for the preparation of photomontages are generally those viewpoints determined to have the greatest potential for visibility of the Processing Facility and the highest visual impact. The reason for selection of the above mentioned viewpoints has been summarised in **Table 7**. Due to the relatively low footprint of the Processing Facility, the highest visual impact will be experienced within the immediate proximity of the Processing Facility. Publicly the highest impact will be experienced along Pola Road and Bennett Road (refer to **Photomontages 01, 02, 05** and **06**). A moderate to low visual impact along Nalder Road will be experienced due to the distance between the road and the Processing Facility (refer to **Photomontage 03**). As the distance between the Processing Facility and the viewing location increases, the potential to view the Processing Facility reduces. **Photomontage 04** is an example of such a viewpoint.



**Figure 15** Photomontage Locations (Map Source: ESRI Imagery)



# 8.0 Visual Impact Assessment

## 8.5 Overview of Visual Impacts

In addition to the photographic viewpoint assessment and development of photomontages, the following section provides an overview of the potential visibility from areas surrounding the Processing Facility. This is by no means an exhaustive description of the visibility from every locality, it is intended to provide an overall assessment of the potential visual impact on areas potentially affected by the Processing Facility.

Overall, the Processing Facility will result in minor modification of the existing visual landscape when viewed from different locations. The modification will be a staged process which will occur over time and the visual impacts associated with the Project Mining Area and the Processing Facility will vary depending on the viewing location.

The modification of stockpile and associated machinery areas is likely to be a progression overtime and they will be largely concealed by noise bunds. Construction activities associated with the pipeline that connects the pump station and the Processing Facility will be temporary, and hence, the impact is likely to be low. Due to the relatively flat topography and existing intervening vegetation around dwellings and on roadsides, views of proposed stockpile areas and the pipeline are likely to be fragmented (see *Figure 12* and *Figure 14*).

### 8.5.1 Potential Visual Impact on Existing Landscape Character

Due to its scale, the Processing Facility has the potential to become a feature of the area. However, the degree to which the existing landscape character and significance is altered as a result of the Processing Facility, is determined by the dominance of the Processing Facility in relation to the existing landscape features.

As discussed in *Section 7.0*, the Processing Facility is to be located within a predominantly rural landscape that has not been identified as significant or rare. The broad landscape character is dominated by established rural land consisting largely of cleared farming land with little topographical variations.

*Table 10* provides an overview of the potential visual impact on each landscape character unit (LCU) identified in *Section 7.3*. The assessment found that dominant feature of the landscape, which is currently characterised by the agricultural production and farming character of the region, will be high in areas that are in proximity of the Processing Facility. The Processing Facility, however, will have moderate to low impacts on the existing scenic quality of these landscape features.

Landscape Character Units		
LCU:	Name:	Preliminary Visual Impact Assessment
LCU01	Kangaroo Lake and surrounding conservation areas	Views from this LCU are both filtered and open. The views, however, are mostly directed towards the lake. The lake is at a significant distance from the Project Mining Area and the Processing Facility, but the proposed Pump Station will be located on the lake's shoreline. Views of the pump station are likely to be available in areas that receive high visitor footfall. However, due to existing infrastructural associations the impact of a pump station is likely to be low.
LCU02	Irrigation Channels	Opportunities to view the Pump Station from this LCU will be available due to the lack of tree cover in this LCU. However, due to existing infrastructural associations the impact of a pump station is likely to be low. Canals and irrigation channels are modified landscape elements that have low scenic associations.
LCU03	Farmlands	Impacts on this LCU are likely to be high in areas that are in closest proximity to the Processing Facility. This is the most dominant character of the region and it has open, unobstructed views of surrounds. The LCU, however, also has a number of agricultural and production associations which includes lands with sheds and silos that are similar to the Processing Facility components.
LCU04	Roadside Vegetation Corridors	Views of the Project from this LCU are likely to be limited due to the dense vegetation character. The Processing Facility is likely to have negligible impacts on areas within this LCU. Topography and existing vegetation will assist in reducing the impact of the Project on existing character.
LCU05	Lalbert	This LCU is located at a significant distance from the Project. It is likely that the Processing Facility will have a low visual impact on the residences and recreational areas of the town. Most areas are flat and are surrounded by vegetation will helps limiting views within the LCU.

Table 10 Preliminary Visual Impacts on Landscape Character Units



# 8.0 Visual Impact Assessment

## 8.5.2 Potential Visual Impact on Public Viewing Locations

There may be few opportunities to view parts of the Processing Facility from publicly accessible land within proximity of its location. However, assessment of viewpoints closer to the Processing Facility indicates that most views towards these structures will be filtered, fragmented or only partially available depending on the location. This is because most roads in the Study Area are characterised by patchy to dense windbreak vegetation which limits views within the road corridor. It is unlikely that the structures of the Processing Facility will be completely visible from significant public locations such as recreational parks and ovals, low use roads and lots utilised for farm infrastructure.

Publicly accessible viewing locations are generally limited to roads adjacent to the Processing Facility. Local roads such as Pola Road, Bennett Road, Shepherd Road, Old School Road and Nalder Road have a low frequency of use and they are generally used to in order to access dwellings or farm lots along these roads. Moderate impact is likely to be experienced along Bennett Road since it is used to access the Processing Facility. This road also has a slightly higher road usability.

**Photomontages 01, 02 and 05** illustrate the visibility of the Processing Facility from dwellings located on Pola Road. **Photomontage 05**, especially, showcases the potential visual impact on a location with the highest opportunity for visibility (as shown without mitigation measures implemented). Views to the structures are likely to be available to the general public only when travelling southwards along Pola Road. However, the resulting impact will be Moderate to Low since the road is not used very often and is characterised by continuous stretches of roadside plantations.

**Photomontages 04 and 06** have been prepared from public locations along Bennett Road to demonstrate the impact on dwellings located on the eastern side of the Processing Facility. Views of the Processing Facility are likely to be fragmented and hindered (as shown without mitigation measures implemented) because of existing roadside vegetation and wind break planting within rural lots. The speed and direction of travel along Bennett Road will result in a Moderate visual impact.

**Photomontage 03** has been prepared from a location along Nalder Road to demonstrate the potential impact dwellings that are located 2.5 km south of the proposed Processing Facility. The opportunity to view the Processing Facility is Low (as shown without mitigation measures implemented) because of existing intervening elements such as roadside vegetation, farm structures and vegetation belts on properties. The speed and direction of travel along Nalder Road will result in a Low visual impact. Areas that are located beyond 2.5 km of the Processing Facility are likely to have low to nil visual impact. Viewpoint analysis in **Section 8.0** and **Appendix A** of this report also indicates that the potential impact on recreation areas in Lalbert is likely to be very Low.

Land has been extensively cleared and modified to support agricultural activities. Apart from the removal

of some trees at the proposed driveway entry/exit locations along Bennett Road, it is expected that roadside vegetation will largely remain intact. Existing vegetation patches in Area 3 are proposed to be retained and the mine footprints have been planned to avoid intersection with significant areas of remnant native vegetation. As a result, the Processing Facility will have minimal impact on the existing vegetation character. It is recommended, however, that tree protection and structural root zones for existing vegetation are established as the Project progresses to detail design stage.

Potential visual impacts are likely to occur during the construction and operational stages of the Project. For example, construction and operation of the pump station is likely to impact users of Kangaroo Lake and its surroundings. However, the size and distance of the pump station from recreational areas within and around the lake would reduce visual impacts on the various users. The potential impact on boat users would be temporary because of their movement across the lake and the distance between the boat ramp/picnic area and the pump station would minimise the impacts (refer **Appendix A**). Temporary visual impacts are also likely to occur during construction of the pipeline but views to the pipeline route will be screened by existing vegetation (See **Image 17** and **18**). The proposed pipeline route runs along low use roads that do not receive heavy traffic, and therefore, the impacts are likely to be low. Contingency and monitoring principles for reducing these potential visual impacts have been discussed in **Section 9.5.3**.

The landscape and visual character will be altered as a result of the Project, however once decommissioned, the visual landscape has the capacity to return to its current state. Measures for rehabilitation and restoration of landscape values have been discussed in **Section 9.4.3**.



**Image 17 Views along Mystic Park - Beauchamp Road - characterised by dense vegetation**



**Image 18 Character of Mystic Park East Road defined by dense vegetation corridors**



# 8.0 Visual Impact Assessment

## 8.5.3 Potential Visual Impact on Residences

There may be few opportunities to view parts of the Processing Facility from privately accessible land within proximity of the Processing Facility. A total of 17 dwellings have been identified within 5000 m of the Processing Facility, of which nine (9) dwellings are surrounded by dense screening vegetation or existing structures such as sheds (refer to **Figure 18**).

The remaining one (1) dwelling (R0012) is partially surrounded by vegetation in its foreground as per desktop assessment. On-site verification confirmed that this dwelling is surrounded by wind break and screen planting. Vegetation surrounding the dwelling partially limits its views to its immediate surrounds. A detailed assessment of this dwelling has been provided in **Appendix D**.

Considering the extent of the Project and position of structures, it is likely most dwellings will not have clear views of the Processing Facility. Views of the mining operations are also likely to be limited due to topographical changes. To further reduce any potential visual impacts, mitigation methodology recommended in **Section 9.0** of this report will minimise opportunities to view the Project from privately accessible locations.

**Figure 16** and **17** illustrate the typical character dwellings within proximity of the Processing Facility. Typically, most dwellings are surrounded by vegetation.



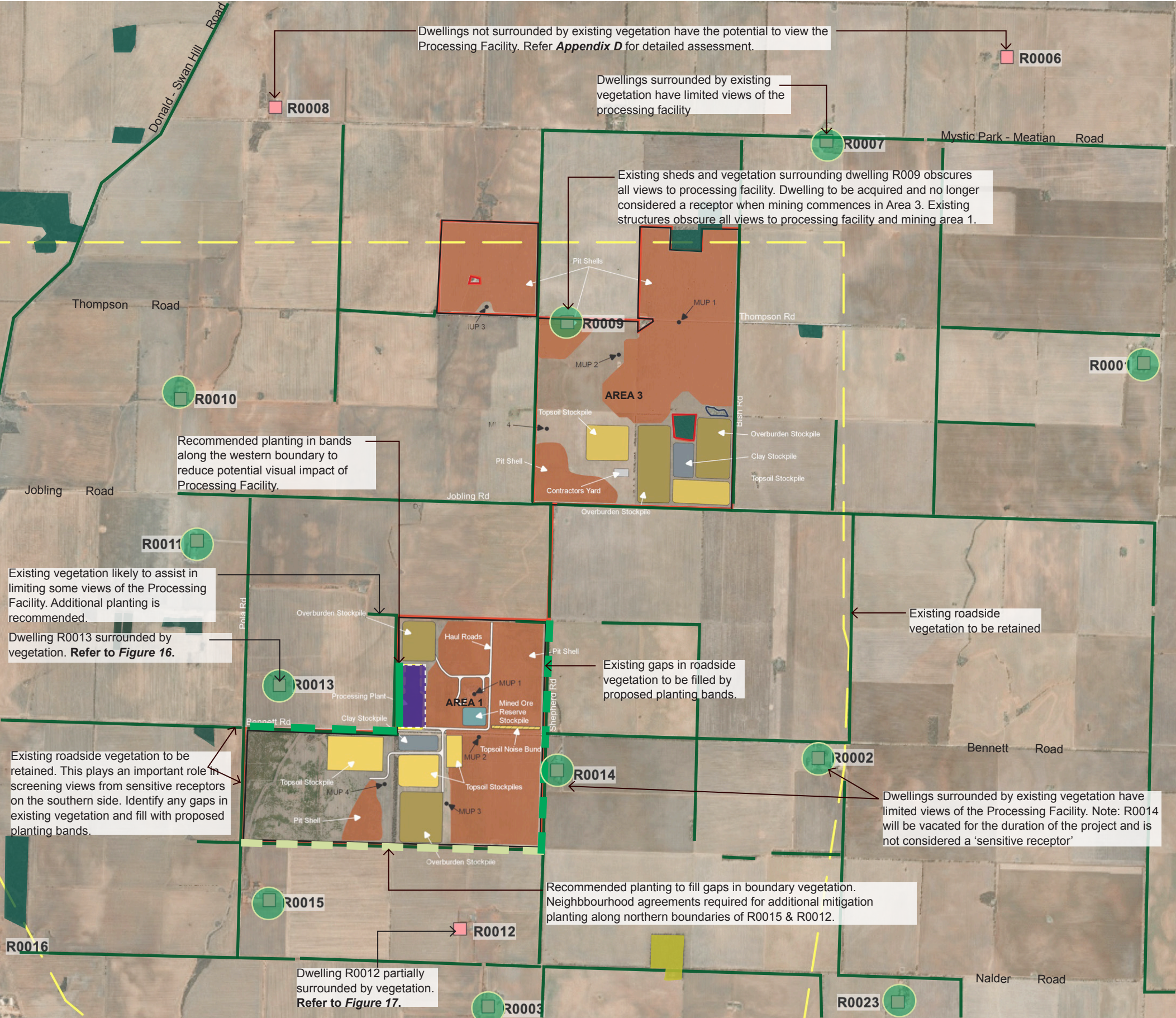
**Figure 16** Example of Dwelling R0013 with surrounding vegetation (typical of the area)  
(Aerial Image Source: VicPlan 31st July 2022)



**Figure 17** Example of Dwelling R0012 surrounded partially with vegetation  
(Aerial Image Source: VicPlan 31st July 2022)



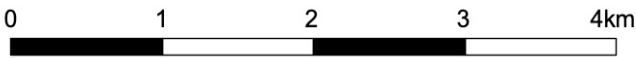
# 8.0 Visual Impact Assessment



## Visual Impact Assessment Goschen Mineral Sands and Rare Earths

### LEGEND

- Project Mining Area
- 5000 m from location of Processing Facility
- R0008 Dwellings
- R0007 Dwellings surrounded by vegetation and/or structures
- Location of Processing Facility
- Vegetation Protection Overlay - Schedule 2 (VPO2)
- Existing vegetation to be retained
- Recommended planting in bands  
(Refer to **Section 10.0 - Mitigation Measures and Appendix C**)
- Recommended planting to fill gaps in existing roadside vegetation (Refer to **Section 10.0 - Mitigation Measures**)
- Recommended planting to fill gaps in existing vegetation along lot boundary. Neighbourhood agreements are recommended to assist with mitigation measure.  
(Refer to **Section 10.0 - Mitigation Measures**)
- Existing roadside and windbreak vegetation to be retained.



**Figure 18** Overview of Visual Impact Assessment (Map Source: ESRI Imagery)



# 8.0 Visual Impact Assessment

## 8.6 Overview of Impacts of Night Lighting Sources

Existing lighting sources within the Study Area are limited due to the limited inhabitation. 17 dwellings were identified within the Study Area. Additionally, the town of Lalbert comprises of approximately 20 dwellings that are located approximately 3.8 km south west of the Project Mining Area and approximately 6 km south west of the Processing Facility. The light sources in surrounding areas are limited to homesteads, agriculture infrastructure and motor vehicles dispersed through the Study Area. Dwellings within the Study Area therefore experience a dark night sky with minimal light pollution.

It is intended that the mine would operate for 24 hours per day and all year round. Proposed lighting sources include floodlights to provide lighting in external areas and bulkhead LED lights installed on each level of the proposed buildings. Additionally, exit lighting and battery backup is proposed to allow for power outages. Vehicles may also operate within the extents of the mine and this may potentially impact surrounding sensitive receptors.

From most dwellings within the Study Area, direct views to the Project are screened by existing vegetation surrounding the dwellings. This is also the case for dwellings R0013, R0014, R0015 and R0012 as they are surrounded by vegetation in their foreground or along the lot boundary. Consequently, views to light sources associated with the Project would be obscured and therefore the impacts of lighting sources on residences are expected to be minor. There is potential for lighting sources to be visible to motorists travelling along adjacent roads through the vegetation. The impacts of such lighting are, however, likely to be limited to glow effect when the night sky is unclear with fog or haze. The impact on travel routes during clear conditions will be intermittent since the lighting will be visible through vegetation gaps. Given that vehicles will not be stationary along the travel route, the impacts of night lighting will be low.

It is recommended that night lighting sources in mining areas should be limited to the mine void or below the level of surrounding bund walls or soil stockpiles. Recommendations for early stages of construction and operation, and fixed night lighting on building structures or other areas in the Processing Facility have been included in **Section 9.3**. The section also provides recommendations to further reduce the potential extent of light spill onto adjoining land.



# 9.0 Mitigation Recommendations

## 9.1 Recommended Mitigation Methods

As discussed in earlier sections, opportunities to view the Processing Facility in its entirety is limited to areas within proximity of the Processing Facility (within 1 km radius). As a result there are limited areas with sensitive receptors likely to experience unacceptable or direct visual impacts. A preliminary mitigation plan has been prepared (See **Appendix C**). This mitigation plan has been developed as a response to the findings of this VIA and assists in establishing the Processing Facility within the existing visual character. The following section outlines recommendations to further reduce any visibility of the Processing Facility.

## 9.2 Design Considerations

Good design principles employed through the project design phase can significantly reduce the visual impact. These include the siting principles, access, layout and other aspects of the design which directly influence the appearance of the Processing Facility. The following outlines the design considerations that have been applied to the Study Area and Processing Facility:

- Consideration has been given to the location of all parts of the Processing Facility to reduce potential visibility from surrounding residences.
- Where possible, the Processing Facility has been designed to retain the existing planting. Existing vegetation generally present around the Study Area will be retained and protected to maintain the existing level of screening. Existing vegetation along roadsides in proximity of the Processing Facility should be retained and protected as far as possible.
- It is recommended that if any existing roadside vegetation is removed to aid construction or accessibility to the Processing Facility, the removal should be mitigated through the provision of additional screen planting. **Figure 18** highlights that removal of vegetation is likely to occur along the stretch of Bennett Road that is located within the extents of Area 1. It is recommended that this vegetation loss is mitigated through the provision of additional planting along the northern boundaries of R0015 (Lot 63\PP2691) and R0012 (Lot 59\PP2691). This, however, will require neighbourhood agreements prior to construction and operation.
- Consideration has been given to the visual appearance and impact of materials used for the Processing Facility. The proposed structures will be finished of non-reflective materials in sandy / earthy colour tones to ensure minimal contrast with surroundings. The material palette aims to blend them into the surrounding landscape to the extent practicable.

## 9.3 Landscape Screen Planting

Most sensitive receptors around the Processing Facility are not likely to be impacted extensively. Existing vegetation around dwellings and on public roads will help fragment views of the Processing Facility. However, due to the height of the proposed structures, the most effective mitigation measure is on-site planting. There are some opportunities to screen the Processing Facility from within its proposed location.

Observations made during site inspections suggest that most areas have moderate to dense screening vegetation cover. However, some areas and a dwelling within close proximity of the Processing Facility are likely to have open views (refer **Figure 17** and **18**). On-site mitigation recommendation includes perimeter planting along the Processing Facility’s western boundary that will help limit views of the structures. It is also proposed that gaps in existing roadside vegetation and along the northern boundaries of Lots 63\PP2691 and 59\PP2691 should be strengthened through the provision of additional planting that will help screen views for sensitive receptors located on the southern side of the Processing Facility. The species proposed for this planting band are fast growing species that also encourage the growth of mid-storey planting. Recommended species are in keeping with the existing vegetation character of the Murray-Mallee Bioregion of North Central Victoria. A draft landscape plan has been prepared to illustrate these principles (refer **Appendix C**).

### 9.3.1 Landscape Principles

To ensure that the screen planting integrates into the existing landscape character, the perimeter vegetation bands should be planted with fast growing small trees and bushes, and low lying vegetation to ensure a naturalistic effect. It is suggested that this mix of fast growing species (such as Acacia) are planted to assist in screening the Processing Facility in the short-term, while other slow growing species establish. Plant species are to be selected in keeping with existing plant communities generally present within and around the Study Area and should promote the growth of mid-storey species.

Species	Estimated Height
Eucalyptus dumosa	8 - 12m
Allocasuarina luehmannii	9 - 15m
Acacia oswaldii	2 - 6m
Acacia melvillei	4 - 6m
Eremophila longifolia	4 - 8m
Dodonaea viscosa subsp. angustissima	3 - 5m

**Table 11** Indicative Plant Species List (Source: Conn 1993, DSE 2004)



# 9.0 Mitigation Recommendations

## 9.4 Night Lighting Design Principles

The following recommendations have been developed with consideration of the principles outlined in relevant best practice guidelines for lighting design. Any lighting to be installed on-site should be in accordance with the Australian Standard AS4282-1997 - Control of Obtrusive Effects of Outdoor Lighting. The Standard sets out criteria for appropriate illuminance and human experience of light. In AS4282 the definition of outdoor lighting is any form of permanently installed exterior lighting and interior lighting systems which emit light that impacts on the outdoor environment. As the nuisance effects of outdoor lighting are best controlled by appropriate design, AS4282 primarily focuses on new lighting installations. New developments must comply with this standard.

The Australian Government Department of the Environment and Energy, National Light Pollution Guidelines for Wildlife: Including marina turtles, seabirds and migratory shorebirds, January 2020 Version 1.0 may also be considered during the detailed design phase. It is rarely possible to contain all light from outdoor lighting within the boundaries of the property on which the light is situated; however this should be the aim. The following principles are to be incorporated into the lighting design:

### 1. Control the level of lighting:

- Only use lighting for areas that require lighting ie. paths, building entry points.
- Reduce the duration of lighting:
  - Switch off lighting when not required
  - Consider the use of sensors to activate lighting and timers to switch off lighting

### 2. Lighting Design:

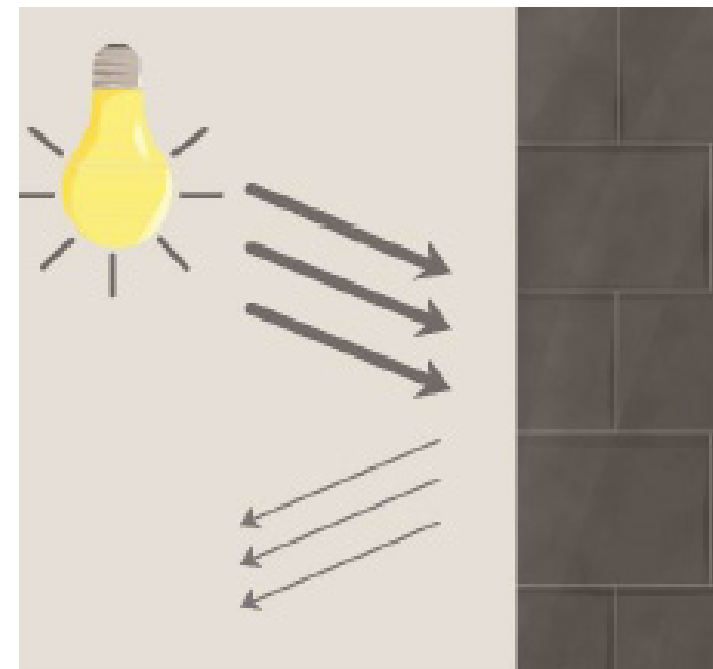
- Use the lowest intensity required for the job. AS4282 recommends the following as an acceptable limit for lighting in post-curfew hours (i.e., after 10 pm or 11 pm):
  - 1 lux\* at the boundary of residential areas in dark settings.
  - 2 lux\* at the boundary of residential areas with typical street lighting.

\*Lux is the unit of measurement of light. Typically, a full moon provides 0.05 - 0.1 lux of illumination. This can be considered as a point of reference for designing night light sources (Council of Standards Australia, 1997).

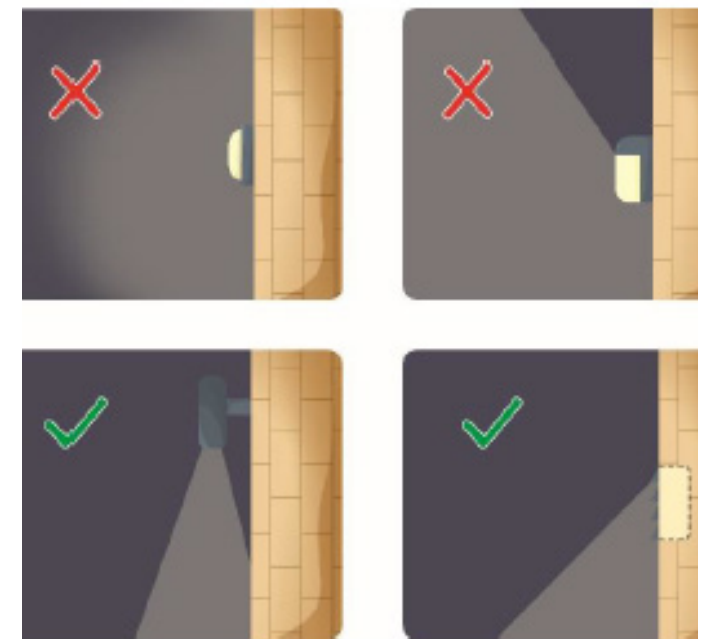
- Use energy efficient bulbs and warm colours.
- Direct light downwards to eliminate light spill or glow effect. Targeted and shielded floodlights should be utilised to minimise impacts in mining areas.
- Fixed LED and exit lighting systems on buildings should be appropriately shielded or baffled to avoid light spill.
- Ensure lights are not directed at reflective surfaces.

Where possible, there is to be no permanent night lighting installed in order to reduce disturbance to neighbouring properties. It is, however, noted that the mine operations will require night lighting. It is likely that the proposed lighting would create a moderate to low impact on the existing night time landscape. Existing vegetation will help screen most lighting sources. The impact likely to be experienced by sensitive receptors will be limited to glow effect when the night sky conditions are unclear and hazy.

- Use non-reflective dark coloured surfaces to reduce reflection of lighting (refer to **Figure 19**)
- Keep lights close to the ground and / or directed downwards (refer to **Figure 20**)
- Use light shield fittings to avoid light spill (refer to **Figure 21**).



**Figure 19** Surface Reflectivity  
(Source: Department of Environment and Energy National Light Pollution Guidelines for Wildlife 2020)



**Figure 20** Downward Lighting  
(Source: Department of Environment and Energy National Light Pollution Guidelines for Wildlife 2020)



**Figure 21** Light Shielding (Source: Department of Environment and Energy National Light Pollution Guidelines for Wildlife 2020)



# 9.0 Mitigation Recommendations

## 9.5 Assessment of Residual Impacts and Risks Associated with the Project

The Project life cycle is expected to last 20 years which will include mining and processing activities. This time frame presents opportunities to create, establish and sustain buffer screening across various parts of the Project Mining Area. It is recommended that the proposed screen planting is established before the mining operations commence so that the visual amenity of surrounding sensitive receptors is maintained as the Project progresses (refer **Figure 18** and **Appendix C**). Adopting these measures is likely to reduce any potential visual impacts that may be caused by the Project. Species typical of the Murray-Mallee Bioregion have been recommended so that they adapt to the existing conditions of the Project Mining Area.

The proposed planting is likely to screen views of majority of the Processing Facility and it is expected that a bulk of the operations will occur at this location. **Section 8.0, Appendix A** and **Appendix B** highlighted locations that are likely to have views of the Processing Facility. Therefore, **Photomontage 01** and **Photomontage 03** were developed further to show the proposed view with on-site screen planting and the likely impact on nearest sensitive receptors once the planting is established (refer **Appendix B**). All mine operations are expected to be screened by topographic changes and existing roadside vegetation. The topsoil noise bund proposed in Area 1 will also contribute towards screening mine operations in the immediate vicinity of the Processing Facility. The establishment of on-site screen planting in the early phases of the Project would ensure that all potential impacts are reduced prior to Project operations.

In addition, the impacts of night lighting and recommendations to mitigate its effects have been discussed in **Section 8.6** and **Section 9.4**. It is expected that the mining and processing operations will utilise lighting fixtures that adhere to occupational health and safety measures for such operations. The use of vehicles for mining operations should be limited to the mine pits as far as possible.

## 9.6 Monitoring and Contingency Measures

Management principles for the construction, post-construction and operations phase of the Project cycle can help manage potential impacts on visual amenity and landscape character. As discussed in **Sections 8.0** and **9.0**, the impacts on existing landscape character are likely to be minimal and potential visual impacts on surrounding sensitive receptors can be mitigated. The following outlines principles that can be adopted through out the Project cycle to maintain, monitor and manage the Project and its impact on the existing character:

- Design and construction phases of the Project should consider the use of materials that are sympathetic to the surrounding character. Design and construction management objectives could

potentially guide the construction process so that the surrounding landowners are least impacted by the Project Mining Area and Processing Facility. The management objectives should also consider the potential impacts of construction of the pipeline and Kangaroo Lake Pump Station which can be mitigated through the retention of existing vegetation.

- It is recommended that detailed Landscape Management Plans are prepared and approved prior to commencement of construction. The plans should aim to reduce the identified impacts in all three phases of the Project: pre-construction phase, construction phase and post-construction/operations phase. The Project presents opportunities for investigation in plant establishment and maintenance regimes that would help reduce potential visual impacts and restore the prevalent landscape character over time.
- Impacted landowners that are near the Project may express concerns towards the Project. It is recommended that they are consulted on a one-on-one basis to determine appropriate mitigation and landscape management measures if required.
- The on-site operations and maintenance teams could potentially limit the use of vehicles and external night lighting wherever possible. It is recommended that surrounding sensitive receptors are informed about the night operations and given sufficient notice prior to commencement of operations. Monitoring of the installation and use of external lighting will be required to comply with AS4282-1997 Australian Standard.

## 9.7 Landscape Restoration and Rehabilitation Principles

The following measures for managing the visual and landscape character during the construction and operations phase are recommended:

- Temporary visual bund walls can be constructed to screen all internal mine activities as a part of Phase 1 of the operations. Wherever possible, it is recommended that the bund walls are vegetated and maintained in accordance with landscape management regimes. The provision of such bund walls would have minimal impacts on the visual amenity of surrounding landowners.
- The transport or removal of mine stockpile or minerals should be limited as far as possible to the daylight hours. This can help reduce the use of night lighting at various operations sites.
- It is recommended that landscape restoration and rehabilitation measures are employed through the course of the Project. Restoration of top soil will help ensure the longevity of vegetation.



# 9.0 Mitigation Recommendations

Although the Project will cause disruptions to the existing agricultural character, strategies can be adopted towards the restoration and rehabilitation of the landscape. In accordance with Leading Practice Sustainable Development Program for the Mining Industry handbook (Commonwealth of Australia, 2016), the following measures are recommended for rehabilitation of affected areas in the post-operations phase:

- Mine voids can be potentially reinstated through landform construction, soil amelioration (physical and chemical), and revegetation strategies (biological amelioration). Techniques that cater to restoration of soil capabilities require detailed investigations as the Project progresses.
- Establishment of a plant growth medium that is capable of supporting vegetation cover is the key to successful biological amelioration. The introduced growth medium should be capable of supporting the new vegetation.
- Vegetation required for removal to accommodate the Project should be replaced with local and indigenous plant material wherever possible. Introduced vegetation should also reflect the existing character.
- It is recommended that rehabilitation monitoring measures follow the ICMM’s Good Practice Guidance for Mining and Biodiversity (ICMM, 2006). These guidelines establish directions for documentation procedures, data collection, record-keeping for plant establishment and performance indicators for the rehabilitation and restoration process.

Restoration and rehabilitation of visual and landscape amenities will reduce all potential impacts as the Project operations reach their final phase. The speed of revegetation and restoration of soil character will be dependent on the strategies employed in the post-operations phase. It is recommended that detailed investigations are carried out in the earlier phases of the Project for the implementation of a successful rehabilitation program.

## 9.8 Summary of Mitigation Recommendations

**Table 12** summarises the recommendations to reduce any visibility of the Project.

Project Phase/Stage	Mitigation Measures
All phases	<p>A detailed Landscape Management Plan (LMP) must be prepared prior to construction for approval to address the following:</p> <ul style="list-style-type: none"><li>• Strategies for vegetation retention, protection of plant material and contingency measures for vegetation removal.</li><li>• Opportunities for the early establishment of vegetation screening along the perimeter of the mine site and along the western boundary of the processing facility.</li><li>• Planting of suitable fast growing screen planting.</li><li>• On-going management and maintenance of vegetation and screen planting.</li><li>• Soil restoration strategies in line with the recommendation of the Soil and Land Resource Technical Report and the Rehabilitation and Closure Technical Report.</li><li>• The establishment of plant growth medium to support revegetation that will help restore landscape values.</li><li>• Monitoring of the rehabilitation measures by providing direction for documentation procedures, data collection, record-keeping and performance tracker for plant establishment.</li></ul>
Construction Phase	<p>Lighting must be designed to limit any potential visual impacts on surrounding sensitive receptors. All lighting fixtures installed on-site should be in accordance with the AS4282-1997 Australian Standard. Wherever possible, lighting should face downwards and shielded to reduce the likelihood of a light spill and glow effect.</p> <p>The building materials and finishes should be sandy/earthy colour tones and should utilise non-reflective materials. Low contrast textures and materials should be used to the extent practicable.</p> <p>Temporary visual bund walls can be constructed to limit visibility of all construction and internal mine activities.</p>
Operations Phase	<p>Landscape maintenance and management must be carried out to help maintain the visual character and reduce potential impacts.</p> <p>Transport and removal of mine stockpile or minerals should be limited as far as possible to daylight hours to reduce the requirement of night lighting.</p>

Table 12 Summary of Recommendations



# 10.0 Conclusion

This report has been prepared to provide a qualitative and quantitative assessment of the potential visual impact of the Project. Study of relevant guidelines indicate, the proposed Project is permissible with consent on the chosen land parcel. This Project contributes to the potential of creating investment and employment opportunities by minimising impacts on the environment.

The Project's life span is estimated to be approximately 20 years and will involve mining and processing of rare earth mineral deposits in stages. The Project comprises of a heavy sand mining and processing operation that will produce heavy mineral concentrates and a range of critical rare earth minerals that will be mined from the Project Mining Area. Water requirements for these activities will be met through the installation of a new pump station at Kangaroo Lake and an underground pipeline that would run along the course of local road easements as discussed in **Section 2.3**.

The Project is located approximately 30 km south of Swan Hill and is surrounded by rural properties used for broadacre grain farming. Predominant character of the surrounds can be categorised as land utilised primarily for agricultural activities with scattered rural dwellings. The topography in the area can be described as generally flat and the nearest town is Lalbert which is located approximately 3.8 km southwest of the Project Mining Area. The visual character of the Project Mining Area is generally defined by open, extensive and flat land parcels that can be accessed via local gravel roads characterised by dense rows of windbreak plantations that run along their course.

With all visual impact assessments the objective is not to determine whether the proposal is visible or not, it is to determine how the proposal will impact on existing visual amenity, landscape character and scenic quality. If there is a potential for a negative impact on these factors it must then be investigated and determined how this impact can be mitigated to the extent that the impact is reduced to an acceptable level.

It has been identified that the most significant Visual Impact when viewed from the public domain is from locations that are in close proximity of the proposed Processing Facility and where there is no existing vegetation of a sufficient scale to screen or fragment these views. Potential visual impact on public land indicated limited opportunities to view the Processing Facility in its entirety due to adequate roadside and windbreak plantations that are prevalent in the area. Potential views from residences are also limited by the existing vegetation that surrounds these dwellings. It is likely that the highest visual impact will be experienced along Bennett Road because it is used to access the Project Mining Area. Moderate to low impacts will be experienced along all other roads such as Pola Road, Shepherd Road, Old School Road and Jobling Road. The impact of the Processing Facility reduces for sensitive receptors located 3 km away, and therefore, it is likely that the Processing Facility will have low to nil impact on the visual character of Lalbert. All other visual impacts such as the construction of the pipeline between the pump station and the Project Mining Area are likely to be minimised by existing vegetation. Due to the existing vegetation character, the relatively planar topography and the broad scale of the view,

the recommended mitigation methods required to reduce the potential visual impacts on certain locations in the public domain are limited. Provision of planting along the perimeter of the Processing Facility will be effective in integrating it into the surrounding landscape. Additionally, it is recommended that all structures should be built with non-reflective, earthy-toned material and the night lighting sources are appropriately shielded, baffled and targeted to avoid light spill. It is likely that the proposed night lighting will have low visual impact when the mitigation measures are implemented. With the implementation of the recommended mitigation measures, the Project could be undertaken whilst maintaining the core landscape character of the area and have a minimal visual impact on the surrounding visual landscape.

Detailed landscape plans and landscape maintenance and management regimes that aim to sustain the quality of plant stock used for mitigation will have to be developed as the Project progresses. It is recommended that the measures are prepared from a holistic perspective which consider pre-construction, detail design and construction, operations and post-construction phases. For example, establishing a dialogue through an on-site maintenance and operations team would make local residents aware of nighttime or critical daytime operations. This could also help mitigate the effects of night lighting caused by the mining operations.

The land within the Project Mining Area will be altered as a result of the Project, however once decommissioned, the visual landscape has the capacity to return to a state that reflects the existing landscape character. Landscape restoration and rehabilitation measures that cater to the establishment of a strong and healthy growth medium, restored top soil and indigenous plant material is critical. The speed of revegetation and restoration of soil character will be dependent on the strategies employed in the construction and post-operations phases. The Project could be undertaken whilst maintaining the landscape character of the area and have a low visual impact on the surrounding visual landscape.



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## MAPS

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Vicplan (2019). *Geocortex Viewer*. [online] Vic.gov.au. Available at: <https://mapshare.vic.gov.au/vicplan/>.

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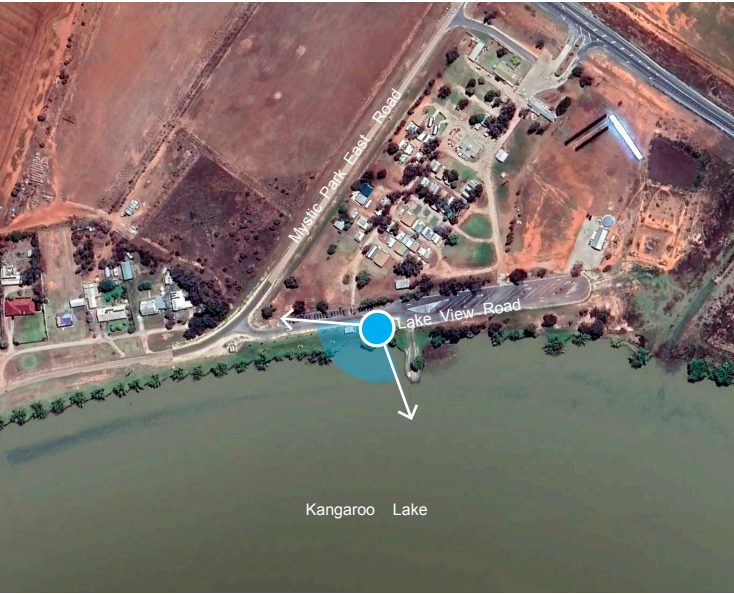
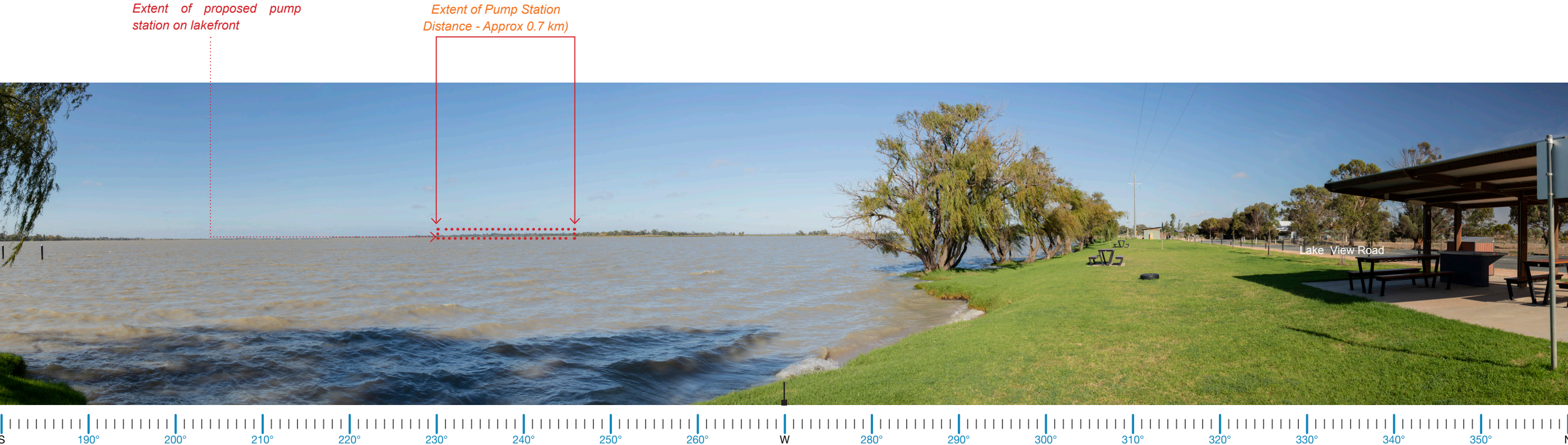
## **Appendix A**

### Viewpoint Analysis



# Viewpoint Analysis

## VP01 Kangaroo Lake Picnic Area, Mystic Park



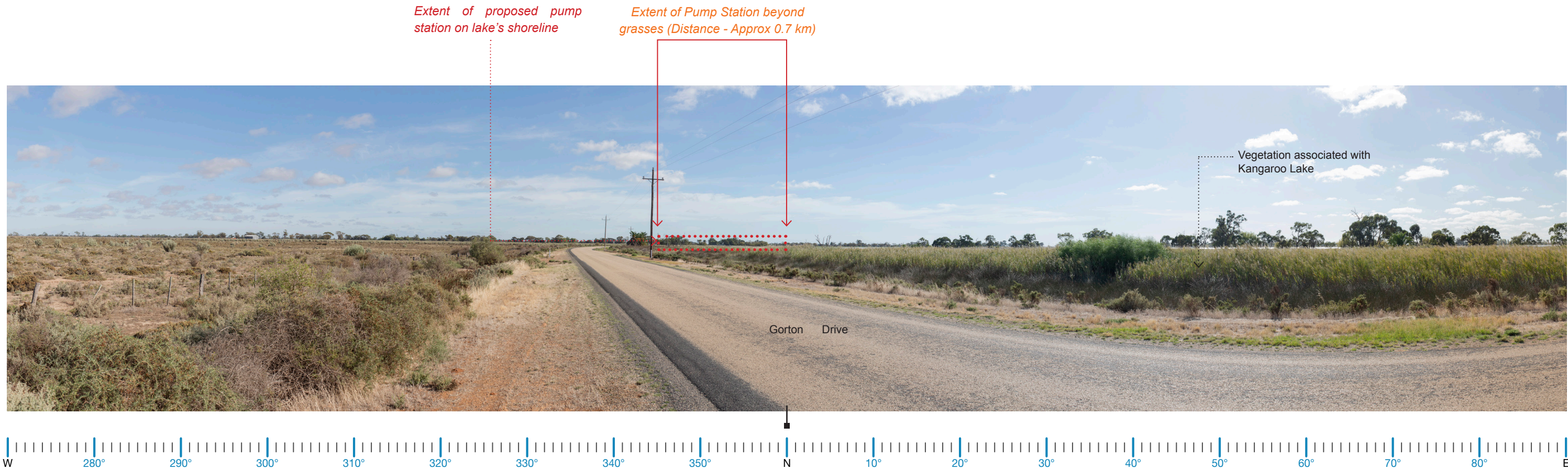
VIEWPOINT VP01			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Kangaroo Lake Picnic Area, Mystic Park	This viewpoint was taken from the Kangaroo Lake Picnic Area on Lake View Road in Mystic Park. The viewpoint assessment represents potential impacts on the users of the Boat Ramp and Picnic Area. It also represents the impact on majority of the boat users of the lake because the boats are launched at this location. Views of the pump station are likely to be available in the southwest. An existing weir is located further along Mystic Park East Road. Views are generally open and expansive.	From this location views of the pump station will be available in the southwestern direction. However, the height and scale of the pump station will not have any significant impact on boat users or visitors.
COORDINATES	35°39'41.78"S 143°22'20.42"E		
ELEVATION	77 m		
VIEWING DIRECTION	Southwest		
DISTANCE TO PRO-POSED PUMP STATION	Approx. 0.7 km		
LAND USE	Recreation	The visual sensitivity of this viewpoint has been rated as HIGH due to the land use and the distance to the Processing Facility.	The inclusion of a pump station along the lake's shore will lead to a visual magnitude rating of Low. The resulting overall visual impact is MODERATE.
VISUAL SENSITIVITY	HIGH		
VISUAL MAGNITUDE	MODERATE		
VISUAL IMPACT	HIGH - MODERATE		

VP01 Location Map (Source: Google Earth)



# Viewpoint Analysis

## VP02 Gorton Drive, Mystic Park



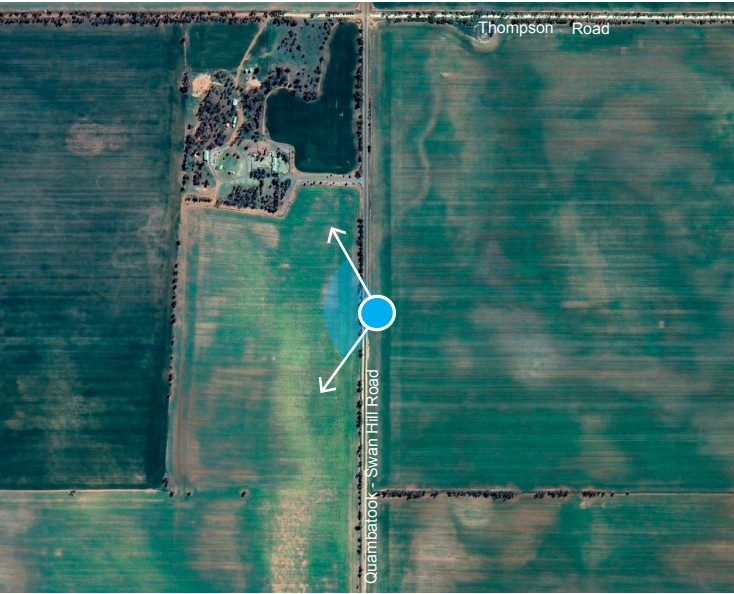
VP02 Location Map (Source: Google Earth)

VIEWPOINT VP02			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Gorton Drive, Mystic Park	This viewpoint is located near Kangaroo Lake on Gorton Drive in Mystic Park and it represents views from the dwellings in the area. Views at this location are generally open and vegetation associated with the wetlands filters some views. View of the pump station is likely to be available in the northern direction. Surrounding land is predominantly classified as Farming Zone and is used for agricultural activity, low density rural dwellings and recreation.	From this location views of the pump station are likely to be screened by existing wetland vegetation associated with Kangaroo Lake. The height, scale and distance of the viewpoint from the proposed pump station contribute towards limited visibility of the proposed infrastructure.
COORDINATES	35°38'14.20"S 143°29'13.35"E		
ELEVATION	93 m		
VIEWING DIRECTION	Southwest		
DISTANCE TO PRO-POSED PUMP STATION	Approx. 0.7 km	The visual sensitivity of this viewpoint has been rated as MODERATE due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Low resulting in an overall visual impact of MODERATE.
LAND USE	Low Use Road		
VISUAL SENSITIVITY	MODERATE		
VISUAL MAGNITUDE	MODERATE		
VISUAL IMPACT	MODERATE		



# Viewpoint Analysis

## VP03 Quambatook - Swan Hill Road, Beauchamp



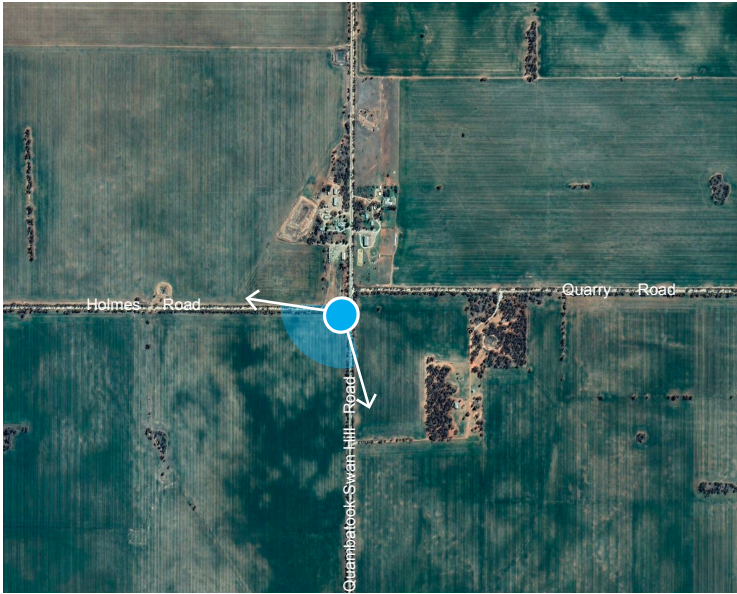
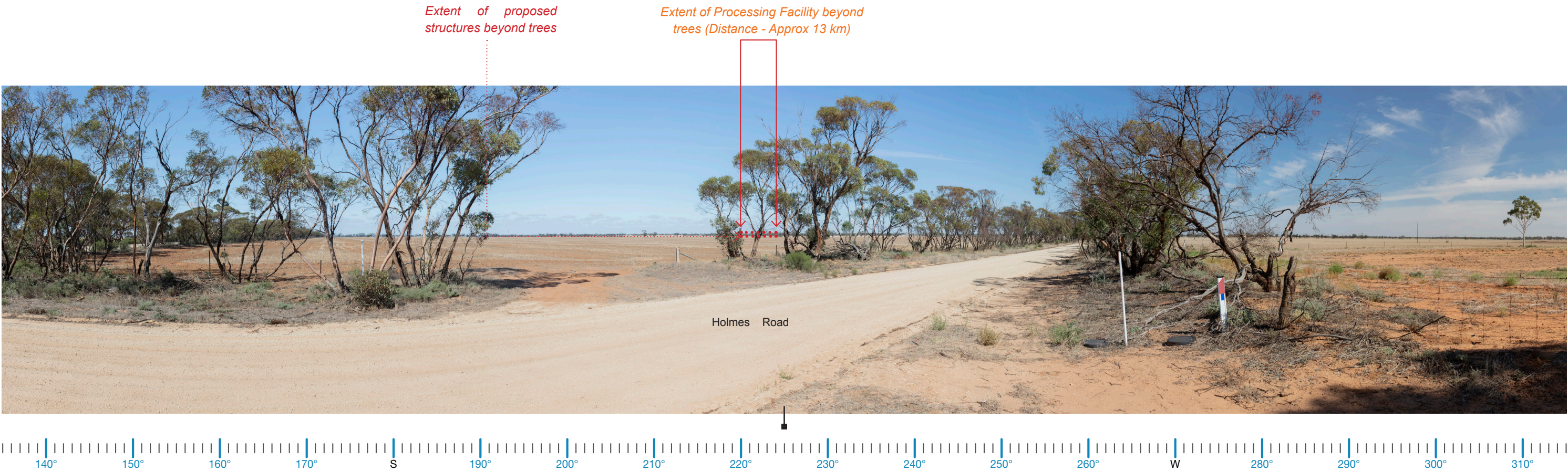
VP03 Location Map (Source: Google Earth)

VIEWPOINT VP03			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Quambatook-Swan Hill Road, Beauchamp	This viewpoint is located on Quambatook - Swan Hill Road to represent views from surrounding dwellings. It is likely that the Processing Facility would be visible in the west. Views towards the west are open. However, there is rise in the topography which will help screen views towards the Processing Facility. Vegetation is generally sparse with intermittent patches of trees located along roadsides. Surrounding land is predominantly used for agricultural activity.	From this location views of the proposed Processing Facility to the west will be restricted mainly as a result of differences between existing topographical changes. It is likely that the Processing Facility will be completely screened by existing undulations.
COORDINATES	35°40'33.74"S 143°26'31.54"E		
ELEVATION	89 m		
VIEWING DIRECTION	West		
DISTANCE TO PROCESS-ING FACILITY	Approx. 9.5 km	The visual sensitivity of this viewpoint has been rated as LOW due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Low resulting in an overall visual impact of NIL or LOW.
LAND USE	Low Use Road		
VISUAL SENSITIVITY	NIL - LOW		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW		



# Viewpoint Analysis

## VP04 Holmes Road, Kunat



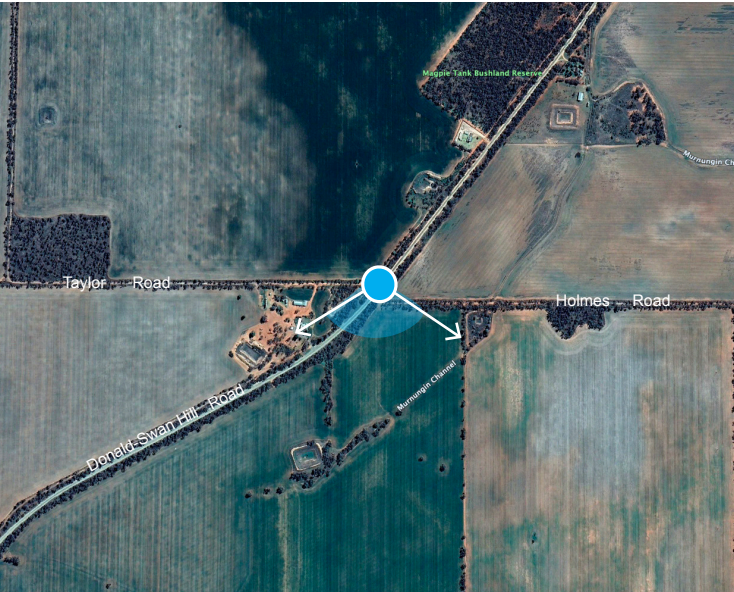
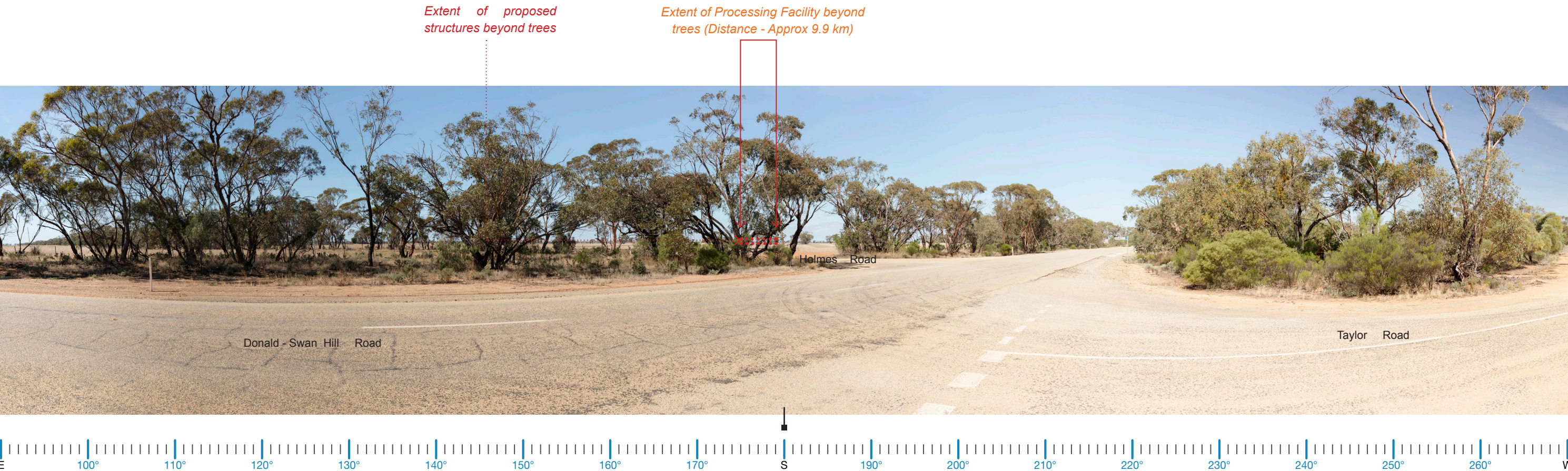
VP04 Location Map (Source: Google Earth)

VIEWPOINT VP04			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Holmes Road, Kunat	This viewpoint is located near the intersection of Holmes Road and Quambatook - Swan Hill Road. Views of the Processing Facility are likely to be available in the southwest and these are filtered by existing roadside vegetation. Existing terrain is flat and land is predominantly used for agricultural activity amidst scattered rural dwellings.  The visual sensitivity of this viewpoint has been rated as NIL - LOW due to the land use and the distance to the Processing Facility.	From this location views of the Processing Facility are likely to be screened by existing vegetation. It is possible that the tips of some of the structures will be visible in the southern direction. Majority of the views, however, will be screened.
COORDINATES	35°38'14.20"S 143°29'13.35"E		
ELEVATION	93 m		
VIEWING DIRECTION	Southwest		
DISTANCE TO PROCESS-ING FACILITY	Approx. 13 km		However, due to the large distance between the Project and this viewpoint, it is likely that most views of the Processing Facility will not be available.  The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.
LAND USE	Low Use Road		
VISUAL SENSITIVITY	NIL - LOW		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW		



# Viewpoint Analysis

## VP05 Donald - Swan Hill Road, Goschen



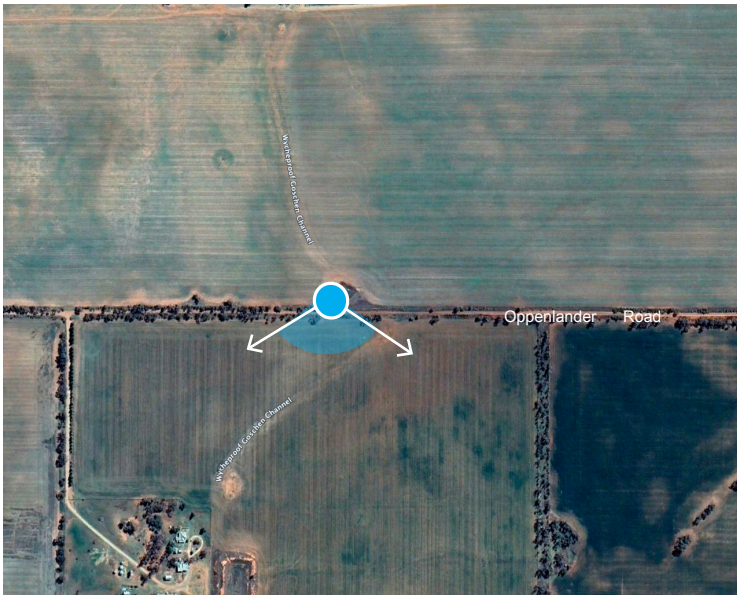
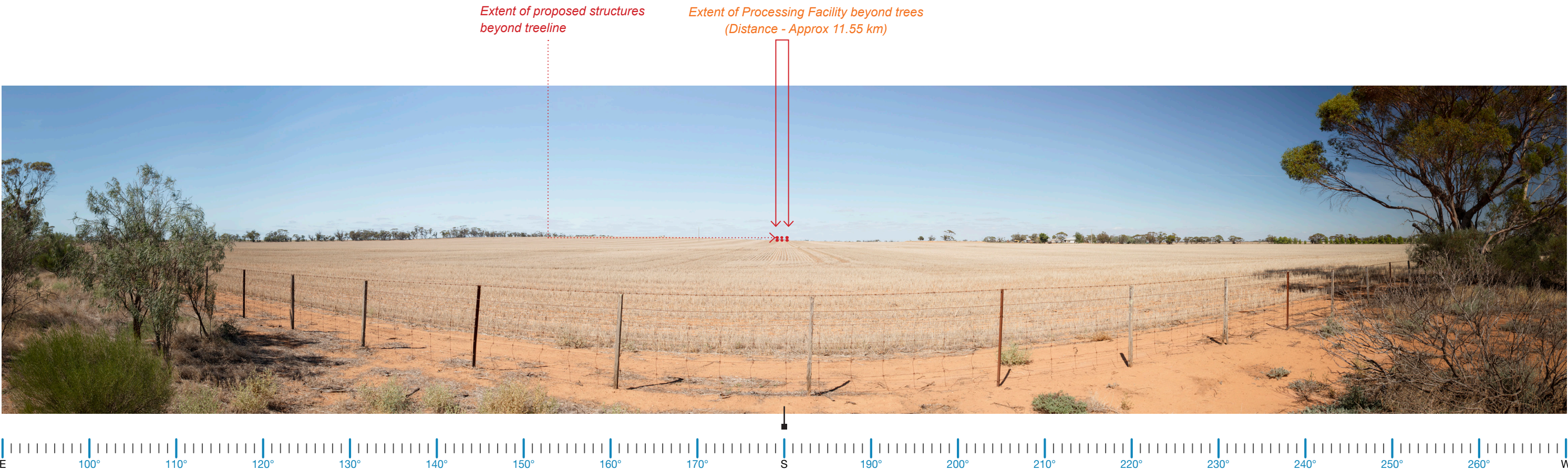
VP05 Location Map (Source: Google Earth)

VIEWPOINT VP05			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Donald - Swan Hill Road, Goschen	This viewpoint is located at the intersection of Donald - Swan Hill Road, Taylor Road and Holmes Road. Views of the Processing Facility are likely to be available in the south and are generally filtered and contained by existing roadside vegetation. Existing terrain is flat and land is predominantly used for agricultural activity. Donald-Swan Hill Road is an important major road that provides connectivity within the region.	From this location views of the proposed Processing Facility are likely to be screened by existing vegetation. It is possible that the tips of some of the structures will be visible in the southern direction. Majority of the views, however, will be screened.
COORDINATES	35°38'14.20"S 143°29'13.35"E		
ELEVATION	91 m		
VIEWING DIRECTION	South		
DISTANCE TO PROCESS-ING FACILITY	Approx. 9.9 km		
LAND USE	Highway	The visual sensitivity of this viewpoint has been rated as NIL - LOW due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.
VISUAL SENSITIVITY	NIL - LOW		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW		



# Viewpoint Analysis

## VP06 Oppenlander Road, Goschen



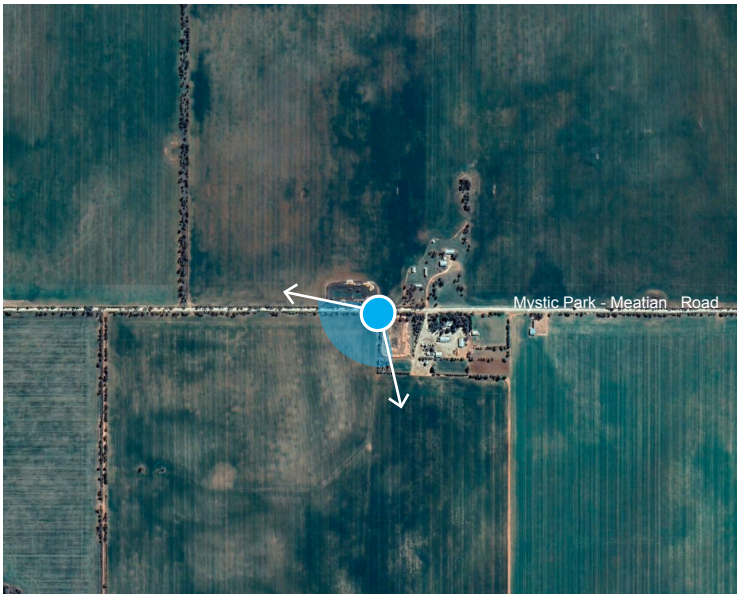
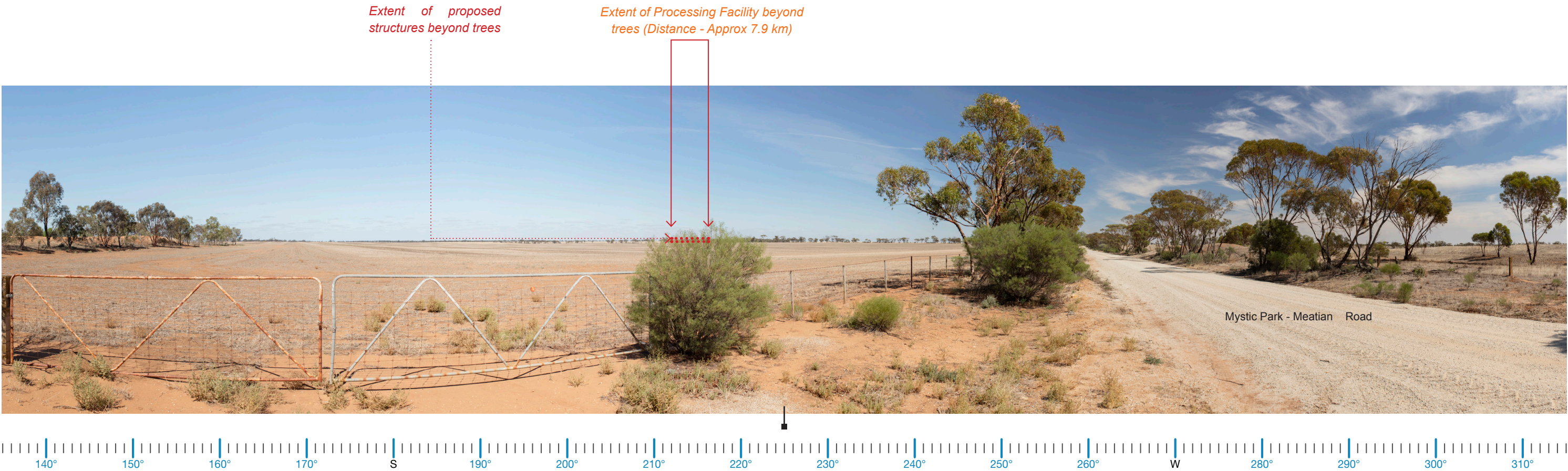
VP06 Location Map (Source: Google Earth)

VIEWPOINT VP06			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Oppenlander Road, Goschen	This viewpoint is located on Oppenlander Road. Views of the Processing Facility are likely to be available in the south. These views are open and expansive and are intermittently filtered by roadside vegetation. Existing terrain is generally flat and land is predominantly used for agricultural activity amidst scattered rural dwellings.	From this location views of the proposed Processing Facility are likely to be distant and unclear.
COORDINATES	35°40'33.91"S 143°29'4.46"E		
ELEVATION	95 m		
VIEWING DIRECTION	South		
DISTANCE TO PROCESS-ING FACILITY	Approx. 11.55 km		
LAND USE	Low Use Road		
VISUAL SENSITIVITY	NIL - LOW		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW	The visual sensitivity of this viewpoint has been rated as NIL - LOW due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.



# Viewpoint Analysis

## VP07 Mystic Park - Meatian Road, Kunat



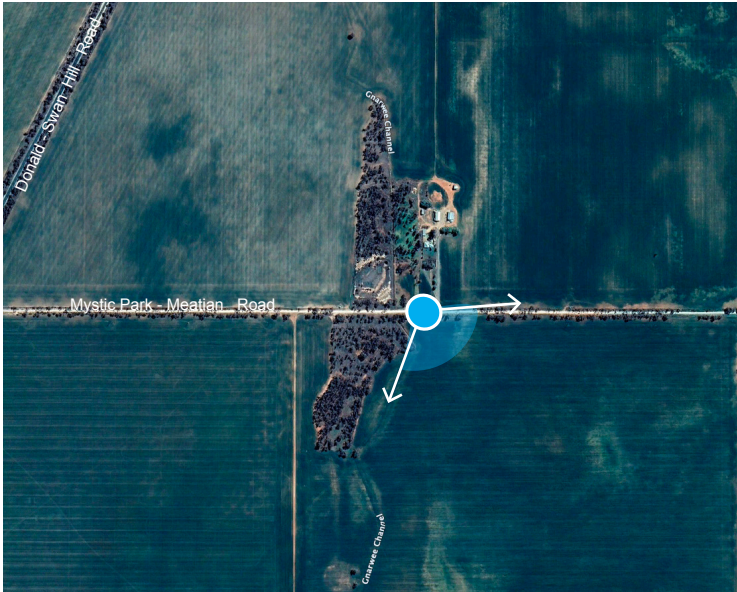
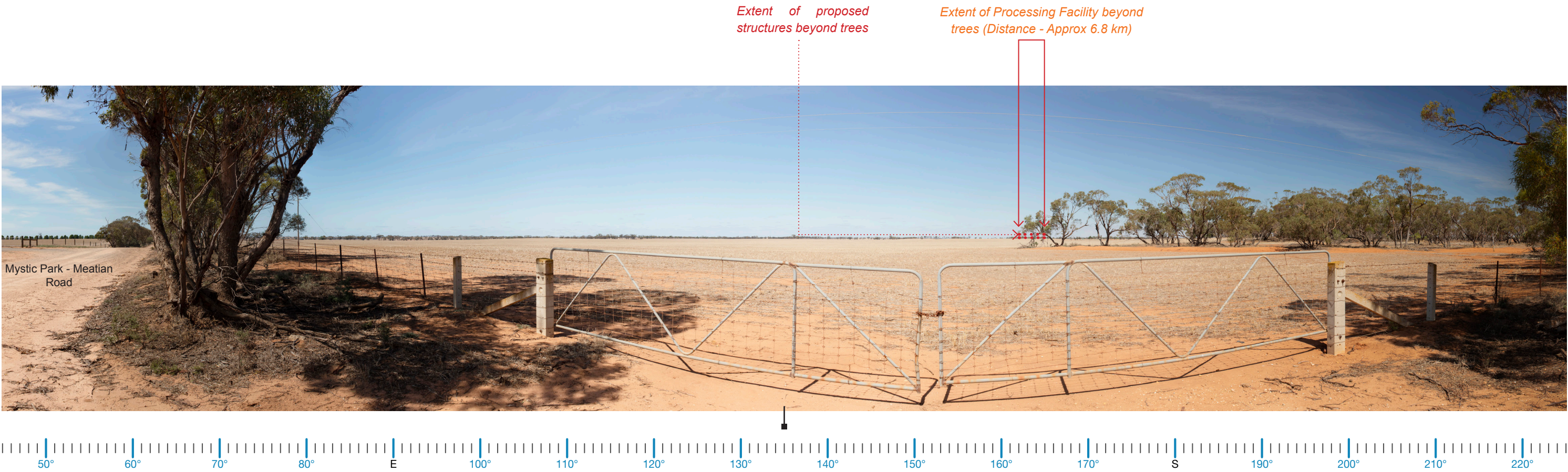
**VP07 Location Map** (Source: Google Earth)

VIEWPOINT VP07			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Mystic Park - Meatian Road, Kunat	This viewpoint is located on Mystic Park - Meatian Road. Views are generally open and filtered by roadside vegetation. The Processing Facility is likely to be visible in the southwest. The terrain is flat and it is likely that the structures will be partially screened by the existing windbreak plantation visble on the horizon. Surrounding land is predominantly used for agricultural activity and is characterised by scattered rural dwellings.	From this location views of the proposed Processing Facility are likely to be partially screened by existing vegetation.
COORDINATES	35°38'14.20"S 143°29'13.35"E		
ELEVATION	102 m		
VIEWING DIRECTION	Southwest		
DISTANCE TO PROCESS- ING FACILITY	Approx. 7.9 km		
LAND USE	Low Use Road	The visual sensitivity of this viewpoint has been rated as NIL - LOW due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.
VISUAL SENSITIVITY	NIL - LOW		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW		



# Viewpoint Analysis

## VP08 Mystic Park - Meatian Road, Meatian



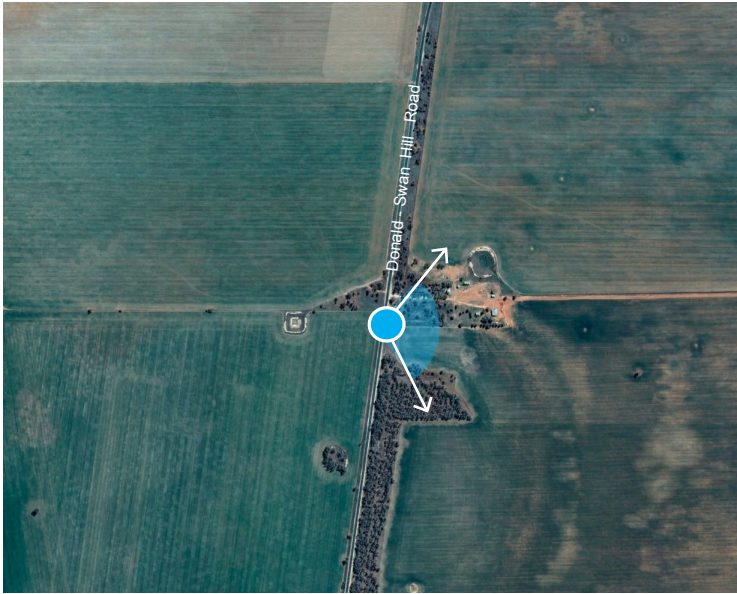
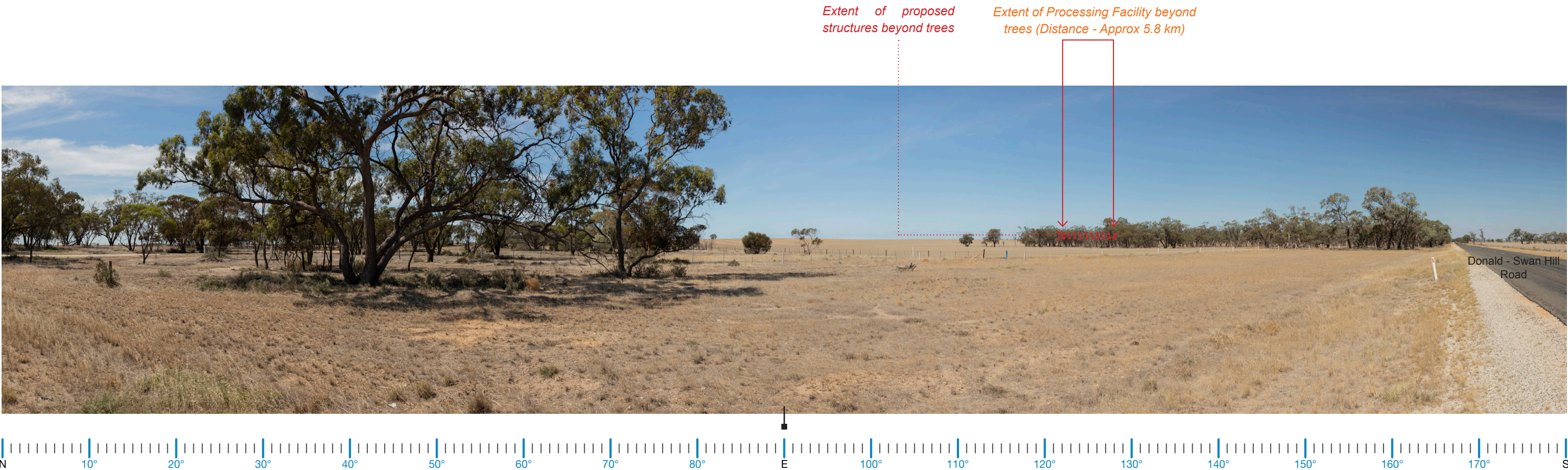
**VP08 Location Map** (Source: Google Earth)

VIEWPOINT VP08			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Mystic Park - Meatian Road, Meatian	This viewpoint is located on Mystic Park - Meatian Road. Views are generally open but filtered by clumps of vegetation in the south. The Processing Facility is likely to be visible in the southeast. The terrain is flat and it is likely that the structures will be partially screened by existing vegetation on the adjoining lot. It is likely that tips of some of the structures would be visible. Surrounding land is predominantly used for agricultural activity.	From this location views of the proposed Processing Facility are likely to be partially screened by existing vegetation on the adjoining lot. Surrounding dwellings are likely to view the Processing Facility partially due to existing vegetation in their surrounds.
COORDINATES	35°40'33.91"S 143°29'4.46"E		
ELEVATION	90 m		
VIEWING DIRECTION	Southeast		
DISTANCE TO PROCESS-ING FACILITY	Approx. 6.8 km		
LAND USE	Low Use Road	The visual sensitivity of this viewpoint has been rated as LOW due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.
VISUAL SENSITIVITY	LOW		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW		



# Viewpoint Analysis

## VP09 Donald - Swan Hill Road, Lalbert



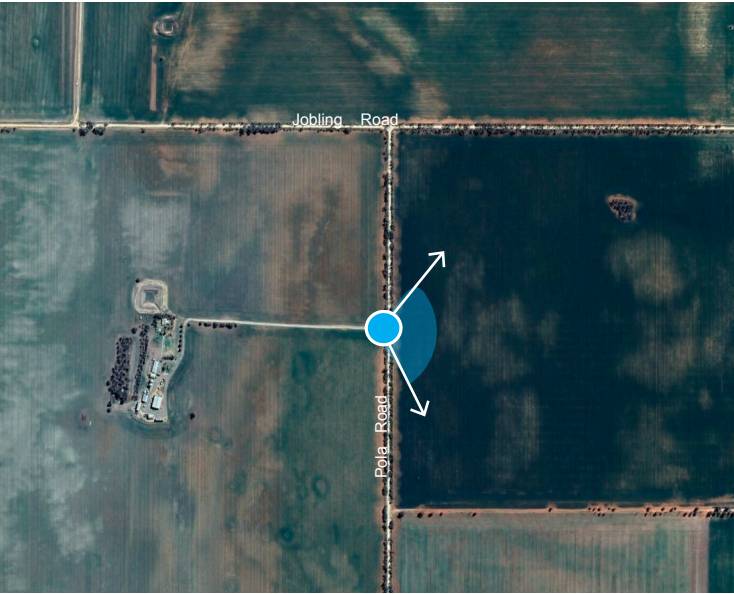
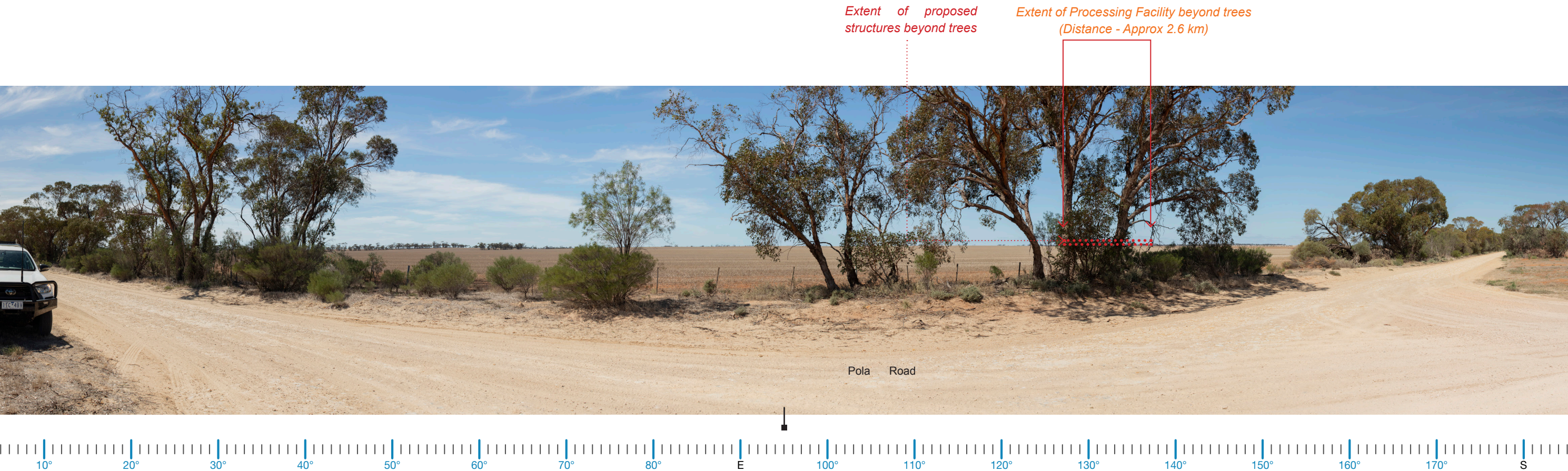
VP09 Location Map (Source: Google Earth)

VIEWPOINT VP09			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Donald - Swan Hill Road, Lalbert	This viewpoint is located on Donald - Swan Hill Road which is also a regional highway. This photo represents views from the adjoining rural dwelling which are open but filtered or contained. Views of the Processing Facility are likely to be available towards the southeast. The terrain is flat and it is likely that the tips of some of the structures will be visible beyond the existing row of plantation visible in the photograph's middleground. Surrounding land is predominantly used for agricultural activity and is characterised by scattered rural dwellings.	Views of the proposed Processing Facility are likely to be partially screened by existing vegetation. It is likely that the tips of some of the structures would be visible towards the southeast.
COORDINATES	35°40'33.91"S 143°29'4.46"E		
ELEVATION	87 m		
VIEWING DIRECTION	East		
DISTANCE TO PROCESS-ING FACILITY	Approx. 5.8 km		
LAND USE	Highway		
VISUAL SENSITIVITY	LOW		
VISUAL MAGNITUDE	LOW	The visual sensitivity of this viewpoint has been rated as LOW due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.
VISUAL IMPACT	LOW		



# Viewpoint Analysis

## VP10 Pola Road, Lalbert



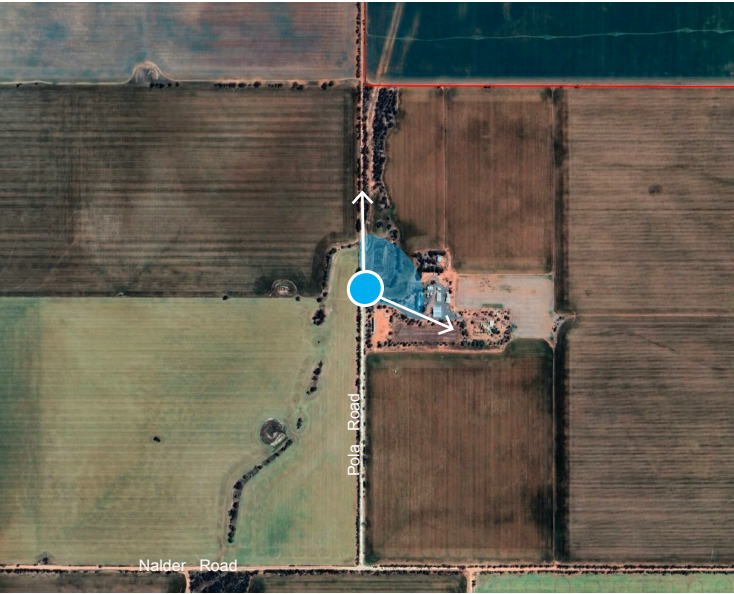
VP10 Location Map (Source: Google Earth)

VIEWPOINT VP10			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Pola Road, Lalbert	This viewpoint is located on Pola Road and represents views from the adjoining rural dwelling. Views of the Processing Facility are likely to be available in the southeast. The terrain is flat and it is likely that the structures will be partially screened by existing roadside vegetation. This vegetation allows filtered views of the surroundings. Land is predominantly used for agricultural activity amidst scattered rural dwellings.	From this location views of the proposed Processing Facility are likely to be partially screened by existing roadside vegetation. It is likely that the tips of some of the structures would be visible in the southeast.
COORDINATES	35°40'33.91"S 143°29'4.46"E		
ELEVATION	86 m		
VIEWING DIRECTION	Generally East		
DISTANCE TO PROCESS-ING FACILITY	Approx. 2.6 km	The visual sensitivity of this viewpoint has been rated as LOW due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.
LAND USE	Low Use Road		
VISUAL SENSITIVITY	LOW		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW		



# Viewpoint Analysis

## VP11 Pola Road, Lalbert



VIEWPOINT VP11			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Pola Road, Lalbert	This photograph was taken from Pola Road to represent views from the adjoining property. Views of the Processing Facility are likely to be available in the northeast. Existing vegetation around the dwelling and on the lot boundary limits most views. The terrain is flat and it is likely that the structures will be screened. Surrounding land is predominantly used for agricultural activity amidst scattered rural dwellings.  The visual sensitivity of this viewpoint has been rated as LOW due to the land use and the distance to the Processing Facility.	From this location views of the proposed Processing Facility are likely to be completely screened by existing vegetation. It is likely that the structures will be screened when viewed from the dwelling.  The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.
COORDINATES	35°38'14.20"S 143°29'13.35"E		
ELEVATION	96 m		
VIEWING DIRECTION	Generally Northeast		
DISTANCE TO PROCESS-ING FACILITY	Approx. 2.8 km		
LAND USE	Low Use Road		
VISUAL SENSITIVITY	LOW		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW		

VP11 Location Map (Source: Google Earth)



# Viewpoint Analysis

## Character around dwelling R0015

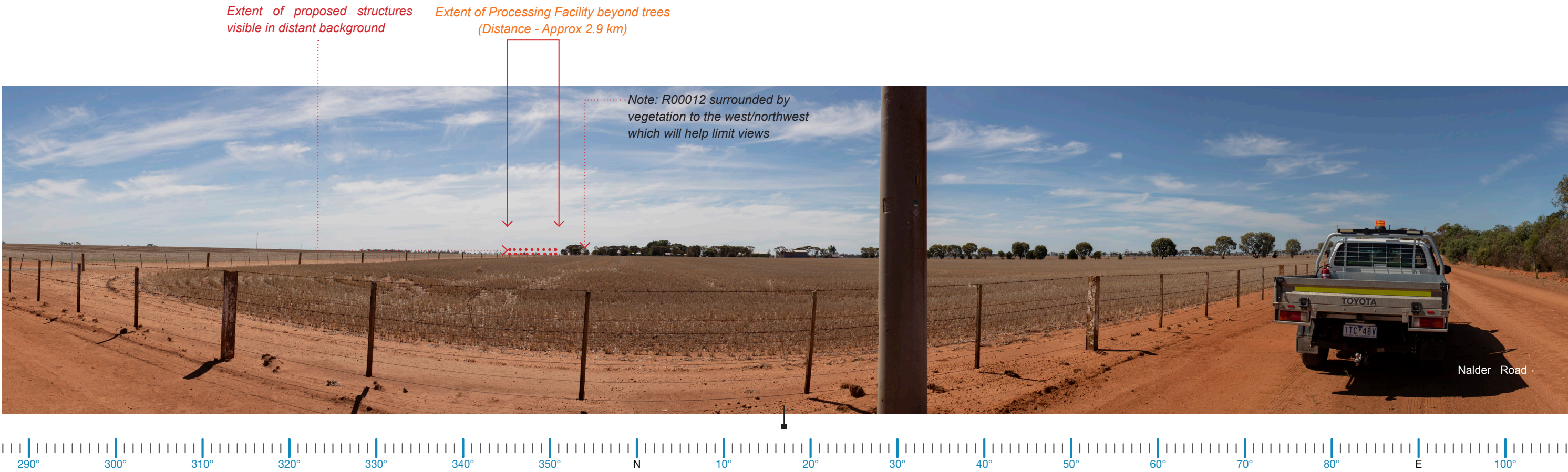
Note: New Image





# Viewpoint Analysis

## VP12 Nalder Road, Lalbert



VIEWPOINT VP12			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Nalder Road, Lalbert	This viewpoint is located on Nalder Road and represents views from the dwelling visible in the north. Views of the Processing Facility are likely to be available in the north. A row of trees planted along the dwelling's boundary help in screening views of the Processing Facility. The terrain is flat and it is likely that the tips of some of the structures would be visible approximately 2.9km away from this location.	From this location views of the proposed Processing Facility to the north will be partly restricted by existing vegetation. It is likely that tips of some of the structures might be visible.
COORDINATES	35°40'33.91"S 143°29'4.46"E		
ELEVATION	116 m		
VIEWING DIRECTION	Generally North		
DISTANCE TO PROCESS-ING FACILITY	Approx. 2.9 km	The visual sensitivity of this viewpoint has been rated as LOW due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.
LAND USE	Low Use Road		
VISUAL SENSITIVITY	LOW		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW		

VP12 Location Map (Source: Google Earth)



# Viewpoint Analysis

## Character around dwelling R0003



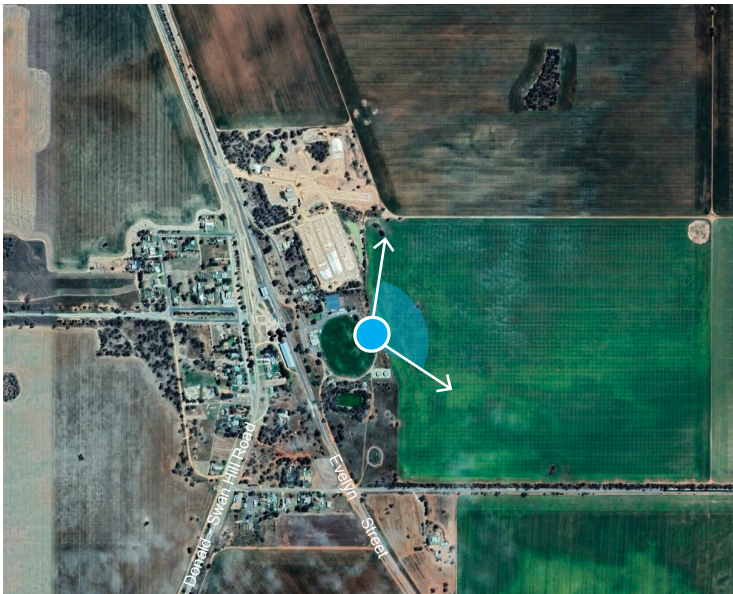
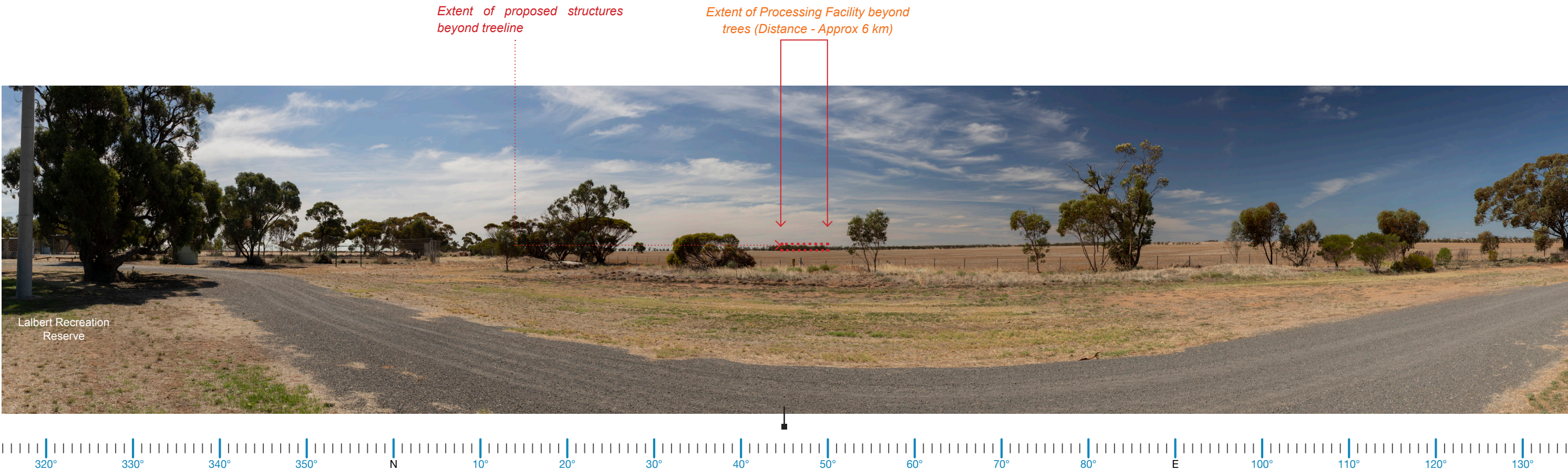
*Note: Character of vegetation along Nalder Road (northern side of R0003). Dwelling R0003 is at similar elevation to the road. It is likely that views of Processing Facility will be screened by dense roadside vegetation*

Pola Road



# Viewpoint Analysis

## VP13 Lalbert Recreation Reserve, Lalbert



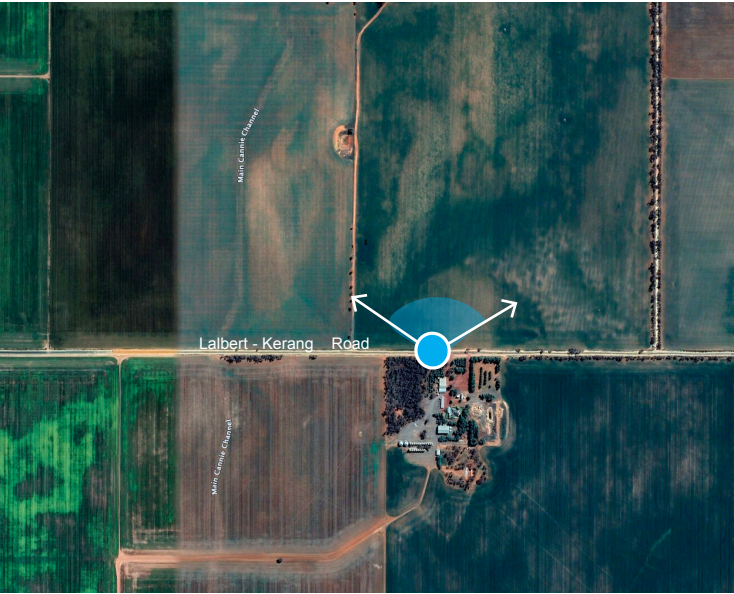
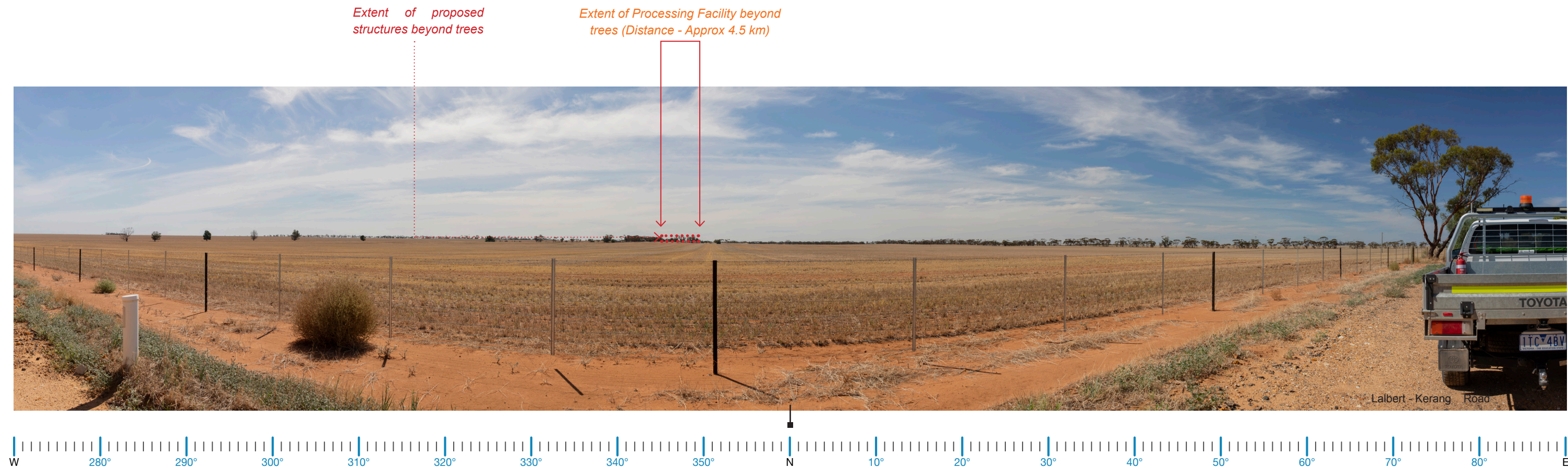
VP13 Location Map (Source: Google Earth)

VIEWPOINT VP13			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Lalbert Recreation Reserve, Lalbert	This viewpoint is located on the eastern edge of Lalbert Recreation Reserve. Views of the Processing Facility are likely to be available in the northeast. Views in this direction are generally open to filtered. A row of trees planted along the boundary of the recreation reserve help in filtering views. The terrain is flat and it is likely that the tips of some of the structures would be visible approximately 6km away from this location. Land parcels beyond the extent of this Reserve are generally used for agricultural activity.	From this location views of the proposed Processing Facility to the northeast will be partly restricted by existing vegetation. It is likely that tips of some of the structures might be visible.  The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.
COORDINATES	35°40'17.45"S 143°22'45.72"E		
ELEVATION	88 m		
VIEWING DIRECTION	Northeast		
DISTANCE TO PROCESS-ING FACILITY	Approx. 6 km		
LAND USE	Recreation Reserve	The visual sensitivity of this viewpoint has been rated as MODERATE due to the land use and the distance to the Processing Facility.	
VISUAL SENSITIVITY	MODERATE		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW		



# Viewpoint Analysis

## VP14 Lalbert - Kerang Road, Lalbert



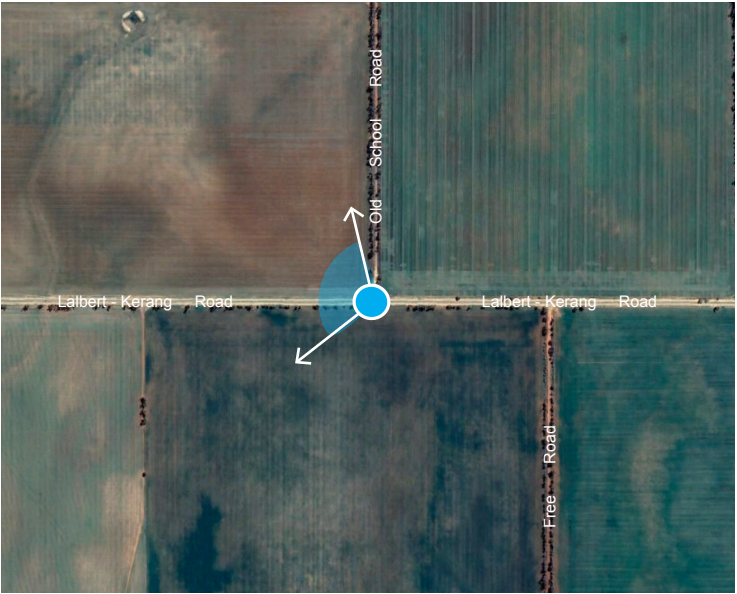
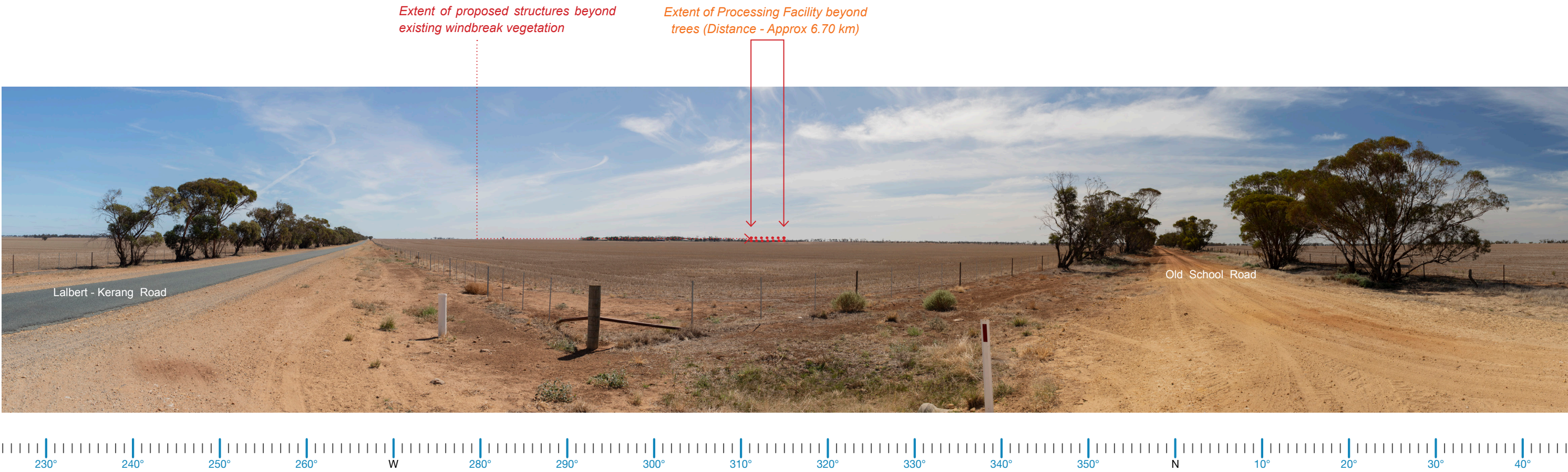
VP14 Location Map (Source: Google Earth)

VIEWPOINT VP14			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Lalbert-Kerang Road, Lalbert	This viewpoint is located on Lalbert-Kerang Road. Views of the Processing Facility are likely to be available in the north. Existing views in this direction are open and expansive. A row of windbreak vegetation is visible in the distant background and this will help screen views in the northern direction. Existing terrain is flat and land is predominantly used for agricultural activity.	From this location views of the proposed Processing Facility are likely to be screened by existing windbreak vegetation. It is possible that the tips of some of the structures will be visible. Majority of the views, however, will be screened.
COORDINATES	35°40'33.74"S 143°26'31.54"E		
ELEVATION	113 m		
VIEWING DIRECTION	North		
DISTANCE TO PROCESS-ING FACILITY	Approx. 4.5 km	The visual sensitivity of this viewpoint has been rated as LOW due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.
LAND USE	Low Use Road		
VISUAL SENSITIVITY	LOW		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW		



# Viewpoint Analysis

## VP15 Intersection of Old School Road and Lalbert-Kerang Road, Beauchamp



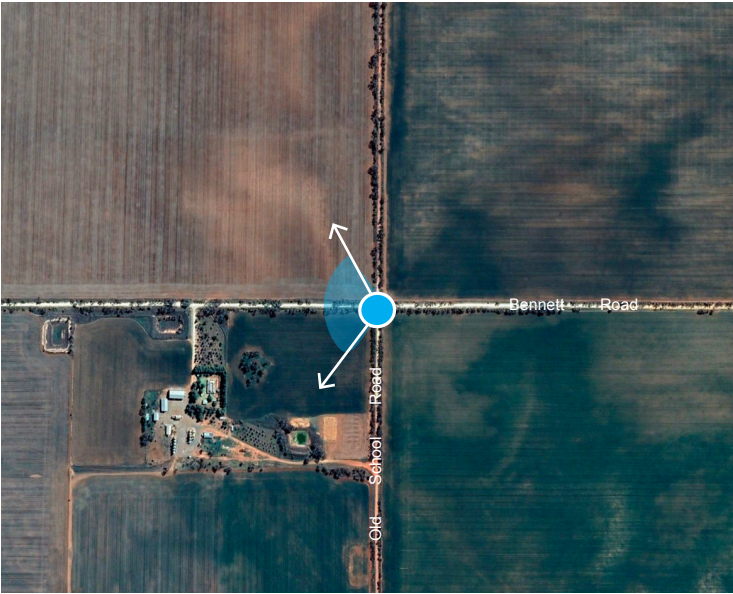
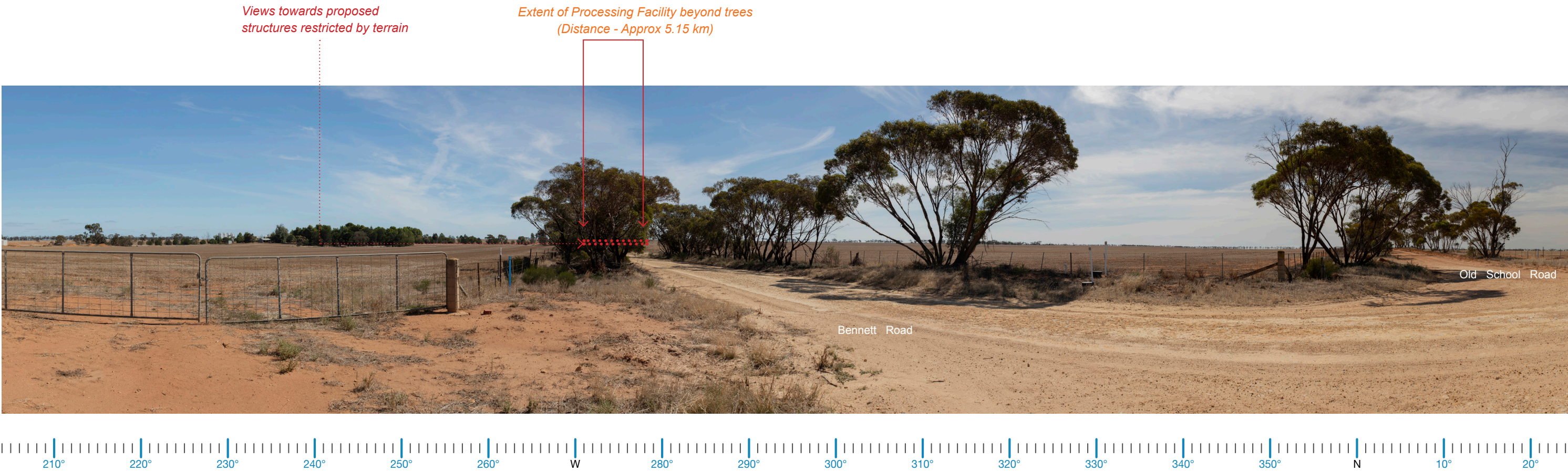
VP15 Location Map (Source: Google Earth)

VIEWPOINT VP15			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Intersection of Old School Road and Lalbert-Kerang Road, Beauchamp	The viewpoint was taken at the intersection of Old School Road and Lalbert-Kerang Road. It is likely that the Processing Facility would be partially visible in the northwest. Views in this direction are open and expansive due to limited obtrusive elements. Intermittent roadside vegetation along Old School Road and Lalbert-Kerang Road helps limit views along these commute corridors. Surrounding land is predominantly used for agricultural activity amidst rural dwellings.	Views of the proposed Processing Facility are likely to be available in the northwest. Certain parts of the Processing Facility are likely to be visible due to lack of visually obtrusive elements.
COORDINATES	35°40'33.91"S 143°29'4.46"E		
ELEVATION	92 m		
VIEWING DIRECTION	Northwest		
DISTANCE TO PROCESS-ING FACILITY	Approx. 6.70 km		
LAND USE	Low Use Road	The visual sensitivity of this viewpoint has been rated as LOW due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.
VISUAL SENSITIVITY	LOW		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW		



# Viewpoint Analysis

## VP16 Intersection of Bennett Road and Old School Road, Beauchamp



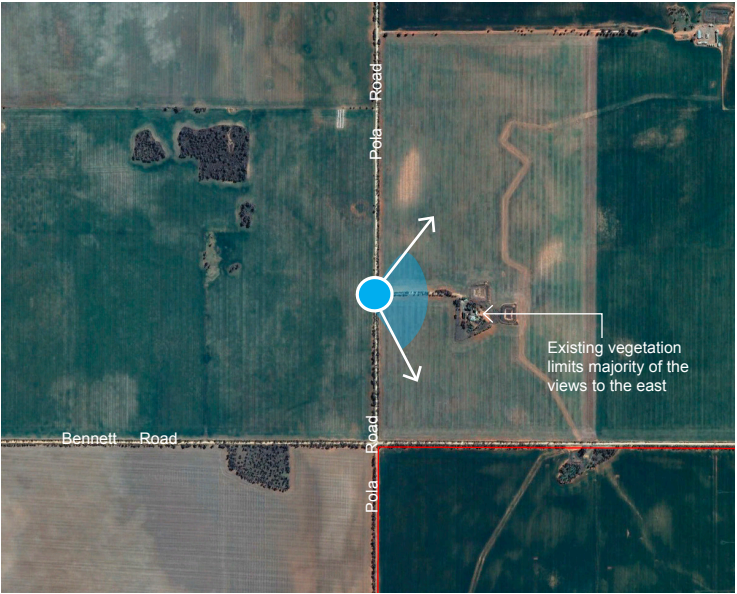
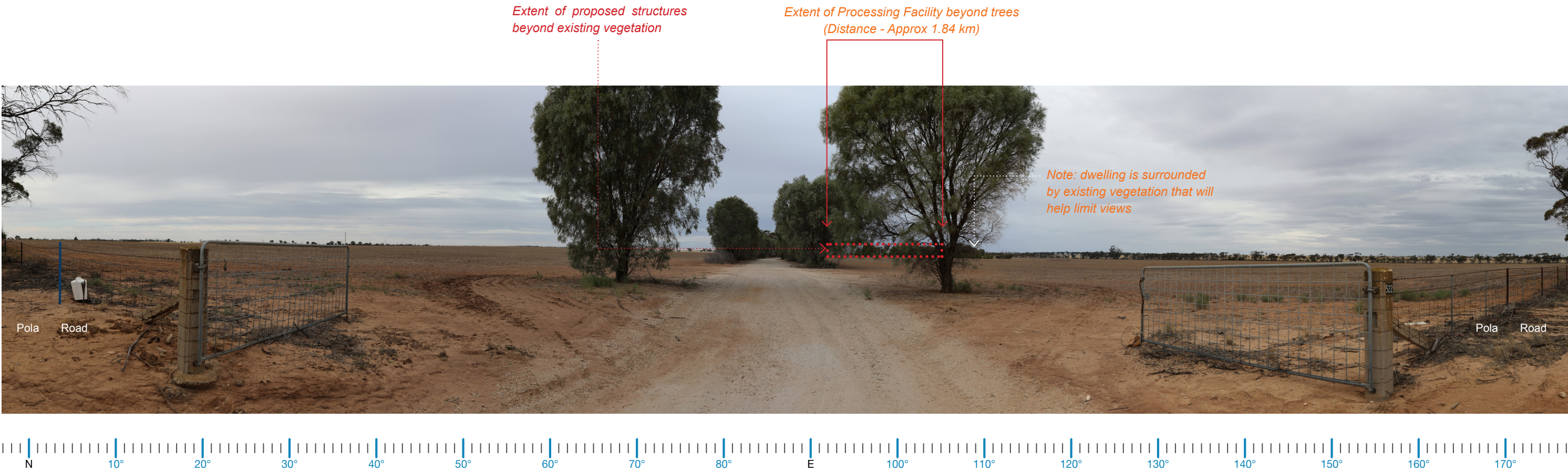
VIEWPOINT VP16			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Intersection of Bennett Road and Old School Road	This photograph was taken at the intersection of Bennett Road and Old School Road. It is likely that the Processing Facility would be partially visible in the west. Views towards the west are filtered by existing vegetation associated with surrounding dwellings. Stands of trees are located along roadsides and these help in screening views. Surrounding land is predominantly used for agricultural activity amidst scattered rural dwellings.	From this location views of the proposed Processing Facility to the west will be partially restricted by existing vegetation. Certain parts of the Processing Facility, however, are likely to be visible.
COORDINATES	35°38'14.20"S 143°29'13.35"E		
ELEVATION	100 m		
VIEWING DIRECTION	Northwest		
DISTANCE TO PROCESS-ING FACILITY	Approx. 5.15 km		
LAND USE	Low Use Road	The visual sensitivity of this viewpoint has been rated as LOW due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Low resulting in an overall visual impact of LOW.
VISUAL SENSITIVITY	LOW		
VISUAL MAGNITUDE	LOW		
VISUAL IMPACT	LOW		

VP16 Location Map (Source: Google Earth)



# Viewpoint Analysis

## VP17 Pola Road, Lalbert



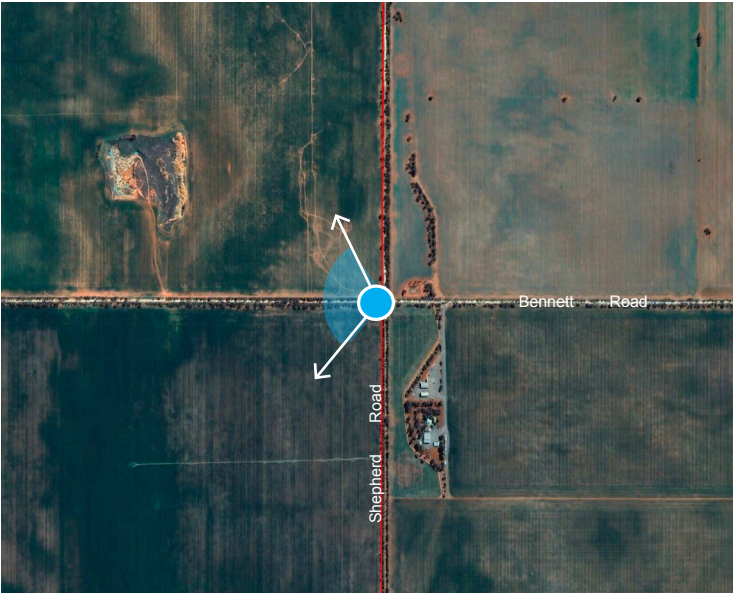
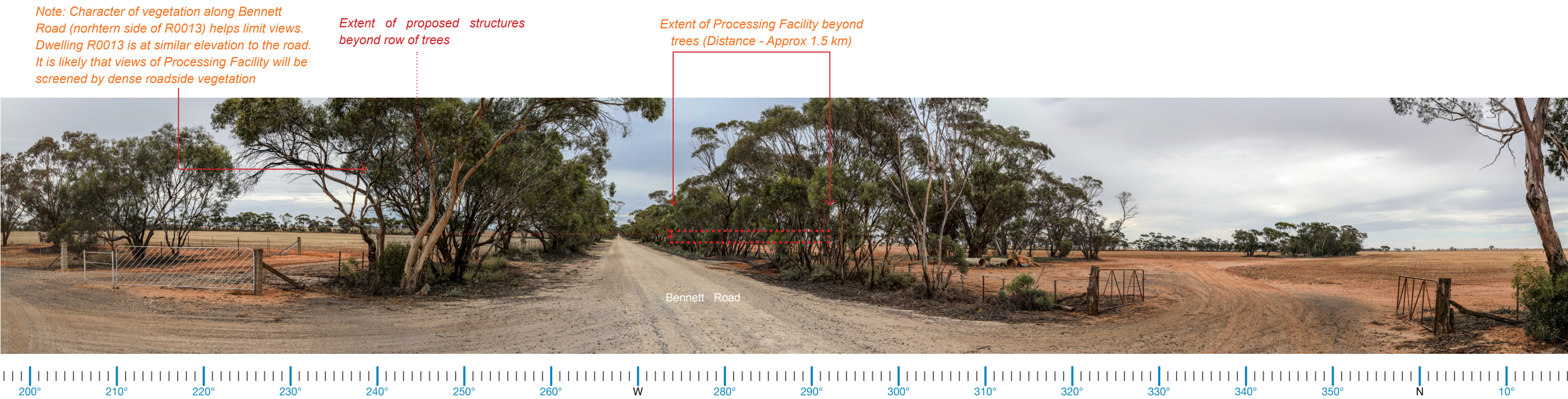
VP17 Location Map (Source: Google Earth)

VIEWPOINT VP17			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Pola Road, Lalbert	The viewpoint was taken at the gate of 522 Pola Road, Lalbert. The landscape is generally defined by flat, cleared land parcels that are used for agricultural activity and low density rural dwellings. Vegetation is sparse and lands are mostly cleared to support cropping. It is likely that the proposed Processing Facility will be visible in the east. Views in this direction, however, are filtered by the existing vegetation associated with the dwelling.	Views of the proposed Processing Facility are likely to be available in the east. Certain parts of the Processing Facility are likely to be visible. Existing vegetation, however, will help limit some of the views, thus allowing the tips of the structures to be visible. Views from the dwelling are likely to be limited due to the existing vegetation in its surrounds.
COORDINATES	35°37'53.82"S 143°24'29.61"E		
ELEVATION	92 m		
VIEWING DIRECTION	Generally East	The visual sensitivity of this viewpoint has been rated as MODERATE due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Moderate resulting in an overall visual impact of MODERATE.
DISTANCE TO PROCESS-ING FACILITY	Approx. 1.84 km		
LAND USE	Low Use Road		
VISUAL SENSITIVITY	MODERATE		
VISUAL MAGNITUDE	MODERATE		
VISUAL IMPACT	MODERATE		



# Viewpoint Analysis

## VP18 Bennett Road, Lalbert



VP18 Location Map (Source: Google Earth)

VIEWPOINT VP18			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Intersection of Bennett Road and Shepherd Road, Lalbert	This photograph was taken at the intersection of Bennett Road and Shepherd Road. It is likely that the Processing Facility would be partially visible in the west. Views towards the west are filtered by existing roadside vegetation. Surrounding terrain is generally flat and has been cleared to support agricultural activity amidst scattered rural dwellings.	From this location views of the proposed Processing Facility to the west will be partially restricted by existing vegetation. It is likely that the tips of some of the structures would be visible due to their height and the proximity of the Project to this location.
COORDINATES	35°38'14.20"S 143°29'13.35"E		
ELEVATION	116 m		
VIEWING DIRECTION	Generally West		
DISTANCE TO PROCESS-ING FACILITY	Approx. 1.5 km		
LAND USE	Low Use Road	The visual sensitivity of this viewpoint has been rated as MODERATE due to the land use and the distance to the Processing Facility.	The visual magnitude is likely to be Moderate resulting in an overall visual impact of MODERATE.
VISUAL SENSITIVITY	MODERATE		
VISUAL MAGNITUDE	MODERATE		
VISUAL IMPACT	MODERATE		





## **Appendix B**

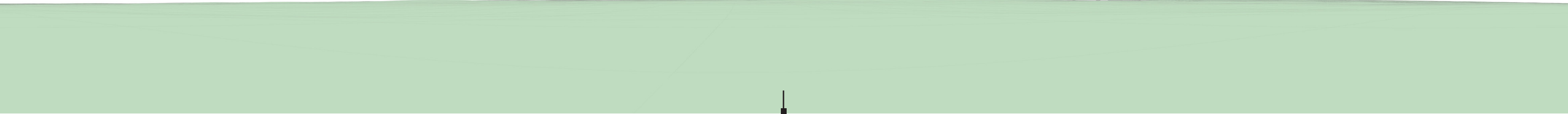
### Photomontages



Photomontage 1 Viewpoint VP10 (Pola Road, Lalbert)



Refer to cropped 60° image





Photomontage 1 Cropped 60° Proposed View





Photomontage 1 Viewpoint VP10 (Pola Road, Lalbert)



10° 20° 30° 40° 50° 60° 70° 80° E 100° 110° 120° 130° 140° 150° 160° 170° S

180° Proposed View of Processing Facility

Refer to cropped 60° image



10° 20° 30° 40° 50° 60° 70° 80° E 100° 110° 120° 130° 140° 150° 160° 170° S

180° Proposed View of Processing Facility with on-site screen planting as per LVIA



Photomontage 1 Cropped 60° Proposed View with on-site screen planting as per LVIA





Photomontage 2 Viewpoint VP11 (Pola Road, Lalbert)

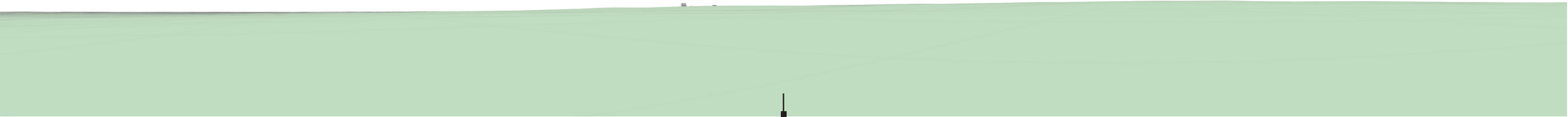


180° Existing View

Refer to cropped 60° image



180° Proposed View of Processing Facility



180° Proposed Wireframe of Processing Facility



Photomontage 2 Cropped 60° Proposed View

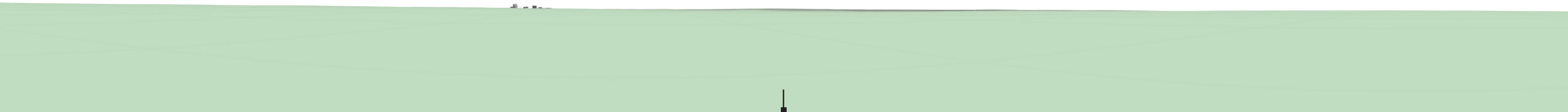




Photomontage 3 Viewpoint VP12 (Nalder Road, Lalbert)



Refer to cropped 60° image





Photomontage 3 Cropped 60° Proposed View





Photomontage 3 Viewpoint VP12 (Nalder Road, Lalbert)



180° Proposed View of Processing Facility

Refer to cropped 60° image



180° Proposed View of Processing Facility with on-site screen planting as per LVIA

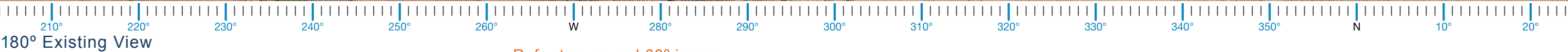


Photomontage 3 Cropped 60° Proposed View with on-site screen planting as per LVIA





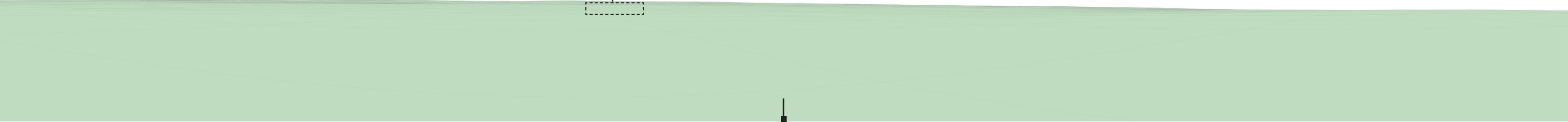
Photomontage 4 Viewpoint VP16 (Intersection of Bennett Road and Old School Road, Beauchamp)



Refer to cropped 60° image



View of Processing Facility restricted by terrain





Photomontage 4 Cropped 60° Proposed View

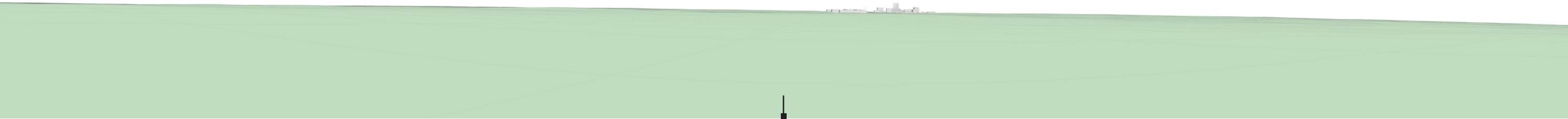




Photomontage 5 Viewpoint VP17 (Pola Road, Lalbert)



Refer to cropped 60° image





Photomontage 5 Cropped 60° Proposed View

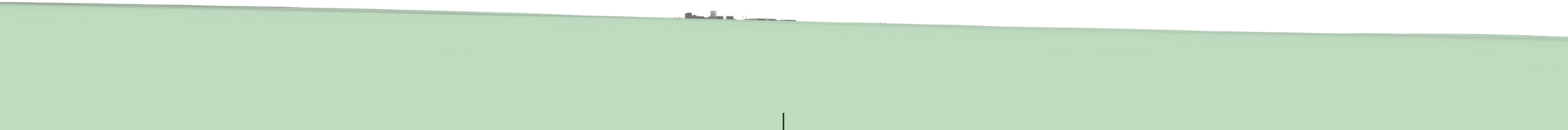




Photomontage 6 Viewpoint VP18 (Bennett Road, Lalbert)



Refer to cropped 60° image





Photomontage 6 Cropped 60° Proposed View







## **Appendix C**

### Preliminary Landscape Plan



Existing vegetation to be retained. This is likely to assist in screening views. However, additional screening is recommended to ensure longevity.

Proposed perimeter planting along the western boundary to reduce visual impact from properties along Pola Road.

Proposed buffer planting to fill gaps in existing roadside vegetation along Bennett Road.

Existing roadside vegetation to be retained and protected during construction and operation.

Existing roadside vegetation to be retained and protected during construction and operation.

Clay Stockpile

Mine Pit and Mined Ore Reserve

Bennett Road

MINERAL PROCESSING PLANT TO SOUTH

LIQUID WASTE HANDLING 60 m x 30 m x 12 m

WASTE LOADING AREA 100 m x 25 m x 6 m

PRODUCT HANDLING & LAYDOWN AREA 60 m x 40 m x 10 m

REAGENTS STORAGE & MAKE UP AREA 100 m x 50 m x 10 m

CONTROL ROOM/ABUTTMENTS 30 m x 25 m x 4 m

NANOFILTRATION 35 m x 25 m x 12 m

SOFTENING 35 m x 25 m x 12 m

NEUTRALISATION 35 m x 25 m x 12 m

RE CARBONATE PRECIPITATION 45 m x 25 m x 12 m

SULPHATION BAKE SCRUBBER STACK (H: 30 m)

SULPHATION BAKE 30 m x 15 m x 12 m

WATER LEACH 35 m x 25 m x 12 m

PURIFICATION 35 m x 25 m x 12 m

AL REJECTION 35 m x 25 m x 12 m

IX & U PROCESSING 35 m x 25 m x 12 m

PRODUCT DRYER STACK (H: 16 m)

CONTAINER STORAGE

PACKING

REMC PLANT

CHANGE ROOM 2

CHROME FLOAT

SWITCHROOM

TRANSFORMER

HMIC CONVEYOR

TRANSFORMER

WIRING N/V GRAVITY CIRCUIT

P-FLOAT STOCKPILE

CHANGE ROOM 3

HAL CIRCUIT

HMIC STOCKPILE

PROCESS WATER DAM

PUMPS

SETTLING POND

FLOCCULANT PLANT

THICKENER

ROM SURGE BIN

WET CONCENTRATOR PLANT

FEED PREP SCREENS

CHARGE OVERSIZE STOCKPILE

MINING CONTRACTORS' YARD

STORES WAREHOUSE

LAYDOWN

LABORATORY BUILDING

CHANGE ROOM 1

MAIN OFFICE BUILDING

POTABLE WATER

SEWAGE TREATMENT PLANT

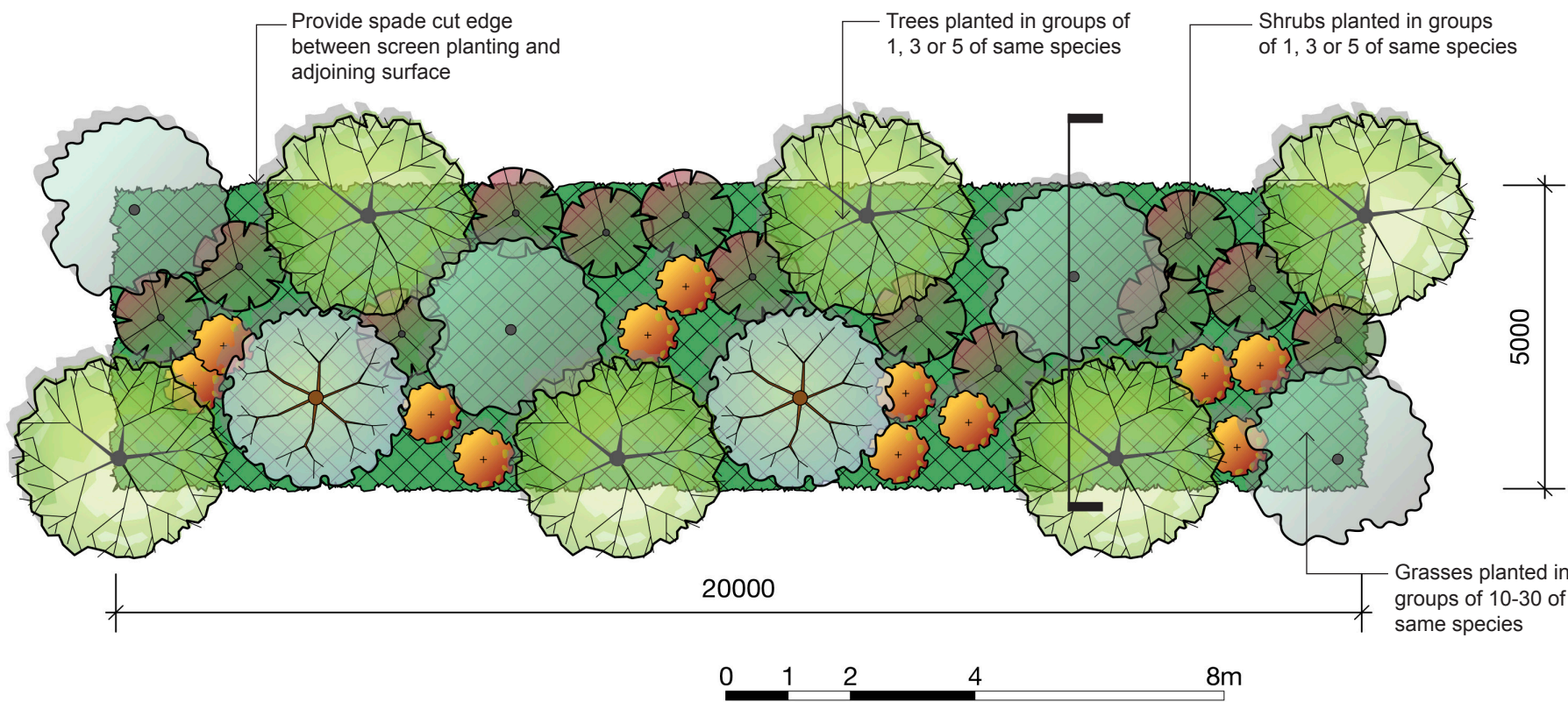
FIRST AID

BEACH/BRIDGE

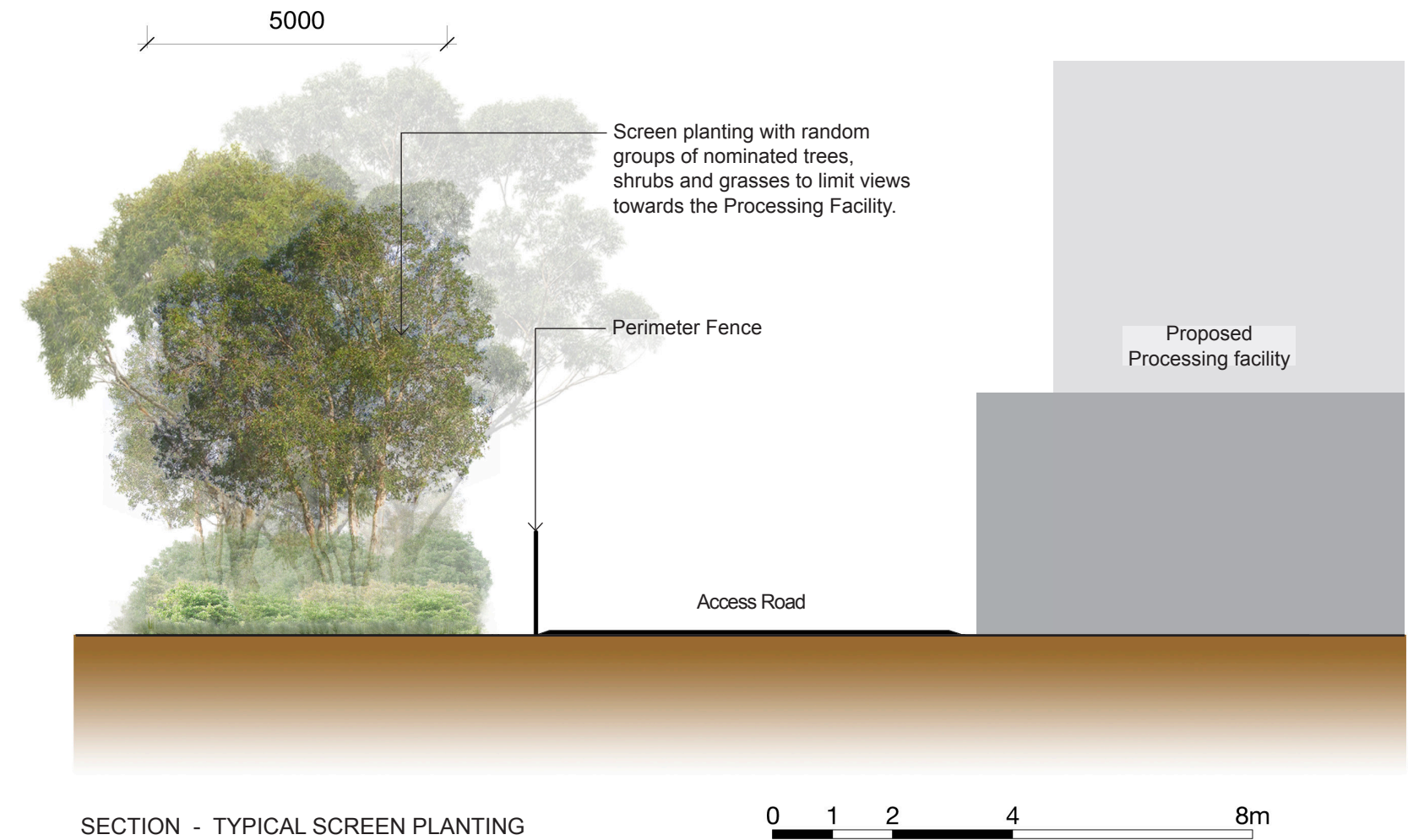
HW ACCESS TO MINESITE

TO WARE PIT





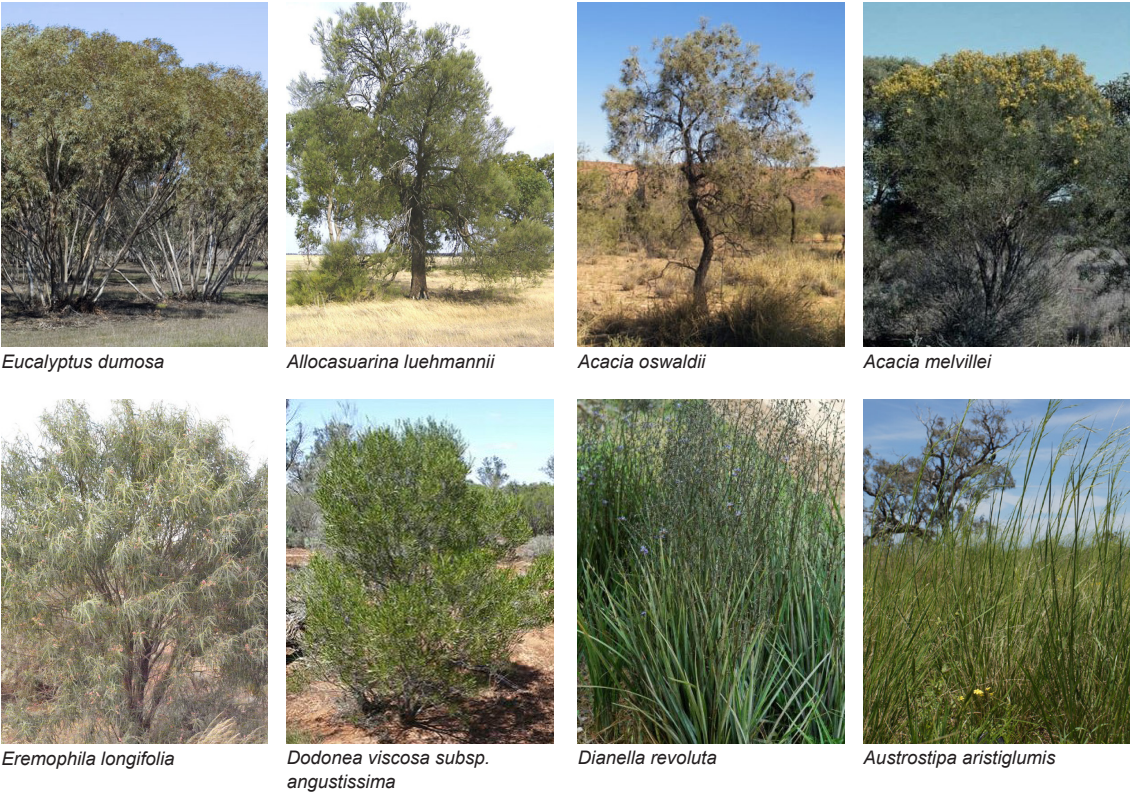
PLAN - TYPICAL SCREEN PLANTING MATRIX



SECTION - TYPICAL SCREEN PLANTING

# LP02

## PLANT IMAGERY



Indicative Planting Schedule Code	Botanical Name	Common Name	Pot Size	Mature Height	Mature Width
<b>Trees</b>					
EUC dum *	<i>Eucalyptus dumosa</i>	White Mallee	45L	8 - 12 m	4 - 5m
ALO leu *	<i>Allocasuarina luehmannii</i>	Bull-Oak	45L	9 - 15m	3 - 4m
ACA mel	<i>Acacia melvillei</i>	Yarran	200m	4 - 6m	2 - 4m
ACA osw	<i>Acacia oswaldii</i>	Umbrella Wattle	200m	2 - 6m	1 - 3m
<b>Shrubs</b>					
ERE lon	<i>Eremophila longifolia</i>	Berrigan / Emu Bush	200m	4 - 8m	1.5 - 3m
DOD vis	<i>Dodonea viscosa subsp.</i>	Narrow-leaf Hop Bush	200m	3 - 5m	0.5 - 2m
<b>Mass Planting Grasses</b>					
DIA rev	<i>Dianella revoluta</i>	Black Anther Flax-lily	Tubestock	0.45 -	0.3 - 0.6m
AUS ari	<i>Austrostipa aristiglumis</i>	Plump Spear-grass	Tubestock	1 - 2m	0.3 - 0.5m

\* Trees to be maintained to a height of 12 - 15 metres.



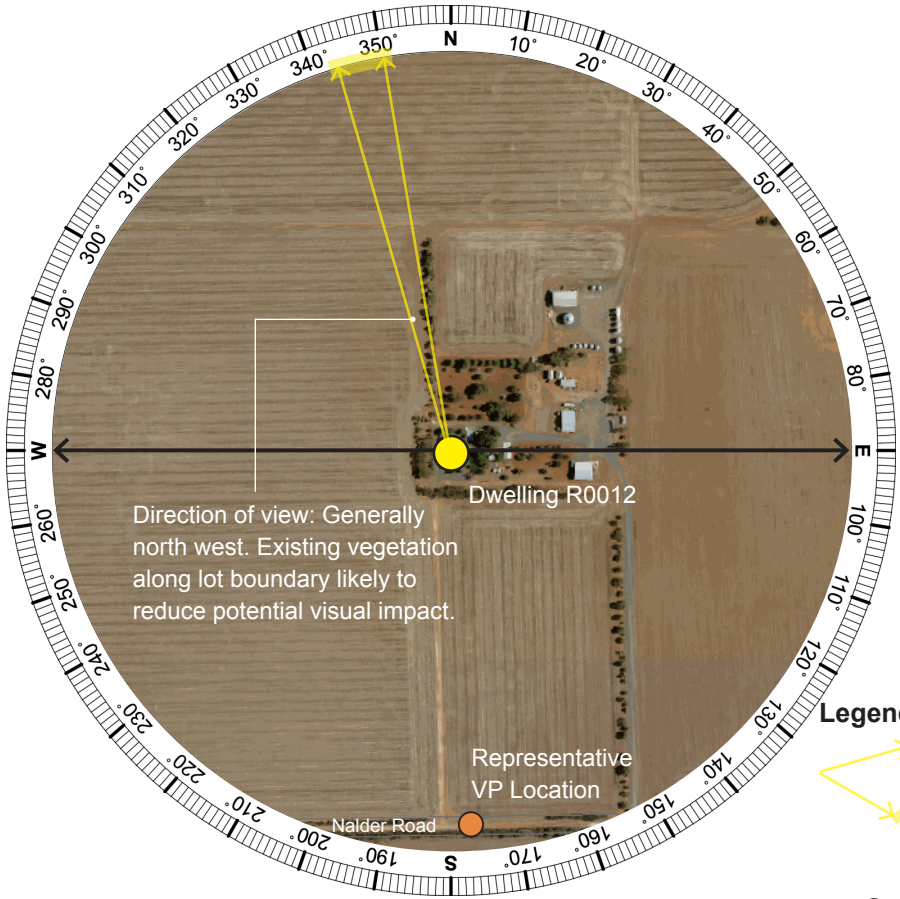


## **Appendix D**

### Dwelling Analysis



# D.1. Dwelling Analysis Dwelling R0012



Dwelling R0012 - Aerial Image  
Location Plan (Image Source: VicPlan 2022)

## Assessment Notes:

Aerial imagery indicates that the dwelling is surrounded by vegetation in the foreground which may not be high enough to screen views. However, an existing row of windbreak vegetation that runs north-south along the boundary/fence of the house will help limit views along the north west.

3D assessment suggests that views of the Processing Facility are likely to be available towards the north west. The dwelling is located within 2000 m of the Project Mining Area and approximately 2.57 km away from the proposed Processing Facility. It is likely that most views of the facility will be fragmented by existing vegetation.

## Potential Visual Impact:

It is likely that views in the north west will be partially screened by existing vegetation along the fence/boundary. The visual sensitivity of the dwelling has been rated as High due to the land use and the distance to the Processing Facility. The visual magnitude is likely to be Low resulting in an overall visual impact of **Moderate**. If deemed necessary, additional screening can be provided in the immediate foreground of this dwelling to completely screen views of the Processing Facility. Consultation with the landowner will be required before recommending any additional planting.

## Legend

Direction & extent of potentially visible Processing Facility (based on 3D assessment)

Representative Viewpoint Location

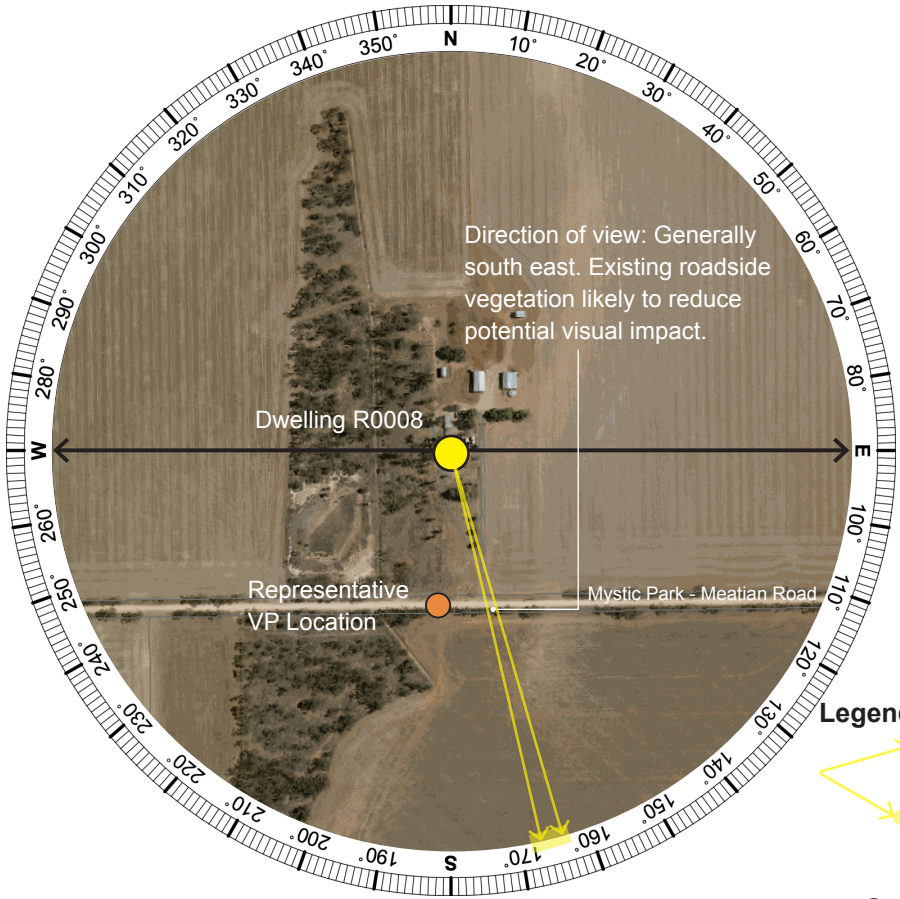
Distance to Processing Facility = 2.57 km



Proposed View  
Representative view and photomontage from Nalder Road near boundary fence of Dwelling R0012



# D.2. Dwelling Analysis Dwelling R0008



Dwelling R0008 - Aerial Image  
Location Plan (Image Source: VicPlan 2022)

## Assessment Notes:

Aerial imagery indicates that the dwelling is surrounded by patchy vegetation in the foreground. However, a row of dense windbreak vegetation runs along Mystic Park - Meatian Road which will help limit views generally in the southern / south eastern directions.

3D assessment suggests that views of the Processing Facility are likely to be available in the southern / south eastern direction. The dwelling is located within 5000 m of the Project Mining Area and approximately 7.06 km away from the proposed Processing Facility. It is likely that views of the facility will be fragmented by existing roadside vegetation.

## Potential Visual Impact:

It is likely that views towards the south will be screened by existing roadside vegetation along Mystic Park - Meatian Road. The visual sensitivity of the dwelling has been rated as Low due to the land use and the distance to the Processing Facility. The visual magnitude is likely to be Negligible resulting in an overall visual impact of **Negligible**.

## Legend

Direction & extent of potentially visible Processing Facility (based on 3D assessment)

Representative Viewpoint Location

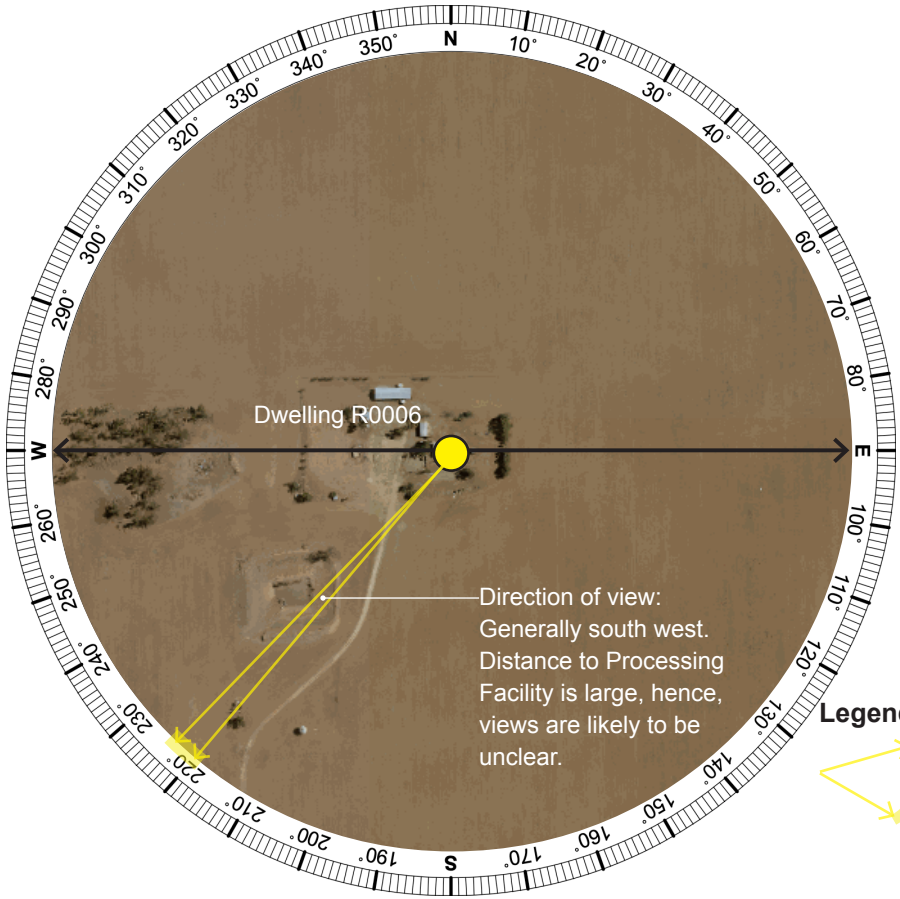
Distance to Processing Facility = 7.06 km



Existing View  
Representative view from Mystic Park - Meatian Road near southern boundary of Dwelling R0008



# D.3. Dwelling Analysis Dwelling R0006



Dwelling R0006 - Aerial Image  
Location Plan (Image Source: VicPlan 2022)

**Legend**

Direction & extent of potentially visible Processing Facility (based on 3D assessment)

Distance to Processing Facility = 10.17 km

**Assessment Notes:**

Aerial imagery indicates that the dwelling is surrounded by patchy vegetation in the foreground. However, a row of dense windbreak vegetation runs along Mystic Park - Meatian Road which will help limit views generally towards the south.

3D assessment suggests that views of the Processing Facility are likely to be available in the south west. The dwelling is located within 5000 m of the Project Mining Area and approximately 10.17 km away from the proposed Processing Facility. It is likely that views of the facility will be distant and fragmented by existing roadside vegetation.

**Potential Visual Impact:**

It is likely that views towards the south west will be screened by existing roadside vegetation along Mystic Park - Meatian Road. The visual sensitivity of the dwelling has been rated as Low due to the land use and the distance to the Processing Facility. The visual magnitude is likely to be Negligible resulting in an overall visual impact of **Negligible**.