Lilydale Energy to Waste - Landscape Visual Impact Assessment

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Yarra Valley Water

Lilydale EfW
11 October 2022

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Project name:	Lilydale EfW		
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Contents

1. Introduction

Jacobs Group (Australia) Pty Ltd (Jacobs) has been engaged by Yarra Valley Water (YVW) to prepare a Landscape and Visual Impact Assessment (LVIA) for the Lilydale waste-to-energy facility (WTE) (the Project) in Lilydale, Victoria. This work forms part of a larger planning permit application report for a planning permit application to the Department of Environment, Land, Water and Planning (DELWP) for the use and development of a WTE.

This report will assess the potential for landscape and visual impacts that might be brought about by the Project.

1.1 Purpose

This report will review the Project and surrounding area before assessing the potential visual impacts that may arise as a result of the Project.

1.2 Project background

This section provides detail on the key components of the Project relevant to views and visual impact. It is proposed to construct a WTE facility adjacent to YVW's existing Sewage Treatment Plant (STP). The intention of the WTE is to power the operations of the STP, with any additional power generated being fed back into the power grid. Ancillary works include construction of a vehicle access track from the Maroondah Highway located east of the site.

1.2.1 Subject site

The Project site is located at 83-85 Nelson Road, Lilydale (Site 1) for the WTE and 535-537 Maroondah Highway, Lilydale (Site 2) for the access road located to the north of Site 1. Both sites are owned by YVW as illustrated in Figure 1-1. YVW's 83-85 Nelson Road, Lilydale site consists of six allotments on the northern side of Nelson Road. The proposed new access to the Maroondah Highway will affect land owned by VicTrack and is adjacent to land owned by Boral.

The southern boundary of the proposed development area is approximately 1,400m north of Nelson Road and 950m west of the Maroondah Highway. The Project site has an area of between 95m – 140m wide at the northern edge of the development area which contains an easement developed with high voltage electricity transmission lines.

The development area is largely cleared of vegetation, with a few scattered trees and grass present. The development area is approximately 3.0ha in area, which represents 5% of the approximately 58.35ha of YVW's overall site.

The surrounding topography is undulated or hilly. Varied land uses surround the development site and includes agricultural, quarry, golf course, industrial/warehouse, recreational and residential uses including:

North: Primarily agricultural farmland cleared of significant vegetation, zoned as Green Wedge. Residential dwellings are located approximately 1100m north-east of the site.

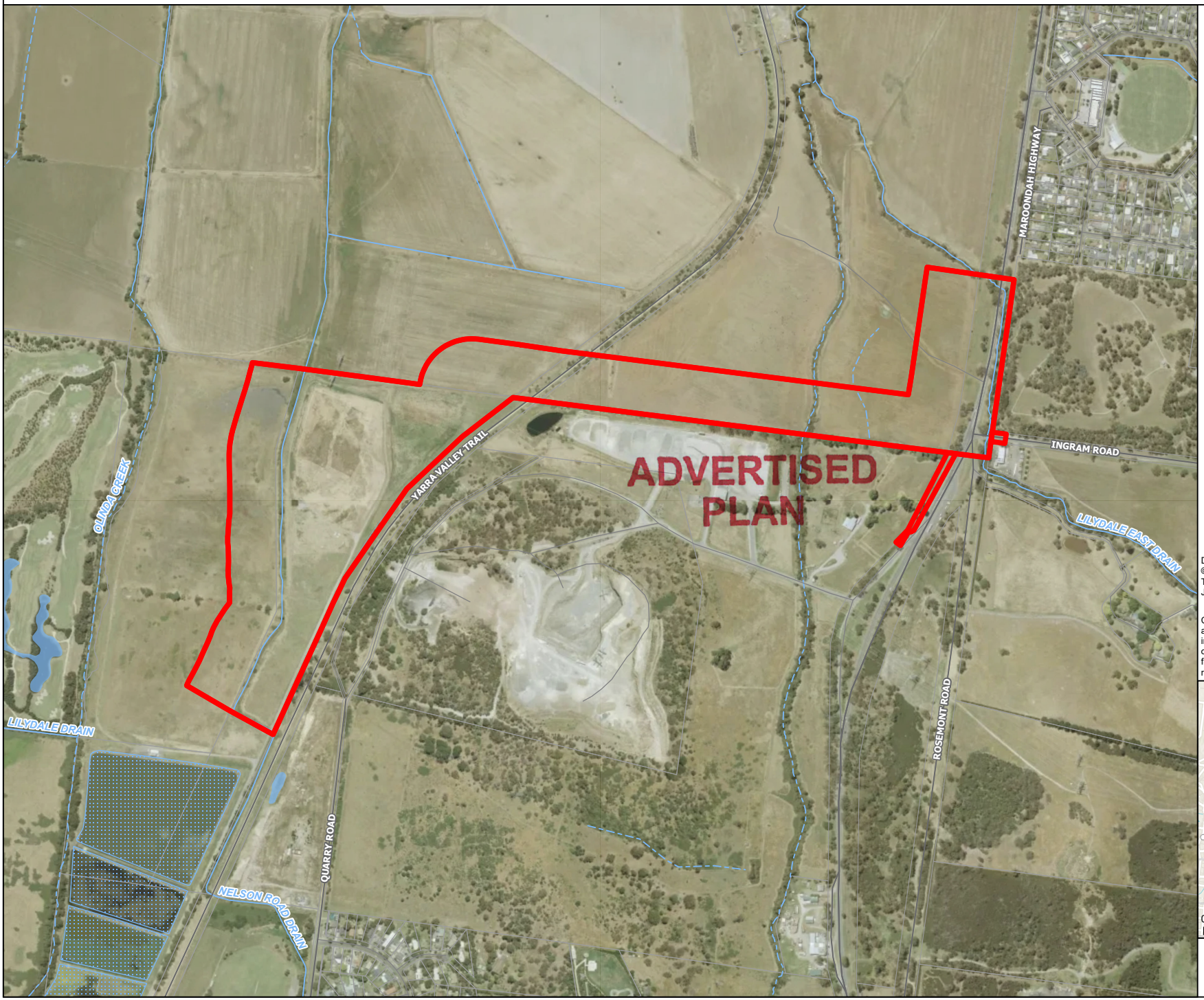
South: Industrial and warehouse uses are located directly opposite the Nelson Road frontage with a BMX track located south-east and residential dwelling beyond the BMX track, approximately 140 metres from the site boundary or approximately 1.45 kilometres from the proposed WTE development area.

East: A decommissioned railway line forms the eastern boundary with a quarry located directly adjacent the site boundary. Vegetation surrounds the main quarry site and provides a barrier to the subject site. Residential dwellings are located just south of the quarry, 250 metres from the site boundary or approximately 780 metres from the proposed WTE development area.

West: Olinda Creek forms the western boundary. A golf course is located immediate opposite Olinda Creek. A Green Wedge zone with small agricultural parcels generally cleared of vegetation is located immediately

south of the golf course. Residential dwellings are located west of the green wedge land, approximately 450 metres from the site boundary or 1.05 kilometres from the proposed WTE development area.

Figure 1-1: Site location



Legend

- Major Road
- Minor Road
- Channel / Drain
- Watercourse Stream
- Activity Area
- Pondage
- Waterbody
- Cadastre

N

IS0803L4

GDA 1994 MGA Zone 55

0 100 200

Metres

DATA SOURCES
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1.2.2 Project infrastructure

The Project proposes the construction and operation of an ETW facility comprising:

- vehicle weighbridge
- waste receival shed with a storage capacity of 600 m3, maintained at a slight negative pressure with entrained air discharged via a series of biofilters
- enclosed pre-treatment trains to de-package, sort, macerate, inspect and otherwise prepare the wastes
- one liquid inlet / waste blending tank (1,637 m3) located in the bunded tank farm
- two anaerobic digestors (3,684 m3 each) operating in series and located in the bunded tank farm
- outlet tank for temporary storage of digestate (1,637 m3) located in the bunded tank farm
- insitu treatment of the air in the headspace of each tank to reduce odour
- combustion of biogas from the digestors in one of 2 CHP units (1.2 MW each)
- provision for emergency flaring of biogas
- separated liquid digestate tank (20 kL) located in the bunded waste receival shed
- generation of electricity and heat for use in the WtE and STP, with excess power fed to the local electricity grid
- processing of the liquid digestate, initially offsite, for use, most likely as a soil conditioner.

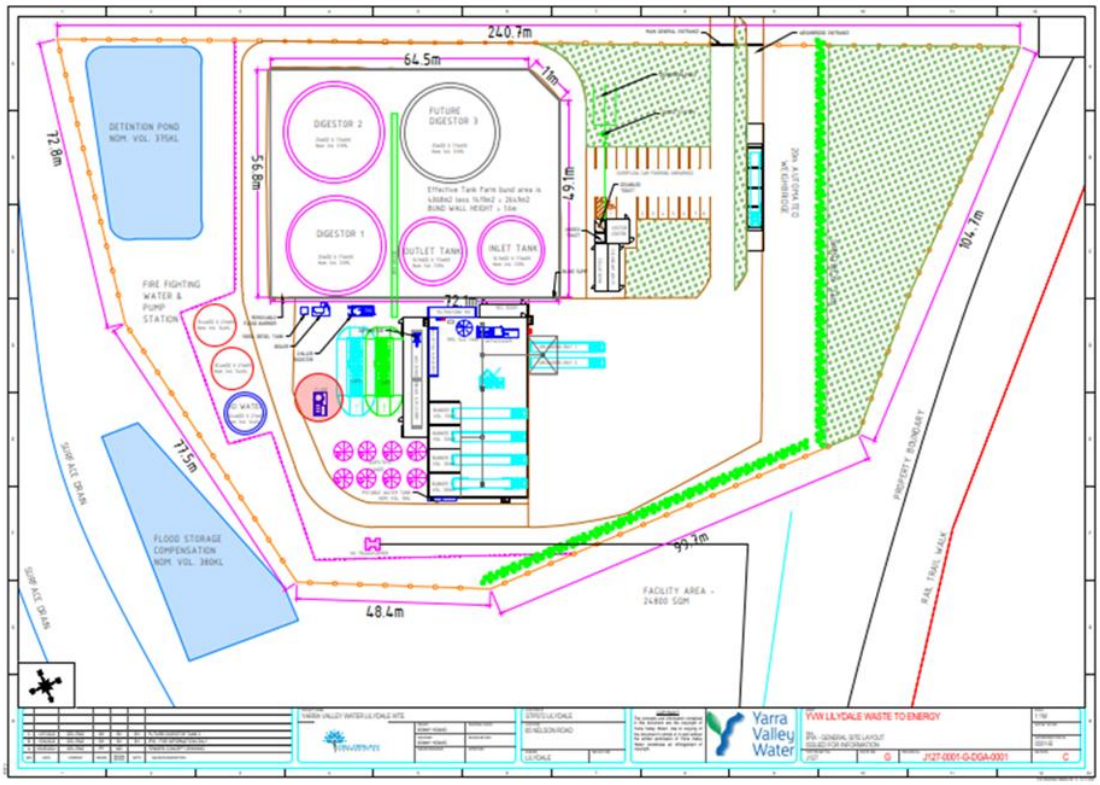

Figure 1-2 shows the proposed layout and configuration of key buildings and infrastructure proposed as part of the EfW.

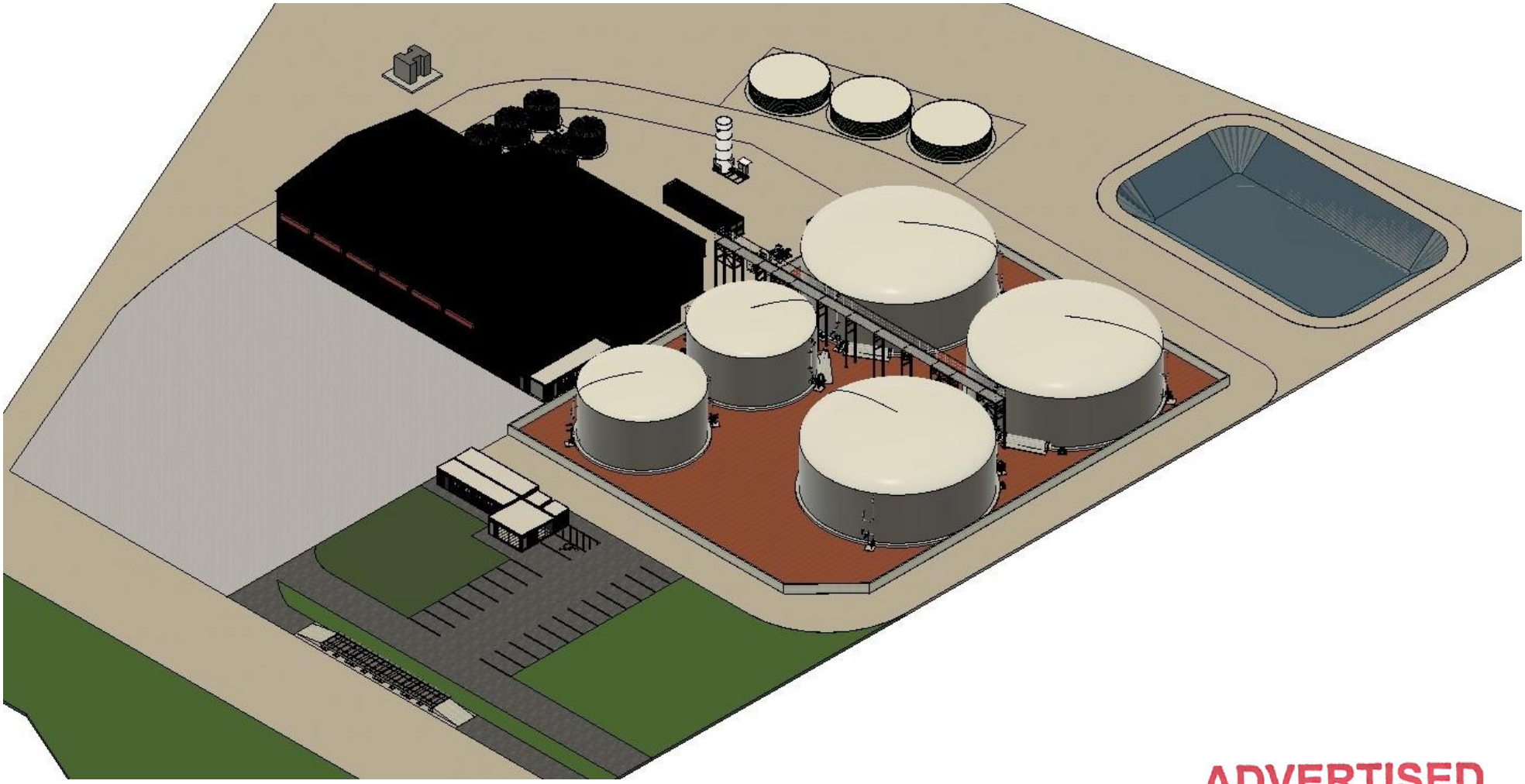

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Figure 1-2. Site Plan
Source – Delorean

1.3 Methodology

The methodology used within this preliminary LVIA of the Project includes the following steps:

Project description

This chapter will outline and describe the visual components of the Project.

Visual study area

This chapter will define the extent of the study area to be considered by the LVIA of the Project. This will be based in part upon the proposed height of the stack and the parameters of human vision.

Policy and Planning review

This chapter will identify the relevant policies and provisions that apply to areas within the study area of the Project that are relevant to views, landscape sensitivity and visual impact.

Existing conditions

Landscape Units are based on the physical characteristics, land-use and planning provisions of the area within the Viewshed. Features that assist in defining the landscape units and a sensitivity rating may include geology, vegetation, topography and drainage patterns, urban development and modification of the landscape. The use of the land and the underlying protections of an area that are afforded by the provisions within the local planning scheme also assist to determine the sensitivity of an area to visual change. This step recognises that the planning scheme identifies landscapes that are significant, rare or threatened and provides guidance on how these features may be preserved.

Viewpoints assessment

This chapter will assess the potential visual impact of the Project from representative and key viewing locations within the public domain to consider the range of views and likely visual impact of the Project.

This assessment will not consider the visual impact from individual dwellings, rather it will locate residential clusters and townships in proximity to the Project. The proximity of nearby towns, residential clusters and dwellings will be identified sufficient to determine a sense of the Project in its overall setting.

Mitigation Options

Mitigation can assist to reduce high or unacceptable visual impacts from sensitive locations and visual receptors. Measures may include screen planting around substations, buildings and lower infrastructure. This LVIA will consider the ability for landscape screening to be effective at filtering or screening views towards the Project.

2. Visual study Area

2.1 Project infrastructure relevant to the LVIA

The greatest vertical visual change brought about by the Project will be the proposed emissions stack at approximately 12.5m, while additional infrastructure such as the boiler room will also pose a significant visual change by taking up more of the horizontal field of view.

The LVIA of the Project will be based predominantly upon the height of the stack but will also consider the size and scale of the ancillary buildings in views towards the Project.

2.2 Zones of visual influence

This section establishes a rational basis on which to determine the extent of the viewshed or study area for the assessment of the visual impact of the Project. Zones of Visual Impact (ZVI) will also be established to consider the scale of the project in views from various distances removed from the site boundary.

The viewshed defines the area or distance from the Project where the key features may be a recognisable element within a view. This distance is established based on the height of the key project features determined above and the parameters of the human vision which are described below.

It may be possible to see the Project from areas beyond the viewshed, however the Project would be a barely discernible element in the view and would therefore not bring about and appreciable change in the view.

Typically, the extent of the viewshed is calculated based on the overall height of the tallest project component rather than its width. This is because the taller the object, generally the greater the distance that the object would be more noticeable from. The width of the project area is contemplated by the horizontal offset of the viewshed and zones of visual influence from the project features.

The parameters of human vision include the vertical and horizontal fields of views as shown in Figure 2-1 below. These figures are based on data from '*Human Dimension and Interior Space*', *Julius Panero & Martin Zellnik, Witney Library of Design,1979*. Similar data can be found in the more recent publication entitled '*The Measure of Man and Woman, Revised Edition', Henry Dreyfuss Associates, John Whiley & Sons, 2012*.

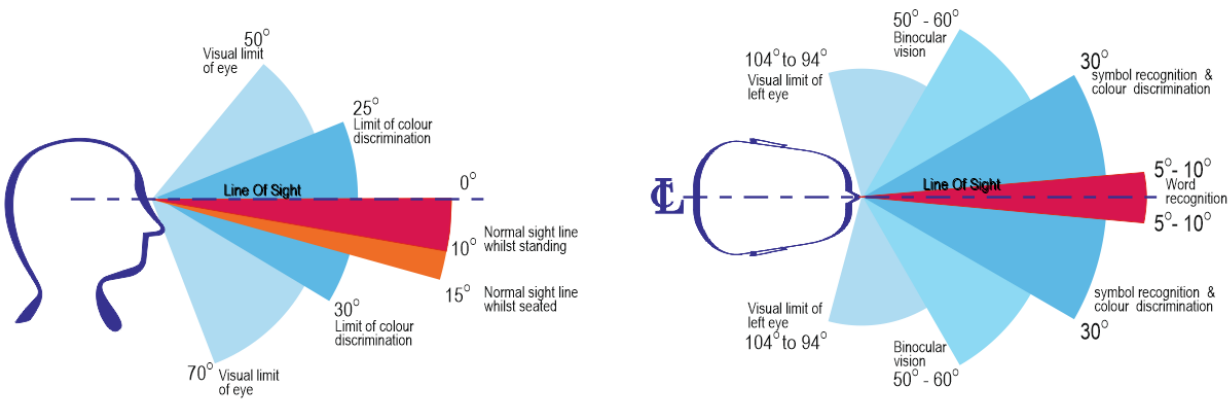


Figure 2-1. Determining the viewshed extent based on project infrastructure within the vertical field of view

The extent of the viewshed can be considered to extend to a distance at which the 12.5 m stack would take up less than 5% of the vertical field of view. Typically, the field of view of a person is 10°, whereby 5% of the vertical field of view is approximately equal to 0.5°.

ZVI assist to assess the overall visual impact of the proposed ETW Plant based on distance. The calculations used to determine the viewshed can also be used to define visual impact based on distance. It must be recognised that zones of visual influence are one of several criteria for assessing visual impacts. For example, when a view location is closer to an emissions stack, the emissions stack would take up a greater percentage of the vertical field of view.

Table 2-1 sets out ZVI for the proposed Project based on an 12.5m high tower, and the distances at which these zones will occur.

Table 2-1. Zones of Visual Influence

Vertical angle of view	Zones of Visual Influence	Distance
<0.5	Visually insignificant – Extent of the Project viewshed A very small element in the viewshed, which is difficult to discern and will be invisible in some lighting or weather circumstances.	1.4km
0.5-1.0	Noticeable, but will not dominate the landscape The degree of visual intrusion will depend on the landscape sensitivity and the sensitivity of the viewer; however, the Project will not dominate the landscape.	0.7km
1.0-2.5	Noticeable and can dominate the landscape The degree of visual intrusion will depend on the landscape sensitivity and the sensitivity of the viewer.	0.3km
2.5-5.0	Highly visible and will usually dominate the landscape The degree of visual intrusion will depend on the Project visibility in views from the landscape and factors such as foreground screening.	0.1km

Figure 2-2 shows the ZVI bands in relation to the Project up to the extent of the viewshed.

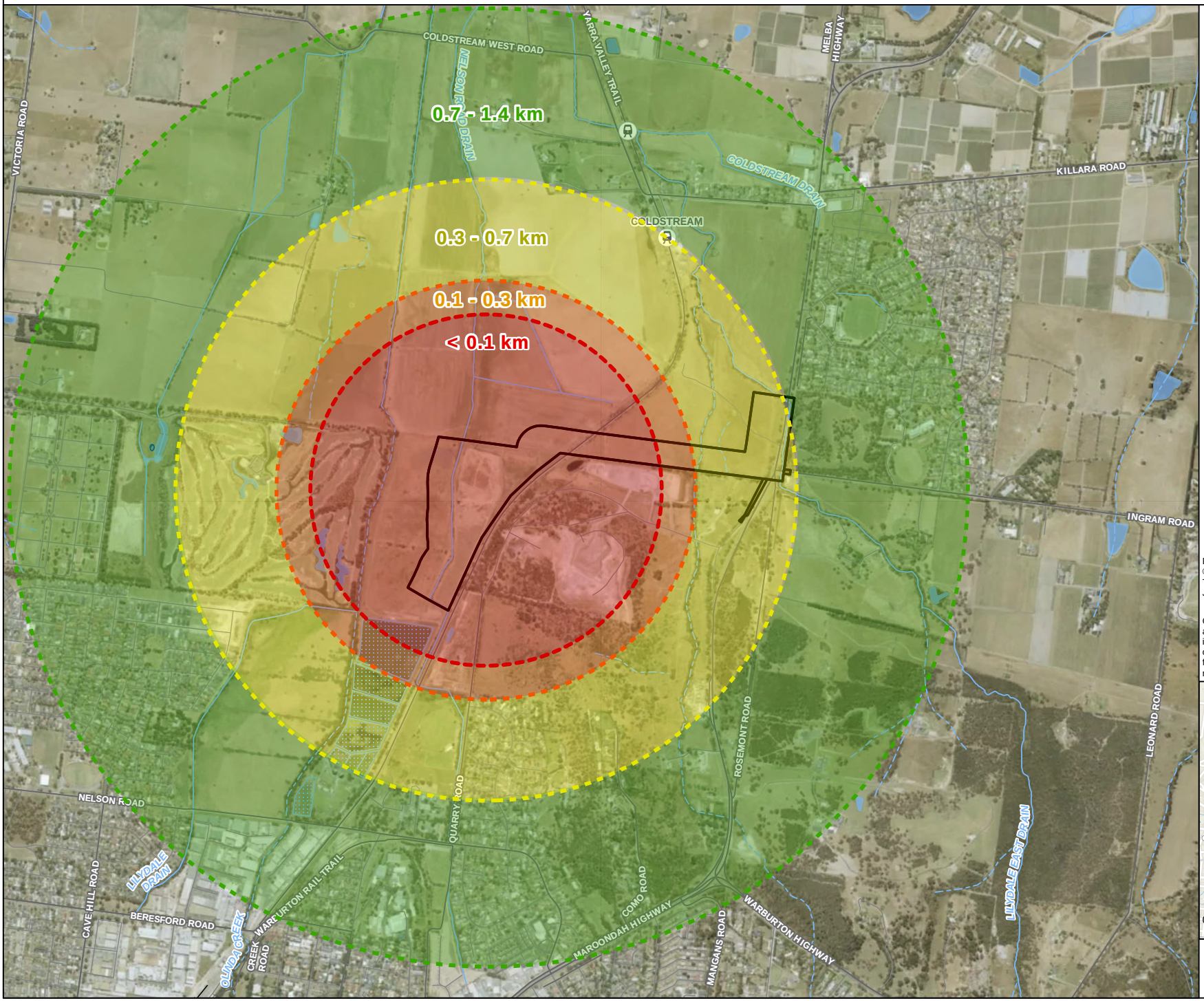
Areas that have the potential to be most visually affected by the proposed Project elements are those within 0.3km of the stack. However, it is acknowledged that the Project elements may be noticeable up to 1.4km.

It is recognised that project visibility will not dramatically alter when a viewer moves from 0.7-1.4km from the nearest project feature, and therefore these zones are a guide only.

The area within the project viewshed will be reviewed to:

- Determine the landscape character, the types of landscape units that occur within this viewshed; and
- Assess the visual impact from indicative viewpoints.

Figure 2-2. Zones of Visual Influence



Legend

- Rail Station
- Railway
- Major Road
- Minor Road
- Channel / Drain
- Watercourse Stream
- Activity Area
- Pondage
- Waterbody
- Wetland Swamp
- 137m radius
- 275m radius
- 687m radius
- 1375m radius

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IS0803L4

GDA 1994 MGA Zone 55

0 400 800

Metres

DATA SOURCES
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3. Policy and planning review

This section seeks to identify and describe the relevant guidelines, and, state and local planning scheme instruments relevant to LVIA and this Project.

The Project site is located within the Yarra Ranges local government area and whilst this form of use and development is subject to a Department of Environment, Land, Water, and Planning [DELWP] application it should take into consideration the Yarra Ranges Planning Scheme to promote integration of the facility to its context and local area. The planning scheme sets out the relevant planning policies which responsible authorities must consider when administering the use and development of land. Pursuant to Clause 72.01-1, the Minister for Planning is the responsible authority for planning permit applications in relation to the use and development of land for an energy generation facility with an installed capacity of 1 MW or greater.

This is not intended to be a thorough review of the planning scheme, mechanisms and triggers, refer to the Planning Permit Application for a thorough review and assessment. Rather this review seeks to identify areas or locations that may be of a particular landscape or visual significance when compared to other landscapes in the region and recognised or protected accordingly.

3.1 Planning Policy Framework (PPF)

The PPF sets out broad policy objectives to ensure uniform and consistent application of the planning scheme. The following Clauses are of relevance to a LVIA of the Project.

3.1.1 12.0-2S Landscapes

The objective of this provision is to protect and enhance significant landscapes and open spaces that contribute to character, identity and sustainable environments. Strategies outlined to achieve this are:

- Ensure significant landscape areas such as forests, the bays and coastlines are protected.
- Ensure development does not detract from the natural qualities of significant landscape areas.
- Improve the landscape qualities, open space linkages and environmental performance in significant landscapes and open spaces, including green wedges, conservation areas and non-urban areas.
- Recognise the natural landscape for its aesthetic value and as a fully functioning system.
- Ensure important natural features are protected and enhanced.

3.1.2 13.07-1S Land use compatibility

The objective of this provision is to protect community amenity, human health and safety while facilitating appropriate commercial, industrial, infrastructure or other uses with potential adverse off-site impacts. Strategies to achieve this are:

- Ensure that use or development of land is compatible with adjoining and nearby land uses.
- Avoid locating incompatible uses in areas that may be impacted by adverse off-site impacts from commercial, industrial and other uses.
- Avoid or otherwise minimise adverse off-site impacts from commercial, industrial and other uses through land use separation, siting, building design and operational measures.
- Protect existing commercial, industrial and other uses from encroachment by use or development that would compromise the ability of those uses to function safely and effectively.

3.1.3 Clause 15.01-2S – Building design

The objective of this provision is to achieve building design and siting outcomes that contribute positively to the local context, enhance the public realm and support environmentally sustainable development. Strategies to achieve this are:

- Ensure a comprehensive site analysis forms the starting point of the design process and provides the basis for the consideration of height, scale, massing and energy performance of new development.
- Ensure development responds and contributes to the strategic and cultural context of its location.

- Minimise the detrimental impact of development on neighbouring properties, the public realm and the natural environment.
- Improve the energy performance of buildings through siting and design measures that encourage:
  - Passive design responses that minimise the need for heating, cooling and lighting.
  - On-site renewable energy generation and storage technology.
  - Use of low embodied energy materials.
- Ensure the layout and design of development supports resource recovery, including separation, storage and collection of waste, mixed recycling, glass, organics and e-waste.
- Ensure the form, scale, and appearance of development enhances the function and amenity of the public realm.
- Ensure buildings and their interface with the public realm support personal safety, perceptions of safety and property security.
- Ensure development is designed to protect and enhance valued landmarks, views and vistas.
- Encourage development to retain existing vegetation.
- Ensure development provides landscaping that responds to its site context, enhances the built form, creates safe and attractive spaces and supports cooling and greening of urban areas.

3.1.4 Clause 15.03-2S – Aboriginal cultural heritage

All or part of this property is an 'area of cultural heritage sensitivity'. 'Areas of cultural heritage sensitivity' are defined under the Aboriginal Heritage Regulations 2018, and include registered Aboriginal cultural heritage places and land form types that are generally regarded as more likely to contain Aboriginal cultural heritage.

3.2 Local Planning Policy Framework (LPPF)

The following clauses are described within the Yarra Ranges Planning Scheme and are of relevance to the LVIA of the Project. They are summarised below.

3.2.1 21.06 Built Form

According to the Yarra Ranges Planning Scheme the Yarra Ranges includes areas of widely recognised natural beauty with landscapes that offer some of the most attractive scenery in the State. The planning and design of new development in Yarra Ranges will be guided by the following 5 sustainable design principles:

- Sense of Place – New development must add to the character and identity of distinct localities in Yarra Ranges.
- Protection of Environments – New development must respect and protect sensitive environments, significant landscapes and cultural and natural heritage.
- Design Quality – New development must be of high design quality.
- Sustainable Urban Form – New development must contribute to environmentally sustainable forms of urban and rural development.
- Sustainable Building Design – New development must incorporate best practice in ecologically sustainable building design.

Objective 3 relates to industrial areas, the provision encourages well designed industrial development. This could be achieved through Provide appropriate levels of visual amenity by means of landscaping and controlling advertising, particularly along main roads and tourist routes.

3.2.2 21.07 Landscape

According to the Yarra Ranges Planning Scheme the rural areas of the Shire contain some of the most visually attractive landscapes in the Shire comprising an intricate mix of open valleys, rolling foothills, steep forested land and majestic mountain ranges. The key issues identified in this area include:

- High environmental and landscape qualities of many of the agricultural areas must be protected from intrusive and poorly designed development and non-sustainable land use.
- The scenic features of the non-urban areas are an integral component of the image and identity of the Shire, and they complement many of the rural and green wedge activities conducted within these areas.

Objective 1 is to retain and protect the scenic landscapes, rural and green wedge character and special environmental features of the Shire. The strategies relevant to the LVIA include:

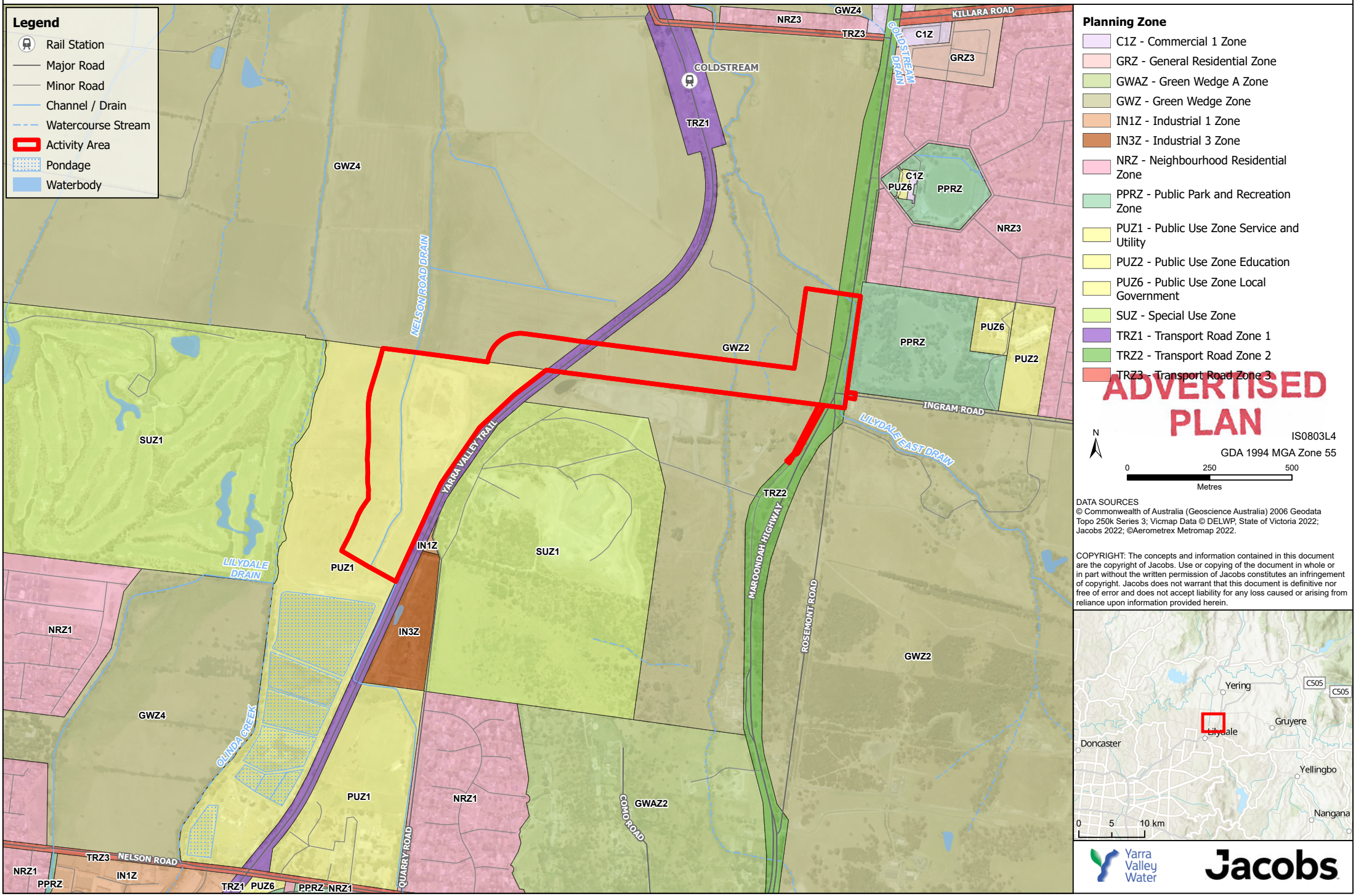
- Protect the rural and green wedge landscapes and forested areas of all non-urban green wedge areas, and ensure that new development complements the established landscape character of significant rural and green wedge landscape areas.
- Provide for land uses that reinforce the rural and landscape character of the rural areas and that do not lead to the loss of productive agricultural land through land degradation processes or the carrying out of non agricultural land uses.
- Ensure, where appropriate, that external surfaces, including roofs, are treated with non-reflective materials and subdued colours to reduce the visual impact of the development on the surrounding area.

3.3 Zoning

Planning zones describe permissible uses, identify areas of sensitivity and protection of features that are special or unique to an area. Zones and overlays also provide protection to enable the continued use of areas and business against adverse amenity claims such as dust, noise, odour or views.

Several zones exist within the study area of the Project. They are shown in Figure 3-1 and summarised below.

Figure 3-1. Map of Zones Within Study Area



3.3.1 Project site zoning

The Project site is subject to the Public Use Zone – Schedule 1 Service & Utility (PUZ1). The purpose of PUZ1 is to:

- Recognise public land use for public utility and community services and facilities.
- To provide for associated uses that are consistent with the intent of the public land reservation or purpose.

The decision guideline of the zone relevant to the LVIA of this Project includes consideration of:

- Whether the development is appropriately located and designed, including in accordance with any relevant use, design or siting guidelines.
- There are / are no stipulated height controls relevant to the site.

The predominant zoning surrounding the study area include:

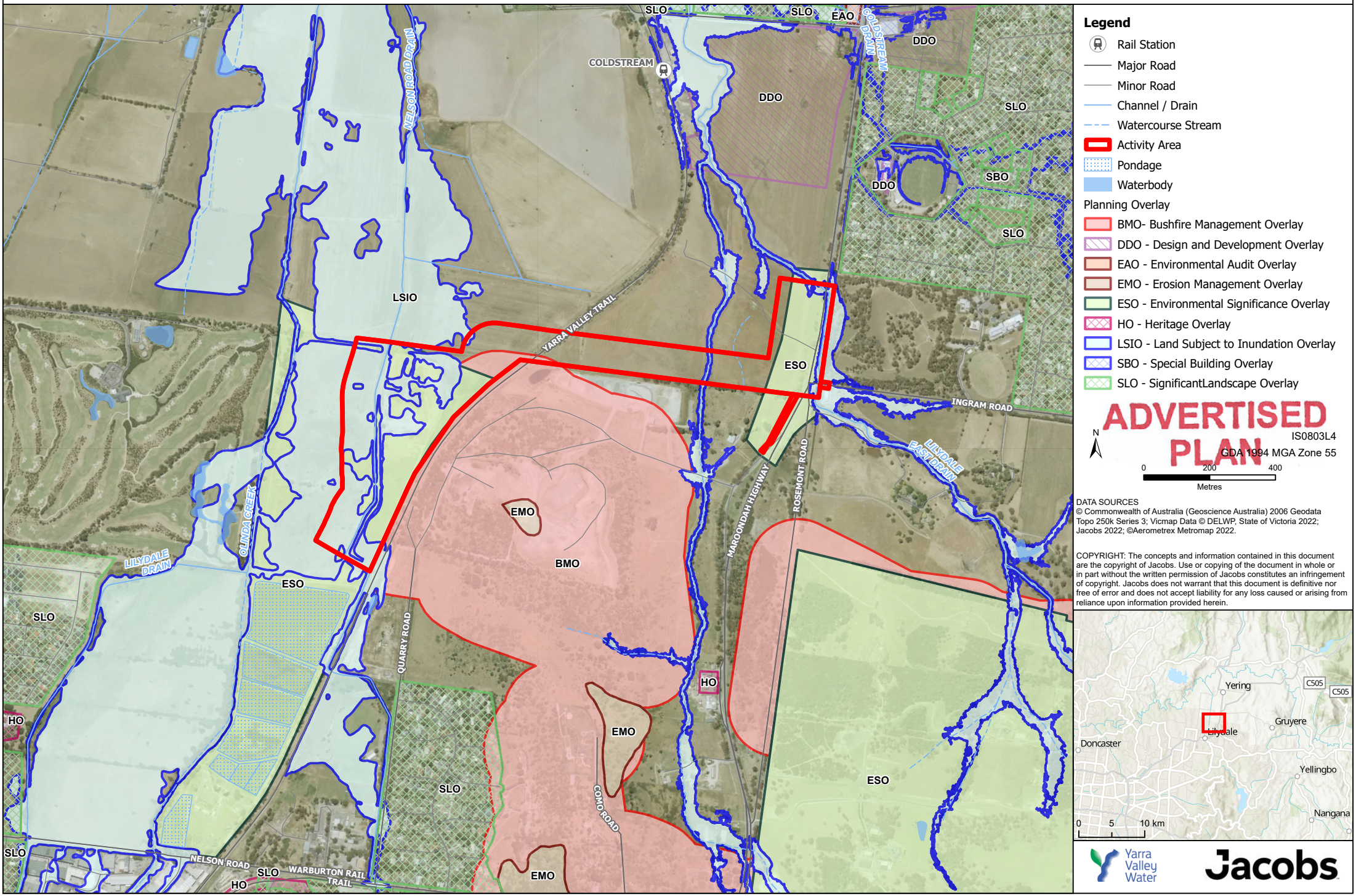
- GWZ- Green Wedge Zone – Schedule 1 and Schedule 4
- SUZ1- Special Use Zone Schedule 1 - Earth and energy resources industry
- NRZ1- Neighbourhood Residential Schedule 1- Incremental Residential Areas: Mooroolbark, Chirnside Park, Kilsyth and Lilydale
- IN1Z- Industrial Schedule 1

3.4 Overlays

Landscapes that exhibit special or unique features are typically found within a Significant Landscape Overlays (SLOs) or Environmental Significance Overlay (ESO) and include guidance on how these areas might be protected. Sensitive uses, such as residential areas or National Parks are often protected against adverse impacts that may be detrimental to the use and enjoyment of these areas from incompatible uses.

These overlays do not affect the site itself, however they are found within the viewshed and help to identify sensitive landscapes. Such overlays can be seen in Figure 3-2 and will be discussed in more detail below.

Figure 3-2. Overlays in the study area



The following overlays, relevant to LVIA, apply to the Project site:

- 42.01-1.0 Environmental Significance Overlay – Schedule 1 Sites of Zoological Significance
- 42.03 – Significant Landscape Overlay (SLO)
- 43.01 – Heritage Overlay (HO)

3.4.1 Project site overlays

The Project site is subject to the Bushfire Management Overlay in a small section of the eastern boundary. This overlay purpose is to ensure that the development of land prioritises the protection of human life and strengthens community resilience to bushfire.

3.4.2 Surrounding area overlays

42.01-1.0 Environmental Significance – Schedule 1 Sites of Zoological Significance

The objective of this provision is to ensure long term protection of the wildlife habitat and other conservation values of sites of botanical and zoological significance. The site is subject to site of zoological significance Z6-Lilydale Purification Plant. Objectives relevant to this LVIA Report include:

- Recognise the importance of sites of botanical and zoological significance as core habitat areas.
- Ensure that the habitat value of the sites is not diminished by the incremental removal of remnant vegetation or inappropriate development.
- Protect the natural resources and maintain the ecological processes and genetic diversity of the region.
- Ensure that any new development is sensitively designed and sited to reinforce the existing environmental characteristics of the area.

Under ESO1-Z6 the development must ensure any alternative means of locating proposed buildings and works so as to protect and enhance the environmental features of the site and its environs.

42.03 – Significant Landscape Overlay (SLO)

The purpose of this provision is to conserve and enhance the character of significant landscapes. Development must ensure the conservation and enhancement of the landscape values of the area.

SLO Schedule 23 - Dandenong Ranges and Upper Yarra Valley (SLO23) includes the residential areas to the south and west of the Project. These residential areas are characterised by established or new/establishing gardens of both native and exotic plants. Large trees provide the backdrop to the surrounding landscape of low hills, undulating pastoral landscapes to the south and north and heavily wooded Dandenong Ranges in the east. The landscape character objectives to be achieved include:

- To recognise and conserve the environmental and visual sensitivity of residential areas of the Dandenong Ranges foothills and the Yarra Valley.
- To ensure all development is sensitively designed and sited having regard to the natural physical features of the land, including slope, the presence of existing vegetation and view lines.
- To retain mature trees which make a significant contribution to the landscape character of the neighbourhood areas.
- To protect vegetation of significance, natural beauty, interest and importance.
- To protect and preserve the riparian areas along waterways.

To the south-east of the Project is subject to SLO22- Foothills and Rural townships. Lilydale has been noted to have a mix of established and newer residential areas with both native and exotic plants and a sense of openness. Many areas are steep and the vegetation in these areas creates a prominent landscape feature in its own right as it can be viewed from much of the surrounding areas. The well treed areas provide the foreground to the broader surrounding landscape of low hills and undulating pastoral landscapes to the south and north and the heavily wooded Dandenong Ranges in the east.

The lower density areas contain blocks of irregular shape and size; gardens are extensively treed and have farm style fencing. Many houses are low, sprawling ranch or homestead style. A small area in the southern

part of Lilydale is developed on the hillside among mature mostly native trees. This area has a semi-forested quality unique in Lilydale.

43.01 – Heritage Overlay (HO)

The purpose of the HO is to:

- To conserve and enhance heritage places of natural or cultural significance.
- To conserve and enhance those elements which contribute to the significance of heritage places.
- To ensure that development does not adversely affect the significance of heritage places.
- To conserve specified heritage places by allowing a use that would otherwise be prohibited if this will demonstrably assist with the conservation of the significance of the heritage place.

HO214 - Lilydale – Warburton Railway is a heritage listed place running to the south of the STP.

4. Existing conditions

Landscape Units are based on areas with similar visual characteristics in terms of topography and features, such as creeks and drainage lines, soil, vegetation and land use. The following sections describe the underlying patterns of these elements to derive the landscape units within the viewshed.

4.1 Topography

Topography within the study area is undulated or hilly. The Project site has an area of between 95m – 140m depth separates the northern edge of the development area from the northern boundary of Lot 1. This buffer area contains an easement developed with high voltage electricity transmission lines.

4.2 Vegetation

The Ecological Assessments prepared by Jacobs in March 2018 and July 2020 describe the Project's ecological context which is located in a rural landscape that has been extensively cleared. The WTE area is heavily disturbed from previous land use of the Lilydale STP, where biosolid stockpiling occurred between 2000-2012. The Access track area mainly occurs within pastoral land which crosses a western branch of the Lilydale East Drain and the decommissioned historical Coldstream Railway line, which is now a public recreational rail trail.

The area was predominantly exotic weed species and the majority of the project area is previously disturbed due to past land use (including unused sludge ponds) and is currently regularly mown and contains livestock. No remnant native vegetation, as defined within the Biodiversity Assessment Guideline (DEPI 2013), was identified within the WTE Project area.

Ecological values include:

- 0.6602 hectares of native vegetation as defined under the *Guidelines for the removal, destruction or lopping of native vegetation* (the *Guidelines*) across the whole project area.
- One scattered tree – Nelson Road Drain
- One *Flora and Fauna Guarantee Act 1988* (FFG Act) protected flora species, Blackwood (*Acacia mearnsi)*.
- Nelson Road Drain – native aquatic vegetation mapped along the extent of the drain.

An assessment of fauna habitat was conducted with an emphasis on potential habitat that may provide shelter, food or resources for significant fauna species. It was determined that the entire Project area has a limited ability to support wildlife. No threatened species or ecological communities were identified during the field assessment. Targeted Growling Grass Frog (Litoria raniformis) surveys on the Lilydale STP site were conducted, resulting in an *Environmental Protection and Biodiversity Conservation Act 1999 (*EPBC Act) referral for the species. The referral was deemed to be 'not a controlled action'

4.3 Land use

Land-uses are determined by the predominant purpose or operation of an area, which helps describe expected landscape characteristics.

Predominant land-uses within the area include:

- Agricultural
- Quarry
- Golf course
- Industrial/warehouse
- Recreational; and
- Residential uses.

The distribution of these land-uses is indicated by the applicable zones, which are set-out within the planning scheme to describe permissible uses. The majority of the area within the Project viewshed is used for recreation, quarrying and agricultural and is zoned as SUZ1 and GWZ4 accordingly.

4.4 Landscape units

Based on the above, there are three (3) clear landscape character types that can be derived based on a description of topography, vegetation, land-use and zoning as follows:

- Landscape Unit 1 – Incremental residential area

Landscape Unit 1 – Incremental residential areas of residential land uses that are predominantly single and double storey residential developments. This landscape type is valued for its neighbourhood character, heritage, environmental or landscape characteristics.

- Landscape Unit 2 – Industrial Areas

Landscape Unit 2 – Industrial Areas are areas primarily used for industrial purposes. There are many instances of constructed elements within this landscape type, including the road network, buildings, machinery and fences. Vegetation within this landscape unit tends to be restricted to buffers around property boundaries.

- Landscape Unit 3 – Recreation

Landscape Unit 3 – Recreation Areas are areas primarily used for public or private sports and/or entertainment.

- Landscape Unit 4 – Green Wedge

Landscape Unit 4 – Green Wedge areas are non-urban areas of metropolitan Melbourne that lie outside the Urban Growth Boundary intended for use for a mix of agriculture and low-density activities.

4.5 Landscape sensitivity

Landscape sensitivity is in part a measure of the ability of a landscape to absorb visual change based on attributes of a particular landscape. The sensitivity of the previously described landscape units will depend upon a number of attributes, such as:

- **Location.** The sensitivity of a potential viewer varies according to location. For example, visitors to a National Park where the landscape appears untouched or pristine will be more sensitive to the imposition of new or artificial elements within that landscape. The same viewer travelling along a rural highway, which contains existing examples of modifications and artificial elements, will be less sensitive to the presence of new elements. Modifications or artificial elements are not confined to vertical structures or built form, they also include removal of native vegetation; and visibility of roads, tracks, fences and other rural infrastructure, all of which decrease the sensitivity of a landscape to further change.
- **The rarity of a particular landscape.** Landscapes that are considered rare or threatened are valued more highly by viewers.
- **The scenic qualities of a particular landscape.** Landscapes that are considered scenic are also those that are considered sensitive. They often contain dramatic topographical changes, the presence of water, coastlines, and other comparable features. The presence of modifications or artificial elements (including built form, roads, tracks, fences, and silos), as well as farming practices including land clearing, cropping and burning can decrease the sensitivity of a landscape's scenic qualities.

Table 4.1 Landscape Units and Sensitivity rates the sensitivity of the various landscape units within the viewshed of the Project.

Table 4.1 Landscape Units and Sensitivity

Landscape Unit	Sensitivity
Landscape Unit 1 – Incremental residential area	Moderate-High - Built form and other visual elements reduce the visual sensitivity of these areas. However as these are urban areas with many houses, the landscape sensitivity is rated moderate-high.
Landscape Unit 2 – Industrial Areas	Low – A highly modified landscape that contains visible infrastructure, is not topographically dramatic and has been largely cleared of remnant vegetation. The clearing of vegetation has allowed long range views to distant landscape features. This landscape unit has relatively low viewer numbers.
Landscape Unit 3 – Recreation	Moderate-High- These landscapes are highly valued for their amenity and recreation benefits, including long-range views.
Landscape Unit 4 – Green Wedge	Low - Primarily agricultural farmland cleared of significant vegetation. A highly modified landscape that contains visible infrastructure, is topographic and has been largely cleared of remnant vegetation. The clearing of vegetation has allowed long range views to distant landscape features. This landscape unit has relatively low viewer numbers.

These landscape sensitivity ratings will be used to assess the visual impact of views from publicly accessible locations within the viewshed.

Landscape sensitivity from individual residential properties will always be assessed as "high". This is because for a resident, their home will always be a highly sensitive location and disturbances to a resident's views must always be considered to have the highest degree of sensitivity.

5. Viewpoint assessment

This section will assess the potential visual impact of the Project from publicly accessible locations. Viewpoints have been selected to consider the location of the proposed infrastructure from key vantage points, major roads, and residential clusters sufficient to give a sense of the Project and its setting.

5.1 Viewpoint locations

Six viewpoints have been selected as representative of the publicly accessible locations in and around the Project site.

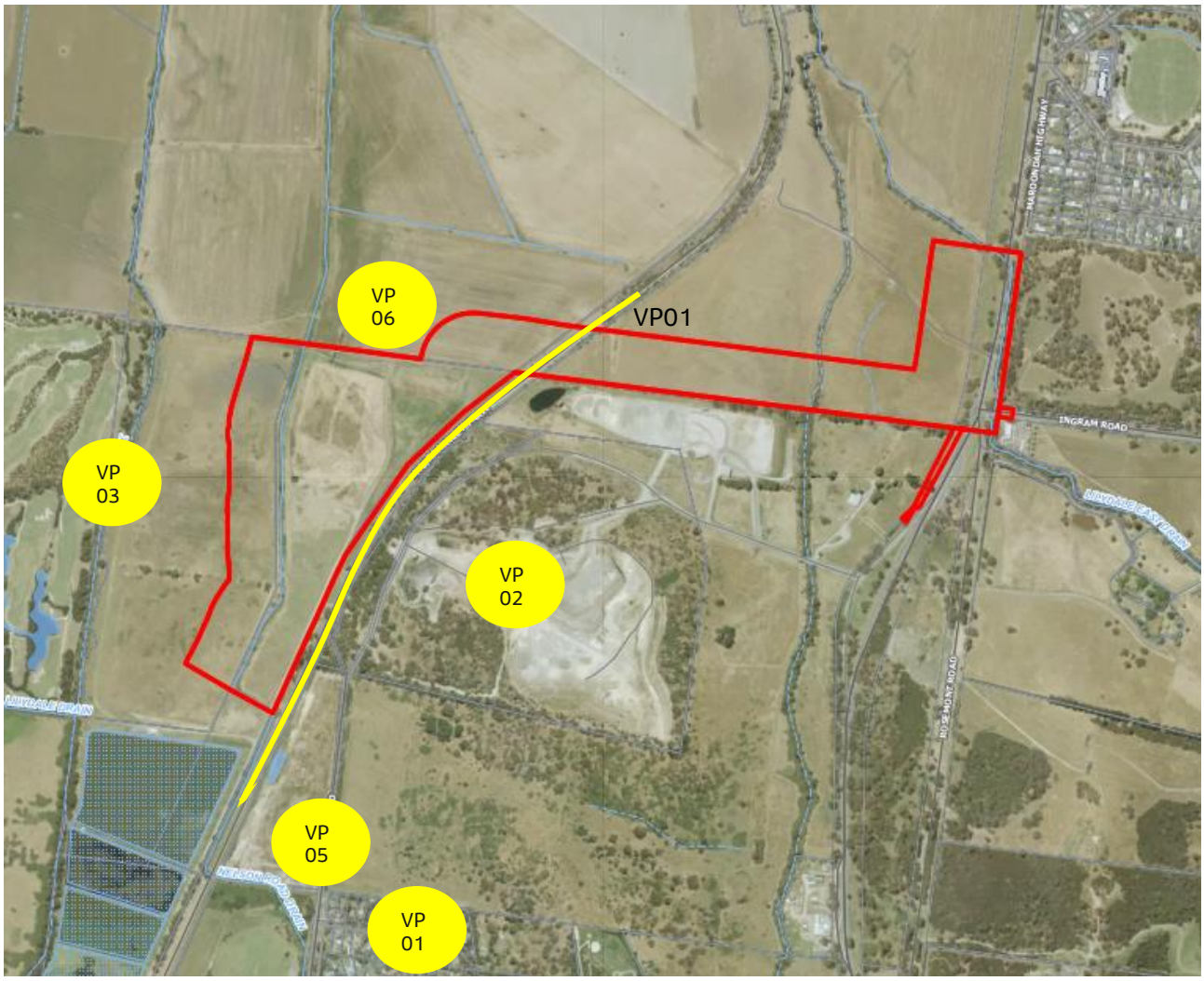


Figure 5-1 Location of Viewpoints

The visual impact from each of these six viewpoints is discussed in the following sections to build up an overall assessment of the visual impact of the Project.

5.1.1 Viewpoint 01 – Lilydale suburb (VP01)

Distance to Project: Approx. 250m from south-east corner

Landscape Unit: Landscape Unit 1 – Incremental residential area

Viewer Numbers: High

VPO1 is from the residential area approximately 140 metres from the site boundary or approximately 1.45 kilometres from the proposed WTE development area. VPO1 starts at 95m contour and increases in

topography further east to a maximum height of 125m. This is compared to the Project at the south-eastern corner at approximately 87m. At the tip of the north-western portion of the residential area the Project may be noticeable and could dominate the landscape. However, the closest portion of the Project to VPO13 is currently and proposed to be used as a detention pond.

For this reason the visual impact is moderate.

Viewpoint 02- Boral Quarry (VP02)

Distance to Project: Approx 50m

Landscape Unit: Landscape Unit 2 – Industrial Areas

Viewer Numbers: Moderate

VPO2 is the Boral Quarries, located approximately 50m west of the Project and occupies 90 hectares of land. The land use of VPO2 can be characterised as heavy industry and thus the visual impact would be equal to or greater than the Project. The area between the two sites is buffered by existing vegetation and the Yarra Trial.

For this reason the visual impact is low.

5.1.2 Viewpoint 03 – Gardiner Run Golf Course (VP03)

Distance to Project: Approx 300m

Landscape Unit: Landscape Unit 3 – Recreation

Viewer Numbers: Moderate

At VP03 the furthest most eastern boundary of the Golf Course site is located approximately 300m from the Project closest western boundary. At this point the Project would be noticeable and could dominate the landscape.

Approximately 400m of the Golf Course from the eastern boundary would have noticeable but not dominate views of the Project. Land within VP01 is slightly undulating, however there is Olinda Creek which acts as a visual and physical barrier to the Project.

For this reason the visual impact is low-moderate.

5.1.3 Viewpoint 04- Yarra Valley Trail (VP04)

Distance to Project: Approx 0m

Landscape Unit: Landscape Unit 3 – Recreation

Viewer Numbers: Moderate

The Yarra Valley Trail forms part of a multistage walking trail project. The Lilydale Stage 1 follows the eastern boundary of the Project site. The approximate separation is less than 100m. The land is relatively flat and unvegetated. Users of the trail will have highly visible and dominant views of the Project.

The nature of the development is consistent with the existing land uses along the trail including the STP and the Quarry, which were developed prior to the trail planning and construction.

An access road for the Project is also proposed to cross the Trail. Consistency is recommended to effectively manage the expectations of pedestrians and cyclists using the trail. The current treatment requires pedestrians and cyclists to give way to vehicles, and thus a similar treatment is considered appropriate and safe for use at the New Access Road crossing point. This approach has also been validated by Council, who noted that the proposed intersection does not pose an unacceptable risk for current and future pedestrian/

cyclist volumes on the trail. The usage of the Yarra Valley Trail should be monitored and assessed regularly by Council to determine if any upgrades are required in the future to improve safety and performance along the trail, including road crossing points.

For this reason the visual impact is high.

5.1.4 Viewpoint 05 - Mount Lilydale Mercy College Sports fields

Distance to Project: Approx 330m

Landscape Unit: Landscape Unit 3 – Recreation

Viewer Numbers: Moderate

VPO5 is the Mount Lilydale Mercy College Sports fields which are located approximately 300m south-east of the Project. The whole precinct is used by sporting facilities including seven multipurpose basketball courts (four outside and three inside) and two multipurpose football fields which are within the viewshed.

However, beyond the northern most boundary beyond 300m, the Project will be noticeable but will not dominate the landscape. VPO5 is located in proximity to existing industry such as the Quarry and the STP with slight vegetation barrier located between the viewshed.

For this reason the visual impact is low.

5.1.5 Viewpoint 06- Green Wedge

Distance to Project: Approx 0m

Landscape Unit: Landscape Unit 4 – Green Wedge

Viewer Numbers: Low

The Green Wedge is immediately abutting the Project site. The area is relatively clear of existing vegetation will direct viewing of the Project.

The Project will not significantly impact on the environmental, landscape and scenic value of the green wedge and will be sympathetic to the visual sensitive nature of the area.

For this reason the visual impact is low.

6. Mitigation options

Based on the above assessment of viewpoints, the proposed development will not significantly impact the environmental, landscape and scenic amenity of the residential, industrial or green wedge landscape units in the study area.

Measures available to mitigate potential visual impacts that may arise due to the Project include:

6.1 Materials

Colouring of the structure's materials in colours that are complementary to the surrounding landscape will promote integration of the facility.

Pale Eucalypt®

Figure 6-1 Suggested colour palette for Digester Cladding and Receiving Shed (note this is a registered colorbond colour).

Evening Haze®

Figure 6-2 Suggested colour palette for Office Building to aid legibility on site (note this is a registered colorbond colour).

Jacobs note that materiality of the Digester Domes is limited and is there for not subject to the suggested colour palette.

6.2 Landscape Mitigation

Landscape mitigation measures in the form of vegetation (shrubs) screening and large trees can be utilised to screen and filter views to the Project from sensitive locations.

Figure 6-3 shows potential landscape screening measures on site. A detailed landscape plan can be found in Appendix A.

Landscape screening of the Project from sensitive viewpoints will be more effective when located closest to the viewpoint. As such, further assessment may be required to ascertain the potential for additional landscape screening to be located in proximity to sensitive viewpoints such as residential areas.

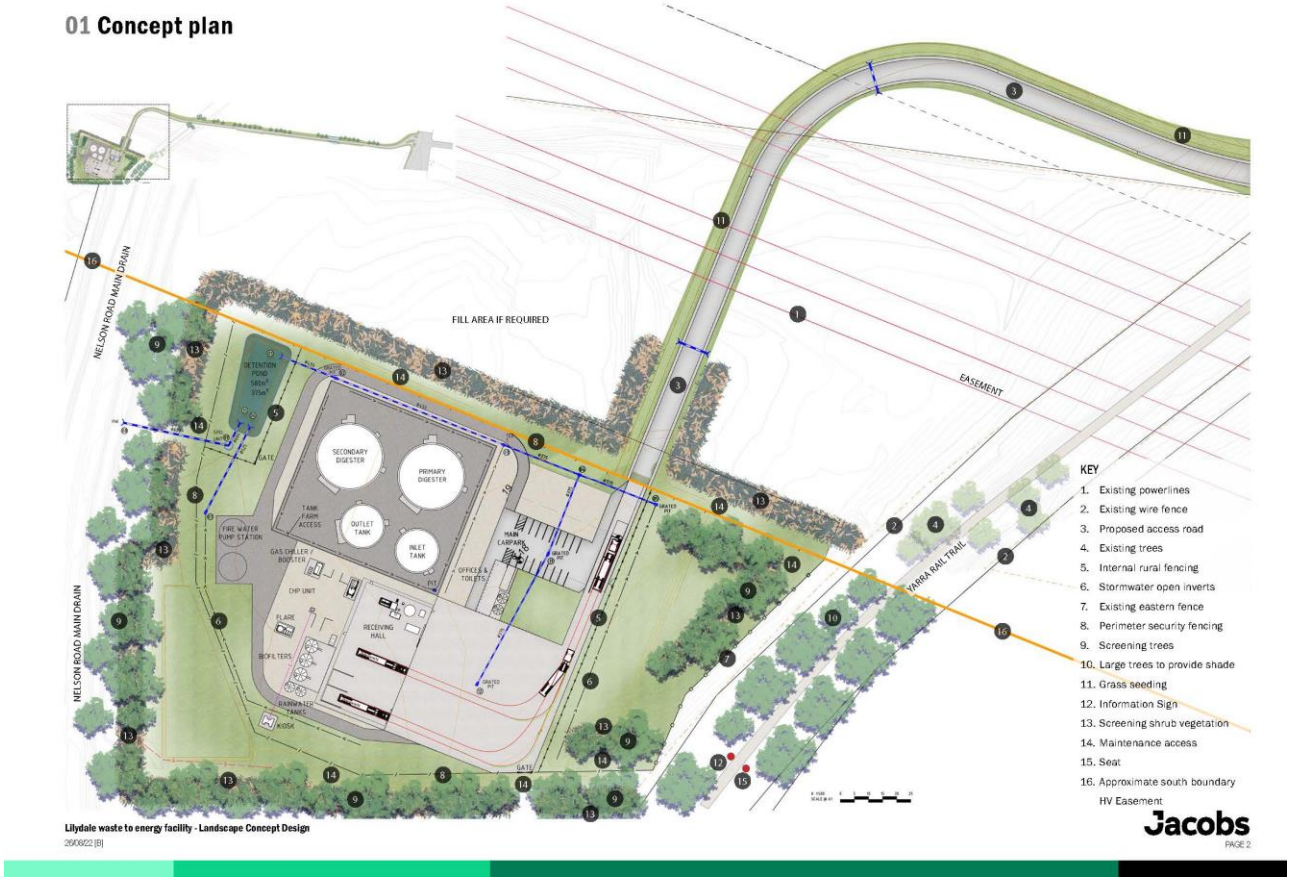


Figure 6-3. Indicative Landscaping Plan

It is recommended that the landscape mitigation use species that are local and endemic to the area.

6.3 Visualisations

Four visualisations have been generated from 4 selected viewpoints to demonstrate how combined with the proposed mitigation measures and landscape concept design the visual impact of the facility maybe lessened. Figure 6-4 shows the locations of each visualisation viewpoint. It should be noted that the facility will also be obscured from existing vegetation which has not been modelled in the Visual representations. It should be noted that these are a representation only of how the project could appear and are not an accurate depiction of the final project.

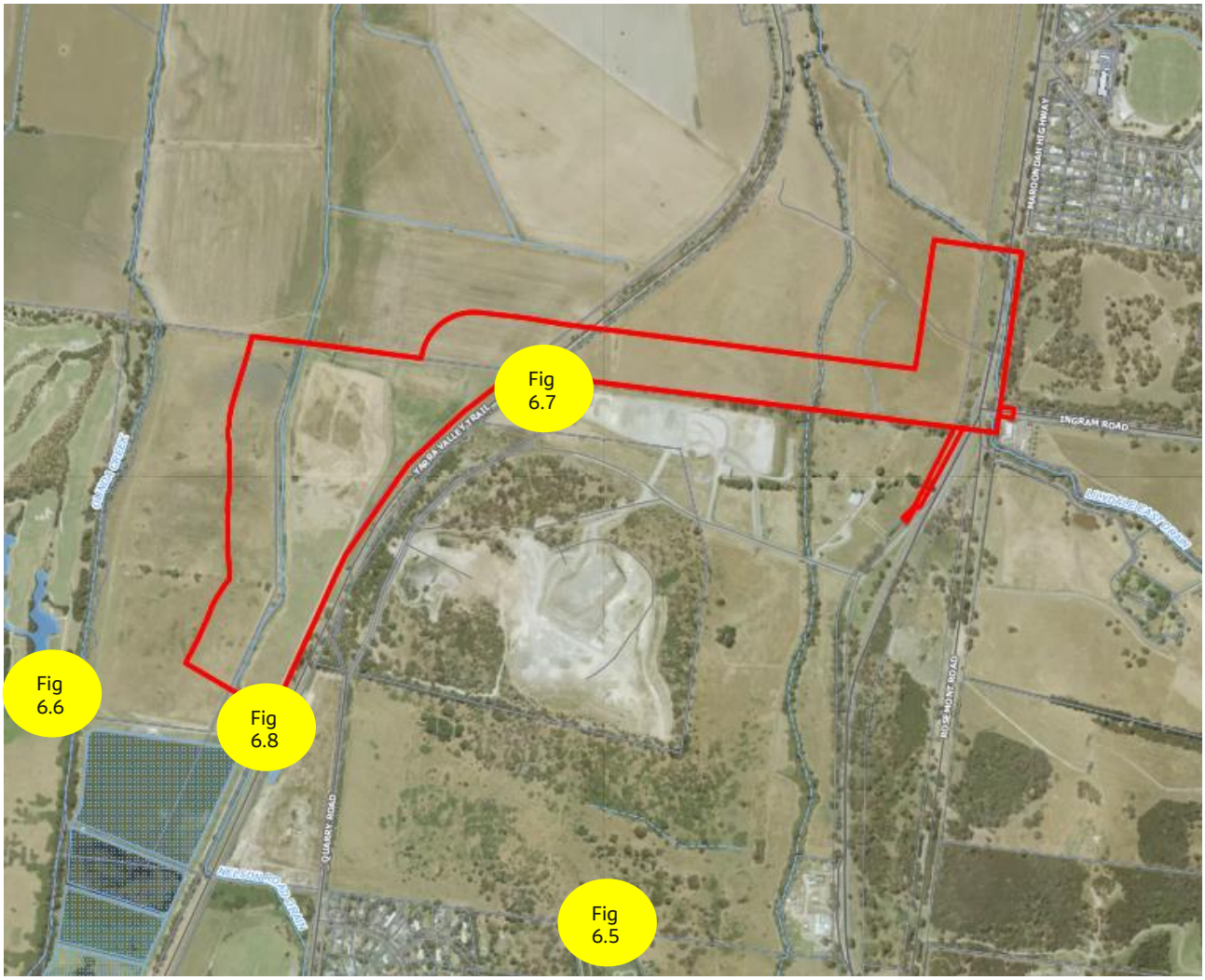


Figure 6-4 Location of Visualisation Points

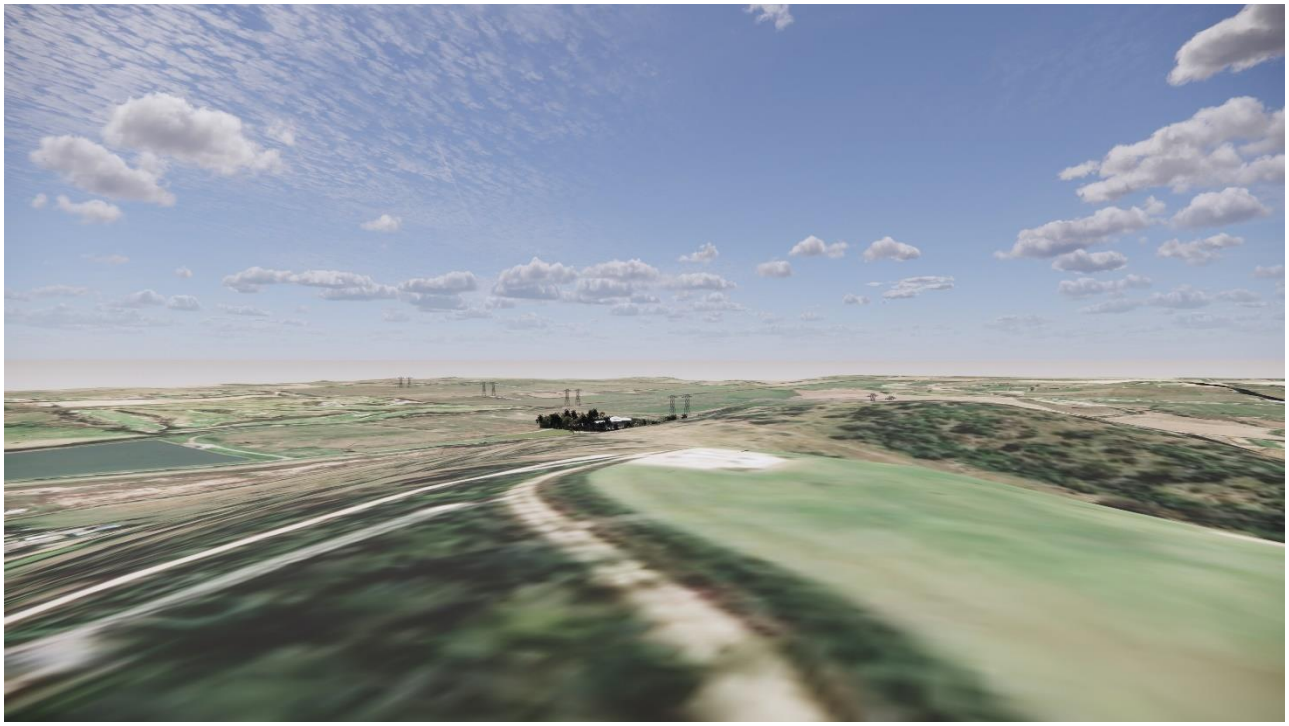


Figure 6-5 View from rear of 75 Como Road

Figure 6-6 View from 34 Nimblefoot Way

Figure 6-7 View of the North Side of the Facility from the Yarra Valley Trail

Figure 6-8 View of the South Side of the Facility from the Yarra Valley Trail

7. Conclusion

7.1 Project Site: Existing Conditions

- An area of between 95m – 140m width separates the northern edge of the development area from the northern boundary of Lot 1. This buffer area contains an easement developed with high voltage electricity transmission lines.
- The development area is largely cleared of vegetation, with a few scattered trees and grass present. The development area is approximately 3.0ha in area, which represents 5% of the approximately 58.35ha of YVW's overall site.

7.2 Study Area: Existing Conditions

The surrounding topography is undulated or hilly. Varied land uses surround the development site and includes agricultural, quarry, golf course, industrial/warehouse, recreational and residential uses.

7.3 Views from Publicly Accessible Locations

The Project will be most visually noticeable on the Yarra Trail and from the Gardiner Run Golf Course. Slight visual impact is anticipated from the residential area and sports fields to the south-east.

As the Project is immediately abutting cleared farmland to the north and industrial areas to the east, most views toward the site are not considered to be visually sensitive as the landscape is already highly disturbed.

7.4 Mitigation

Measures available to mitigate potential visual impacts that may arise due to the Project include:

- The use of use of colours on the structures that are complementary to the surrounding landscape.
- The use of endemic vegetation (shrubs and trees) around the immediate perimeter of the project to screen and filter views into the project.
- The use of endemic vegetation to screen and filter views to the Project from sensitive locations.
- Design requirements set out by schedule 18 to clause of the Yarra Valley Planning Scheme including vegetation buffers, site layout and building design.

Further assessment may be required to ascertain the potential for additional landscape screening to be located in proximity to sensitive viewpoints such as residential areas.

Appendix A. Landscape Design Concept

LILYDALE WASTE TO ENERGY FACILITY

Landscape Concept Design

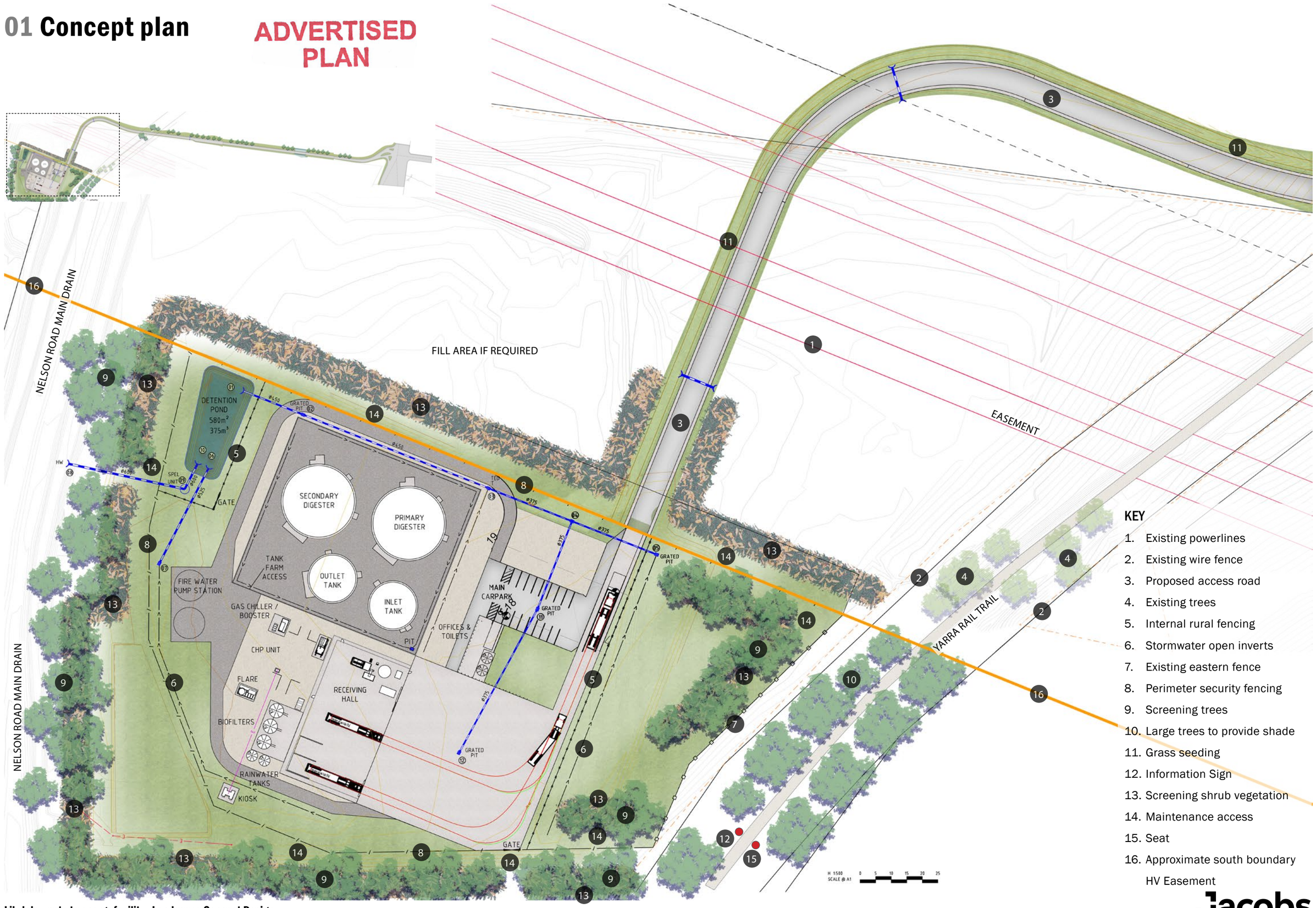
ADVERTISED
PLAN

Jacobs

Challenging today.
Reinventing tomorrow.

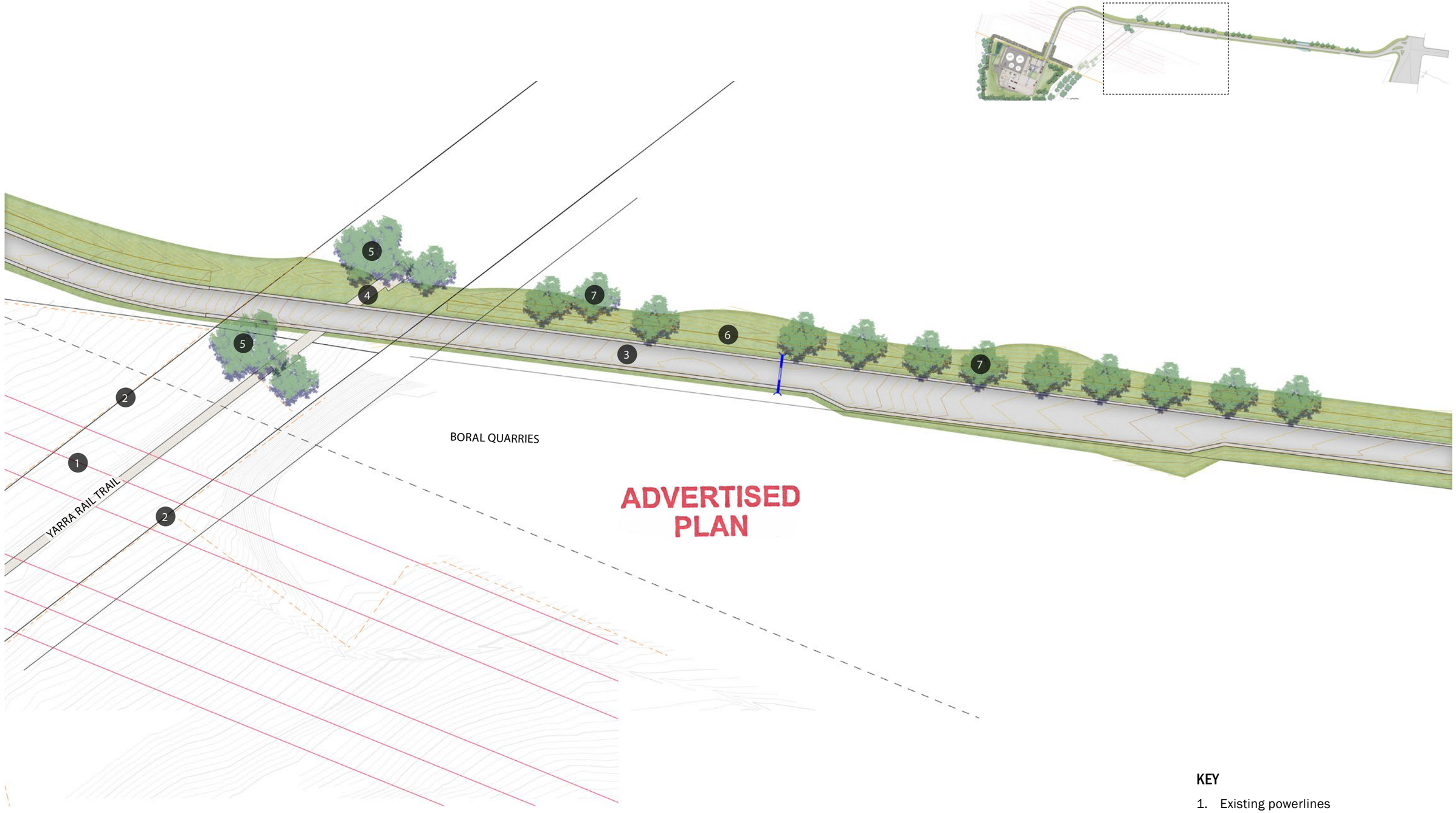
01 Concept plan

ADVERTISED PLAN



KEY

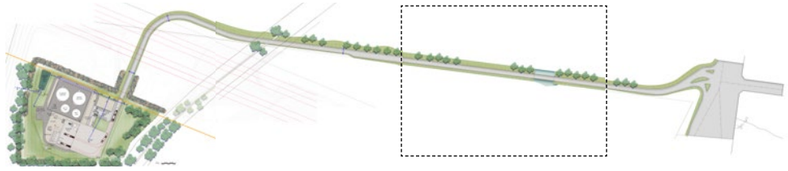
1. Existing powerlines
2. Existing wire fence
3. Proposed access road
4. Existing trees
5. Internal rural fencing
6. Stormwater open inverts
7. Existing eastern fence
8. Perimeter security fencing
9. Screening trees
10. Large trees to provide shade
11. Grass seeding
12. Information Sign
13. Screening shrub vegetation
14. Maintenance access
15. Seat
16. Approximate south boundary HV Easement

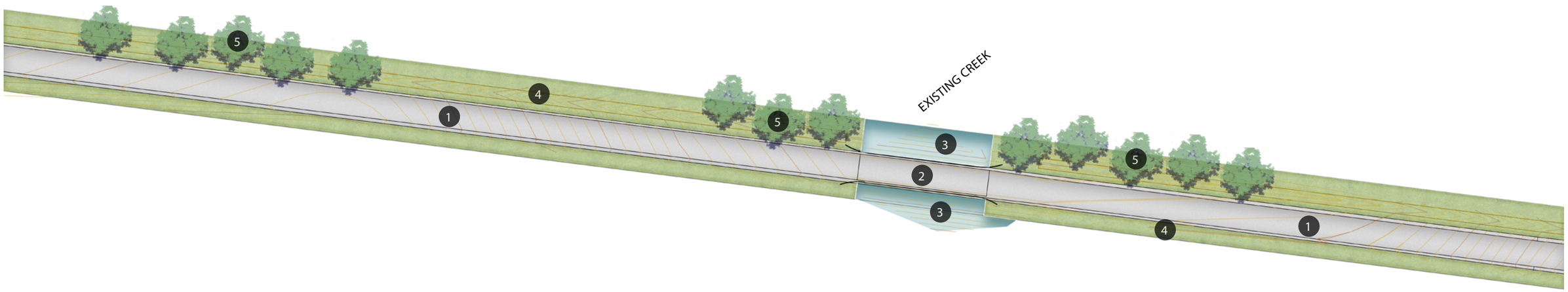


H 1:500
SCALE @ A1
0 5 10 15 20 25

KEY

1. Existing powerlines
2. Existing wire fence
3. Proposed access road
4. Proposed Yarra Rail Trail crossing.
   Refer OMG drawing: 210143CLP400
5. Large trees to provide shade
6. Grass seeding
7. Screening Trees





ADVERTISED PLAN

H 1500
SCALE @ A1
0 5 10 15 20 25

KEY

1. Proposed access road
2. Proposed dual lane bridge and guard rails. Refer to OMG drawing: 210143CLP300
3. Riparian planting
4. Grass Seeding
5. Screening Trees

ADVERTISED PLAN

KEY

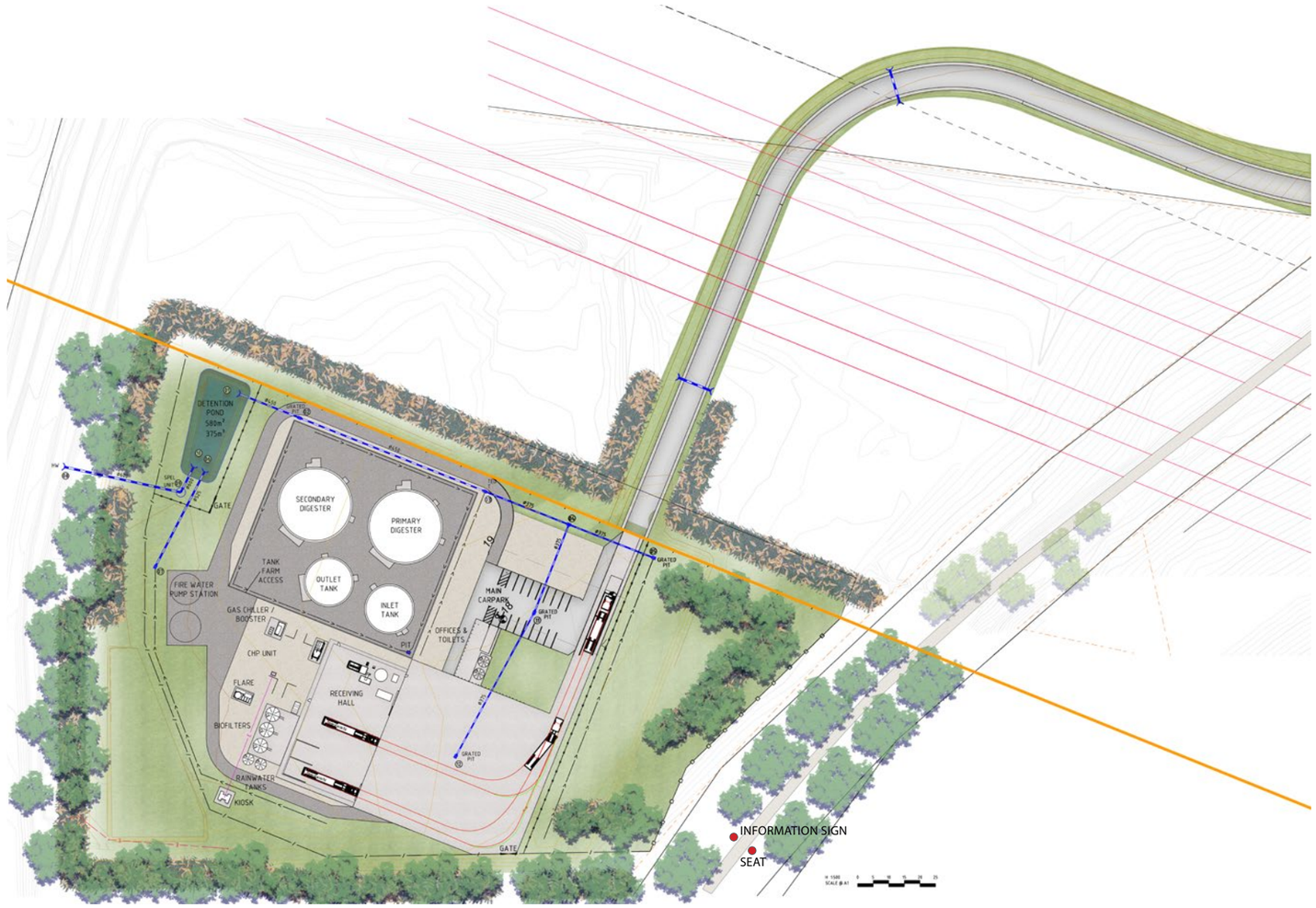
1. Proposed access road
2. Grass Seeding
3. Screening Trees

Lilydale waste to energy facility - Landscape Concept Design

26/08/22 [B]

Jacobs

02 Details



LANDSCAPE PLAN

ADVERTISED PLAN

INFORMATION SIGN
SUPPLIER - SIGNS EXPRESS
BRIEF - SIGN MUST BE SIMILAR TO OTHER SIGNS ON THE YARRA VALLEY TRAIL BUT MUST BE MADE OF RECYCLED SUSTAINABLE MATERIALS
INFORMATION FOR SIGN TO BE PROVIDED BY YARRA VALLEY WATER

SEAT
SUPPLIER - CSA (COMMERCIAL SYSTEMS)
BRIEF - SEAT MUST BE SIMILAR TO OTHER SEATS ON THE YARRA VALLEY TRAIL
SUITE - FLORA
CUSTOM MODIFICATION - YARRA VALLEY TRAIL LASER CUT

ADVERTISED PLAN

03 Planting Palette

SELECTED PLANTING SPECIES HAVE BEEN DEVELOPED IN CONSULTATION WITH YARRA RANGES COUNCIL HOWEVER PLANTING PALETTES ARE INDICATIVE AND SUBJECT TO FURTHER DESIGN AND APPROVAL.

SHADE TREES

EUCALYPTUS YARRAENSIS
YARRA GUM
IMAGE - YARRA RANGES COUNCIL PHOTO LIBRARY

SCREENING TREES

ACACIA MEARNSII
BLACK WATTLE
IMAGE - MARILYN BULL©

ACACIA MELANOXYLON
BLACKWOOD
IMAGE - MARILYN BULL©

EUCALYPTUS CEPHALOCARPA
SILVER-LEAF STRINGYBARK
IMAGE - MARILYN BULL©

EUCALYPTUS OVATA VAR. OVATA
SWAMP GUM
IMAGE - MARILYN BULL©

EUCALYPTUS RADIATA SSP. RADIATA
NARROW-LEAF PEPPERMINT
IMAGE - MARILYN BULL©

EUCALYPTUS VIMINALIS SSP. VIMINALIS
MANNA GUM
IMAGE - MARTY WHITE©

SCREENING TREES

ACACIA PARADOXA
HEDGE WATTLE
IMAGE - DAVID BLAIR©

ACACIA VERTICILLATA SSP. VERTICILLATA
PRICKLY MOSES
IMAGE - MARILYN BULL©

CALLISTEMON SIEBERI
RIVER BOTTLE BRUSH
IMAGE - MARILYN BULL©

HAKEA NODOSA
YELLOW HAKEA
IMAGE - MARILYN BULL©

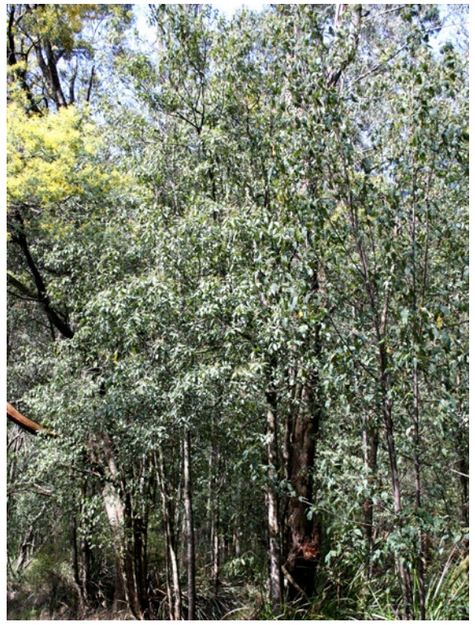
KUNZEA LEPTOSPERMOIDES
YARRA BURGAN
IMAGE - MARILYN BULL©

LEPTOSPERMUM LANIGERUM
WOLLY TEATREE
IMAGE - PETER CLARK©

LEPTOSPERMUM SCOPARIUM
MANUKA
IMAGE - MARILYN BULL©

MELALEUCA ERICIFOLIA
SWAMP PAPERBARK
IMAGE - MARILYN BULL©

MELALEUCA SQUARROSA
SCENTED PAPERBARK
IMAGE - YARRA RANGES COUNCIL
PHOTO LIBRARY



POMADERRIS ASPERA
HAZEL POMADERRIS
IMAGE - MARILYN BULL©