

Appendix L. Landscape and visual assessment



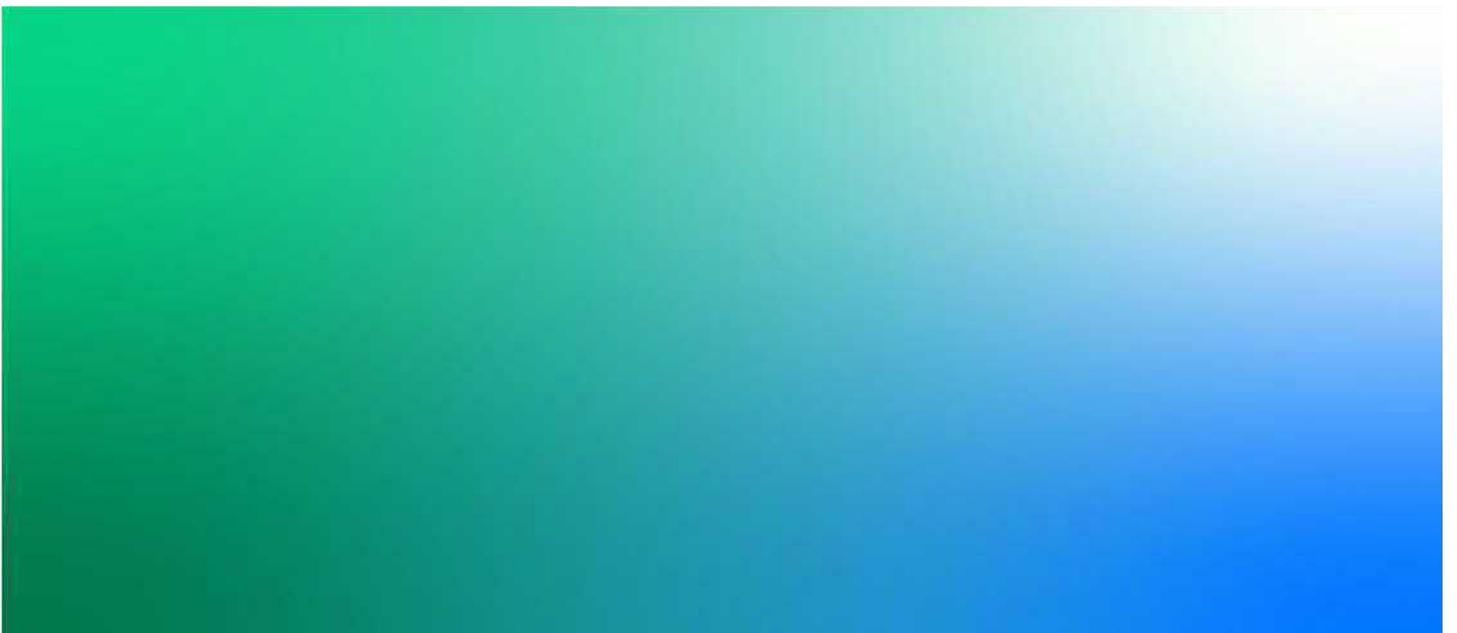
Prospect Hill Energy from Waste Plant

Prospect Hill LVIA

Rev 0

24 September 2020

Prospect Hill International



Prospect Hill Energy From Waste Plant

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Appendix A. Photomontages

Appendix B. Landscape Plan

1. Introduction

Jacobs Group (Australia) Pty Ltd (Jacobs) has been engaged by Prospect Hill International (PHI) to prepare a Landscape and Visual Impact Assessment for the Prospect Hill Energy from Waste (EfW) Plant (the Project) in Lara, Victoria.

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

2. Assessment Methodology

The methodology used within this Landscape and Visual Impact Assessment (LVIA) of the Project includes the following steps:

- Project Description;
- Baseline of the Study Area;
- Policy and Planning Review;
- Landscape Character Units and Sensitivity;
- Assessment of Publicly Accessible Viewpoints;
- Assessment of the Scale of Effects;
- Assessment of Residential Impacts;
- Development of Mitigation Options; and
- Preparation of Photomontages.

2.1 Project Description

This section will outline and describe the visual components of the Project. These include, but are not limited to, emissions stacks, onsite substation, electrical distribution lines, access roads and security fencing. The major visual component of this Project will be the emissions stack (80 m high), boiler room (50 m high), waste bunker (41.6 m high) and the flue gas cleaning hall (41.6 m high). These structures will be the focus of this assessment.

2.2 The Study Area

This section will define the extent of the study area to be considered by the Landscape and Visual Impact Assessment of the Project. This will be based in part on the proposed height of the stack (the tallest element) and the parameters of human vision.

The viewshed is considered as the distance at which the visual changes brought about by the Project may no longer contribute to views in a meaningful way, based on parameters of the human vision. The rationale behind the definition of the viewshed is discussed in Section 4 of this report.

2.2.1 Zones of Visual Influence

Zones of Visual Influence (ZVI) seek to quantify the scale of the potential effects of a Project over varying distances. This step is a useful measure to contemplate the potential for visual dominance of the Project in views.

2.3 Policy and Planning

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

2.4 Landscape Character Units and Sensitivity

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.

The sensitivity of a landscape unit considers the ability for a landscape to accommodate the level of change that is proposed by a Project. Generally, the greater the extent of modifications in an area, or the prevalence of the landscape type and its use, the lower the sensitivity that landscape will be to visual change. Further, places of work or productivity are less significant than residential dwellings and recreation areas.

2.5 Assessment of Publicly Accessible Viewpoints

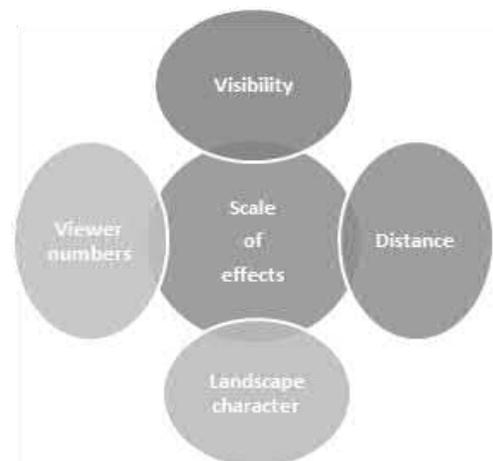
This section will assess the potential visual impact of the Project from representative and key viewing locations within the public domain to consider the range of views and likely visual impact of the Project.

This assessment will be supported by photomontages to assist with describing the location, scale and visibility of the Project in views.

The assessment of visual impact from each location in the public domain is based on four criteria which include visibility, distance, landscape character and viewer sensitivity and the number of viewers to arrive at an overall visual impact from each location. Time or likely duration to dwell at each location is also considered. Although considered, this is not easily quantified as it may vary from fleeting or transitory views, to stationary views of varying duration, depending on the individual, purpose of the stop and the setting. The scale of visual effect ranges from Negligible to High and, recognises that a visual change may have a no impact.

A more detailed description of the four criteria and their influence in determining the assessment of the overall visual impact from the public domain are set out below:

- **Visibility:** The visibility of the Project elements can be affected by topography, vegetation, built form and infrastructure.
- **Distance:** Infrastructure visibility and dominance will decrease with distance. The Zones of Visual Impact (ZVI) provides an indication of visual dominance and potential impact based on distance. This criterion is one of several to be considered when assessing the overall visual impact of the Project from any location.
- **Landscape character and sensitivity:** Landscape character of an area is based upon visual features such as topography, vegetation and the use of the land, the naturalness of the area and planning provisions. Sensitivity may also be influenced by specific landscape studies and assessments within the project viewshed. Typically, a modified landscape that is prevalent within the viewshed or the region is less sensitive than one that is ostensibly natural or protected for its environmental, ecological or cultural values.
- **Viewer numbers:** The overall level of visual impact, which considers these four criteria, will decrease where there are fewer people able to view the Project. Conversely, the level of visual impact may also increase where the viewing location is a recognised vantage point or tourist route. Viewer numbers from these locations would be rated as 'High'.



The overall visual impact is not numerically based alone, rather it is the outcome of the above quantitative criteria that can be measured, balanced by a discussion of the qualitative aspects from each viewpoint.

The overall visual effect will range from Nil to High. The definition for each scale is discussed below.

2.6 Scale of Effects

2.6.1 Nil Visual Impact

Nil – The project will be screened by topography, vegetation or buildings and structures.

2.6.2 Negligible Visual Impact

Negligible – Minute level of effect that is barely discernible over ordinary day-to-day effects. The assessment of a 'Negligible' level of visual impact is usually based on distance. That is, the Project will be at such a distance

that, when visible in good weather, it would be a minute element in the view within a modified landscape, or will be predominantly screened by intervening topography, vegetation or buildings and structures.

2.6.3 Low Visual Impact

Low – Visual impacts are those where the Project is noticeable but will not cause significant adverse impacts. The assessment of a “Low” level of visual impact will be arrived at if the rating of any one or more of the four criteria (visibility, distance, viewer numbers and landscape sensitivity) are assessed as Low. Therefore, an additional piece of infrastructure in a landscape which is man-modified, and which already contains many examples of existing infrastructure may be rated as a Low level of visual impact.

2.6.4 Medium/Moderate Visual Impact

Medium/Moderate – Visual impact may occur when several of the four assessment criteria are considered as higher than “Low” or the visual effects are able to be mitigated / remedied from an initial rating of High. This will of course be moderated by the context of the existing view and the modifications within the landscape.

2.6.5 High Visual Impact

High adverse effect – Extensive adverse effects that cannot be avoided, remedied or mitigated. The assessment of a “High or unacceptable adverse effect” from a publicly accessible viewpoint requires the assessment of all criteria to be High. For example, a highly sensitive landscape, viewed by many people, with the Project in close proximity and largely visible, would lead to an assessment of an unacceptable adverse effect.

2.7 Residential Impacts

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.

The assessment of visual impact from residences is different to that undertaken from publicly accessible viewpoints, in that visitor numbers are not applicable, and the sensitivity is also always rated as ‘High’. It is recognised that people feel most strongly about the view from their house and attached outdoor living spaces.

2.8 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.

2.9 Photomontages

Photomontages are used within the report to show the anticipated change in views that might be brought about by the Project. Photomontages can assist in visual assessment by illustrating the scale and location of the proposed components of the Project. Photomontages can also demonstrate how landscape screening can assist filter or screen views to Project elements.

2.9.1 Lens Size and Photos used within the Photomontages

Photomontages are prepared to show the change in a fixed view of 60° horizontal and either 10° or 15° in the vertical field of view. The 60° horizontal field of view represents the central cone of view in which symbol recognition and colour discrimination can occur. By using a standard field of view (60° horizontal and 10° or 15° vertical) the photomontages can also assist to portray the scale of the project elements, such as the stack when

viewed over various distances. The 60° horizontal field of view is important to demonstrate the context and scale of the Project in views.

The vertical field of view assist to represent the central field of view of human vision as shown in Figure 2.1.

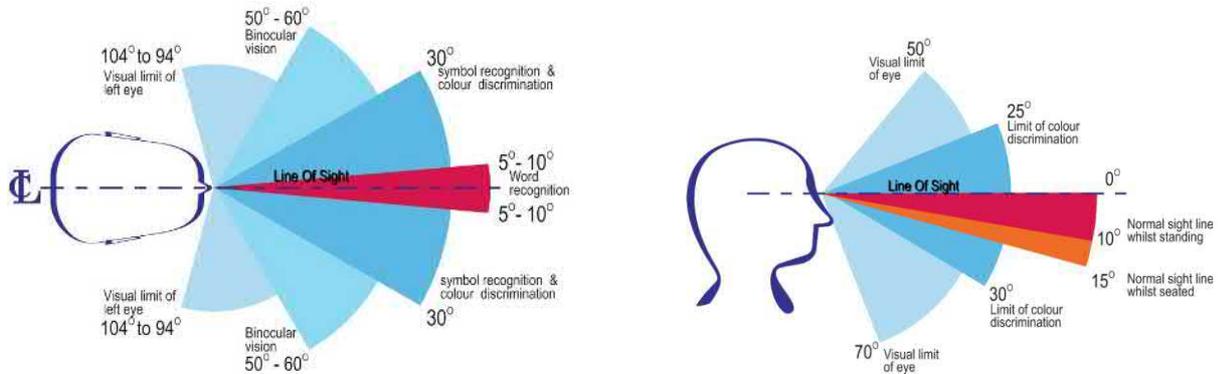


Figure 2.1: Horizontal and vertical field of view (Human Dimension and Interior Space, Julius Panero & Martin Zelnik, Witney Library of Design, 1979)

Similar data can be found in the more recent publication entitled 'The Measure of Man and Woman, Current Edition', Henry Dreyfuss Associates, John Wiley & Sons, 2012.

The A3 photomontages, which are appended to this report in **Appendix A**, provide a better size in which to view the images in the context of the report and the assessment.

For verification purposes, each photomontage in the appendices includes:

- The existing view and proposed photomontage;
- A 60° horizontal field of view of the existing view and photomontage; and
- A wireframe view of the computer model accompanied by a numbered turbine layout.

The latter technically illustrates how the photomontages are prepared. In these views vertical 'poles' or cylinders located features such as trees, towers or buildings and a 'mesh' models the existing topography into the view. These features allow the computer model (prepared in 3D Studio Max) and the photograph to be accurately aligned prior to preparing the final renderings.

This ensures that the proposed Project elements are accurately located within the photograph and then the rest of the model is removed, and the Project is rendered into the image. This is explained further in Section 2.10.3.

2.9.2 Photographs

A 70 mm lens on a Nikon D850 digital camera has a picture angle of 26.5° and a horizontal angle of view of approximately 21.3°. <https://imaging.nikon.com/lineup/dslr/basics/19/01.htm>.

Four photographs overlapped by approximately 1/3 create an image approximately the same as the central cone of view of human vision, i.e. 50°-60° horizontal and 15° vertical. Figure 2.2 demonstrates this theory.

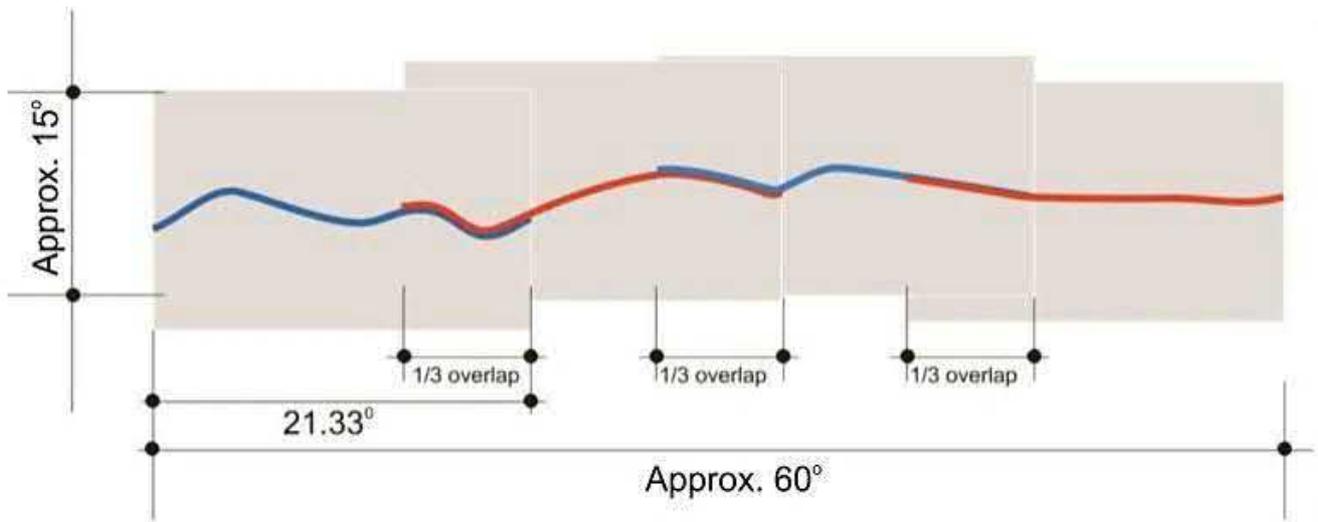


Figure 2.2 Photomontage Layout

This technique also assists to remove distortion at the edges of the images that would be pronounced using a single image captured through a wide-angle lens.

2.9.3 Computer modelling and the wireframe model

Contour data, as well as the proposed development are modelled within a computer program (3ds Max). A virtual camera is set up in the model at the GPS coordinates for each of the photographs that are being used within the panorama.

The digital model or wireframe view is then overlaid on the photographic panorama. Known points in survey information such as topography, building locations or other infrastructure are registered into the base photographs (or other predetermined points). For technical accuracy, these points must align. This verifies the location and apparent height and scale of the proposed development.

After the background reference points have been aligned, the wireframe is removed, leaving only the proposed Project elements, which are rendered, either to match the lighting conditions at the time the photographs were taken or, more typically, to maximise their visibility by increasing their contrast against the background sky.

Photomontages are prepared with a 60° field of view, which follows the parameters of human vision. Wider panoramas are also used to indicate the full extent of the proposed facilities where appropriate.

2.9.4 GPS Coordinates and distance to the wind farm

The Nikon D850 camera also records the GPS coordinates as part of the metadata. GPS coordinates are also taken based on a separate hand-held GPS and the locations from which the photographs were taken is also marked on a digital map at the location of each photograph.

2.9.5 Photomontages

Three photomontages have been prepared to assist with informing this LVIA. The photomontages have been prepared from locations within the public domain and have been included at viewpoints 08, 09 and 13.

These photomontages are appended to this report (Refer **Appendix A** for A3 size photomontages with a 60° field of view).

3. Project Description

3.1 Subject Site

The Project site is located at 164-200 McManus Road, Lara, approximately 1.5 km north of the Geelong Ring Road and 2.3 km west of the Princes Freeway.



Figure 3.1: Site Location Map

The areas surrounding the Project comprise a mix of industrial uses to the south and east, farming to the north and west, with low-density residential development to the site's north-west along Minyip Road, and residential dwellings further to the west. Several sites within the adjoining industrial areas are yet to be developed.

Surrounding industrial land uses in proximity to the site include hazardous materials storage and refining, including an Elgas fuel storage site and Viva fuel refinery to the site's south-west. Land uses to the east of the site include the Accensi agricultural chemical plant and a waste storage facility, previously managed by Central Recyclers.

The site's boundaries are shared with Production Way (currently incomplete) to the north, McManus Road to the west, vacant land to the south and industrial sheds and buildings to the east. The total site area is approximately 16 Ha.

Figure 3.2 shows the existing conditions on site. The site is highly modified, cleared of native vegetation and trees.



Figure 3.2: Subject Site

The site is generally flat with little noticeable fall.

3.2 Project Infrastructure

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

- 80.0 m emissions stack;
- 50.0 m high x 58 m wide x 70 m long boiler room building;
- 41.6 m high x 39.6 m wide x 58 m long waste bunker;
- 41.6 m high x 43.2 m wide x 70 m long flue gas cleaning hall;
- 36 m high air pollution control residue silo;
- 23.0 m high steam turbine hall;
- Ash transfer conveyor (from boiler room to bottom ash pre-treatment storage area);
- 12.0 m high cooling towers;
- Site office and administration building;
- Weigh bridge;
- Staff and visitor parking;
- Dedicated onsite water tanks for firefighting purposes;
- Fencing;
- Perimeter landscaping; and
- Aviation Obstacle lighting (the project is in close proximity to the Avalon Airport)

Figure 3.3 shows the proposed layout and configuration of key buildings and infrastructure proposed as part of the EfW.

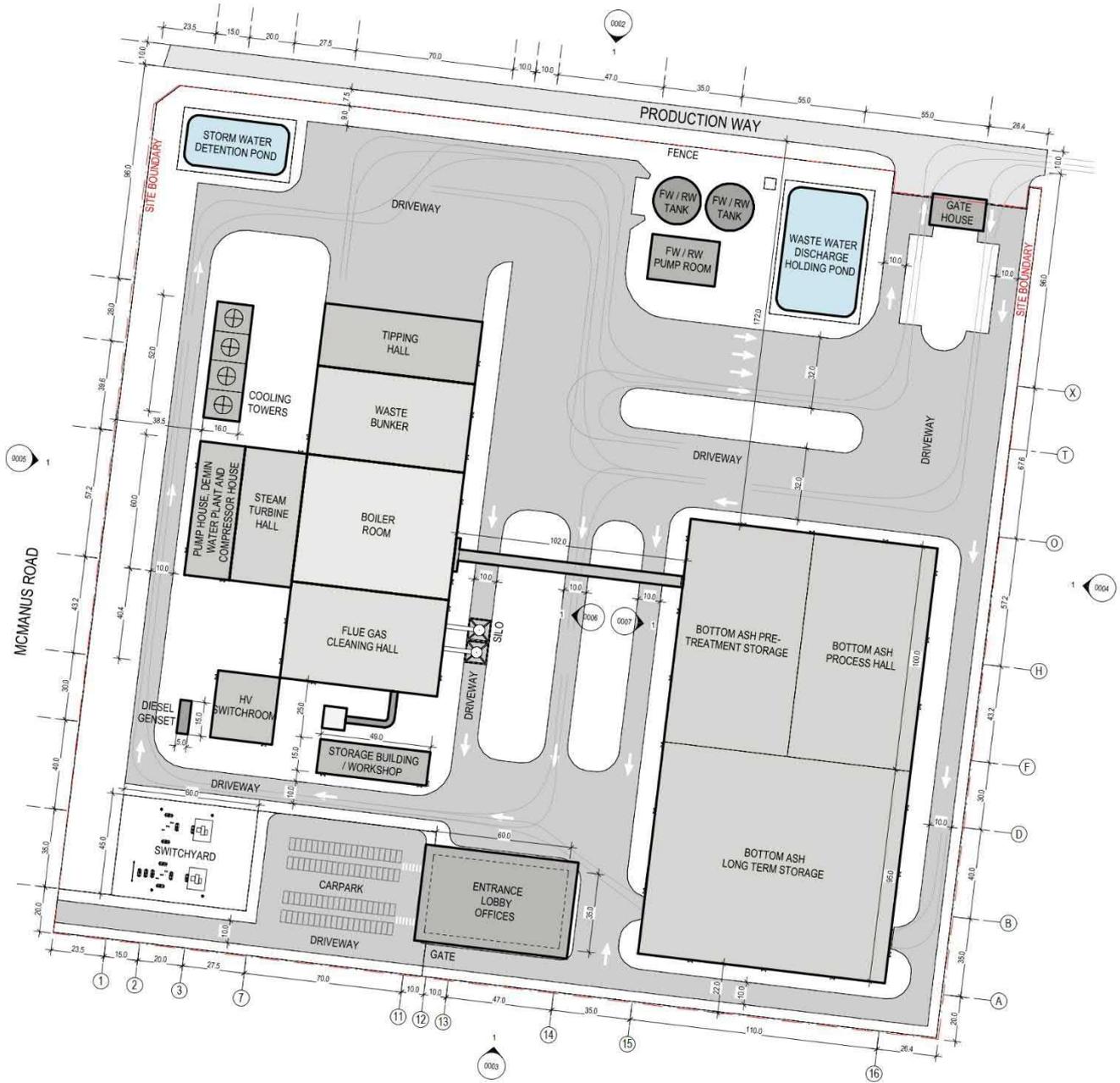


Figure 3.3 Site Plan (Source: Jacobs drawing IS305100-0000-ARC-DRG-0001 Rev B)

Site access during construction and operation of the EfW will be from Production Way to the north.

Figure 3.4 shows the northern elevation of the Project, including the proposed 80 m high stack and proposed buildings.

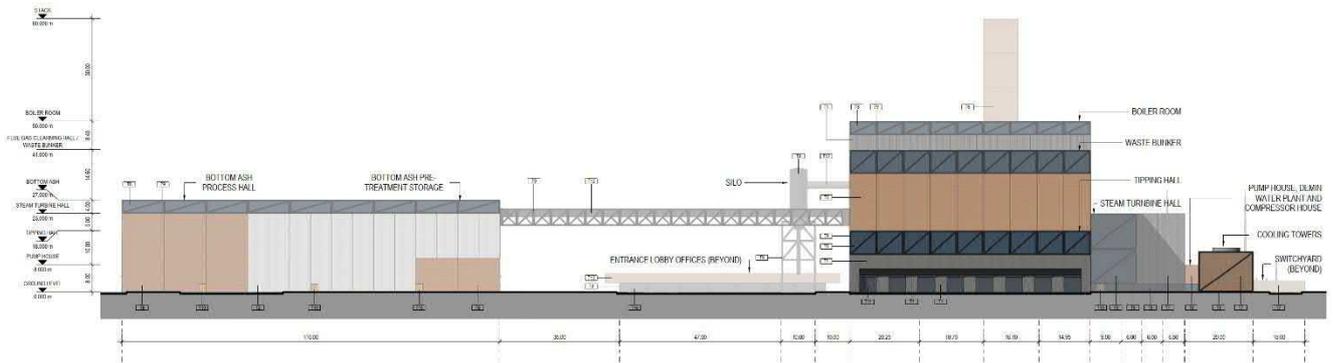


Figure 3.4: Northern Elevation (Source: Jacobs drawing IS305100-0000-ARC-DRG-0002 Rev B)

Figure 3.5 shows the western elevation of the Project, including the proposed 80m high stack and proposed buildings.

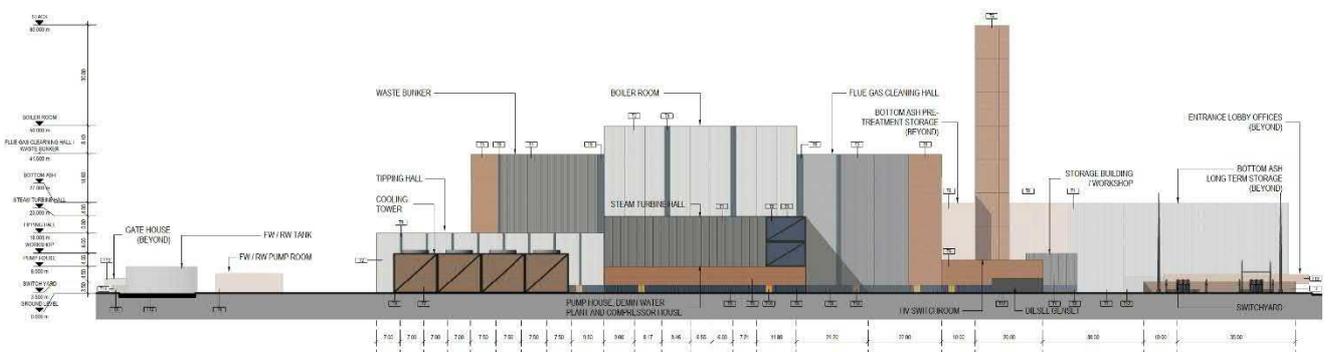


Figure 3.5: Western Elevation (Source: Jacobs drawing IS305100-0000-ARC-DRG-0005 Rev B)

It is understood that the Project will primarily use municipal solid waste as its primary resource, supplemented by commercial and industrial waste as a secondary source where necessary. Material will be transported to the site via trucks along Production Way and unloaded in the tipping hall.

Connection to the electricity grid would require the construction of electrical infrastructure including an onsite substation and distribution lines.

The EfW plant will also produce bottom ash, fly ash and air pollution control residue which will be recovered and reused to the extent practicable, with residues disposed to licensed landfills.

Wastewater will be temporarily stored in stormwater ponds located onsite, prior to discharge.

3.3 Relevance to this assessment

The greatest vertical visual change brought about by the Project will be the proposed emissions stack at approximately 80 m. 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.

4. Study Area

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 Influence (ZVI) are 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, as outlined in Section 3.0, and the parameters of human vision.

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 an 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 4-1. These figures are based on data from 'Human Dimension and Interior Space', Julius Panero & Martin Zelnik, 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 Wiley & Sons, 2012.

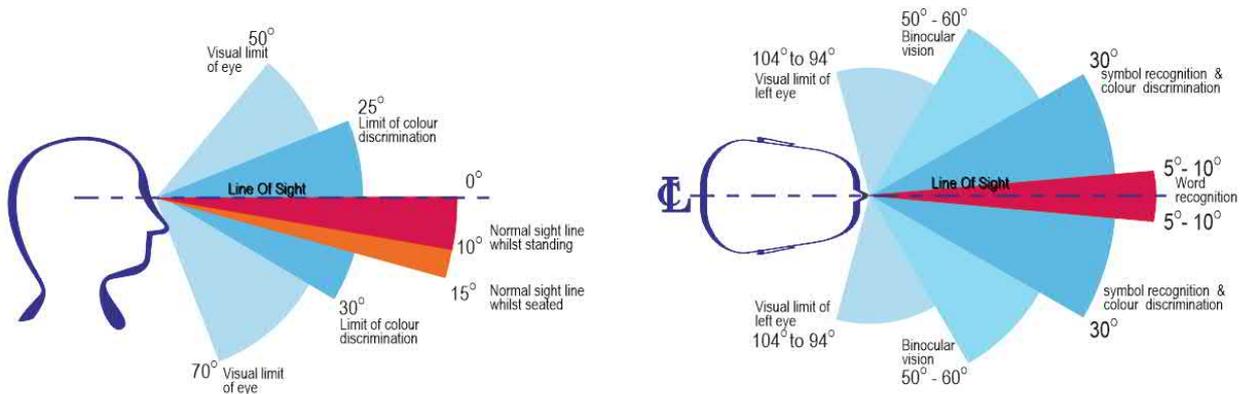


Figure 4-1: Determining the viewshed extent based on project infrastructure within the vertical field of view

The extent of the viewshed can be considered to extend to a distance at which the 80 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°.

4.1 Zones of Visual Influence

Zones of Visual Influence (ZVI) assist to assess the overall visual impact of the proposed EfW 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 4.1 Zones of Visual Influence sets out ZVI for the proposed Project based on an 80 m high tower, and the distances at which these zones will occur.

Table 4.1 Zones of Visual Influence

Vertical Angle of View	Zones of Visual Influence	Distance
<0.5°	<p>Visually insignificant – Extent of the Project viewshed</p> <p>A very small element in the viewshed, which is difficult to discern and will be invisible in some lighting or weather circumstances.</p>	<9.2 km
0.5-1.0°	<p>Noticeable, but will not dominate the landscape</p> <p>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.</p>	4.6-9.2 km
1.0-2.5°	<p>Noticeable and can dominate the landscape</p> <p>The degree of visual intrusion will depend on the landscape sensitivity and the sensitivity of the viewer.</p>	1.8-4.6 km
2.5-5.0°	<p>Highly visible and will usually dominate the landscape</p> <p>The degree of visual intrusion will depend on the Project visibility in views from the landscape and factors such as foreground screening.</p>	0.9-1.8 km
>5.0°	<p>Will always be visually dominant in the landscape</p> <p>Dominates the landscape in which it is sited.</p>	<0.9 km

Figure 4.2 shows the ZVI bands in relation to the Project up to the extent of the viewshed.

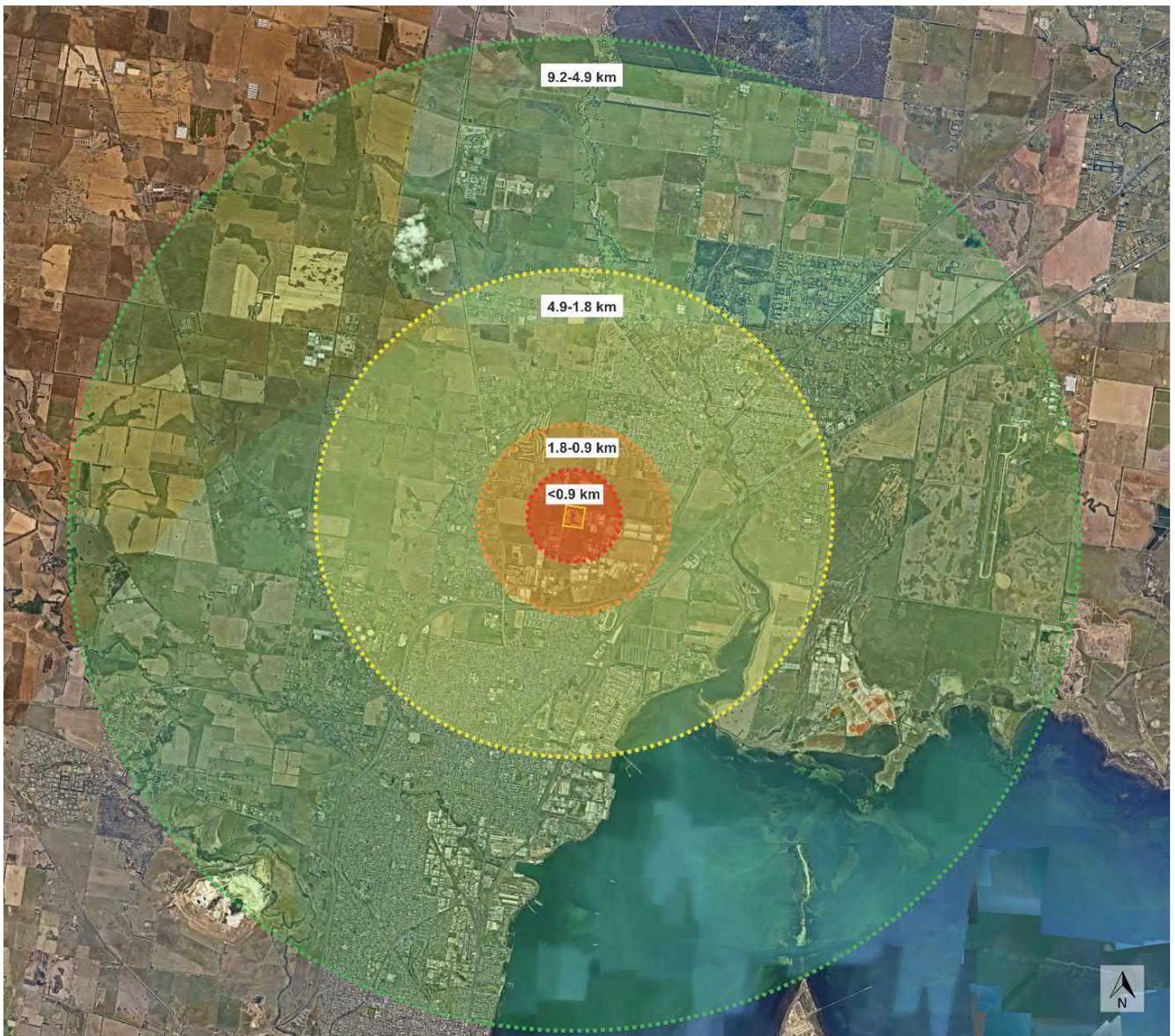


Figure 4.2: Zones of Visual Influence

Areas that have the potential to be most visually affected by the proposed Project elements are those within 1.8 km of the stack. However, it is acknowledged that the Project elements may be noticeable up to 4.6 km. On clear days, the Project may be visible beyond 9.2 km, however it would be a small element in views.

ZVI provide a guide to considering the visual scale of the Project based on distance as part of the overall scale of visual effects described at in this report. The overall assessment also considers the visibility and sensitivity of the landscape at the viewpoint.

It is recognised that Project visibility will not dramatically alter when a viewer moves from 4.5 km to 4.7 km from the nearest Project feature, and therefore these zones are a guide only.

The area within the viewshed was reviewed to:

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

5. 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.

This is not intended to be a thorough review of the planning scheme, its mechanisms and triggers, rather it 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 protect accordingly.

5.1 Victorian Planning Policy (VPP)

The VPP 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.

5.1.1 Clause 12.05-2S Landscapes

The objective of this provision is to protect and enhance significant landscapes and open spaces that contribute to character, identity and sustainable environments. Key strategies include:

- *Ensure significant landscape areas such as (Native) 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; and*
- *Ensure important natural features are protected and enhanced.*

SLO1 – Foothills of the You Yangs occurs within the Project viewshed. These objectives will be considered in the LVIA, and throughout the design process to mitigate impacts to the significant landscape, and to enhance it where possible.

5.1.2 Clause 13.07 Land use compatibility

The objective of this provision is to safeguard community amenity while facilitating appropriate commercial, industrial or other uses with potential off-site effects.

The strategy of this provision is to ensure the compatibility of a use or development as appropriate to the land use functions and character of the area by:

- *Directing land uses to appropriate locations; and*
- *Using a range of building design, urban design, operational and land use separation measures.*

The compatibility of the proposed EfW plant in relation to surrounding sensitive land uses will be considered in the LVIA.

5.1.3 Clause 17.03-2S Sustainable industry

The objective of this provision is to facilitate the sustainable operation of industry. Strategies relevant to this LVIA Report include:

- *Ensure that industrial activities requiring substantial threshold distances are located in the core of industrial areas;*
- *Encourage activities with minimal threshold requirements to locate towards the perimeter of the industrial area;*
- *Minimise inter-industry conflict and encourage like industries to locate within the same area; and*

- *Provide adequate separation and buffer areas between sensitive uses and offensive or dangerous industries and quarries to ensure that residents are not affected by adverse environmental effects, nuisance or exposure to hazards.*

This clause is relevant for the LVIA considerations of this Project, which will consider the potential offsite effects of the proposed Project to sensitive uses within the study area.

5.2 Local Planning Policy Framework (LPPF)

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

5.2.1 Clause 21.13 - Lara

Lara is a township designated for urban growth, the rural landscape setting is important to the character of the town. The following are objectives relevant to this LVIA Report:

- *To maintain a compact urban form and provide for sustainable communities;*
- *To maintain and enhance the rural characteristics of Lara;*
- *To protect the rural landscape setting of the township, particularly to the north overlooking the You Yangs;*
- *To provide community and recreation services and infrastructure to meet the needs of the local and surrounding population;*
- *To protect and enhance key environmental, cultural and landscape features; and*
- *To protect Avalon Airport, Geelong Ring Road Employment Precinct and the potential intermodal transport facility from urban encroachment and sensitive uses.*

The following strategies are relevant to this LVIA Report:

- *Ensure new development incorporates sustainability principles including environmentally sustainable design, energy efficiency, connectivity and water sensitive urban design; and*
- *Retention of the rural landscape setting including views to the You Yangs*

5.3 Land-use Zones within the Viewshed

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 5.1 and summarised below.

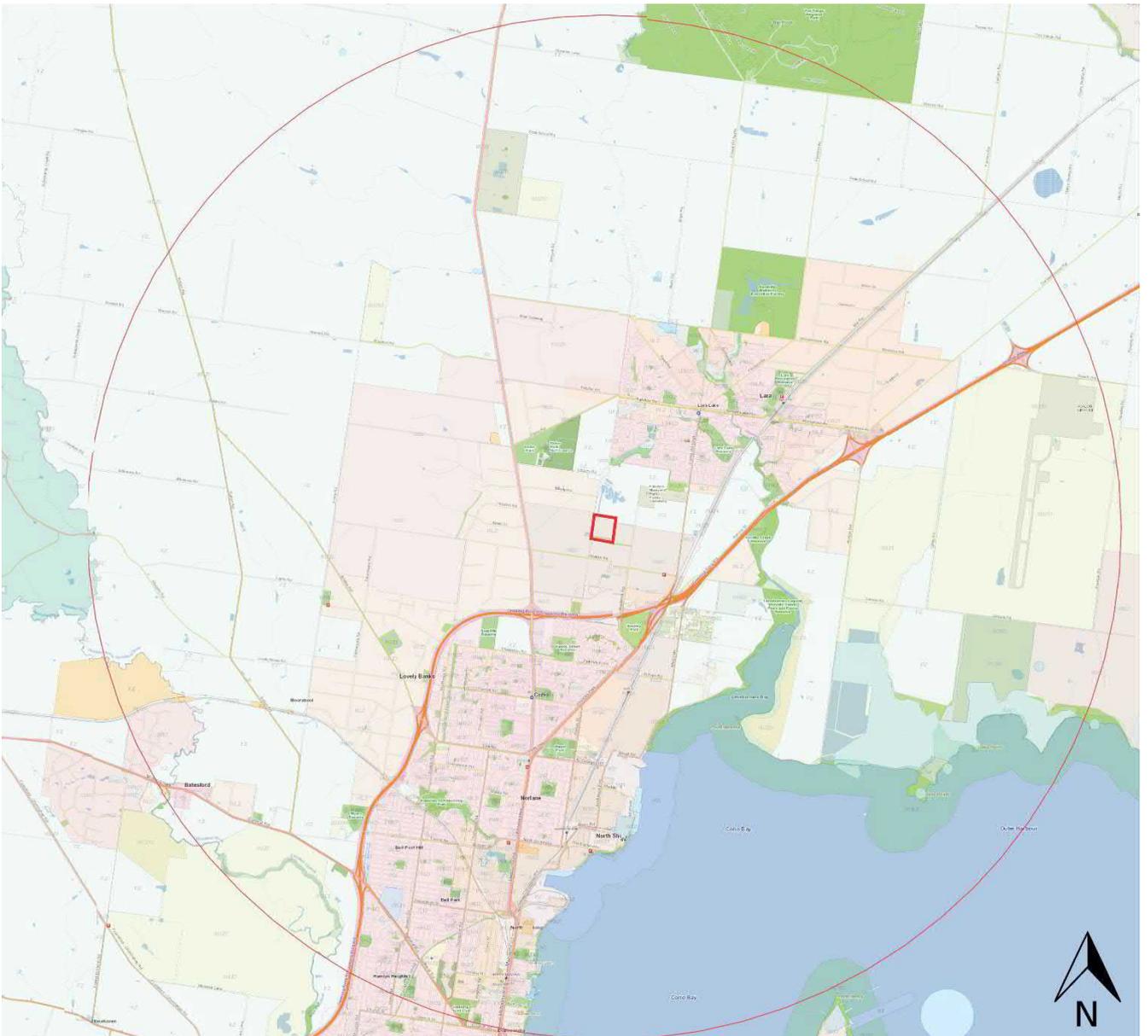


Figure 5.1 Map of zones within the viewshed

Predominant land-use zones within the study area are:

- RLZ – Rural Living Zone
- GRZ1 – General
- IN2Z – Industrial Zone 2
- FZ – Farming Zone
- RLZ - Rural Living Zone
- PUZ5 – Public Use Zone – Cemetery/crematorium
- GRZ1 - General Residential Zone 1
- PPRZ – Public Park and Recreation Zone
- UGZ – Urban Growth Zone
- PCRZ – Public Conservation and Recreation Zone

5.4 Subject Site Zoning

The subject site is zoned Industrial Zone 2 (IN2Z).

5.4.1 IN2Z – Industrial 2 Zone

The purpose of the IN2Z is:

- *To provide for manufacturing industry, the storage and distribution of goods and associated facilities in a manner which does not affect the safety and amenity of local communities;*
- *To promote manufacturing industries and storage facilities that require a substantial threshold distance within the core of the zone; and*
- *To keep the core of the zone free of uses which are suitable for location elsewhere so as to be available for manufacturing industries and storage facilities that require a substantial threshold distance as the need for these arises.*

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

- The effect that the use may have on nearby existing or proposed residential areas or other uses which are sensitive to industrial off-site effects, having regard to any comments or directions of the referral authorities.

There are no stipulated height controls relevant to the site.

5.5 Overlays (Subject Site)

The site is affected by the following Design and Development Overlay (DDO):

- Clause 43.02 Design Development Overlay (Schedule 18 – Geelong Ring Road Employment Precinct) DDO18

Design Development Overlays seek to identify areas which are affected by specific requirements relating to the design and built form of new development. DDO18 overlay applies to the Project site and areas immediately surrounding.

5.5.1 DDO18 – Geelong Ring Road Employment Precinct

The purpose of this overlay is:

- *To facilitate the development of the Geelong Ring Road Employment Precinct as a high amenity industrial area suited to the needs of advanced manufacturing and production support industries;*
- *To provide a high level of amenity for workers on and visitors to the estate;*
- *To ensure development provides an attractive frontage to the Geelong Ring Road;*
- *To ensure development provides a high level of visual amenity when viewed from major transport routes and surrounding non-industrial land uses; and*
- *To promote best practise sustainable design including storm water quality and reuse measures.*

Decision guidelines of this overlay include the consideration of:

- *Whether the design and landscaping of the site contributes to the amenity of the Geelong Ring Road employment precinct;*
- *The appearance of the site when viewed from adjacent major transport routes and surrounding non-industrial land uses; and*
- *The performance of the development against the Advertising Sign Guidelines, City of Greater Geelong 1997 and the Geelong Ring Road Employment Precinct Urban Design Guidelines, July 2010.*

5.6 Overlays within the Viewshed

Landscapes that exhibit special or unique features are typically found within Significant Landscape Overlays (SLOs) or Environmental Significance Overlays (ESOs) 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.

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 5.2 and will be discussed in more detail below.

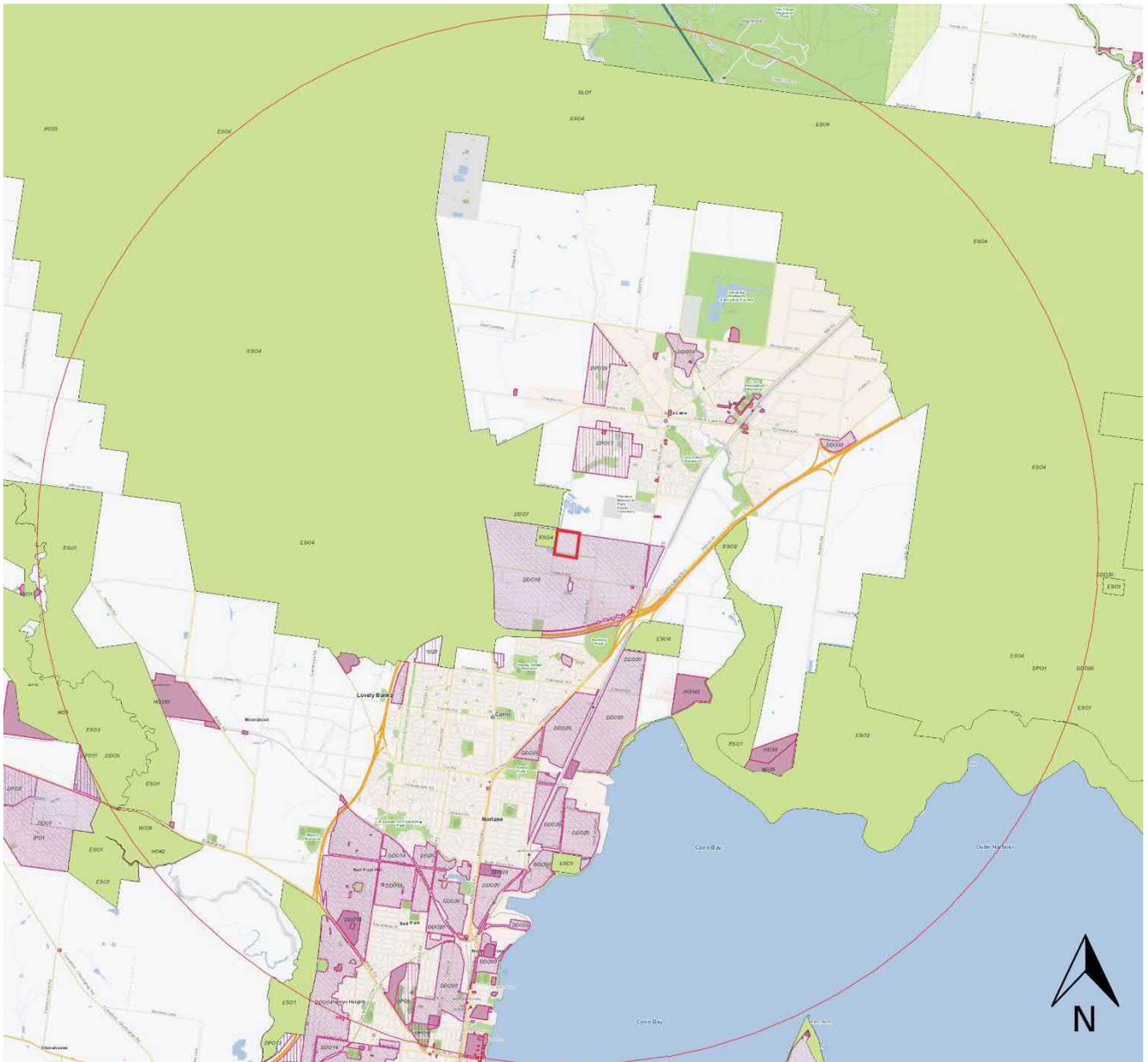


Figure 5.2 Map of overlays within the viewshed

The following overlays, relevant to LVIA, apply to the study area:

- Clause 42.03 Significant Landscape Overlay (Schedule 1 – Foothills of the You Yangs) SLO1
- Clause 42.01 Environmental Significance Overlay (Schedule 1 – Areas of flora and fauna habitat of geological and natural interest) ESO1

- Clause 42.01 Environmental Significance Overlay (Schedule 2 – High value wetlands and associated habitat protection) ESO2
- Clause 42.01 Environmental Significance Overlay (Schedule 3 – Mt Misery Creek, Surface Hill – Smythedale, Klein and Swanston Road area, Dereel, Swamp road – Dereel, Yarrowee Creek, Teesdale reserve, Moorabool valley, Sutherland Creek, Meredith, Steiglitz) ESO3
- Clause 42.01 Environmental Significance Overlay (Schedule 4 – Grasslands within the Werribee Plains Hinterland) ESO4
- Clause 43.01 Heritage Overlay

5.6.1 Significant Landscape Overlays (SLO)

The purpose of Significant Landscape Overlays (SLOs) is to identify significant landscapes so that they may be conserved and protected. SLO1 is applied to an area within the project viewshed, not within the site itself. SLO1 is discussed below.

5.6.2 SLO1 – Foothills of the You Yangs

SLO1 applies to the treeless foothills and plains at the base of the You Yangs in Greater Geelong. The You Yangs are one of the most prominent landscape features in Greater Geelong municipality, providing scenic vantage points and enabling panoramic views of Geelong. The key character of the foothills is that they are flat and plain, creating contrast and an open view path of the You Yangs from below.

The objectives of this overlay are:

- *To protect and enhance the open character, contrast and scenic quality of the landscape;*
- *To maintain an open view path to the regionally significant You Yangs;*
- *To protect the landscape from visual intrusion by inappropriate buildings and works and their siting, design or materials;*
- *To encourage the siting, design and landscaping of buildings and works to be responsive to the landscape values of the area; and*
- *To facilitate the rehabilitation of extractive industries when they reach the end of their economic life.*

The decision guidelines of the overlay include the consideration of:

- *The landscape values of the edges of the foothills of the You Yangs;*
- *Whether the siting, height, scale, materials and form of proposed buildings and works has been designed to have least visual effect on the landscape and scenic views of the foothills of the You Yangs;*
- *Whether approval of the proposed buildings and works is compatible with maintaining the visual and natural significance of the landscape;*
- *The benefit of permit conditions requiring all building materials to be non-reflective and of colours which are complementary to those of the natural landscape;*
- *The benefit of conditions requiring the landscaping of buildings and works, while also having regard to the maintenance of existing view lines; and*
- *Whether an alternative site is available on the land for the proposed buildings and works that would better meet the landscape objectives of this schedule.*

5.6.3 Environmental Significance Overlay (ESO)

Environmental Significance Overlays (ESOs) identify areas where the development of land may be affected by environmental constraints. The ESOs ensure that development is compatible with identified environmental values. The ESOs highlighted in the following section do not occur within the Project site, rather, adjacent to the

site and within the Project viewshed. The ESOs that have been identified as having landscape and visual significance are described below.

5.6.4 ESO1 – Areas of flora and fauna habitat of geological and natural interest

This overlay applies to a small wedge adjacent Limeburner's Lagoon and some areas located around Moorabool river. The areas protected in this overlay include a number of significant flora and fauna habitats which contain remnant vegetation, marsh flats, bird and wildlife habitats and corridors, natural scrub heathland vegetation, and/or river and streamside corridors.

The objectives of this overlay include:

- *To conserve and protect areas of flora and fauna habitat and geological and natural interest;*
- *To ensure that development does not impact on the environmental significance of the land; and*
- *To ensure that siting and design of any buildings and works maintains the environmental integrity of the land.*

5.6.5 ESO2 – High Value Wetlands and Associated Habitat Protection

This overlay applies to Limeburner's Lagoon and Avalon Coastal Reserve which exist within the Project viewshed. Environmental objectives relevant to the LVIA of this Project are:

- *To encourage ecological restoration, regeneration and revegetation with indigenous species within the site and in adjoining areas;*
- *To protect cultural (including aboriginal and non-aboriginal heritage) values; and*
- *To protect visual amenity.*

Decision guidelines of this overlay include the consideration of:

- *The impact on the natural environment including any important landscape or conservation characteristics of the area and the suitability of the proposed development;*
- *The function of the wetland, watercourse or habitat area as part of a broader natural system;*
- *The impact of the siting, shape, size and height of any proposed buildings, extensions or works on the visual amenity of the area; and*
- *The extent to which the materials, colours and external finishes of buildings conform in appearance and character with the natural features of the area (for example, the use of non-reflective roofing surfaces, muted tones and natural materials) and with any adjacent buildings.*

5.6.6 ESO3 – Mt Misery Creek, Surface Hill – Smythedale, Klein and Swanston Road area, Dereel, Swamp road – Dereel, Yarrowee Creek, Teesdale reserve, Moorabool valley, Sutherland Creek, Meredith, Steiglitz

The objectives of this overlay include:

- *To protect the conservation values of the above areas;*
- *To protect habitat for fauna; and*
- *To protect geological formations and landscape values.*

5.6.7 ESO4 – Grasslands within the Werribee Plains Hinterland

This overlay applies to the largest area surrounding the Project, and within the Project viewshed. The areas included form part of the Victorian Volcanic Plain Bioregion, and native vegetation within this region is some of the most depleted vegetation in Victoria.

The landscape has an early history of European settlement, because of this, the landscape has been radically altered. Although native vegetation has been cleared for agricultural, urban and industrial land uses, there are areas of intact native vegetation and high-quality wetlands. Such areas are important for the threatened species that inhabit them, species which do not occur elsewhere in the bioregion. Important flora species in this area include, the Button Wrinklewort, Large-fruit Fireweed, Small Golden Moths, Small Milkwort, Small Scurf-pea, Spiny Rice-flower, and the only remaining wild population of Sunshine Diuris. Important fauna species include, the Grassland Earless Dragon, Orange-bellied Parrot, Plains-wanderer, Red-chested Button-quail, Striped Legless Lizard and Swift Parrot.

Objectives and decision guidelines relating to ESO4 are predominantly concerned with management and conservation of vegetation. Because this overlay does not exist within the Project site, these objectives are not relevant to this LVIA report. An objective of relevance to this report is as follows:

- *To enhance the environmental and landscape values of the area.*

5.7 Other relevant documents

5.7.1 Native Vegetation Precinct Plan, Geelong Ring Road Employment Precinct

The Project site occurs within the Geelong Ring Road Employment Precinct (GREP). The GREP Native Vegetation Precinct Plan (NVPP) is listed under the Schedule to Clause 52.16 of the City of Greater Geelong Planning Scheme.

The purpose of the NVPP is to specify the native vegetation to be protected and the native vegetation that can be removed, destroyed or lopped.

5.7.2 Urban Design Guidelines, Geelong Ring Road Employment Precinct

This Urban Design Plan outlines the Council's Urban Design expectations for all lots within the GREP.

Guidelines of relevance to the LVIA of this Project include:

- *The development of any lot should relate to adjacent existing buildings to ensure compatibility of built form, height, landscape character and vehicular access;*
- *Sites should be landscaped with an emphasis on the street frontages;*
- *All designs should be practical and easily maintained to a high standard of presentation;*
- *Native and indigenous species should be used;*
- *Solar access should be considered in planting schemes by planting deciduous trees closer to buildings on the south side of east-west streets and planting evergreen trees to the north;*
- *Landscaping should comply with CPTED principles;*
- *Minimise exposed back fences and blind walls; and*
- *Plant species for all landscape areas (including canopy trees) should be selected to allow clear sightlines for all users.*

5.8 Relevance of this review of the Planning scheme

The proposal is located within an area zoned for industrial uses, a zone which contemplates uses and built form outcomes that have the potential to contribute to offsite amenity impacts, including visual impacts.

There are no apparent height control limits identified within the review of the PPF and LPP that would preclude the construction of an 80 m high stack proposed as a key component of the Project.

The site is also within an area covered by DDO18 – Geelong Ring Road Employment Precinct. This overlay does not preclude the proposed development or key features, it does however require the visible components of the proposal to be of *high amenity... provides an attractive frontage to the Geelong Ring Road and to ensure*

development provides a high level of visual amenity when viewed from major transport routes and surrounding non-industrial land uses.

There is potential for the Project to be visible and viewed from sensitive locations which include the You Yangs, nearby residential areas and locations along the coast and foreshore areas. These are examined in Section 7 of this report.

6. Landscape Character and Sensitivity

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.

6.1 Topography

Topography within the study area is relatively flat, with the Project site and immediately surrounding area being characterised as open plains to gently undulating. The site sits relatively low in comparison to an elevated ridgeline approximately 6.5 km west (to the west of Bacchus Marsh Road), and the You Yangs on the northern edge of the viewshed.

Figure 6.1 shows the contour map of the study area which highlights the areas of topographical variation.

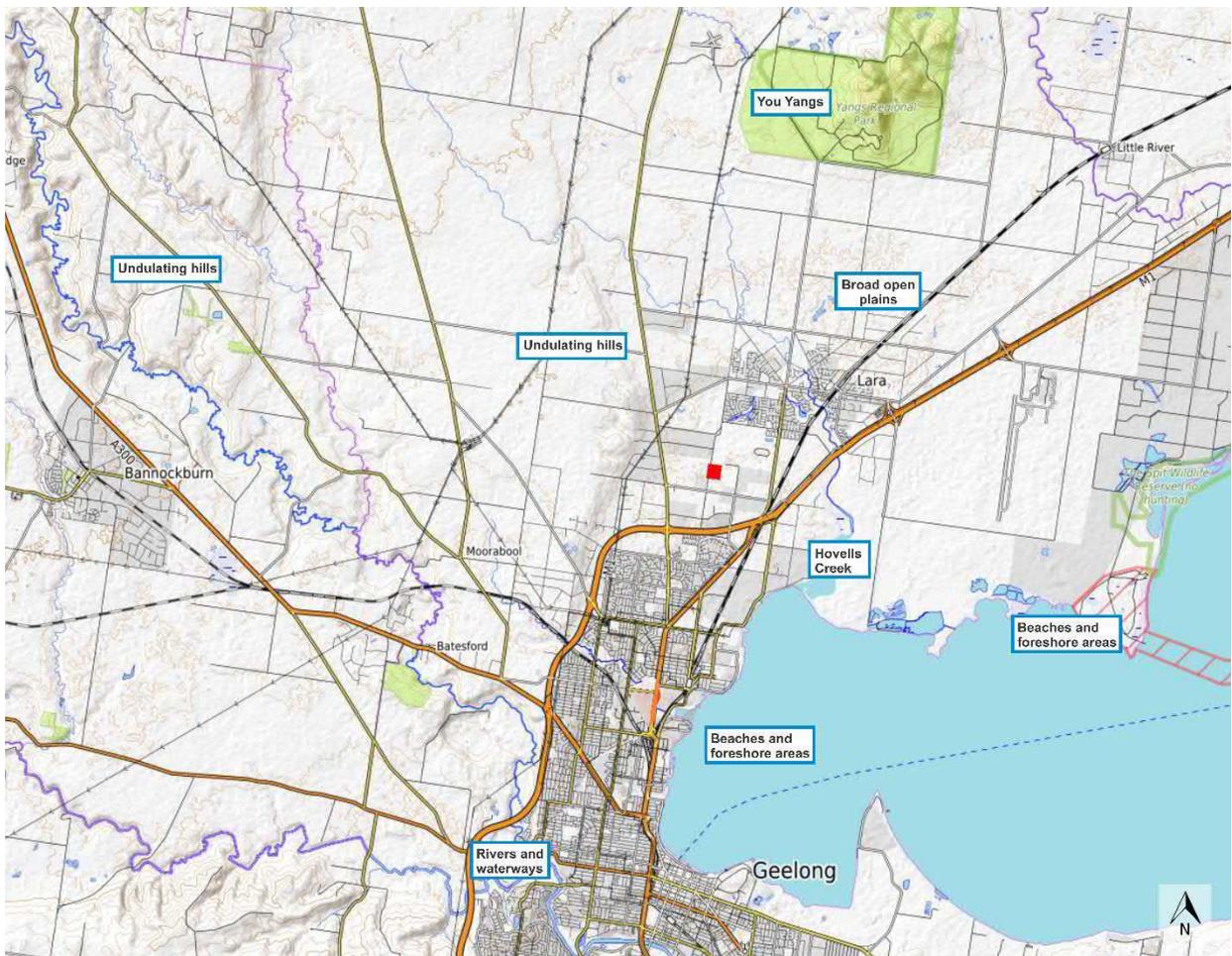


Figure 6.1 Topography of Study Area

This is evidenced in the image shown at Figure 3.2 (Subject Site).

Topography within the broader study area support the following land forms:

- Ridges and escarpments in the You Yangs to the north;
- Undulating Hills to the west;
- Beach and Foreshore areas to the east;
- Rivers and waterways around the Barwon River to the south east and Hovells Creek to the north; and

- Broad open plains within which the site is proposed.

Clause 42.03 Significant Landscape Overlay (Schedule 1 – Foothills of the You Yangs) highlights the You Yangs as a dominant feature of the landscape, and attributes this to the nature of flat topography of the landscape below them, as well as the relative lack of vegetation leading up to the area. The formation of the You Yangs can be seen in Figure 6.1.

6.2 Vegetation

Native vegetation within the study area is limited to the Plains Grassland Ecological Vegetation Class (EVC). This EVC consists of treeless vegetation mostly less than 1 m tall and is dominated by largely graminoid and herb life forms.

Remnant vegetation can be found along water ways and foreshore areas, within the boundaries of the You Yangs regional park to the north and road reserves.

The majority of the study area has been modified or cleared for land uses such as industry, agriculture or urban development as seen in Figure 6.2.

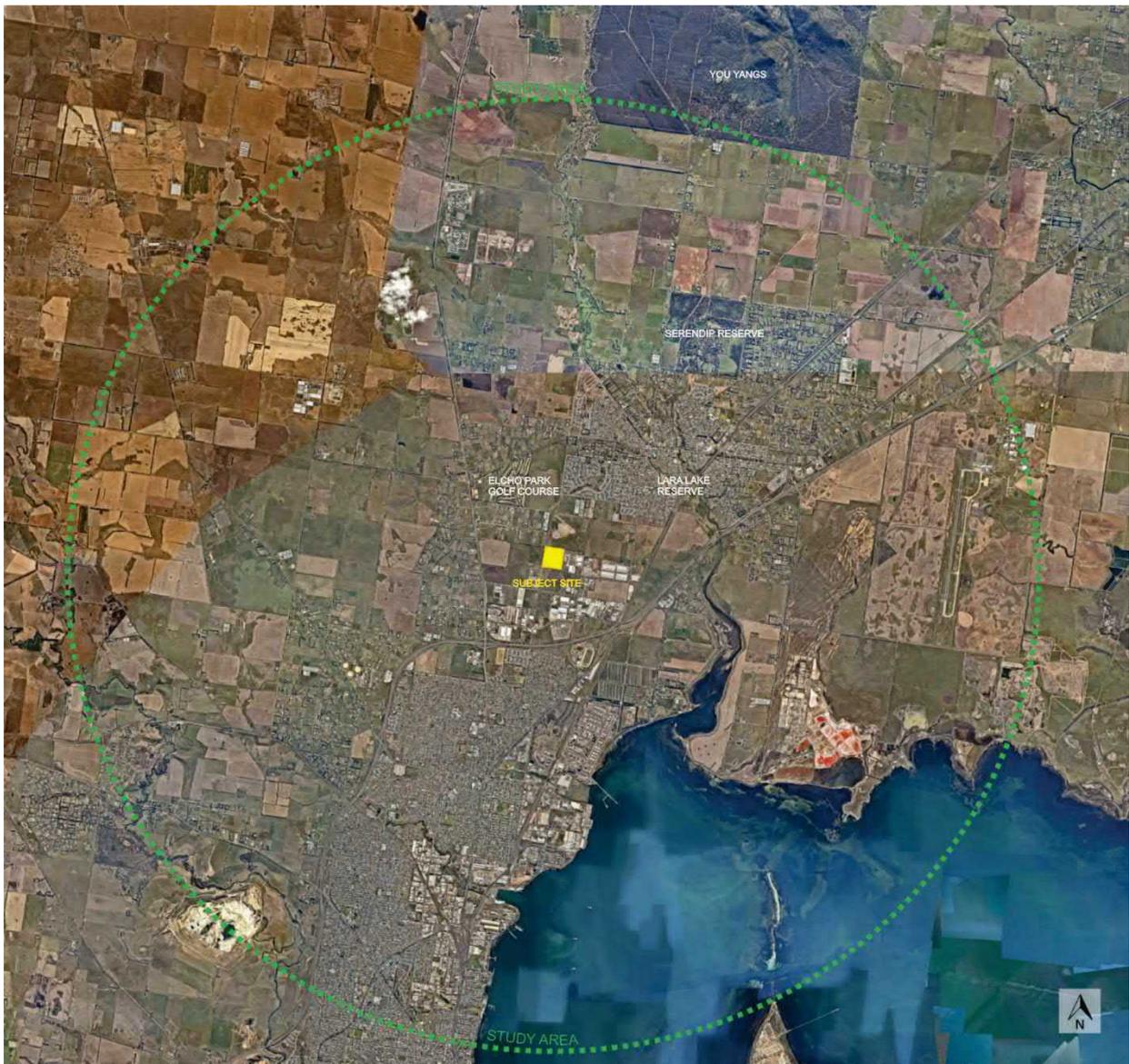


Figure 6.2 Vegetation in the Study Area

Vegetated areas include the Elcho Park Golf Course, Serendip Wetland Reserve and the Lara Lake Reserve and in the private gardens and road reserves gardens.

The coastline in the study area is mapped as a Coastal Saltmarsh/Mangrove Shrubland Mosaic. Vegetation consists of shrubs to 2m tall in areas protected from coastal elements, and floristic communities consisting of succulent herbs, low succulent shrubs, rushes and sedges.

The You Yangs regional park exists to the north of the Project and at the edge of the study area. It consists of dry, open eucalypt woodland to 15 m tall often with a sparse shrub layer. The understorey is dominated by a carpet of herbs and grasses. The peak of the outcrop consists of low woodland with the dominant trees often being stunted by the elements.

6.3 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:

- Commercial and Industrial;
- Residential & rural residential and townships;
- Agriculture; and
- State Parks, conservation and tourism.

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 land within the study area is used for industrial, agricultural and rural residential purposes and is zoned as IN2Z, FZ and RLZ accordingly. Industrial and agricultural land uses are typically not sensitive to visual change. Industrial land-use is also one that contemplates a level of off-site impacts to amenity through its ongoing use.

6.4 Landscape Units

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

- Landscape Unit 1 – Rural residential
- Landscape Unit 2 – Townships
- Landscape Unit 3 – Cleared flat farmland
- Landscape Unit 4 – Industrial Areas
- Landscape Unit 5 – National or State Parks/Reserves
- Landscape Unit 6 – Coastal Areas
- Landscape Unit 7 – Memorial Parks

6.4.1 Landscape Unit 1 – Rural residential

Landscape Unit 1 – Rural Living are areas of residential land uses outside of townships that are not inherently linked to agriculture or other rural industries. This landscape type is valued for its natural-appearing or 'rural' amenity, but does include a number of built features, including neighbouring agricultural or horticultural infrastructure and machinery, tourism-related land uses and the road network.

6.4.2 Landscape Unit 2 – Townships

Landscape Unit 2 – Townships are characterised by a cluster of residential dwellings around a main street with shops. Some townships have parks and reserves as well as community orientated buildings. Vegetation within rural communities and townships are typically located within road reserves and residential gardens.

6.4.3 Landscape Unit 3 – Cleared Flat Farmland

Landscape Unit 3 – Cleared Flat Farmland are areas used primarily for agricultural purposes. There are many instances of constructed elements within this landscape type, including the road network, farm buildings and fences. Vegetation within this landscape unit tends to be restricted to property boundaries, windbreaks, around rural dwellings and within road reserves. Some paddocks contain scattered trees.

6.4.4 Landscape Unit 4 – Industrial Areas

Landscape Unit 4 – 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.

6.4.5 Landscape Unit 5 – National or State Parks/Reserves

Landscape Unit 5 – National or State Parks/Reserves are areas of dramatic topographical features, often heavily vegetated with native vegetation. These areas appear pristine and may serve as landmarks or vantage points. These areas may contain minor development, such as unpaved/low-traffic roads, walking or cycling trails.

6.4.6 Landscape Unit 6 – Coastal Areas

Landscape Unit 6 – Coastal Areas refers to those areas typically found along the bay that contain landscape elements typical of coastal landscapes, such as beaches, dunes, coastal cliffs and estuaries.

6.5 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 depends on 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 6.1 Landscape Units and Sensitivity rates the sensitivity of the various landscape units within the viewshed of the Project

Table 6.1 Landscape Units and Sensitivity

Landscape Unit	Sensitivity
LU1 – Rural residential	Moderate-High While these areas are valued for their ‘natural-appearing’ or rural landscape amenity, they are modified landscapes within zones that are set aside for rural related industries such as farming or extractive resources, and thus inherently contain land uses with potential off-site amenity impacts.
LU2 – Townships	Moderate - 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.
LU3 - Cleared Flat Farmland	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.
LU4 – 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.
LU5 – National or State Parks/Reserves	High - This landscape is attractive as it contains areas that are and appear pristine. Encroaching development into this landscape type has increased the rarity of this landscape.
LU6 – Coastal Landscapes	High – These landscapes are highly valued for their amenity and recreation benefits, including long-range views.
LU7 – Memorial Parks	High - These landscapes hold a high amount of sentimental and visual value.

These landscape sensitivity ratings are 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.

7. Publicly Accessible Viewpoints

This section assesses 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.

7.1 Viewpoint Locations

15 viewpoints have been selected as representative of the publicly accessible locations in and around the Project site. Figure 7.1 shows the locations of each of these viewpoints.

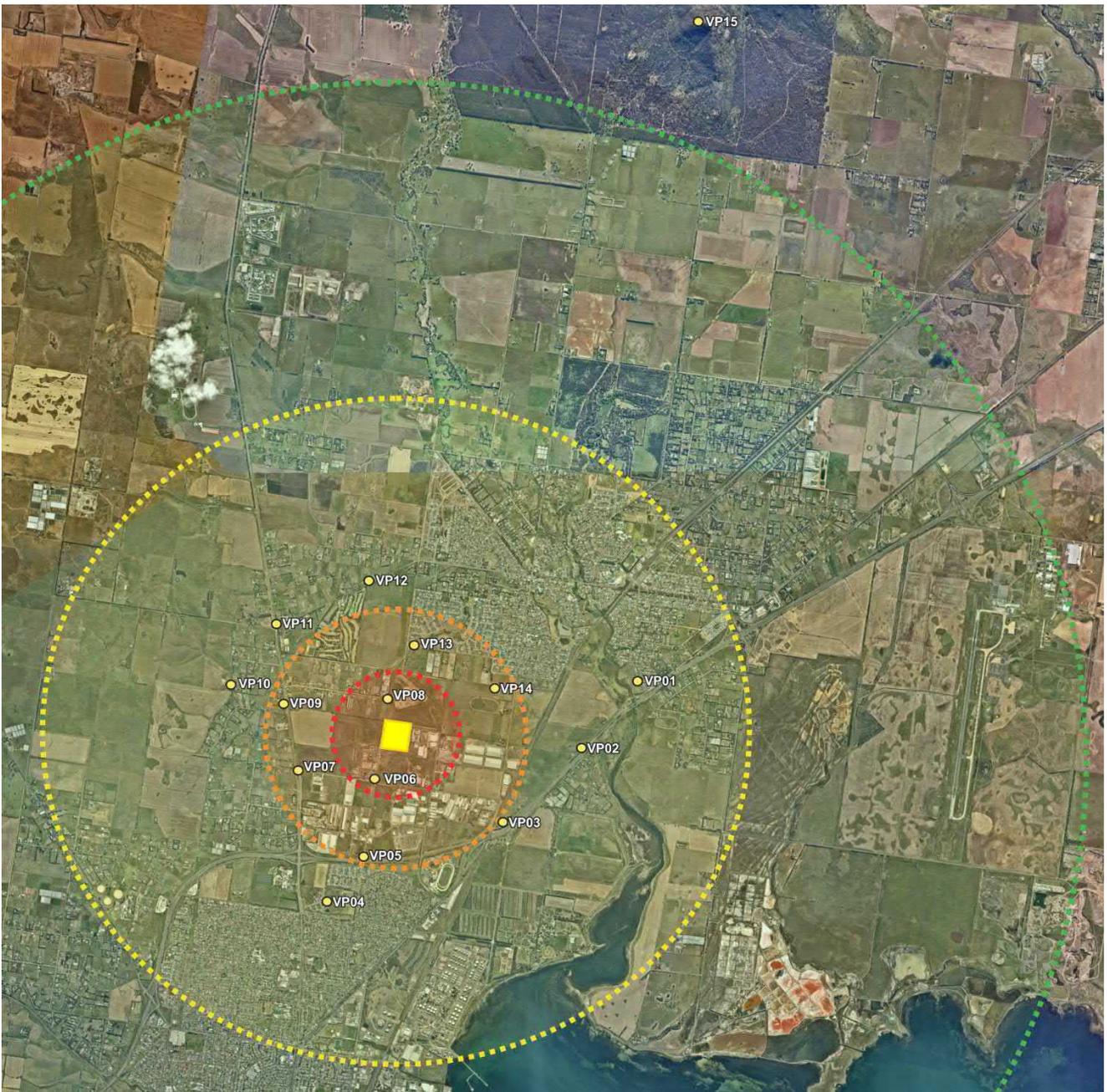


Figure 7.1 Location of Viewpoints

The visual impact from each of these 15 viewpoints is discussed in the following sections to build up an overall assessment of the visual impact of the Project. The visual impact of the Project from nearby locations is also informed by photomontages which have been prepared for viewpoints 08, 09 and 13.

7.2 Viewpoint 01 – Hovells Creek Public Recreation Reserve

Distance to Project	3.3 km south west
Landscape Unit	LU2 – Townships
Viewer Numbers	Low

Viewpoint 1 is situated within Hovells Creek Public Recreation Reserve, approximately 3.3 km to the north east of the Project.

VP 01 is located on a slight ridgeline, resulting in relatively clear views of the Project site above the canopy of vegetation.

Figure 7.2 shows the view looking south west towards the Project.



GPS 55H 272992, 5786932



Figure 7.2 Viewpoint 01 - looking south west

Figure 7.3 shows an enlargement of the view focussing on the site.



Figure 7.3 Viewpoint 01 - Enlargement of the view focussing on the site

Viewpoint 01 looks across at the Hovells Creek Public Recreation Reserve, an area zoned as Public Park and Recreation Zones (PPRZ). Views towards the Project are over cleared land in the foreground with development and built form on the horizon in the background of the view.

At a distance of 3.3 km, the proposed stack has the potential to be a noticeable element in view however it would not be a dominant structure. The ancillary buildings and structures would sit within the context of the existing buildings and structures seen in the background of this view.

For these reasons, the overall visual impact would be Low.

7.3 Viewpoint 02 – Rennie Street / Princes Highway

Distance to Project	2.4 km west
Landscape Unit	LU3 – Cleared flat farmland
Viewer Numbers	Moderate

Viewpoint 02 is located on Rennie Street, approximately 2.4 km east of the site and immediately west of the Princes Highway.

This view is indicative of views from the Princes Highway.

Figure 7.4 shows the view looking south west towards the Project.



GPS 55H 272223, 5785949



Figure 7.4 Viewpoint 02 - looking south west

The Geelong Ring Road is located behind the vegetation to the left of Figure 7.4 . The You Yangs in the right of the image. Figure 7.5 shows an enlargement of the view focussing on the site.



Figure 7.5 Viewpoint 02 - Enlargement of the view focussing on the site

This view is indicative of road users heading south along the Princes Highway. Views look across landscape units LU3 Cleared Flat Farmland and LU4 - Industrial Areas. The industrial areas are yet to be fully developed. Buildings and structures in this area would be to the east of the Project site and between the Princes Highway and Project. The project would be generally to the righthand side and oblique to views for travellers heading south along the Prices Highway.

At 2.4 km from the viewpoint the Project has the potential to be noticeable and has the potential to be a dominant feature on the landscape. Although there would be moderate-high viewer numbers with potentially clear views, the Project would be in the background of views, and over cleared farmland. Overtime, new development within the industrial subdivision would screen or filter views to the buildings, however it is likely that the stack would remain visible. This location is also from the western access lane that is clear of road side vegetation and the motion of other vehicles heading north along Princes Highway.

For these reasons, the visual impact is assessed as Low.

7.4 Viewpoint 03 – Rennie Street Embankment

Distance to Project	1.7 km north west
Landscape Unit	LU4 – Industrial Areas
Viewer Numbers	High

Viewpoint 03 is located atop an embankment on Rennie Street, approximately 1.7 km south east of the site and immediately west of the Princes Highway.

This view is indicative of views from the Princes Highway.

Figure 7.6 shows the view looking north west towards the Project.



GPS 55H 271101, 5784822



Figure 7.6 Viewpoint 03 - looking north west

The Princes Highway can be seen to the right of Figure 7.6. Figure 7.7 shows an enlargement of the view focussing on the site.



Figure 7.7 Viewpoint 03 - Enlargement of the view focussing on the site

This view is indicative of road users heading north along the Princes Highway towards Melbourne. Views look across Landscape Unit 4 – Industrial Areas. Figure 7.7 shows an already developed parcel of land, behind which the Project site sits. The full extent of the industrial area is yet to be developed. Further development in this area would sit between the Princes Highway and the Project. The Project would be generally oblique to views for travellers heading north along the Princes Highway.

At 1.7 km from the site the Project has the potential to be highly visible and will usually dominate the landscape. Although there would be high viewer numbers, with potentially clear views, the Project would be in the background of views, and over industrial development. As further development arises over time, buildings and structures would screen or filter views to the Project, however the stack will likely remain visible.

Further, this view is taken from an embankment adjacent to the Highway and is clear of roadside vegetation and the motion of other vehicles heading east along the Princes Highway.

For these reasons, the visual impact is assessed as Low.

7.5 Viewpoint 04 – Hendey Street Reserve	
Distance to Project	2.3 km north east
Landscape Unit	LU2 – Townships
Viewer Numbers	Low
Viewpoint 04 is located at Hendey Street Reserve in Corio, approximately 2.3 km south west of the Project and south of the Geelong Ring Road.	
Figure 7.8 shows the view looking north east towards the Project.	



GPS 55H 268657, 5783622



Figure 7.8 Viewpoint 04 - looking north east

Figure 7.9 shows an enlargement of the view focussing on the site.



Figure 7.9 Viewpoint 04 - Enlargement of the view focussing on the site

VP 04 looks across Hendey Street Reserve, an area zoned as Public Park and Recreation Zones (PPRZ). At 2.3 km from the site the Project would be noticeable in the landscape and have the potential to be a dominant feature where clear views are permitted.

However, from this location the raised Ring Road and dwellings between this view and the Project would filter or screen the majority of the project infrastructure. There is the potential for the top of the 80 m stack to be partially visible above the treeline.

For these reasons, the visual impact is assessed as Low-Negligible.

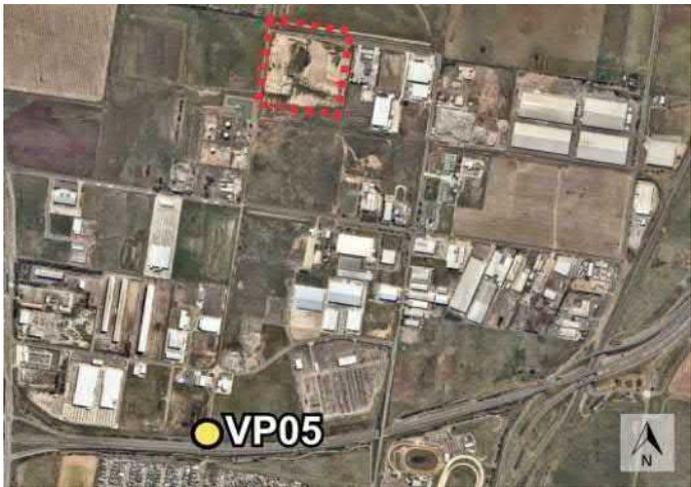
7.6 Viewpoint 05 – McManus Road

Distance to Project	1.5 km north
Landscape Unit	LU4 – Industrial Areas
Viewer Numbers	High

Viewpoint 05 is located on the southern-most point of McManus Road, approximately 1.5 km south of the site and immediately north of the Highway.

This view is indicative of views from the Geelong Ring Road.

Figure 7.10 shows the view looking north towards the Project.



GPS 55H 269156, 5784302



Figure 7.10 Viewpoint 05 - looking north

Figure 7.11 shows an enlargement of the view focussing on the site.



Figure 7.11 Viewpoint 05 - Enlargement of the view focussing on the site

This view is indicative of road users heading east along the Geelong Ring Road, views to the project are oblique to the direction of travel for users of the Highway.

Although there would be high viewer numbers within proximity to the site, views look across Landscape Unit 4 – Industrial Areas. Figure 7.11 shows existing development in the area, the full extent of industrial infrastructure is yet to be developed. Over time, further development in the area would sit between this view and the Project site, likely screening most views towards the Project. However, it is likely the stack would remain visible.

This location is also taken from an embankment adjacent to the Highway which is clear of roadside vegetation and the motion of other vehicles heading north along the Geelong Ring Road.

For these reasons, the visual impact is assessed as Low-Negligible.

7.7 Viewpoint 06 – Corner McManus Road and Heales Road

Distance to Project	420m North East
Landscape Unit	LU4 – Industrial Areas
Viewer Numbers	Low

Viewpoint 06 is located on the corner of McManus and Heales Roads, approximately 420 south of the Project.

Figure .7-12 shows the view looking north towards the Project.



(GPS 55H 269299, 5785409)



Figure .7-12 Viewpoint 06 - looking north

The existing Geelong Elgas Plant can be seen to the left of Figure .7-12, the Project site is located towards the back of the cleared land to the right. Figure 7.13 shows an enlargement of the view focussing on the site.



Figure 7.13 Viewpoint 06 - Enlargement of the view focussing on the site

VP 06 is indicative of views of the Project from the industrial estate that is incorporated in the Geelong Ring Road Employment Precinct.

Although this location is in proximity to the site and affords a clear view of the Project, this location has low viewer numbers and falls within Landscape Unit 4 – Industrial Areas, which is not considered as being visually sensitive due to its highly modified nature. The cleared land in the foreground of Figure 7.13 is zoned for industrial use, over time new development within this subdivision will screen or filter views of the Project.

For these reasons, the visual impact is assessed as Low.

7.8 Viewpoint 07 – Corner Bacchus Marsh Road and Heales Road

Distance to Project	1.2 km north east
Landscape Unit	LU3 – Cleared Flat Farmland
Viewer Numbers	Moderate

Viewpoint 07 is located at the intersection of Heales and Bacchus Marsh Roads.

Figure 7.14 shows the view looking north east towards the Project.



GPS 55H 268173, 5785570



Figure 7.14 Viewpoint 07 - looking north east

Figure 7.15 shows an enlargement of the view focussing on the site.



Figure 7.15 Viewpoint 07 - Enlargement of the view focussing on the site

This viewpoint is taken from a major road and looks over Landscape Units 3 & 4 - Cleared Flat Farmland and Industrial Areas.

The majority of the Project will sit behind vegetation seen to the right of the power pole in Figure 7.15. Where visible above or beyond the vegetation the Project will be consistent with other visible built form in the industrial area.

Whilst viewer numbers from this location are moderate and across already disturbed landscapes. The full extent of infrastructure is yet to be developed in the industrial area. As such, new developments will arise within the view toward the site and will likely filter some views of the Project.

For these reasons, the visual impact is assessed as Low.

7.9 Viewpoint 08 – Minyip Road

Distance to Project	410m south east
Landscape Unit	LU1 – Rural Residential
Viewer Numbers	Low

Viewpoint 08 is located on the corner of McManus and Minyip Roads, approximately 410 m north of the Project.

Figure 7.16 shows the view looking south towards the Project.



GPS 55H 269420, 5786631



Figure 7.16 Viewpoint 08 - looking south

Figure 7.17 shows the same view with the Project superimposed into the view.

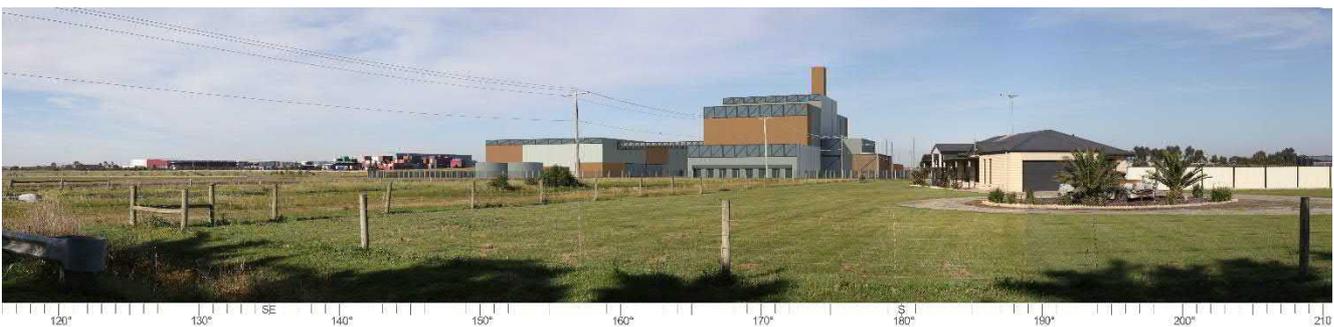


Figure 7.17 Viewpoint 08 – Photomontage

This location is indicative of views from a residential area approximately 410 m from the site. Figure 7.17 shows the clear view users will have towards the Project, however the viewpoint is taken from the edge of the residential area and dwellings that sit behind roadside vegetation or that have vegetation within their gardens may have differing views to this. There may be more or less vegetation that affects their visibility of the Project.

Viewer numbers are low and lack of connection north on McManus Road restricts access to local traffic only. However, views from residential areas are always to be considered highly sensitive. This is because for a resident, their home will always be a highly sensitive location.

For these reasons, the visual impact is assessed as Moderate-High.

7.10 Viewpoint 09 – Bacchus Marsh Road

Distance to Project	1.4 km east
Landscape Unit	LU3 – Cleared Flat Farmland
Viewer Numbers	Moderate

Viewpoint 09 is located on Bacchus Marsh Road, just north of Houston Road, approximately 1.4 west of the Project.

Figure 7.18 shows the view looking east towards the Project.



GPS 55H 268004, 5786399



Figure 7.18: Viewpoint 09 – Looking east

Figure 7.19 shows the same view with the Project superimposed into the view.



Figure 7.19: Viewpoint 09 – Photomontage

This viewpoint is taken from a major road within Landscape Unit 3- Cleared Flat Farmland. Figure 7.19 demonstrates that the Project will be a highly visual feature on the landscape. Although viewer numbers in this area are moderate, views are over Landscape Units 3&4 - Cleared Flat Farmland and Industrial Areas which are highly disturbed landscapes and not recognised as being visually sensitive. This view would be perpendicular to the direction of travel.

Topography looking towards the site is relatively flat and the landscape is generally cleared of native vegetation. Vegetation to the left of Figure 7.18 shows the effectiveness of screening views when vegetation is located closest to the viewpoint.

For these reasons, the visual impact is assessed as Low-Moderate.

7.11 Viewpoint 10 – McNeil Court

Distance to Project	2.3 km east
Landscape Unit	LU1 – Rural Residential
Viewer Numbers	Low

Viewpoint 10 is located at the western-most point of McNeil Court, approximately 2.3 west of the Project.

Figure 7.20 shows the view looking east towards the Project.



GPS 55H 267230, 5786757



Figure 7.20 Viewpoint 10 - looking east

Figure 7.21 shows an enlargement of the view focussing on the site.



Figure 7.21 Viewpoint 10 - Enlargement of the view focussing on the site

This viewpoint is taken from a local road on an elevated ridgeline overlooking Landscape Units 1, 3 & 4 – Rural Residential, Cleared Flat Farmland and Industrial Areas. The elevation of this location affords clear views towards the project over the existing vegetation. The existing high voltage transmission line that runs between the Geelong Terminal and the Keilor Terminal with the lines running to the north west and west of the site are visible in Figure 7.21.

VP 10 demonstrates views from a local road in this residential area, other dwellings within the area may have differing views to this, depending on a viewpoint’s location on the ridgeline and its proximity to roadside vegetation.

Although viewer numbers from residential areas are low and views look across highly disturbed landscapes not recognised as being visually sensitive, views from residential areas are always to be considered highly sensitive. This is because for a resident, their home will always be a highly sensitive location.

For these reasons, the visual impact is assessed as Low-Moderate.

7.12 Viewpoint 11 – Intersection of Elcho and Bacchus Marsh Roads

Distance to Project	2.1 km south east
Landscape Unit	LU1 – Rural Residential
Viewer Numbers	Moderate

Viewpoint 11 is located at the western-most point of Elcho Road where it intersects with Bacchus Marsh Road.

Figure 7.22 shows the view looking south east towards the Project.



GPS 55H 267835, 5787610



Figure 7.22 Viewpoint 11 - looking south east

Figure 7.23 shows an enlargement of the view focussing on the site.



Figure 7.23 Viewpoint 11 - Enlargement of the view focussing on the site

VP 11 looks across Elcho Park, an area zoned as Public Park and Recreation Zones (PPRZ). Areas zoned for PPRZ use are landscapes that are recognised as being visually sensitive. The existing high voltage transmission line that runs between the Geelong Terminal and the Keilor Terminal with the lines running to the north west and west of the site is also visible from this location.

At 2.1 km from the site the Project has the potential to be noticeable in the landscape and will have the potential to be a dominant feature where clear views are permitted.

Existing vegetation demonstrates the effectiveness of vegetation in screening views toward the Project. The Project may be visible above the treeline however it would not be a dominant feature in the view.

For these reasons, the visual impact is assessed as Low-Negligible.

7.13 Viewpoint 12 – Elcho Park Golf Course

Distance to Project	2 km South
Landscape Unit	LU3 – Cleared Flat Farmland
Viewer Numbers	Low

Viewpoint 12 is located 1.5 north east of the intersection of Elcho and Bacchus Marsh Roads, approximately 2 km north of the Project.

Figure 7.24 shows the view looking south west towards the Project.

GPS 55H 269096, 5788247



Figure 7.24 Viewpoint 12 - looking south west

Figure 7.25 shows an enlargement of the view focussing on the site.



Figure 7.25 Viewpoint 12 - Enlargement of the view focussing on the site

Flat topography and cleared vegetation result in clear views toward the Project from VP 12, and at 2 km from the site the Project will be noticeable in the landscape and will have the potential to be a dominant feature on the landscape.

VP 12 looks across Landscape Unit 3 – Cleared Flat Farmland, which are highly disturbed landscapes and not recognised as being visually sensitive.

The existing vegetation to the left of Figure 7.24 demonstrates the effectiveness of vegetation in screening views toward the Project.

For these reasons, the visual impact is assessed as Low.

7.14 Viewpoint 13 – Westlakes Boulevard

Distance to Project	1.2 km south east
Landscape Unit	LU2 - Township
Viewer Numbers	Moderate

Viewpoint 13 is located on the corner of Westlakes Boulevard and Canterbury Road.

There is a reserve within the estate which sinks into the landscape surrounding it. Figure 7.26 shows views looking south towards the Project from this reserve and highlights the effectiveness of vegetation in screening views toward the Project site.

GPS 55H 269821, 5787393

Figure 7.26 Reserve within estate at Viewpoint 13 - looking south

Due to its height, the 80 m stack may be visible above the treeline, however due to distance, it will be lower in height than the existing power poles and street lights seen beyond the pond.

Figure 7.27 shows the existing view looking south towards the Project from the southern edge of the estate where clear views are permitted over farming land.



Figure 7.27 Viewpoint 13 - looking south

Figure 7.28 shows the same view with the Project superimposed into the view.



Figure 7.28 Viewpoint 13 - Photomontage

Figure 7.28 shows that the Bottom Ash Treatment and Storage Hall building which would be located at the western end of the site is similar in size to the stacked containers situated in the adjoining site. This view also shows the ability for landscape to screen or filter views towards the majority of the ancillary buildings, and over time the 80 m high stack.

VP 13 is indicative of views from an estate located north of the Project, this viewpoint has been taken at the outer edge of the estate, and dwellings that sit behind roadside vegetation or that have vegetation within their gardens may have differing views to this. There may be more or less vegetation that affects their visibility of the Project.

At 1.2 km, the Project has the potential to be a dominate element in views. VP 13 falls within the LU2 – Township landscape unit, which is considered to be of moderate sensitivity due to its residential nature.

Views from within the estate would be largely filtered or screened by existing vegetation within road reserves, recreational areas and roadside as well as the residential dwellings.

For these reasons, the visual impact is assessed as Low.

7.15 Viewpoint 14 – Flinders Memorial Park

Distance to Project	1.4 km north east
Landscape Unit	LU7 – Memorial Parks
Viewer Numbers	Low

Viewpoint 14 is located at the western edge of the Flinders Memorial Park on Forest Road.

Figure 7.29 shows the view looking south west from the entrance to the Flinders Memorial Park.

GPS 55H 271000, 5786753



Figure 7.29 Entrance to Flinders Memorial Park

This view also shows the existing vegetation within and around the site. This vegetation will filter or screen views towards the Project.

Figure 7.30 shows the view looking south towards the Project.



Figure 7.30 Viewpoint 14 - looking south west

Figure 7.31 shows an enlargement of the view focussing on the site.



Figure 7.31 Viewpoint 14 - Enlargement of the view focussing on the site

Viewer numbers from this location would be considered to be low, however highly sensitive. At 1.4 km from the site, the Project has the potential to be a highly visual feature and will usually dominate the landscape. Views from western edge of the Park are over LU3 & LU4 - Cleared Flat Farmland and Industrial Areas which are highly modified landscapes and not recognised as being visually sensitive.

Although VP 14 demonstrates a clear view of the Project site from the sensitive location, vegetation to the left Figure 7.30 shows the effectiveness of vegetation in screening views when it is located closest to the viewpoint.

The majority of views from within the Memorial Park will be filtered by existing vegetation within the Park.

For these reasons, the visual impact is assessed as Low.

7.16 Viewpoint 15 – You Yangs Regional Park

Distance to Project	10.9km south west
Landscape Unit	LU5 – National or State Parks/Reserves
Viewer Numbers	Moderate



GPS 55H 273790, 5796416

Viewpoint 15 is located at the You Yangs Regional Park.

Figure 7.32 shows the view looking south towards the Project.



Figure 7.32 Viewpoint 15 - looking south

Views of the You Yangs fall within LU5 – National or State Parks/Reserves, which is considered to be of high sensitivity due to its pristine nature. Views from the You Yangs overlook many landscape types, predominantly LU3 & 4 (Cleared Flat Farmland and Industrial Areas) which are highly disturbed landscapes.

Views from the You Yangs recreational trail will generally be filtered or screened by vegetation, as seen in Figure 7.33. There may be views from locations where breaks in vegetation afford longer views across the landscape and in the direction of the project, as well as clear views of the Project from the peak of the You Yangs.



Figure 7.33 Views from the You Yangs Recreational Trail

Although views from the peak give a clear sighting of the Project, it is important to note that views are largely of cleared farmland and industrial uses. The Geelong Refinery and other industrial infrastructure are already dominant features in the panoramic views from this location.

For these reasons, the visual impact is assessed as Low-Negligible.

7.17 Publicly Accessible Viewpoint Summary

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

Figure 7.1 below summarizes the visual impact assessment from each of the 15 viewpoints.

Table 7.1: Visual Impact Summary

Viewpoint	Visual Impact
VP01 - Hovells Creek Reserve	Low
VP02 - Rennie Street / Princes Highway	Low
VP03 - Rennie Street Embankment	Low
VP04 - Hendey Street Reserve	Low-Negligible
VP05 - McManus Road	Low-Negligible
VP06 - Corner McManus Road and Heales Road	Low
VP 07 = Corner Bacchus Marsh Road and Heales Road	Low
VP08 - Minyip Road	Moderate-High
VP09 - Bacchus Marsh Road	Low-Moderate
VP10 – McNeil Court	Low-Moderate
VP 11 - Intersection of Elcho and Bacchus Marsh Roads	Low-Negligible
Vp12 - Elcho Park Golf Course	Low
Vp13 - Westlakes Boulevard	Low
VP14 - Flinders Memorial Park	Low
VP 15 - You Yangs Regional Park	Low-Negligible

The Project has the potential to be noticeable in the landscape and will have the potential to be a dominant feature where clear views are permitted within close proximity to the site. These views are generally over cleared farmland or industrial areas which have a low sensitivity to visual change. These landscapes also include various infrastructure such as the existing high voltage transmission line that runs to the north west and west of the site and other industrial built form.

Many views of the Project site are broken up through sporadic roadside vegetation, highlighting the effectiveness of vegetation in screening views of the Project, particularly when vegetation is located closest to the viewpoint.

Viewpoints further removed from the site have the potential to see the Project, however it would not be a dominant feature in the view.

The overall visual impact of the Project would be assessed as Low-Moderate.

8. Mitigation Options

Mitigation options available to manage visual impact from locations that are considered to be significantly visually affected by a Project include façade, built form articulation and also landscape mitigation.

8.1 Materials

It is clear from the photomontages shown in Section 7 that the building benefits from applying different materials and colours to assist in breaking up the bulk of the built form.

Mitigation of facilities such as this relies on firstly the form and profile of the building, articulation of the façade and lastly materiality. This is due to the height, scale, mass and built form required to house the necessary functions to create a EfW facility and to minimise as far as practically possible, impact to offsite amenities such as noise and odour.

The external design of the building can often be used to conceal it's internal use and function. For example. The building is not dissimilar to that of an indoor sporting complex such as a basketball or volleyball centre. Therefore, the design of the building can assist in integrating the proposed use into an area that is not sensitive in zoning such as Industrial Zone 2, where there are no restrictions of height, scale or built form. This approach does however recognise that this EfW facility is visible from some areas where the sensitivity is higher, such as the rural residential areas to the west and north west, the residential to the north and also the Ring Road to the south which is recognised by the Design Development Overlay.

Through design development, materials should be selected that are in keeping with the Design Development Overlay to assist in breaking up the bulk of the buildings, are non-reflective and avoid having large plank facades facing street frontages.

8.2 Landscape Mitigation

Landscape mitigation measures can be used to screen and filter views to the Project from sensitive locations. Such measures are also suitable for lower onsite infrastructure such as the workshop, the steam turbine hall (23 m) and the cooling tower (12 m). Infrastructure such as the boiler room (50 m) and the emissions stack (80 m) are not able to be screened by landscape mitigation on the site.

The preceding analysis has demonstrated the scale and extent of existing vegetation found in many areas across the Project viewshed and the influence that this vegetation plays in screening views in the area.

Viewpoints have also been captured from a range of landscape settings that exist within the Project viewshed. These viewpoints demonstrate how landscape mitigation can be effective in screening or filtering views towards the proposed Project site.

Figure 8.1 shows proposed on site landscaping. A detailed landscape plan and elevations can be found in **Appendix B**.

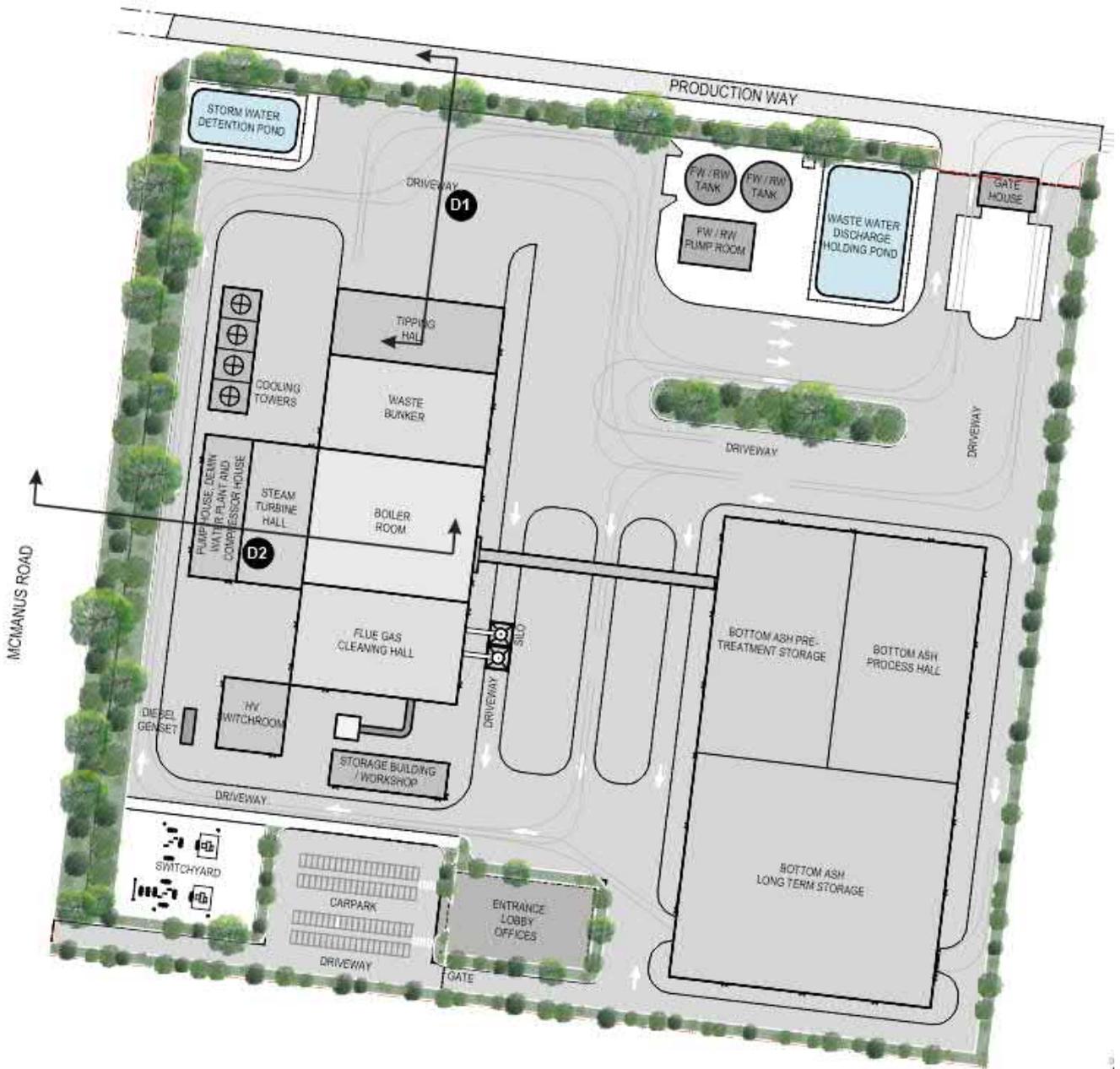


Figure 8.1 Indicative Landscaping Plan

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.

8.3 Lighting

All permanent lighting should be designed and installed in accordance with the requirements of *AS1158 Road Lighting* and *AS4282 Controlling the Obtrusive Effects of Outdoor Lighting*. An appropriate lighting management plan should be prepared to minimise the impact of lighting into adjacent visually sensitive properties and would include downward direct lights, baffling and shielding.

9. Conclusion

The Project site is located approximately 12 km north of Geelong. The site is zoned as Industrial 2 Zone (IN2Z) for the use of the manufacturing industry, the storage and distribution of goods and associated facilities. Areas such as these are not considered as being visually sensitive.

As the Project is immediately surrounded by cleared farmland and industrial areas, most views toward the site are not considered to be visually sensitive as the landscape is already highly disturbed. Some views, like those close to residential areas, public parks/reserves and Flinders Park Memorial Reserve, may be considered as visually sensitive due to the public's value of the areas.

Views of the Project from recreational reserves within the study area were assessed to be Low. Views are varied, with topography being the main determinant of whether or not a reserve affords a clear view towards the Project site.

The You Yangs Regional Park is a dominant landscape feature within the study area. The peak of the landform provides panoramic views of Greater Geelong, including views of the Project site through breaks in vegetation. Views from the peak already overlook a highly disturbed landscape, including other industrial infrastructure such as the Geelong Refinery. As a result, the predicted visual impact from the Project on this site has been assessed to be Low-Negligible.

Many views of the Project site are broken up through sporadic roadside vegetation, highlighting the effectiveness of vegetation in screening views of the project, particularly when vegetation is located closest to the viewpoint.

Appendix A. Photomontages

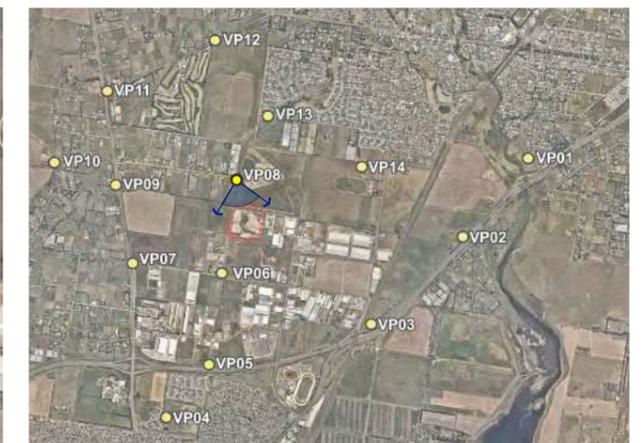
View looking south east



Existing View



Photomontage



- Viewpoint location and orientation
- Project location

View looking south east



Existing View

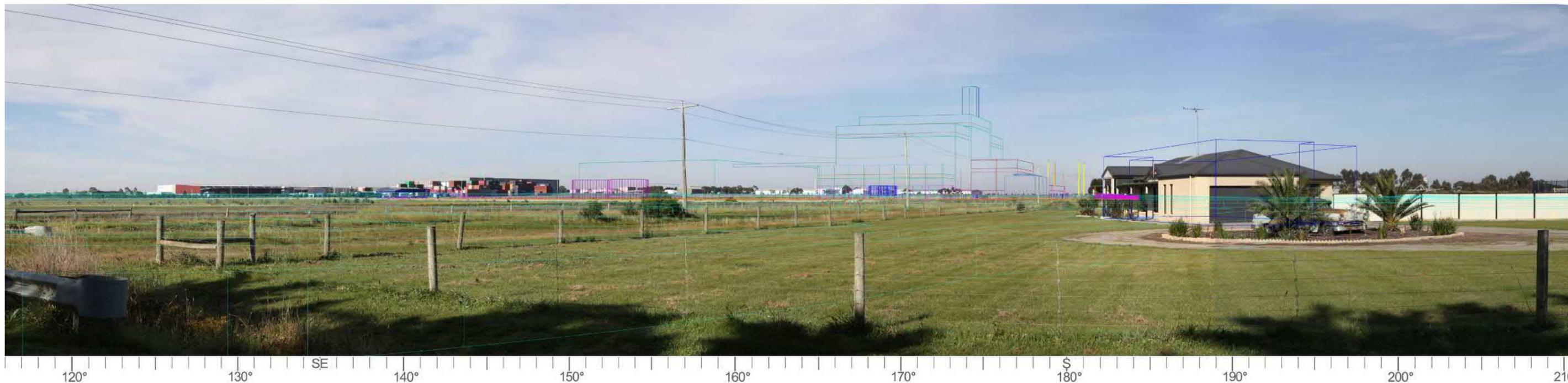


Photomontage

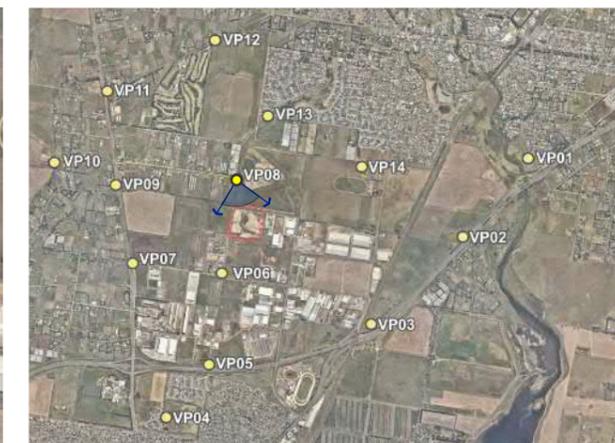
View looking south east



Wireframe - Existing



Wireframe - Proposed



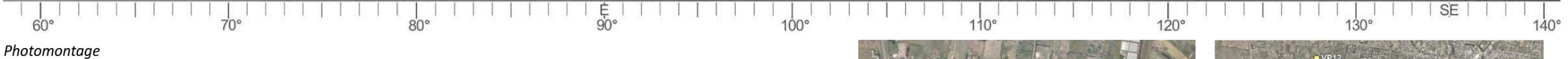
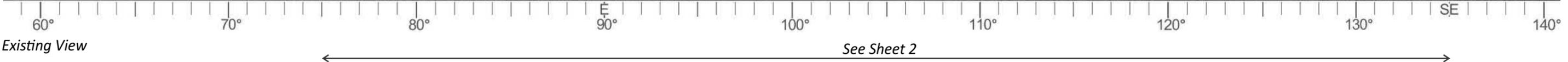
Viewpoint Map

-  Viewpoint location and orientation
-  Project location

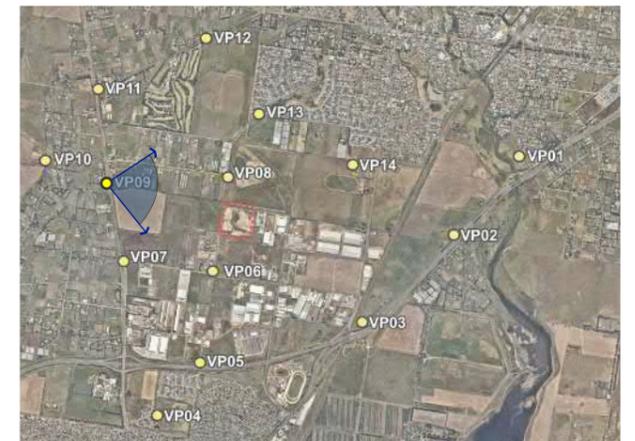
VIEWPOINT 09: BACCHUS MARSH ROAD, LARA

(GPS 55 H, 268004m E, 5786399m S)

View looking east



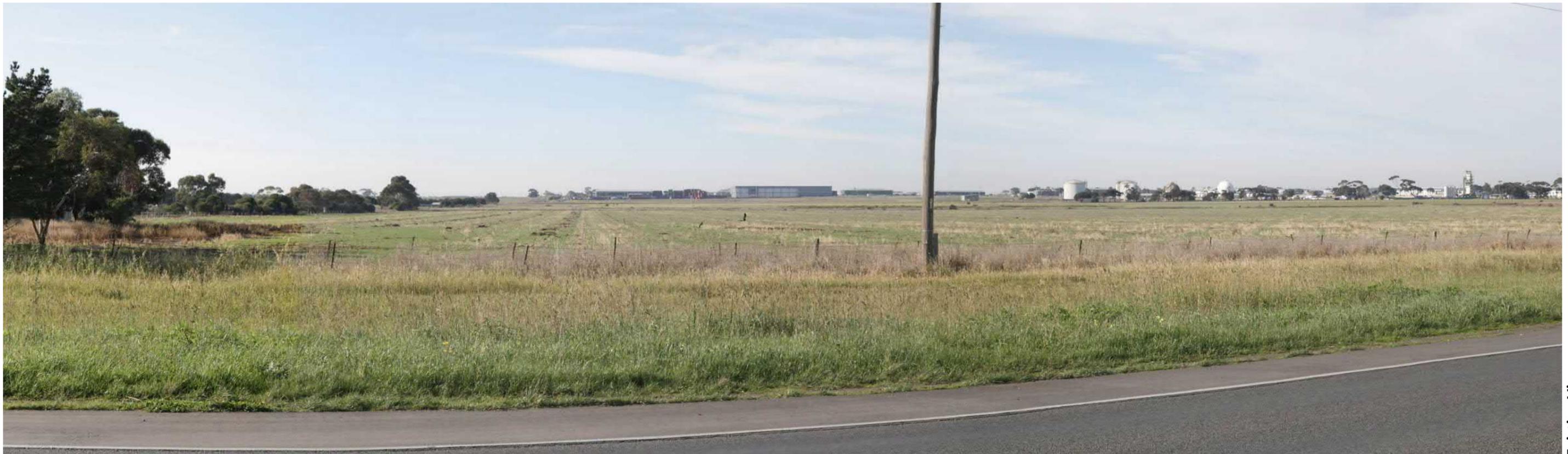
Photomontage



Viewpoint Map

-  Viewpoint location and orientation
-  Project location

View looking east



Existing View



Photomontage

VIEWPOINT 09: BACCHUS MARSH ROAD, LARA

(GPS 55 H, 268004m E, 5786399m S)

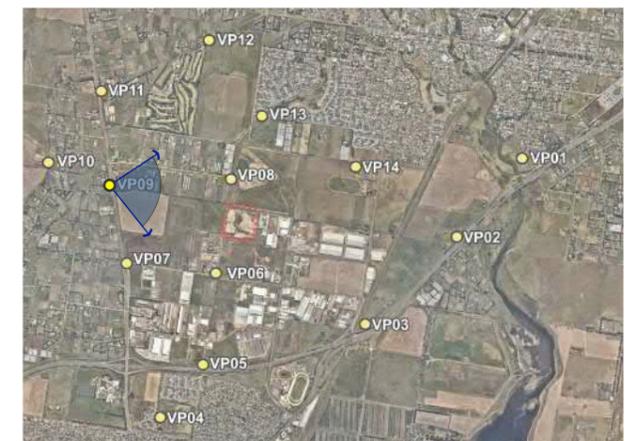
View looking east



Wireframe - Existing



Wireframe - Proposed



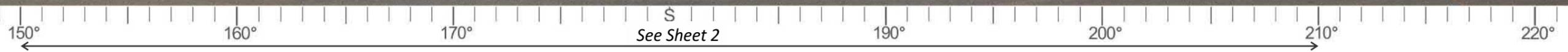
Viewpoint Map

-  Viewpoint location and orientation
-  Project location

VIEWPOINT 13: WESTLAKES BOULEVARD, LARA

(GPS 55 H, 269821m E, 5787393m S)

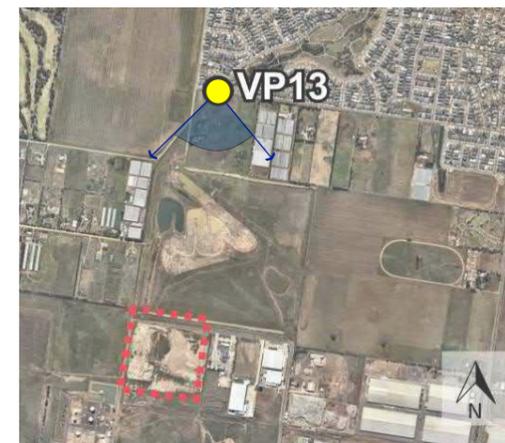
View looking south



Existing View



Photomontage



Viewpoint Map

-  Viewpoint location and orientation
-  Project location

VIEWPOINT 13: WESTLAKES BOULEVARD, LARA

(GPS 55 H, 269821m E, 5787393m S)

View looking south



Existing View



Photomontage

VIEWPOINT 13: WESTLAKES BOULEVARD, LARA

(GPS 55 H, 269821m E, 5787393m S)

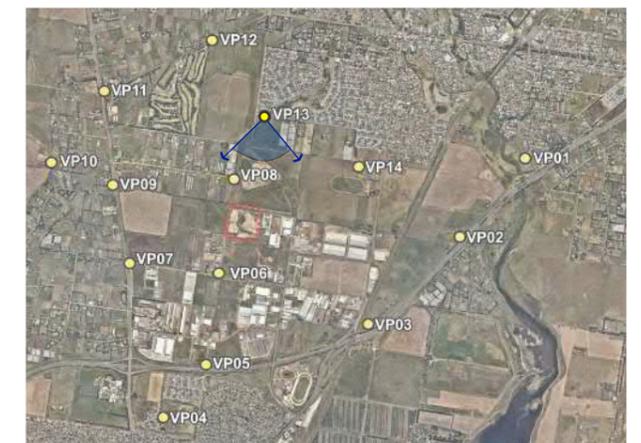
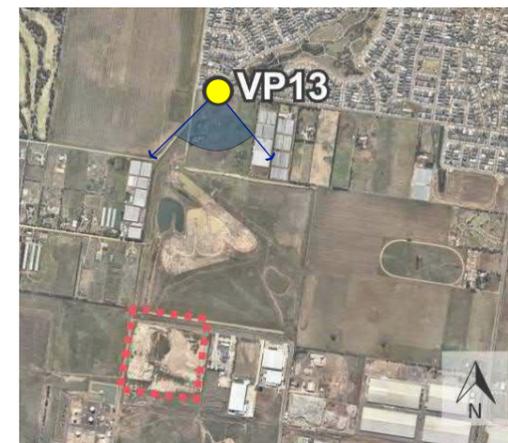
View looking south



Wireframe - Existing



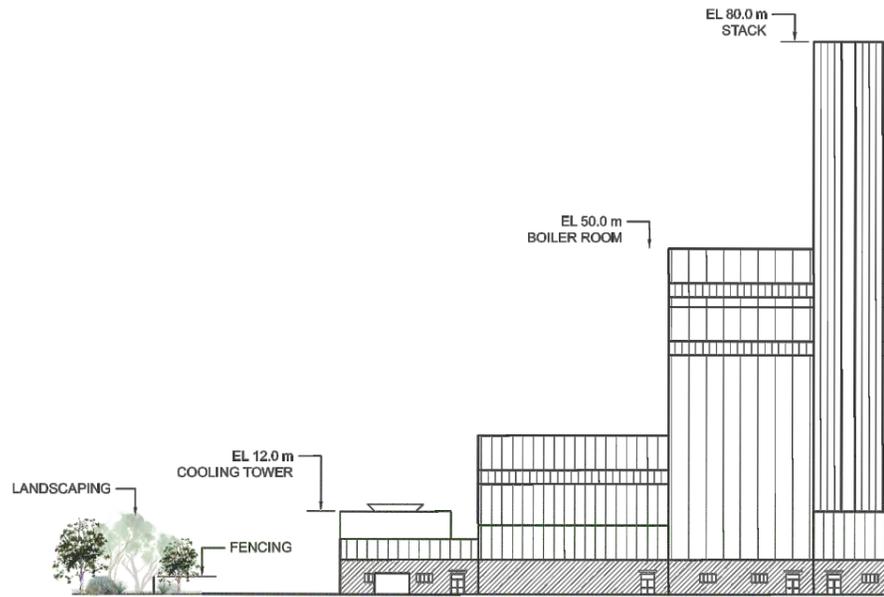
Wireframe - Proposed



Viewpoint Map

-  Viewpoint location and orientation
-  Project location

Appendix B. Landscape Plan



D1 Indicative Elevation
1:500 @ A1



D2 Indicative Elevation
1:500 @ A1

Indicative Planting Species List

Species Name	Common name	Height*	Installation size
Trees			
<i>Acacia melanoxylon</i>	Blackwood	10-20m	Tube
<i>Eucalyptus polyanthemos</i>	Red Box	10-20m	Tube
Small - Medium Shrubs			
<i>Daviesia ulicifolia</i>	Gorse Bitter-pea	2m	Tube
<i>Rhagodia parabolica</i>	Fragrant Saltbush	3m	Tube
<i>Correa glabra</i>	Rock Correa	1-3m	Tube
Grasses			
<i>Poa labillardieri</i>	Tussock Grass	0.5-1m	Tube
<i>Atriplex semibaccata</i>	Berry Saltbush	0.8m	Tube
<i>Dianella revoluta</i>	Black Anther Flax-lily	0.5m	Tube

*Height at maturity, under ideal growing conditions
Indicative species selected made in consideration of the City of Greater Geelong Indigenous plants list for Colluvial and You Yangs Plains.

