LEVEL CROSSING REMOVAL AUTHORITY

MERNDA RAIL EXTENSION PROJECT

Landscape and Visual Impact Assessment

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1. Introduction and Scope

1.1 Purpose of the Study

This Landscape and Visual Impact Assessment (LVIA) has been prepared by GHD Pty Ltd (GHD) and AECOM Australia Pty Ltd (AECOM) on behalf of Level Crossing Removal Authority (LXRA). The LVIA addresses the proposed 8km Mernda Rail Extension Project from South Morang Station to Mernda.

The purpose of this report is to assist in the technical design documentation by undertaking a LVIA as part of the broader reference design. This report provides a detailed assessment, comprising:

- Understanding the landscape and visual attributes and characteristics of the project area
- Identifying key sensitivities with regard to landscape character and visual change associated with the project
- Assessing potential landscape and visual impacts associated with the project
- Satisfying regulatory requirements under the *Planning and Environment Act 1987* (Vic)
- Provide recommendations for managing identified landscape and visual impacts arising from the project.

Visual amenity is described as "The overall pleasantness of the views people enjoy of their surroundings which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area" (Landscape Institute and Institute of Environmental Management and Assessment, 2013).

Landscape value is described as "The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons" (Landscape Institute and Institute of Environmental Management and Assessment, 2013).

1.2 Project Background

In 2014 the Victorian State Government election made a commitment to extend the metropolitan rail services from South Morang to Mernda. The project seeks to enhance connectivity to the residential growth areas through the extension of the railway line along the rail reserve to Mernda.

The project objectives include:

- Extend rail services from South Morang to Mernda
- Increase the number of people using public transport in the Mernda growth corridor, by providing better connections to employment, education, healthcare, entertainment and retail
- Bring local jobs to Yan Yean, tackle congestion and kick start the Mernda Town Centre
- Provide integrated transport and land use along the rail reserve between South Morang and Mernda.

1.3 Project Description

The Mernda Rail Extension Project (MREP) is a proposed new dual track electrified rail line from the existing South Morang station to Mernda. The extension is approximately 8 km in length and predominantly within an existing rail reserve. New stations are proposed at Mernda and near Marymede Catholic College. Provision is made for a third station near Hawkstowe Parade that bidders would be asked to price.

MREP also includes stabling facilities, a transport interchange at Mernda, and car parking at each of the railway stations. To ensure no new level crossings, the following road crossings would be grade separated from the new rail line:

- McDonalds Road,
- Plenty Road & Gordons Road,
- Hawkstowe Parade,
- The Parkway (and Simons Creek), and
- Bridge Inn Road.

A high voltage cable would be installed within the existing operational rail reserve from Epping Substation, through the existing South Morang Tie-Station and up to Hawkstowe, to provide extra traction power infrastructure.

The proposed new rail infrastructure would be located within the existing rail reserve between South Morang and Mernda, generally following the alignment of the original Whittlesea rail line that was decommissioned in 1959. The project area includes additional land required for a new transport interchange and car park at Mernda station, as well as some land parcels that would provide for temporary construction laydown areas, temporary construction access and for ancillary works associated with drainage and road modifications.

A map of the project area is shown on Figure 1.

1.4 Study Area

For the purposes of this assessment, the key area of focus is considered to be those areas within a 1 km radius of the proposed infrastructure between South Morang and Mernda (refer to Figure 2).

The landscape and visual impact of the proposed high voltage cable within the existing operational rail reserve from Epping Substation to South Morang Station is expected to be visually absorbed into the background and to have a negligible impact, and is therefore not a focus of this assessment.

Given the potential for the project to be visible from further afield (greater than 1 km), particularly from elevated areas, the extent of the overall study has therefore been defined as all land within 5 km of the proposed infrastructure between South Morang and Mernda. Beyond this area, it is anticipated that the combined effects of distance, atmospheric conditions, intervening landform, built form and vegetation would combine to render landscape and visual impacts negligible.

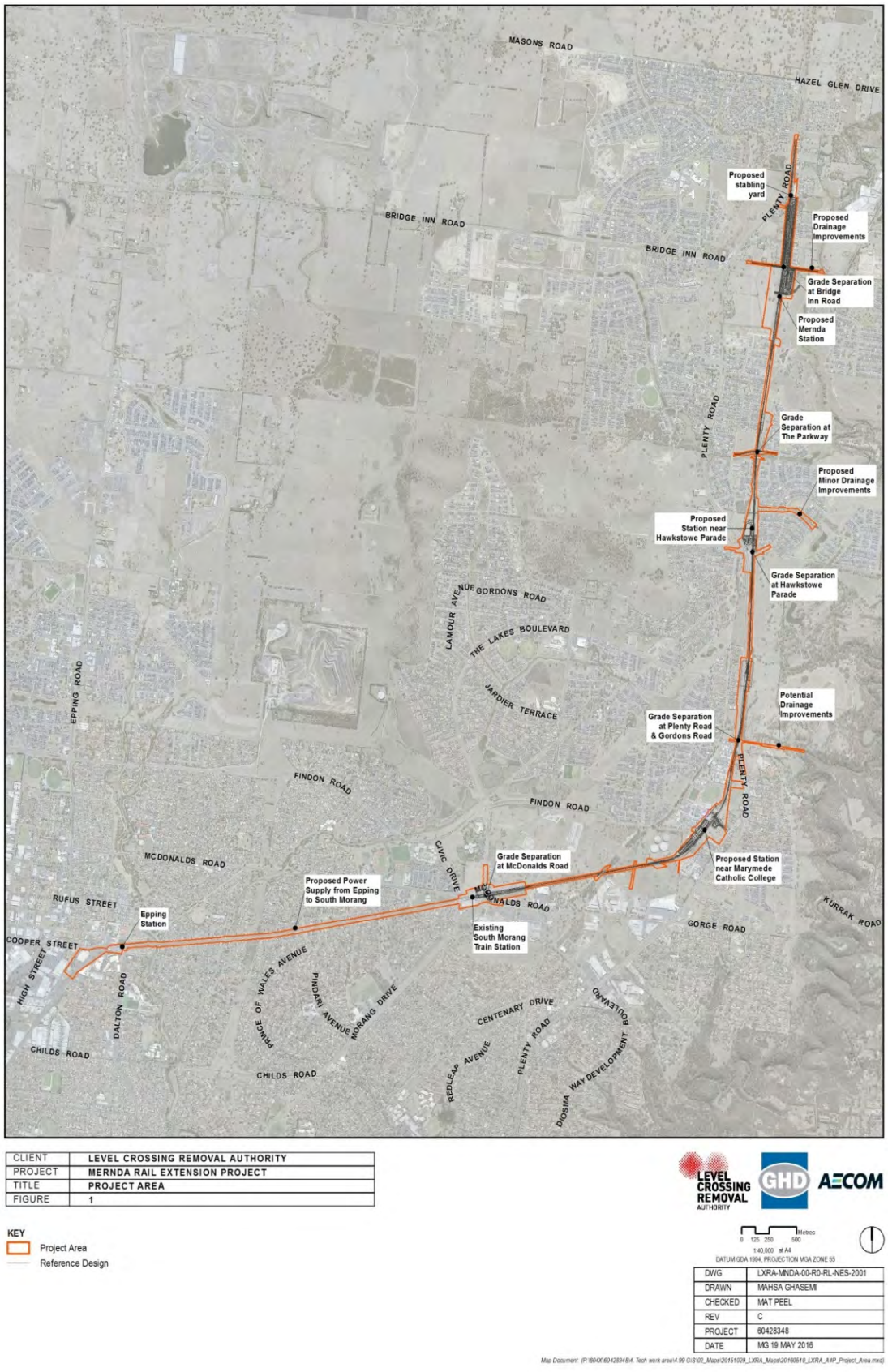


Figure 1 Site Location

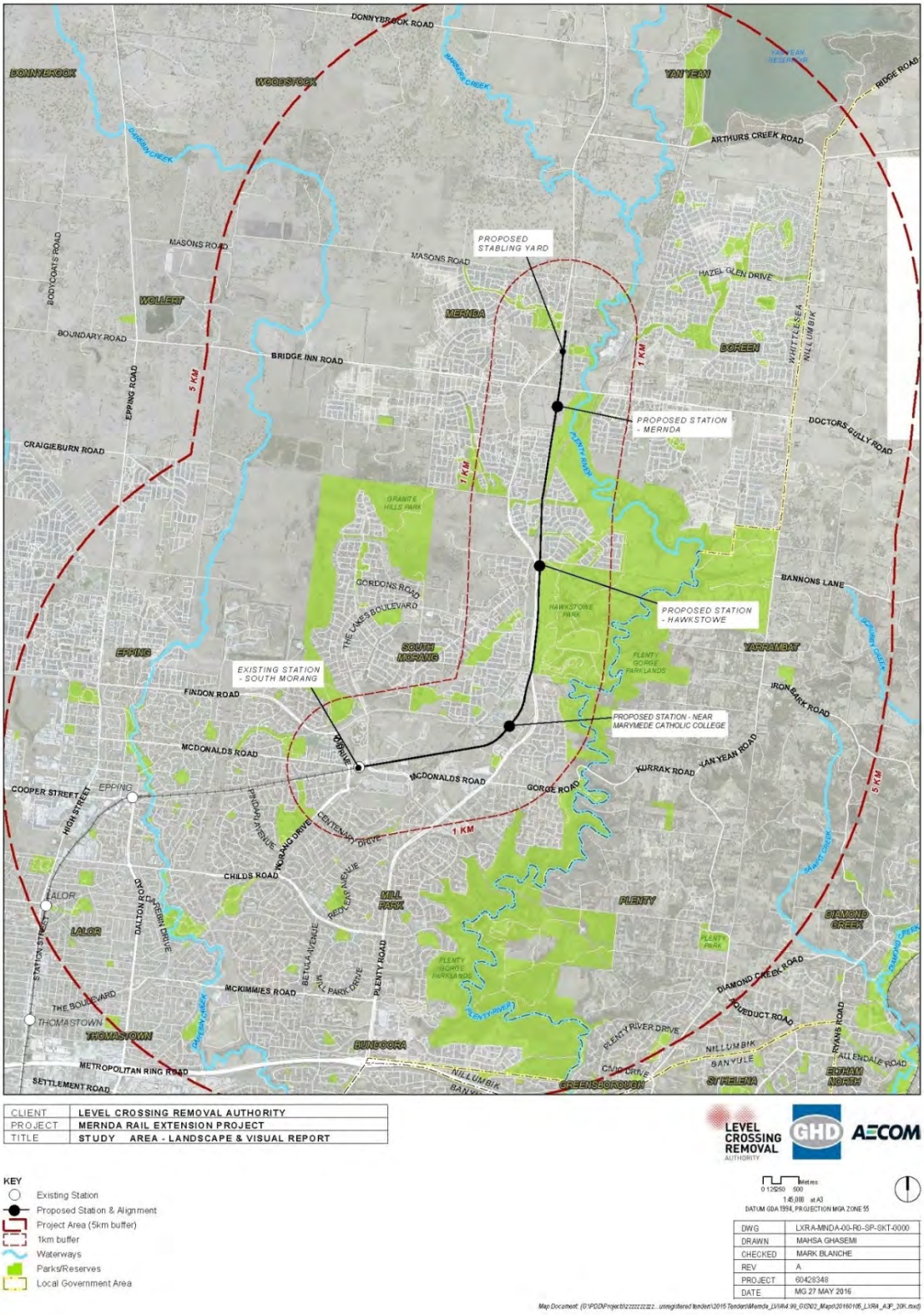


Figure 2 Study area

1.5 Site Assessment

A site visit was undertaken by two AECOM team members on 14 January 2016 to understand the project area and take photographs to confirm and illustrate key views, and to illustrate the landscape character of the existing area for the purposes of the project.

A further site inspection was undertaken by two AECOM team members on 4 May 2016 to confirm initial findings from representative receiver locations, and to view examples of recent new stations at night (South Morang Station and Epping Station). The night inspection was undertaken to gain an appreciation of lighting levels from the two stations with associated car parking, and the train stabling facility at Epping Station. These stations were considered to provide a reasonably good analogue for lighting levels that could be expected from the project stations, carparks and stabling facility.

2. Methodology

The methodology focusses on identifying the key likely or potential impacts on landscape and visual receptors including community members. The study methodology involves the following key tasks:

1. Understand and describe the character of the landscape within which the project is set (including the mapping of landscape character zones), via desktop studies and site work, as a means of establishing a baseline against which impacts associated with the alignment can be assessed
2. Provide an overview of the project within the context of the proposed urban design and landscape concept
3. Understand the planning and policy setting for the project with regard to landscape character and visual amenity, through a review of relevant legislation, planning policy and planning studies, including any existing urban and landscape design objectives determined as part of the project planning and design process
4. On the basis of the above, define a project area
5. Undertake a landscape character impact assessment
6. Determine the visibility of the project
7. Identify key existing viewpoints
8. Assess visual impacts of the project (based upon the reference design, and assuming the landscape to be at an early stage of development, i.e. 12-18 months after completion)
9. Assess the extent to which the project meets the landscape planning objectives for the project area
10. Provide mitigation measures which may further reduce landscape and visual impacts of the project.

There is no accepted national or state level published guidance on landscape and visual amenity impact assessment specific to Australia. Therefore, the assessment is made with reference to an understanding of techniques set out in documents such as The Guidelines for Landscape and Visual Impact Assessment, Third Edition (2013) developed by the (United Kingdom) Landscape Institute and Institute for Environmental Management, the Western Australian Planning Commission's Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design (2007), and Guideline for Landscape Character and Visual Impact Assessment (v.2) by NSW Transport - Roads and Maritime Services.

2.1 Desktop Assessment

Key resources have been identified and reviewed as a component of the desktop analysis. These include:

- Reference design developed by GHD/AECOM
- Planning zones and overlay schemes, policies and guidelines
- GIS analysis of the topography
- Digital aerial imagery from LXRA/GHD/DEPI/DTPLI
- Google Earth imagery.

2.2 Assessment Limitations

Assessment limitations associated with this project comprise:

- Due to the reference design stage of project development at the time of this assessment, detailed design of elements was not available. However, the reference design was considered to be generally well-developed, sufficient in particular to provide a substantial level of confidence with the vertical alignment plans, which are likely to be close to the final design. This level of design development is considered sufficient for the key potential impacts of the project to be assessed.
- All representative views were assessed from publicly accessible locations, e.g. representative views similar to those likely to be obtained from Marymede Catholic College and residential areas were obtained from publicly accessible areas without entering school / private land.
- Assessment was not undertaken for alternative at-grade station options.
- Passenger views from the train were not formally assessed as a representative receiver location, although they were considered when assessing other relevant representative receiver locations.
- Areas around the proposed stations are proposed for future development, including land within the rail reserve. Given that the timing or precise nature of this development is unknown at the time of writing, it is noted within the descriptions of anticipated views, but not assessed.
- Information with regard to noise wall heights along the length of the rail reserve other than for the stabling yard were shown at the time of writing as being between 1.5m and 2.5m in height. For the purposes of assessing visual impact, these noise walls were assessed as 'worst case', being 2.5m in height.

2.3 Assessment of Landscape Impacts

Landscape character refers to a distinct and recognisable pattern of elements that occur consistently in a particular type of landscape. Particular combinations of geology, landform, soils, vegetation, land use and human settlement create character, which makes each part of the landscape distinct and gives each its particular sense of place.

Assessment of landscape effects deals with the effect of change and development on landscape as a resource.

The concern here is with how the proposal would affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character (Landscape Institute and Institute of Environmental Management and Assessment, 2013).

The consideration of potential impacts on landscape character has been determined based on an assessment of the sensitivity of the existing landscape to change and the magnitude of change that is likely to occur.

The sensitivity of a landscape is judged on the extent to which it can accept change of a particular type and scale without adverse effects on existing landscape character. The level of sensitivity is determined based on:

- The landscape's inherent values (e.g. perceptual qualities, cultural importance) and any specific values that may apply such as planning overlays related to landscape or visual amenity

- The landscape's ability to absorb changes associated with the project (e.g. the extent to which the project may fit or be absorbed into the landform, land use, pattern, scale or texture of the existing landscape).

The magnitude of change to landscape character depends on the nature, scale and duration of the change that is expected to occur. The magnitude of change also depends on the loss, change or addition of any feature to the existing landscape. It is based on that part of the landscape character type which is likely to be impacted to the greatest extent by the project (i.e. worst case scenario).

2.4 Assessment of Visual Impacts

Assessment of visual impacts deals with the effects of change and development on the views available to people and their visual amenity. It assesses how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. This can also apply to the visual effects of lighting, including the predicted effects of light levels on night-time visibility (Landscape Institute and Institute of Environmental Management and Assessment, 2013).

Visual receptors were considered in terms of the people within the project area who have the potential to be affected by views of the project. This includes consideration of any key vantage points, such as lookouts or other locations where there is particular interest in the view, and night-time views, including within the context of 'dark' landscapes. Visual receptors were identified based on:

- Proximity of the receptors to the project, as the most affected visual receptors are anticipated to be located closest to the project, unless located at an elevated vantage point
- Type of receptor (e.g. residents, those passing through the area by vehicle, pedestrians or workers) as different viewer types would have different perceptions of and concern about the change.

The evaluation of potential impacts on visual amenity was based on the sensitivity of the viewpoint, and the visual receptors it represents, to the proposed change and the magnitude of change that is likely to occur.

The sensitivity of each viewpoint is considered to be dependent on the:

- Importance of the view, its existing scenic qualities and the presence of other existing manmade elements in the view
- Type of visual receptor audience and their likely interest in the view
- Angle of view
- Number of visual receptors and the duration of time that receptors spend experiencing the view.

The magnitude of change to views and visual amenity depends on the nature, scale and duration of the proposed change that is expected to occur. The magnitude of a change also depends on the loss, change or addition of any feature in the field of view of the receptor including an assessment of the level to which the change contrasts with the existing view or expected view of the landscape. This includes the degree of any change to the backdrop to, or outlook from, a viewpoint.

There are no established distance thresholds for the assessment of impacts as visibility is affected by a whole range of factors including elevation, slope, land cover and the nature of the project being assessed in relation to the existing setting. However, typically at very close distances a dominant change results, diminishing in magnitude of change as distance increases.

2.5 Impact Significance

The significance of impact is determined by combining a judgement of magnitude and sensitivity, as indicated in the following table:

Table 1 Impact assessment matrix

		Magnitude of change			
		Very High	**High**	**Medium**	**Low**
Sensitivity	**High**	Major	Moderate to Major	Moderate	Minor to Moderate
	Medium	Moderate to Major	Moderate	Minor to Moderate	Minor
	Low	Moderate	Minor to Moderate	Minor	Negligible
	Negligible	Minor to Moderate	Minor	Negligible	Negligible

Using this table as a guide, a judgement is made regarding the level of significance of the impact, which is described as being negligible, negligible to minor, minor, minor to moderate, moderate, moderate to major or major. There is often a gradual transition between levels of significance; and where impacts lie on the borderline they may be described, for example as minor to moderate.

3. Study Area Context

The Mernda Rail Extension is an 8 km rail reserve starting at the existing South Morang Station at McDonalds Road in South Morang running mostly south to north along the existing rail reserve, running parallel to Plenty Road terminating close to Plenty Road & Hayes Rd in Mernda. The rail reserve is within the City of Whittlesea Local Government Area traversing suburbs of South Morang and Mernda. The Shire of Nillumbik is 600 m to the east of the rail reserve and the following suburbs are nearby; Epping, Mill Park, Yarrambat and Doreen (refer to Figure 2).

3.1 Landform

The terrain along the 8 km rail reserve is illustrated in Figure 3: Elevation & Figure 4: Slope. As these figures illustrate, the terrain along the rail reserve is relatively flat, 143 m (AHD) at South Morang Station, rising to 165 m (AHD) in the north above Bridge Inn Road. The closest hills/ridgeline to the alignment incorporates Granite Hills Park, starting at 210 m west of alignment (north of The Lakes Boulevard) and rising to 265 m (AHD) further north, located 2 km west from Plenty Road between McArthur Road and Hunters Road. Beyond this is Quarry Hill at 270 m but approximately 3 km from the alignment. There is a smaller ridgeline in Yarrambat, rising to 210 m (AHD), approximately 3 km west from the rail reserve.

Plenty River flows in a north to south direction east of the rail reserve. At its closest the river is approximately 220 m from the proposed Mernda Station, and generally beyond 500 m and up to approximately 2.3 km from the rail reserve. The river sits in a small incised valley form lower than the rail reserve, starting at 10 m below at Bridge Inn Road to approximately 50m lower near Gorge Road in the south.

The corridor is predominately less than 1/10 slope grade, however there are some small sections of greater slope 1:10 along Plenty Road. The steepest slopes near to the rail reserve are Plenty River which is greater than 1:3 along gully edges. The slope grade up to Granite Hills Park is up to 1:3.

3.2 Land Use

The Mernda Rail Extension Project sits primarily within an existing rail reserve, which has a long history of use. The rail reserve was spawned in 1853 as part of the Yan Yean water supply project, and comprised a 19 mile long tramway (Yan Yean Tramway) constructed adjacent to the route of the pipeline between Yan Yean and Melbourne. The tramway was abandoned at the conclusion of the project, to be replaced in 1889 by a railway line to the township of Whittlesea. This in turn was closed beyond Epping in 1959 (GHD / AECOM 2016a).

The rail reserve is part of Melbourne's rapidly growing Northern Growth Corridor, providing a connection between the South Morang and Mernda Principal Activity Centres, with land uses including low density residential, schools, commercial and utilities sites, open space and parklands, and some rural lots to the north, in addition to farming and protected landscapes. The rail reserve is owned by VicTrack and zoned for rail use (see Figure 5: Land Use).

At the existing South Morang Station, adjacent land use includes large commercial, community and utility parcels. These include the Westfield Plenty Valley shopping centre and associated carpark, City of Whittlesea council offices and the large SP AusNet South Morang Terminal Station. Land use close to the proposed Station near the Marymede Catholic College comprises the Marymede Catholic College to the north, and a mix of low density residential lots and vacant land, and an aged care residential community to the north east. From Gordons Road to the proposed Hawkstowe Station, the rail reserve follows the Plenty Road alignment, with

adjacent land use comprising predominantly of low density residential and large undeveloped open space lots on the western side of Plenty Road, with Hawkstowe Park on the east.

North of proposed Hawkstowe Station, adjacent land use comprises low density residential lots and linear open space corridors. The alignment crosses the newly constructed Simmonds Creek Wetlands, with a vacant lot to the North West where a school is planned. The land use on the west comprises predominantly newly built low density residential lots, with the North West land use a combination of Goulburn Park and Plenty Gorge Parklands. North of this location, much of the adjacent land is undeveloped with land to the west is the site zoned for the Mernda Town Centre. North of Bridge Road Inn, land use comprises large rural lots on the west, and earlier period low density residential lots on the east, with Mernda Recreation Reserve and Community Centre.

3.3 Vegetation

Vegetation within the rail reserve consists of a combination of remnant, urban and cultural plantings. Remnant vegetation includes both patches of Ecological Vegetation Class (EVC) vegetation as well as scattered remnant trees (AECOM / GHD 2016b).

As illustrated in Figure 6 and outlined in the Ecological Assessment Report for the project, the majority of remnant EVC vegetation within 1 km of the rail reserve comprises sporadic patches of disturbed Plains Grassy Woodland with a River Red Gum overstorey, with many trees containing hollows which have habitat value (ibid.).

Sections of Riparian Scrub/Swampy Riparian Woodland Complex, Escarpment Shrubland, Plains Grassy Wetland, and Creekline Herb-rich Woodland are also present along the Plenty River gully running east of the rail reserve. Further from the rail reserve to the west near Granite Hills Park contains patches of Granite Hills Woodland along with Grassy Dry Forest and Valley Grass Forest. Beyond 1 km south east of the rail reserve are more prominent patches of Grassy Dry Forest and Swampy Riparian Complex continuing up to 5 km.

Scattered remnant trees were recorded within the rail reserve, consisting predominantly of Red River Gums, with several Swamp Gum species including *Eucalyptus ovata*. Also of significance is the presence of the *Environmental Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) listed Matted Flax-lily *Dianella amoena* (ibid.).

Vegetation resulting from urban development near the rail reserve includes street tree planting, vegetation within residential lots, commercial areas and parklands. Included in this is a combination of native and exotic species of varying ages, with native species dominating the streetscape planting palette, providing a cohesive palette for the integration of large remnant urban eucalypts.

The southern sections of the rail reserve are also substantially defined by native trees which line the old rail tracks (AECOM / GHD 2016a).

Existing cultural plantings include those related to the historical rural character of the region. The Ecological Assessment found several planted eucalypts within the study area such as Sugar Gum (*Eucalyptus cladocalyx*) and Blakely's Red Gum (*Eucalyptus blakelyi*) (AECOM / GHD 2016b). Within this context, Sugar Gum has been widely planted beyond its native range in southern Australia, as either an ornamental tree, a windbreak or in timber plantations. It has escaped from many of these plantings and is now regarded as an environmental weed in Victoria, where it is thought to pose a serious risk to lowland grasslands, grassy woodlands, dry sclerophyll forests, riparian vegetation and rocky outcrop vegetation in Victoria.

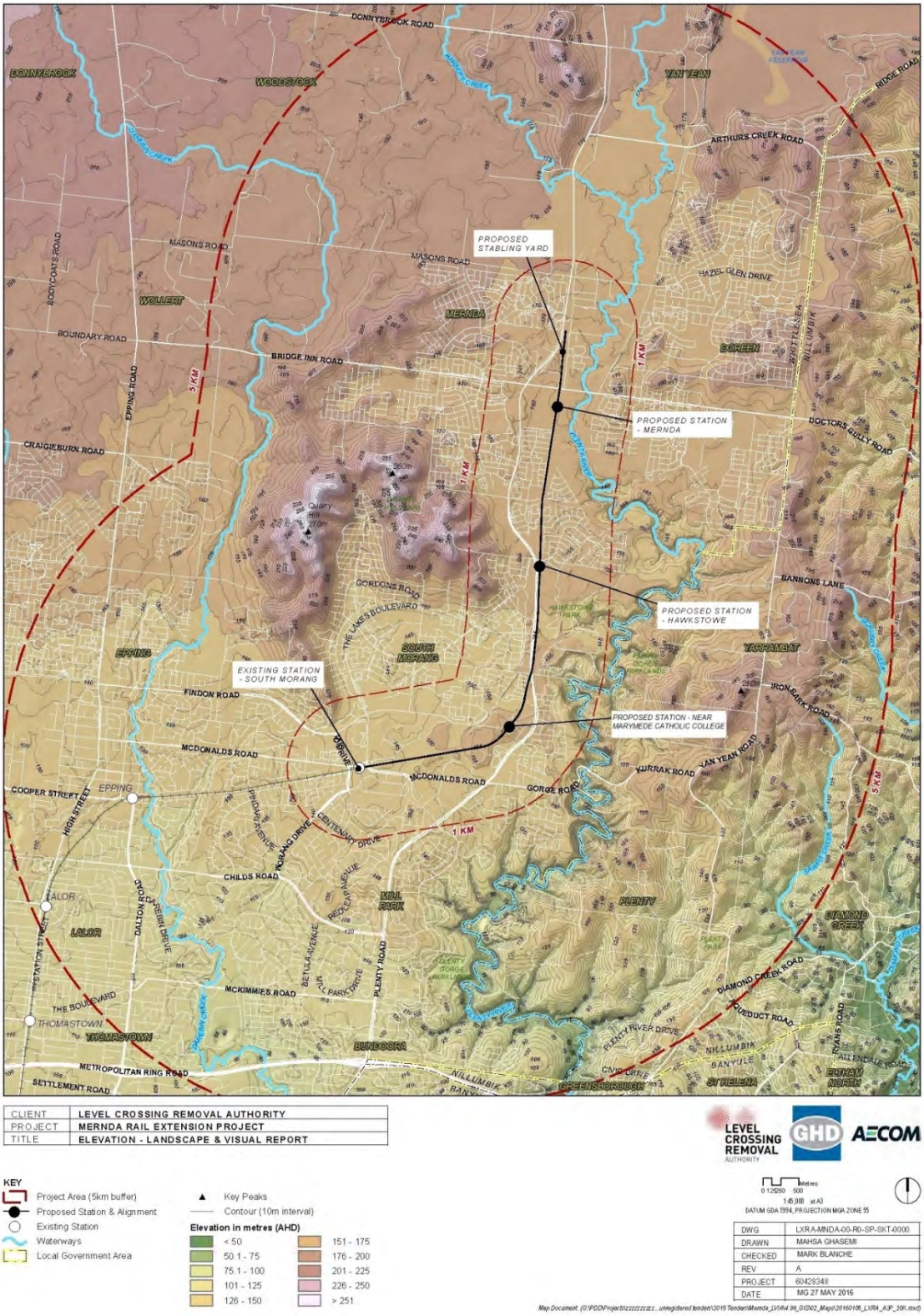


Figure 3 Elevation

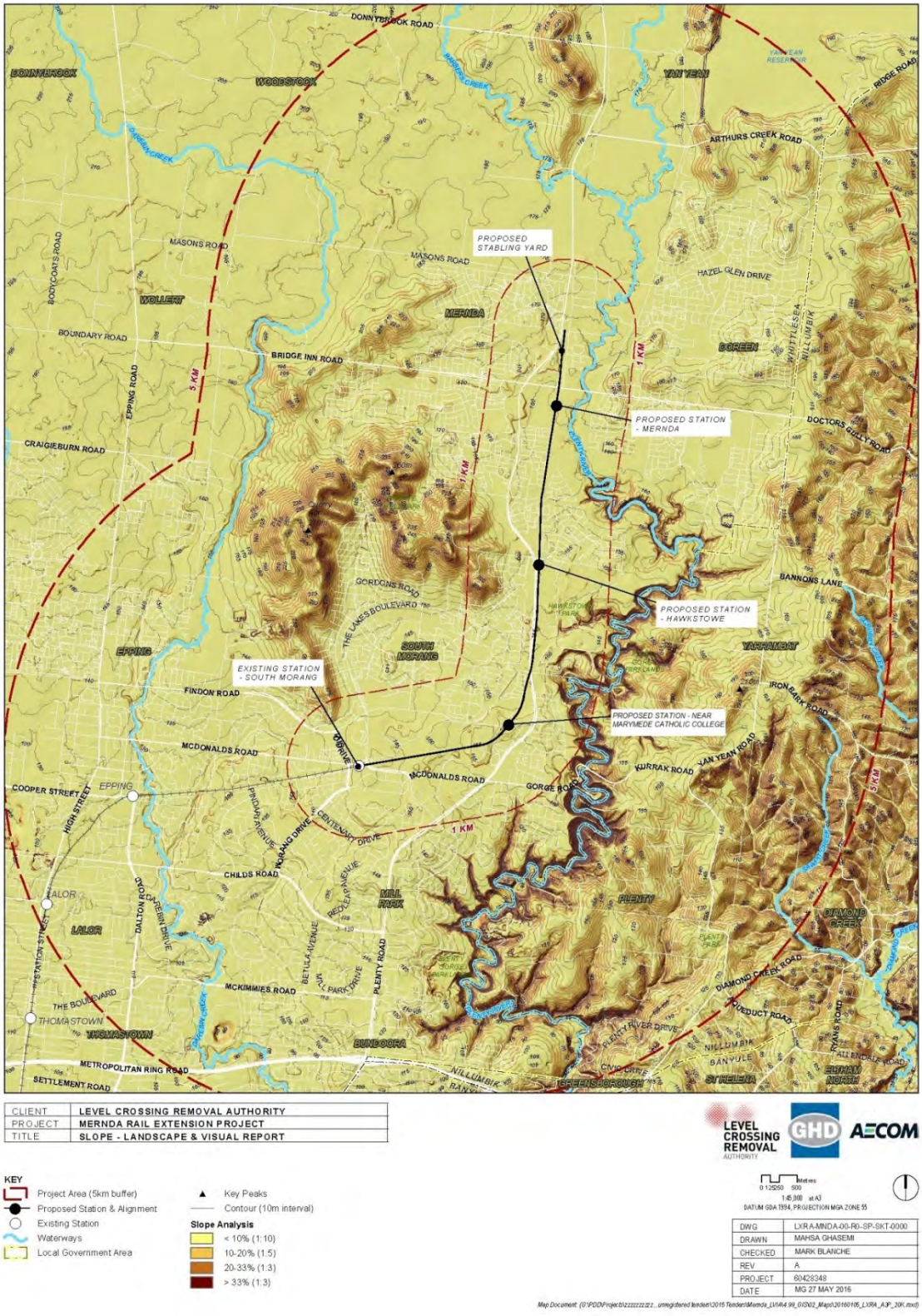


Figure 4 Slope

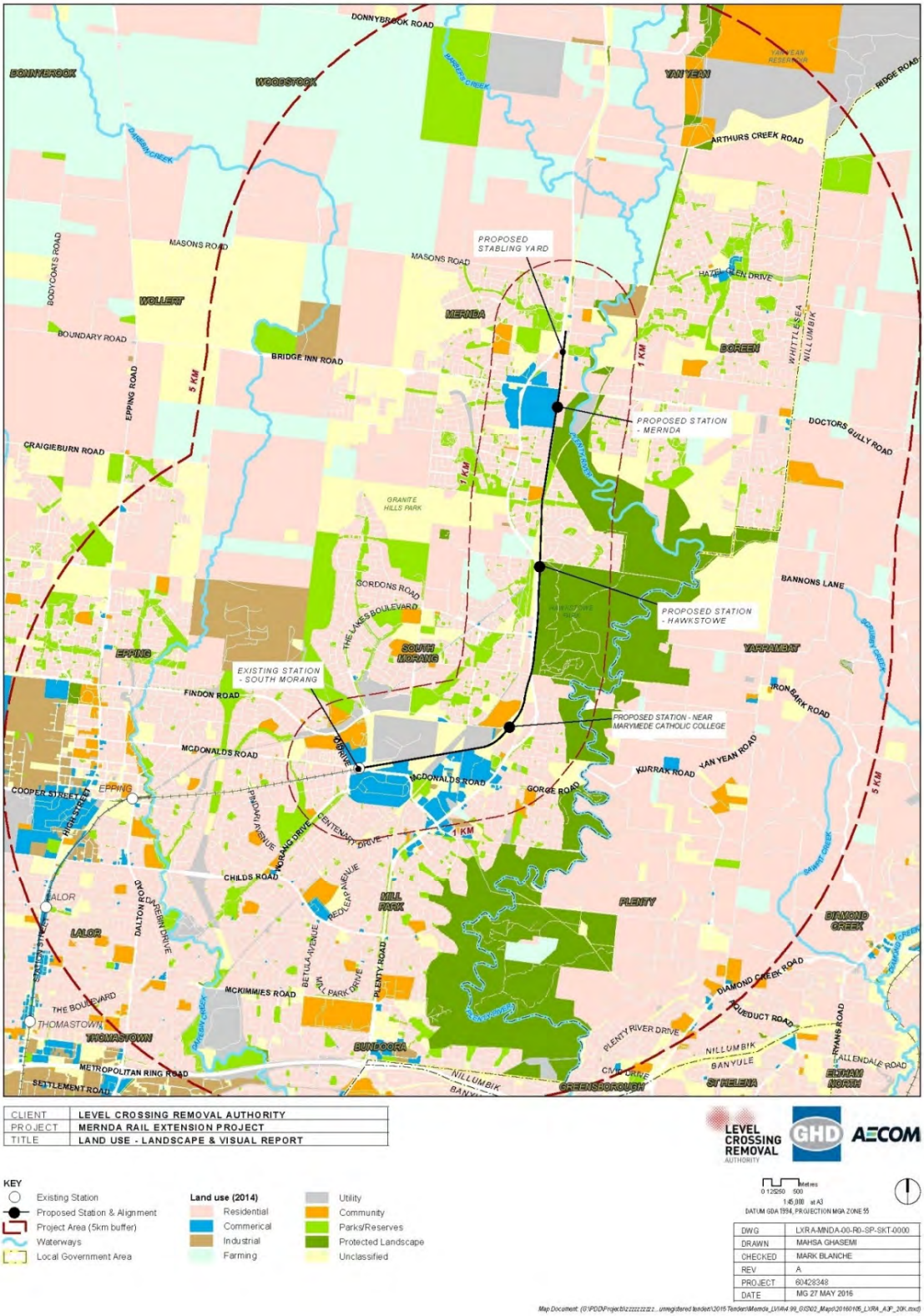


Figure 5 Land Use

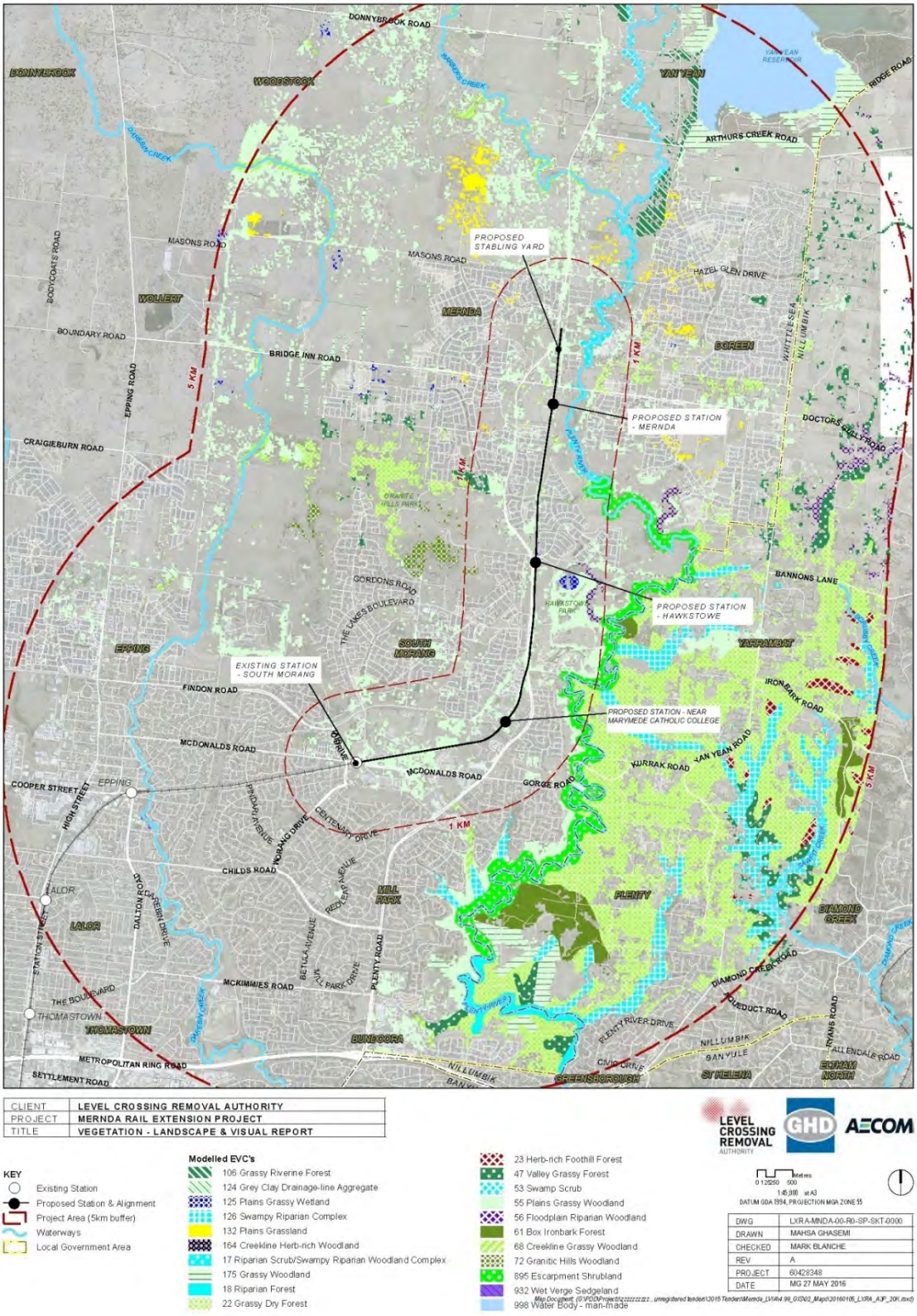


Figure 6 Vegetation

3.4 Landscape Character Types

Based upon the assessment of the natural and cultural influences that shape the landscape and visual context of the study area, Landscape Character Types (LCTs) have been identified below.

Each character type identified represents a relatively homogenous character based on the consideration of the following attributes:

- Landscape value (e.g. landscapes designated for their scenic or landscape importance or valued recreational function)
- Landscape elements that contribute to defining character e.g. residential, river/creek corridors, rural and landform, etc.
- Landscape character attributes (including scale, grain and perceptual characteristics such as the sense of remoteness, tranquillity and/or its perceived rural character).

The LCTs are outlined below and defined in Figure 7.

- LCT1: Flat Residential
- LCT2: Undulating Large / Rural Lots
- LCT3: Flat Rural
- LCT4: Undulating Rural
- LCT5: Undulating Rural Conservation
- LCT6: River Corridor
- LCT7: Utility Reserves
- LCT8: Yan Yean Reservoir

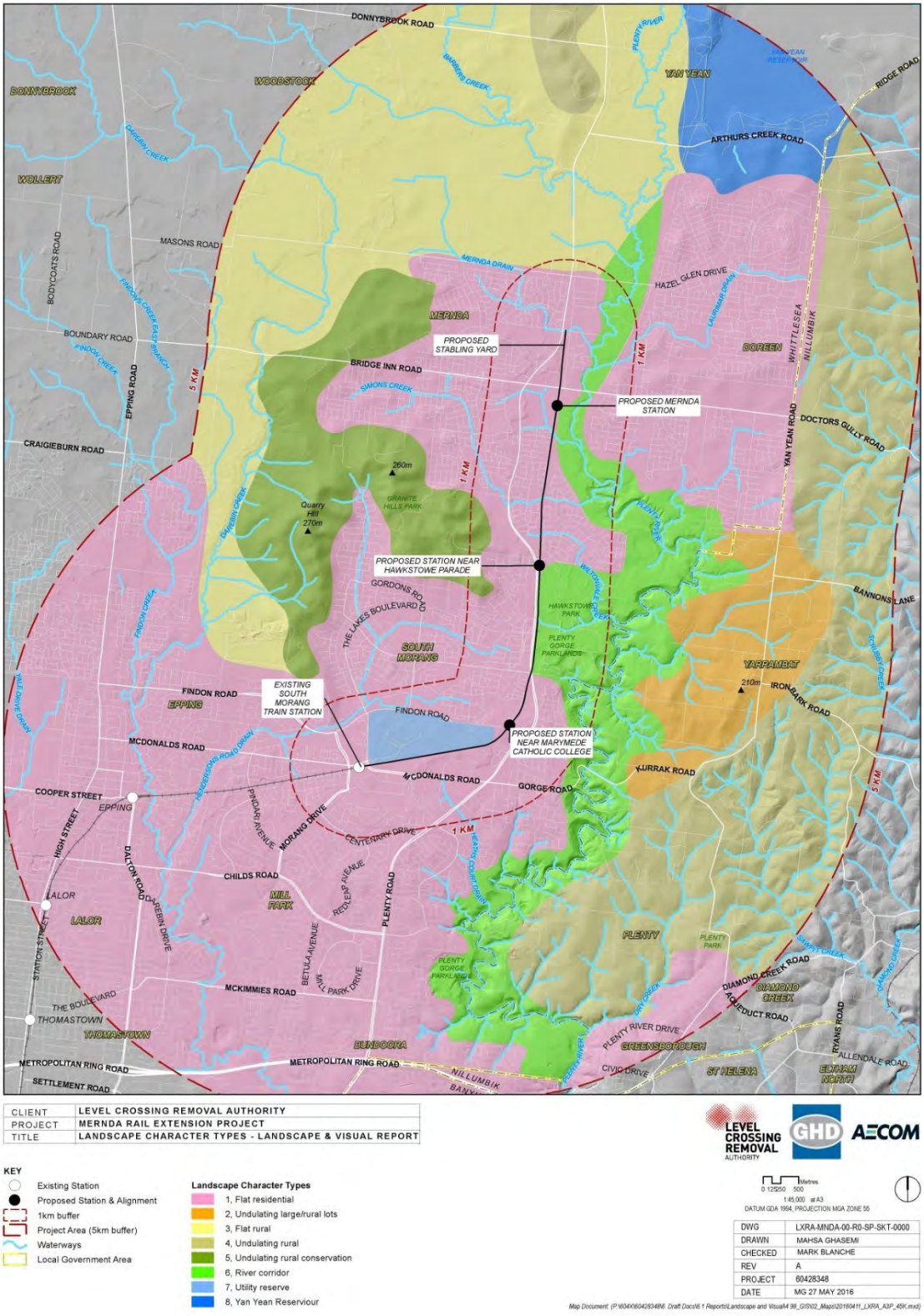


Figure 7 Landscape Character Types

3.4.1 LCT1: Flat Residential

The Flat Residential landscape character type is located within the low-lying flood plains of the Plenty Valley, topographically contained by the Quarry Hills to the west and the southern ridgeline of the Plenty Ranges to the east (City of Whittlesea 1997). This relatively flat valley has been extensively cleared for agriculture over time, and is now a key urban growth area for the City of Whittlesea. Land use therefore consists of a combination of old and new predominantly residential urban development, with some undeveloped land earmarked for future development such as for the Mernda Town Centre.

For the purposes of this assessment, commercial development has been included within this LCT. Commercial areas include the established Epping Activity Centre to the west, and the developing South Morang and Mernda/Doreen.

Existing historic development within this LCT includes the Whittlesea rail corridor and associated relics, and the Yan Yean Pipe Track cycleway.

Built form ranges from typically single and double storey housing within estates, up to four storeys in some locations. The commercial buildings primarily comprise 'big box' / large shed form and are grouped adjacent to the utility reserves (LCT 7). Scattered remnant mature vegetation amongst urban development, as well as establishing new street tree plantings combined with built form tend to restrict views in many locations within LCT1. However, views from occasional high points within Doreen look out over adjacent urban development and to the distant Quarry Hills landscape. Figure 8 illustrates the landscape character of the Flat Residential landscape character type.

Figure 8 Typical character of LCT1

3.4.2 LCT2: Undulating Large / Rural Lots

The Undulating Large / Rural Lots landscape character type is confined to the western slopes of the ridgeline at Yarrambat, east of Plenty River. This character type is distinguished from LCT4 Undulating Rural with a change in land use zoning, with the primary zoning here being 'Low Density Residential'. The topography is undulating with a gentle drop in elevation towards Plenty River and associated parklands to the west. Also similar to LCT4, mature stands of native remnant predominantly Grassy Dry Forest vegetation is interspersed with open paddocks and rural roadways. From the more urban Yan Yean Road streetscape, long views exist to the west across the Plenty River flats.

Figure 9 illustrates the character of the Undulating Large / Rural Lots landscape character type.

Figure 9 Typical character of LCT2

(Source: Google 2016)

3.4.3 LCT3: Flat Rural

The Flat Rural landscape character type lies to the north-west of the study area beyond the current urban growth extent of the City of Whittlesea. The area includes rural residential farming development upon the flat plains of the Plenty Valley and basalt Western Plains towards Woodstock (City of Whittlesea 1997). Scattered remnant eucalypt paddock trees and cultural fence-row plantings define open agricultural farming land. Residences are set back far from the roadway and often somewhat protected from view by vegetation. A large Boral quarry exists to the south of Quarry Hill adjacent to Darebin Creek.

Dry basalt stone walls to property entries enhance the rural character of this region. Concentrated bands of mature River Red Gum trees throughout this region are also defining visual and cultural features in the landscape (City of Whittlesea 1997).

Figure 10 illustrates the landscape character within Flat Rural landscape character type.

Figure 10 Typical character of LCT3

3.4.4 LCT4: Undulating Rural

The Undulating Rural landscape character type runs in a north-south direction stretching from Yan Yean Reservoir, along the ridgeline and undulating hills east of Doreen, meeting the Plenty River at a slightly lower elevation to the south. This character type primarily consists of rural density residential development zoned 'Rural Conservation'. Stands of mature native vegetation interspersed with open paddocks and gently undulating hills create a pleasant rural atmosphere. Residences are set back from informal roadways and often partially shielded from view. The undulating treed topography protects views from lower-lying urban development, preserving the rural character. Significant amounts of remnant EVC's exist within this character type, with particularly large and widespread amounts of Grassy Dry Forest.

Figure 11 illustrates the landscape character within Undulating Rural landscape character type.

Figure 11 Typical character of LCT4

(Source: Google 2016)

3.4.5 LCT5: Undulating Rural Conservation

The Undulating Rural Conservation landscape character type is defined by the Quarry Hills which form the western edge of the Plenty Valley (City of Whittlesea 1997). Rising to more than 250 m (AHD), this series of sparsely vegetated hills are a dominant landscape feature contrasting with the adjacent plains and intensive urban development of the growth area. Land use consists of residential, parkland, farming and rural conservation, with Granite Hills Park and Quarry Hills Bushland Park located on the highest elevations. Some existing remnant vegetation includes that from the Grassy Dry Forest and Granite Hill Woodland EVC's, scattered amongst cleared areas of pasture and fence-row trees. Quarry Hills offer extensive views out over the surrounding plains.

Figure 12 illustrates the landscape character within Undulating Rural Conservation character type.

Figure 12 Typical character of LCT5

3.4.6 LCT6: River Corridor

The River Corridor character type runs in a north-south direction following the alignment of the Plenty River riparian corridor to the east of the proposed rail extension. Stretching from the Barbers Creek confluence south to Greensborough, the river corridor consists of undeveloped land adjacent to the river. The land use is predominantly 'Protected Landscape', including Hawkstowe Park and Plenty Gorge Park closest to the rail reserve, and various other uses such as the Farm Vigano property and Yellow Gum Park further to the south. The landscape surrounding the river steepens as it travels south descending into the Plenty River Gorge. The landscape tree cover varies from more dense vegetation around the river itself, particularly around the gorge, to a series of open spaces within Hawkstowe Park, and Plenty Gorge Park which contains rich biodiversity, cultural heritage and geological value. The parks also delineate the division between two distinct bioregions comprising the relatively flat Victorian Volcanic Plains to the west, and the Highland hills and valleys (Southern Falls) to the east (GHD / AECOM 2016b). Most of the existing remnant Ecological Vegetation Classes identified in the study area are located within this character type.

Figure 13 illustrates the landscape character of the River Corridor.

Figure 13 Typical character or LCT6

3.4.7 LCT7: Utility Reserves

The Utility Reserves landscape character type lies within LCT1 and is defined by two major existing utilities, the SP AusNet South Morang Terminal Station and the Melbourne Water reserve, located between the existing South Morang Station and proposed Station near the Marymede Catholic College. These large utility reserves are visually prominent within the urban development however not accessible to the public. The SP AusNet site is characterised by open grassland devoid of trees and containing a cluster of large utility stations and structures dominating the skyline. Overhead electrical wires and an associated broad utility reserve stems from this substation in a north-westerly axis. A transparent wire fence and irregular scattering of trees typically form the border to this site without buffering the view in. Large round water tanks are elevated and prominent within the Melbourne Water reserve.

Figure 14 illustrates the landscape character of the Utility Reserves Landscape Character Type.

Figure 14 Typical character or LCT7

3.4.8 LCT8: Yan Yean Reservoir

The Yan Yean Reservoir landscape character type is located to the north of the study area and is defined by Yan Yean Reservoir and the adjacent southern and western elevated topography. Land use consists of the Yan Yean Reservoir Park, the Melbourne Water Pumping Station, and rural agricultural land to south of Arthur's Ridge Road. Significant amounts of EVC vegetation are present surrounding the Reservoir, including the Plains Grassy Woodland, Grassy Woodland, and Grassy Riverine Forest. This vegetation connects around the eastern edge of the Reservoir extending to the north-east forming a large landscape corridor joining the Kinglake National Park.

Figure 15 illustrates the landscape character of the Yan Yean Reservoir.

Figure 15 Typical character or LCT8

4. Legislation, Planning & Policy Context

An assessment was undertaken of key Commonwealth, state and local planning policy and legislation as relevant to landscape and visual amenity of the project area.

4.1 Commonwealth Legislation

There is no Commonwealth legislation relevant to the visual assessment of this project.

4.2 State Legislation

4.2.1 Planning and Environment Act 1987

The *Planning and Environment Act 1987* (Vic) establishes the framework for the use, development and protection of land in Victoria. The Act provides the standard provisions for planning schemes which are administered by local government.

The most relevant objectives in terms of LVIA are:

- To enable land use and development planning and policy to be easily integrated with environmental, social, economic, conservation and resource management policies at State, regional and municipal levels
- To ensure that the effects on the environment are considered and provide for explicit consideration of social and economic effects when decisions are made about the use and development of land.

4.2.2 Transport Integration Act 2010

The *Transport Integration Act 2010* (Vic) provides the policy framework for an integrated and sustainable transport system, developed after a comprehensive program of consultation with transport stakeholders. The Act brings together all elements of the transport portfolio – including roads, rail, ports and marine – under one statute. The Act requires transport agencies and other areas of government to have regard to broader social, economic and environmental considerations – a clear triple bottom line framework – when making decisions about the transport system. Section 10 of the Act requires that "the transport system should actively contribute to environmental sustainability by: (a) protecting, conserving and improving the natural environment; and (b) avoiding, minimising and offsetting harm to the local and global environment, including through transport-related emissions and pollutants and the loss of biodiversity." Section 11.4, Integration of Transport and Land Use, states that "…the transport system should improve the amenity of communities and minimise impacts of the transport system on adjacent land uses".

4.2.3 State Planning Policy Framework

The State Planning Policy Framework (SPPF) is a dynamic document that informs planning and responsible authorities about the planning policies that need to be taken into account when planning in their respective areas. Of particular relevance to the LVIA are the following clauses: Environment and Landscape Values (Clause 12), Built Environment and Heritage (Clause 15); and Transport (Clause 18). A summary of those aspects of the SPPF with direct reference to landscape and visual issues are discussed within Table 2 below.

Table 2 SPPF clauses relevant to the project's landscape & visual values

Clause	Relevance to landscape & visual values of the project
12.04-2	Provides guidance to protect landscapes and significant open spaces that contribute to character, identity and sustainable environments
15.01-1	Focuses upon the provision of environments that are safe and functional and which reinforce a sense of place and cultural identity
15.01-2	Strives for urban design outcomes which contribute positively to local urban character and minimise detrimental impacts upon neighbouring properties
15.01-5	Provides guidance to recognise and protect neighbourhood character and sense of place with specific regard for the built environment and heritage elements
18.01-2	Strives to locate transportation routes such that they minimise impacts upon the environment
18.02-4	Regulates the design of transport routes to achieve visual standards appropriate to the importance of the route with particular reference to landscape treatments

4.3 Local Policies and Planning Schemes

Relevant planning designations are shown on Figure 16 and Figure 17.

There are two Local Government Areas in the project area; however the rail reserve sits entirely within the jurisdiction of City of Whittlesea. Nillumbik Shire Council is to the east of Plenty River to Doreen, then east of Yan Yean Road to the North.

Table 3, Table 4 and Table 5 provide a summary of the City of Whittlesea Municipal Strategic Statement and Local Planning Policies and Zones/Overlays specifically relevant to landscape and visual values.

4.3.1 City of Whittlesea Municipal Strategic Statement (MSS)

Table 3 Municipal Strategic Statement relevant to LVIA

Clause	Relevance to landscape & visual values of the project
21.02	Identifies that the natural environment of the City is valued by the community as providing a quality landscape and environmental setting.
21.05	Identifies 3no. rural land character areas: The Plenty Valley, The Plenty Ranges and The Western Plains, and requires all applications within these areas to satisfy the requirements of the *'Rural Land Character Areas – Siting Use and Development Guidelines, 2006'*, with relevant policies including: the need for rural land character, the environment and important views and vistas to be considered; and the need for conservation of the pattern of existing vegetation.
21.08	Equally, maintenance of the image and amenity that is offered by the areas which have been excluded from urban development is of vital importance. Designated non-urban breaks and visually exposed hilltops and ridgelines are of particular significance in this regard.

4.3.2 City of Whittlesea Municipal Local Planning Policies

Table 4 Local Planning Policies relevant to LVIA

Clause	Relevance to landscape & visual values of the project
21.15	Encourage design solutions that reduce the visual impact of the high voltage transmission line easement through innovative design.

4.3.3 City of Whittlesea Zones and Overlays

Table 5 Zones and Overlays relevant to LVIA

Zone/Overlay	Requirements relevant to landscape & visual values of the project
Public Use Zone 4 - Transport	To provide for associated uses that is consistent with the intent of the public land reservation or purpose.
General Residential Zone 1	Encourage development that respects the neighbourhood character of the area.
Public Conservation and resource Zone	Protect and conserve the natural environment and natural processes for their historic, scientific, landscape, habitat or cultural values.
Township Zone	Encourage development that respects the neighbourhood character of the area.
Comprehensive Development Zone 1	Mernda Town Centre, to ensure that new development respects, interprets and sensitively integrates the area's natural and cultural heritage, including the Plenty Gorge Parklands, for the benefit of the wider community.
Heritage Overlay 43	To conserve and enhance heritage places of natural or cultural significance.
Development Plan Overlay 19	Williamsons Road Education and Residential Precinct Development Plan.
Vegetation Protection Overlay 1	Ensure that development minimises loss of vegetation and recognises vegetation protection areas as locations of special significance, natural beauty, interest and importance.
Incorporated Plan Overlay 1	The Mernda Strategy Plan applies to all the land shown in the Incorporated Plan Overlay (below).
Development Contributions Plan Overlay 9	Mernda Precinct 5 Development Contributions Plan.

Mernda Strategy Plan 2008

The extension of a heavy rail service to Mernda is central to the overall transport strategy. It is envisaged that the Epping line would be extended initially to South Morang and ultimately to a transport interchange in the Mernda Town Centre. Parking space should be provided near the station to encourage park-and-ride commuting from the wider catchment.

The timely introduction of rail public transport should be promoted by ensuring that development in the Mernda Town Centre is physically supportive of these services. Built form around transport nodes should have the following characteristics:

- Higher than average residential densities
- A diversity of land-uses to generate activity over a 24-hour period
- Convenience and safety for public transport users.

4.3.4 City of Whittlesea Mernda Rail Extension Design Guidelines

Key points relevant to the landscape & visual values of the project are:

- Provide a positive passenger experience though attractive corridor edges on their journey
- Provide a positive, safe and attractive interface to the adjacent land use interfaces.
- Promote connections by encouraging accessibility and permeability of the rail reserve.
- Minimise impacts including noise and light spill on adjacent communities and profile locations
- Provide attractive screening, level change and or landscape buffer to the edge of storage, stabling or other infrastructure requirements to minimise impact on the community
- Consider enhancement of view lines and visual connections across the rail reserve in the design
- Minimise environmental damage and enhance environmental values along the rail reserve.

4.3.5 Heritage

Heritage sites identified in the rail reserve by Dr Vincent Clark & Associates (2016) are listed below.

Table 6 Identified Heritage Sites

Site Name	Site Code/s	Listing Type	Site Description / Visibility
Mernda Railway Station	H7922-0356	VHI	**Station Platform** At the time it was recorded the station platform was the most visible remaining feature. Bluestone structural foundations, a historic peppercorn tree and a large mound were also present. Location: Within the rail reserve. Visibility: Any remains are unlikely to be visible once the project is in place.
Mernda 1, Berry Lane	H7922-0036 HO19	VHI and HO	**Bluestone Features** The item comprises the remnants of a cobbled roadway which runs between Mayfield Railway Bridge and Plenty Road for a distance of 700m. The lane is able to be visually distinguished within the landscape by the hedge planting / partially tree-lined edge that runs alongside it. See below for HO19. Location: About 100m north of and parallel to Blackcurrant Circuit between Plenty Road and the proposed rail reserve. Visibility: If Berry Lane is retained as part of the Mernda Town Centre development, it has the potential to be visible from the rail reserve. 'Mayfield Farm' is highly unlikely to be visible from the project once the Mernda Town Centre development is in place.

Site Name	Site Code/s	Listing Type	Site Description / Visibility
Mernda 2, Mayfield Railway Bridge	H7922-0037	VHI	**Iron, red brick & bluestone railway bridge** It is probable that the bridge was erected at the same time that the Whittlesea Line was established in 1889. The bridge measures 3.65m in length and is 2.62m wide and spans the canal leading to the Plenty River. The bridge has been constructed of iron and machine made red brick, dressed with one course of bluestone blocks along the top. Location: Within rail reserve, east of Mango Circuit. Visibility: Likely to be removed as part of the project.
Sirriani Stream Channel, Plenty Gorge	H7922-0482	VHI	**Stone-lined culvert** The Sirriani stream channel is a canalised stream that crosses the floodplain on the western side of the Plenty River at Mernda, south of Bridge Inn Road. The stream channel forms a stone-lined culvert with dressed bluestone portals on each side where is crosses the embankment for the Yan Yean Pipe Track (H7922-0281). Location: As above. Visibility: Unlikely to be visible from the project.
Whittlesea HS1	D7922-0256	De-listed	**Railway easement and plantings** Whittlesea HS 1 comprises a section of the former Fitzroy to Whittlesea railway easement. Associated with original Yan Yean tramway which allowed for the transport of produce. Location: Within the rail reserve, adjacent to Goulburn Street, south of Apricot Avenue. Visibility: Unlikely to be distinguishable from the project.
Yan Yean Pipe Track	H7922-0281	VHI	**Water infrastructure** The Yan Yean Pipe Track provides increasingly rare evidence of the evolution of engineering practices and techniques in the last 150 years. The Pipe Track includes the metal piping, bluestone footings, basalt dry stone walls, a brick and basalt feature and two rows of planted Sugar Gum (*Eucalyptus cladocalyx*). Location: Crosses the rail reserve between South Morang and Proposed station near Marymede Catholic Colleges and either side of Simons Creek. Visibility: Potential for high levels of visibility from both locations (assuming transparent noise walls if required at these locations).

Site Name	Site Code/s	Listing Type	Site Description / Visibility
Yan Yean Water Supply System	H2333 and HO43	VHR and HO	**Water infrastructure** The Yan Yean Water Supply System is a place of State level significance. It is a registered place on the Victorian Heritage Register (H2333). It was constructed from 1853 to 1891 and comprises a series of catchment weirs and reservoirs connected by aqueducts and the pipe track. The system was the first large-scale, engineered, water supply system in Victoria and extends from the north of the Great Dividing Range to Merri Creek in Northcote. The Yan Yean Water Supply System still functions today and supplies 3% of Melbourne's water. Location: As above. Visibility: As above.
Sheep Station Creek	H7922-0341	VHI	**Weatherboard rural dwelling, building foundations and mature exotic plants** It is estimated that the weatherboard dwelling and surrounding building foundations and mature exotic trees on this site date to the 1860s to 1870s. The site is listed on the Victorian Heritage Inventory and represents one of the few remaining rural properties associated with the early occupation (late 19th century) at South Morang. Location: Adjoining rail reserve east of Arilla Village. Visibility: Likely to be not visible from the train given that the project rail reserve is in cut at this point in order to cross under Plenty Road.
Railway Stopping Place, Gordons Rd, Morang	H7922-0357	VHI	**Raised mounds associated with railway** The site includes a raised mound on either side of the former railway track, just to the south of Gordons Road, thought to represent a small station platform/railway stopping place associated with the Epping to Whittlesea railway. Location: Within the rail reserve, adjoining Arilla Village boundary, south end. May be disturbed / removed by the works. Visibility: If retained, unlikely to be visually prominent from the train.
South Morang Railway Station, South Morang 26	H7922-0033	VHI	**Railway platform and concrete-based, brick structures** The railway station site comprises a platform and three concrete-based structures which have incorporated brick. The railway siding construction involved timber frame and bluestone fill which is still evident to the west of the platform. The nearby dwelling and surrounding ruins and archaeological remains comprise one of the few remaining places associated with the early occupation at South Morang, with the building being built to house rail construction workers.

Site Name	Site Code/s	Listing Type	Site Description / Visibility
			Location: The heritage item is located just south of and immediately adjacent to the proposed Station near the Marymede Catholic College. Visibility: The nearby dwelling curtilage planting would be visible from the Proposed station near Marymede Catholic College platforms and trains standing in the station. Additionally, some of the associated archaeological remains and the dwelling itself may be visible from this location, although a proposed noise wall on the down side of the rail reserve has the potential to preclude direct views of the dwelling from the rail reserve.
City of Whittlesea Planning Scheme Heritage Overlay	HO12 'Thomas' Mill', Mernda	HO	640 Bridge Inn Road, Mernda Mill machinery, dam wall, water race, bluestone lane (Berry Lane) and remains of the Old Bridge Inn Hotel. Location: Extension of Berry Lane east of the project to narrow north south lot, located about 100m east of the project, projecting north broadly opposite the proposed Mernda Town Centre development and south to the Yan Yean Pipe Line. Visibility: Currently under pasture. Low visual prominence from the project, including within the context of the broader Plenty River Valley landscape.
	HO19 'Mayfield Farm, Dairy and Berry Lane', Mernda (also H7922-0036)	VHI and HO	The Heritage Overlay (HO19) for this site lies immediately adjacent to both sides of the rail reserve. HO19 includes "Mayfield Farm, Dairy & Berry Lane" located at 1410A and 1410C Plenty Road, Mernda. The overlay covers: a residence; dairy and well; milking sheds; outbuilding; mature trees surrounding the farm complex; bluestone lane; hawthorn hedge; and a timber bridge. Location: The site area covers the southern half of the proposed Mernda Town Centre development. However, the key visible elements of the HO area comprise 'Mayfield Farm and Dairy', the rear boundary of which is set about 450m west of the project, and is substantially screened with a planting of cultural tree species. The location of Berry Lane is described above (H7922-0036). Visibility: the 'Mayfield Farm and Dairy' buildings within the homestead allotment are substantially screened and relatively distant from the project. The heritage item is highly unlikely to be visible from the project once the Mernda Town Centre development is in place.

Site Name	Site Code/s	Listing Type	Site Description / Visibility
City of Whittlesea Planning Scheme Heritage Overlay (*continued)*	HO22 'Wesleyan Church', Mernda	HO	97-105 Schotters Road, Mernda Church and adjoining brick hall. Location: About 160m short of the end of the project (a single stabling rail line at this point), and about 15m east of the rear boundary of the heritage item. Visibility: No fencing along this boundary. High visibility of the back of the heritage item from the project.
	HO23 'Turner's Bakery', Mernda	HO	107 Schotters Road, Mernda – Bakehouse with ovens, stables, coach house, brick well, dwelling, shop. Location: About 40m short of the end of the project (a single stabling rail line at this point), and about 15m east of the rear boundary of the heritage item. Visibility: The heritage item presents a 'wall' of 1800 high fencing and 2no. corrugated iron sheds to the project. Very low visibility into the heritage item from the project.
	HO27 'Bluestone Cottage', South Morang	HO	27 Old Plenty Road, South Morang Location: The rear boundary of the house allotment adjoins a proposed long development boundary edge associated with the Proposed station near Marymede Catholic College Precinct. Visibility: The main buildings within the allotment are well screened from the project by trees located close to them. Two large trees are also situated within the back corners of the allotment. However, depending on the nature of any development along this boundary, there is potential for overlooking between the two trees of the rear garden area of the heritage item.

4.4 Key Considerations

Key considerations arising from the above comprise:

4.4.1 Environmental Sustainability

- Contribute to environmental sustainability by (a) protecting, conserving and improving the natural environment; and (b) avoiding, minimising and offsetting harm to the local and global environment, including through … the loss of biodiversity (*Transport Integration Act 2010*)
- that "the transport system should actively contribute to environmental sustainability by enhancing environmental values along the rail corridor (*City of Whittlesea Mernda Rail Extension Design Guidelines*)

4.4.2 Sense of Place

- Focus on environments which reinforce a sense of place and cultural identity, … and contribute positively to local urban character (*State Planning Policy Framework*)
- The pattern of existing vegetation is conserved so as to maintain the landscape quality and natural environment (*City of Whittlesea Municipal Strategic Statement (MSS), s.21.05*)
- The existing low density rural character of the Plenty Valley … be maintained (*City of Whittlesea Municipal Strategic Statement (MSS), s.21.05*)

4.4.3 Heritage

- Protect neighbourhood character and sense of place with specific regard for … heritage elements (*State Planning Policy Framework*)
- Conserve and enhance heritage places of natural or cultural significance (*City of Whittlesea Zones and Overlays – Heritage Overlay*)
- With regard to the listed heritage items (refer Table 6 above), the following are considered to contribute to the sense of place for landscape setting within which the project sits, and comprise elements that have the potential to be conserved and viewed from the rail reserve:
    - Berry Lane
    - Yan Yean Pipe Track
    - Yan Yean Water Supply System
    - South Morang Railway Station, South Morang 26 (specifically the adjacent 1800's dwelling and potentially also archaeological remains associated with the original station)

  In this regard, the conservation and integration of these elements relative to the project are supported by all of the other key considerations listed above.

4.4.4 Landscape Amenity

- Improve the amenity of communities and minimise impacts of the transport system on adjacent land uses (*Transport Integration Act 2010*)
- Provide a positive passenger experience through attractive rail reserve edges on their journey (*City of Whittlesea Mernda Rail Extension Design Guidelines*)
- It is noted that no Significant Landscape Overlay occurs within the vicinity of the Project Area.

4.4.5 Views

- Important views and vistas to be considered (*City of Whittlesea Municipal Strategic Statement (MSS), s.21.05*)
- Consider enhancement of view lines and visual connections across the rail reserve in the rail design (*City of Whittlesea Mernda Rail Extension Design Guidelines*).

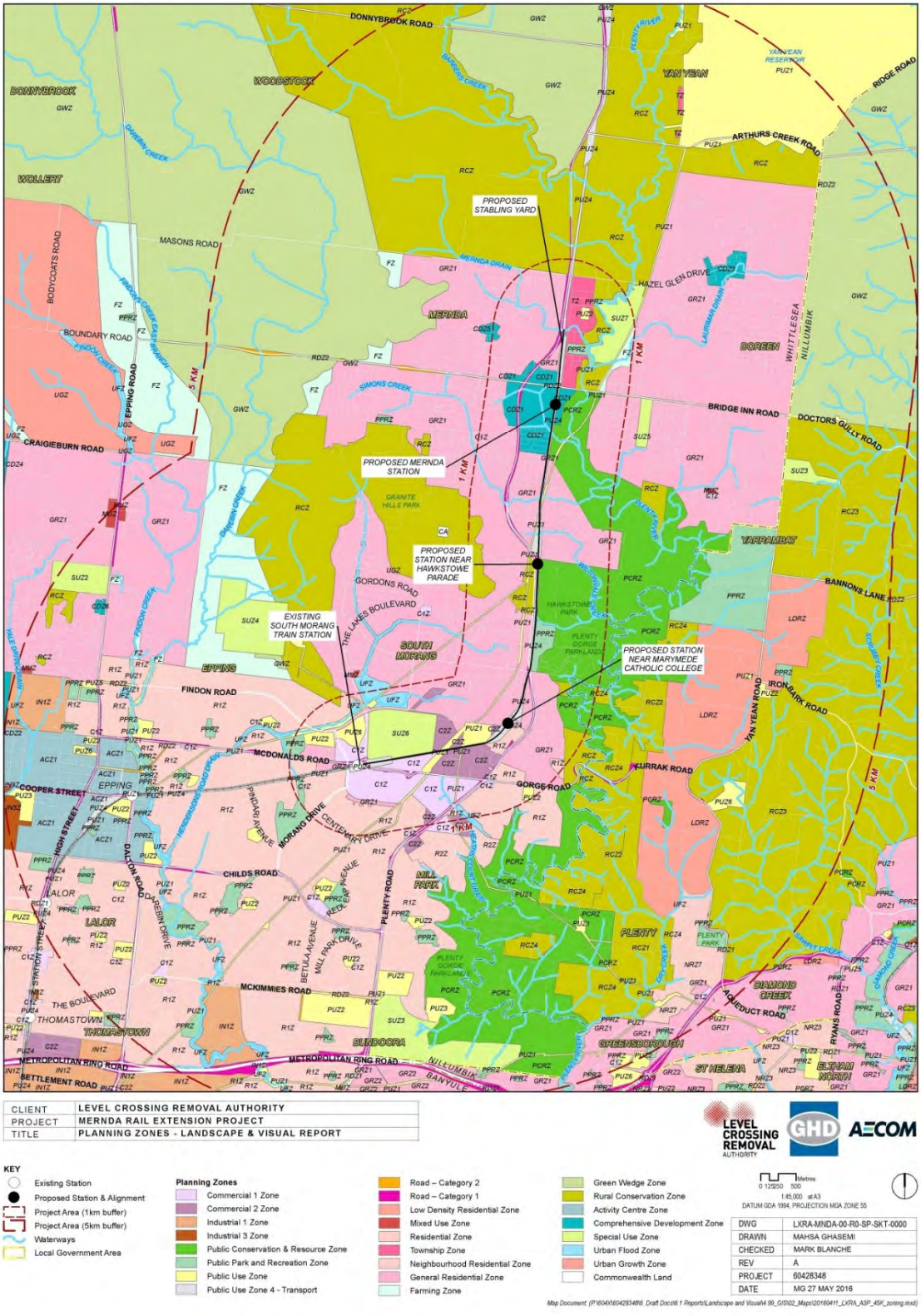


Figure 16 Planning Zones

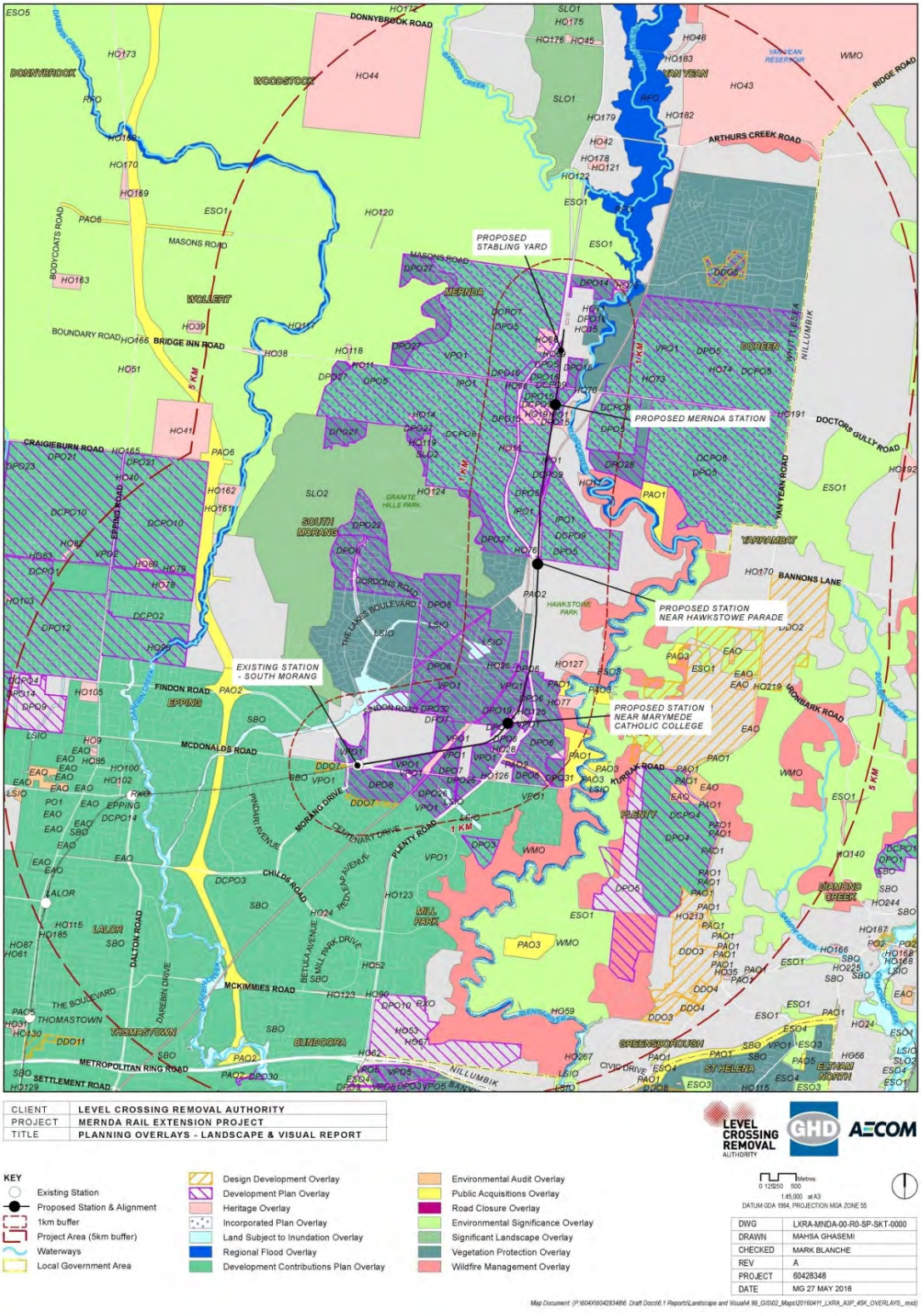


Figure 17 Planning Overlays

5. Visual Context

5.1 Representative Viewpoints

A total of 11 representative public viewpoints have been identified within the LVIA study area, as shown in Figure 18. These viewpoints are listed in Table 7 with photographs from each provided, reasoning behind their selection, and their relationship to the proposed rail alignment and stations, as discussed in Section 6.2.

The representative viewpoints have been selected to identify locations that have sensitive receptors and/or high numbers of receptors. The viewpoints have been organised into the following key receptor groups which share similar sensitivities:

5.1.1 Nearby residential properties (VP2, VP4, VP5, VP6, VP7, VP8, VP9)

Residents are interested in the outlook from their properties and have prolonged viewing opportunities, so are typically considered to have a high sensitivity to change. The Guidelines for Landscape and Visual Impact Assessment (2013) state at 6.33 that "The visual receptors most susceptible to change are generally likely to include: residents at home…" Note: The provided representative views are located within publicly accessible areas as access was not permitted to private property.

5.1.2 Recreational users, shared trails and parks (VP3, VP4, VP6, VP7, VP8, VP11)

Recreational users are usually interested in the appearance of their surroundings, specifically seeking out recreational opportunities in visually pleasant environments, so are typically considered to have a high sensitivity to change. The Guidelines for Landscape and Visual Impact Assessment (2013) state at 6.33 that "The visual receptors most susceptible to change are generally likely to include: people, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focused on the landscape and on particular views…"

5.1.3 Schools and Community (VP1, VP2, VP7)

Workers, including students and teachers are generally regarded as having a moderate sensitivity to change. While they may have some interest in the quality of their surrounding environment, the attention of this user group is expected to be primarily focussed on their task (e.g. teaching, studying or sport). The Guidelines for Landscape and Visual Impact Assessment (2013) state at 6.34 "Visual receptors likely to be less sensitive to change include:

- People engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape
- People at their place of work whose attention may be focused on their work or activity, not on their surroundings, and where the setting is not important to the quality of working life (although there may on occasion be cases where views are an important contributor to the setting and to the quality of working life.)".

Motorists usually have only a passing interest in the quality of their surroundings as they are travelling through at speed (especially on Plenty Road) and concentrating on road conditions, so are typically considered to have a low sensitivity to change.

Section 6.2 below provides a summary of the anticipated impact of the proposed Mernda Rail Extension on the selected viewpoints.

These viewpoints were selected based upon a three stage process, outline below.

Stage 1: Identification of Zone of Theoretical Visual Influence

Two Zone of Theoretical Visibility analyses were undertaken to provide a preliminary representation of the likely 'worst case' visual envelope of the rail reference design alignment. These are illustrated within Figure 19 and Figure 20.

Zone of Theoretical Visibility (ZTV) mapping uses a digitally produced map which shows areas of land within which a proposed development is theoretically visible. It should be noted that the output of these plans are limited, and do not take into account the screening effect of intervening vegetation or built form, and therefore provide an exaggerated indication of the theoretical extent of visibility of each alignment option. They were therefore used primarily to guide the desktop studies and site visit work.

- ZTV Figure 19. Views the top of the train travelling at design grade (including elevated viaduct sections) with the height of train 4.21 m (X'Trapolis). This approach provides a worst case scenario with regard to the visibility of a train and associated infrastructure anywhere along the rail reserve.
- ZTV Figure 20. Viewshed from the proposed station entrances. This is a generic 40 x 40 m site with a 10 m vertical height above the ground surface.

Stage 2: Desktop Studies

A desktop study was undertaken of the project area in order to identify potential visual receptors likely to be impacted upon by the Rail Extension. This included an assessment of public open spaces, public gathering nodes, and clusters of residential properties. A preliminary list of potential representative public viewpoints was established for subsequent ground proofing on-site.

Stage 3: Site Visit

The site visits occurred on 15 January 2016 and 4 May 2016. During the visit the representative viewpoints were confirmed and an assessment was made of each potential representative public viewpoint against the known extent of the alignment.

Table 7 Representative Public Viewpoints

Viewpoint No.	Representative Public Viewpoint location and description
VP1	Marymede Catholic College, 65 Williamsons Road, South Morang View looking south east with proposed Station near Marymede Catholic College located obliquely to right of frame
VP2	Arilla Village, 60A Williamsons Road, South Morang View looking south east from inside Arilla Village along rail reserve
VP3	Hawkstowe Park, Plenty Road South Morang View looking north west from playground
VP4	Foxtail Park, 16 Foxtail Terrace, South Morang View east to Hawkstowe Park
VP5	95A McArthurs Road, South Morang View east to Hawkstowe Park
VP6	Winton Vale Creek Park, 28 Mount Eccles Way, South Morang View north west to Huntingfield Drive & Torbreck Avenue

Viewpoint No.	Representative Public Viewpoint location and description
VP7	Barmah Drive Bridge over Simons Creek, South Morang View west towards The Parkway
VP8	45 Hathfelde Boulevard, Mernda View north west towards Goulburn Street
VP9	Mango Crescent, Mernda View south east towards Plenty Gorge Parklands
VP10	6 Station Road, Mernda View north east towards Schotters Road and Mernda Recreational Reserve
VP11	Playground / Park on Towerhill Avenue, Doreen View south west towards Plenty River corridor with the Quarry Hills in the background

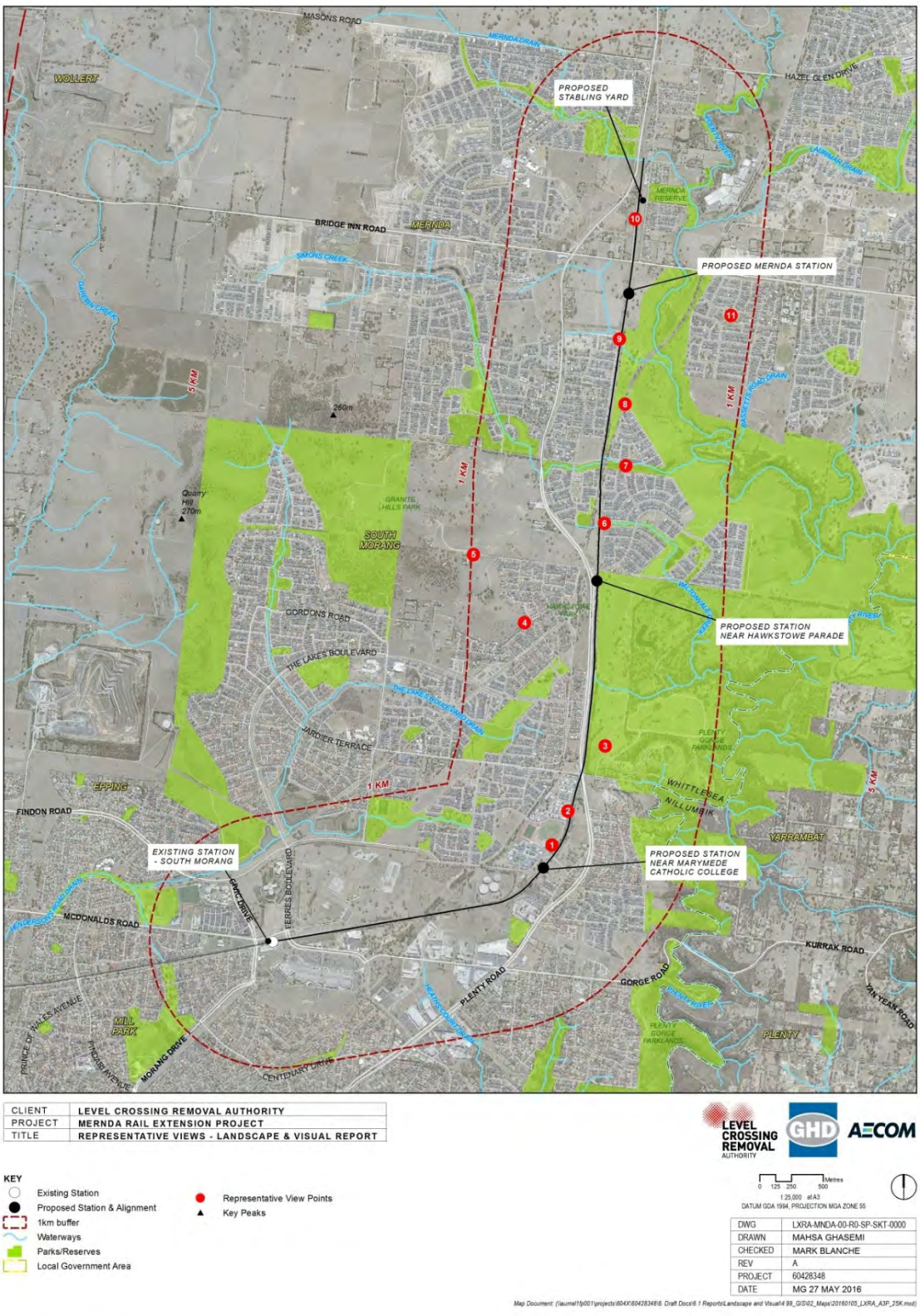


Figure 18 Key Representative Views

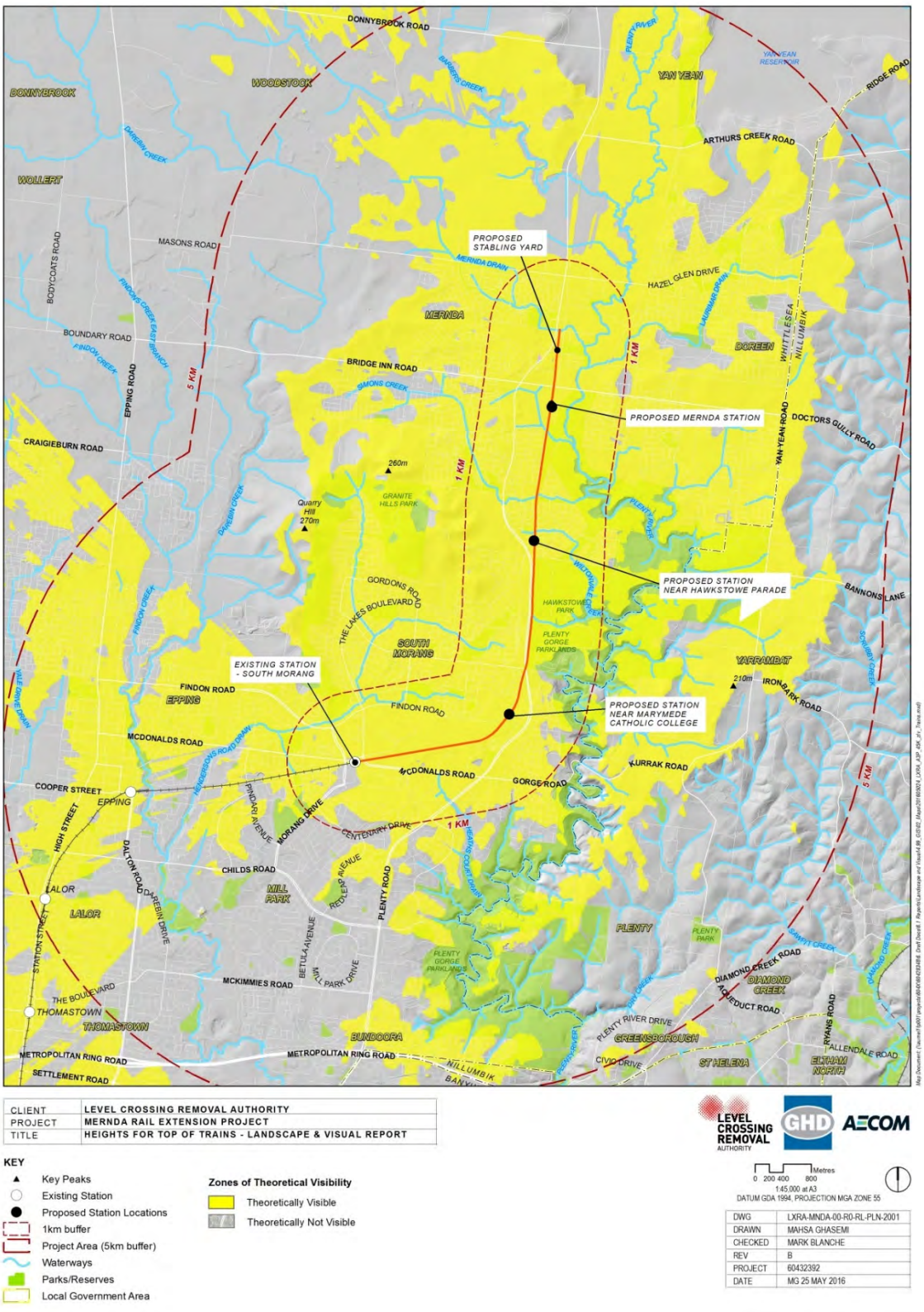


Figure 19 ZTV – Top of Train

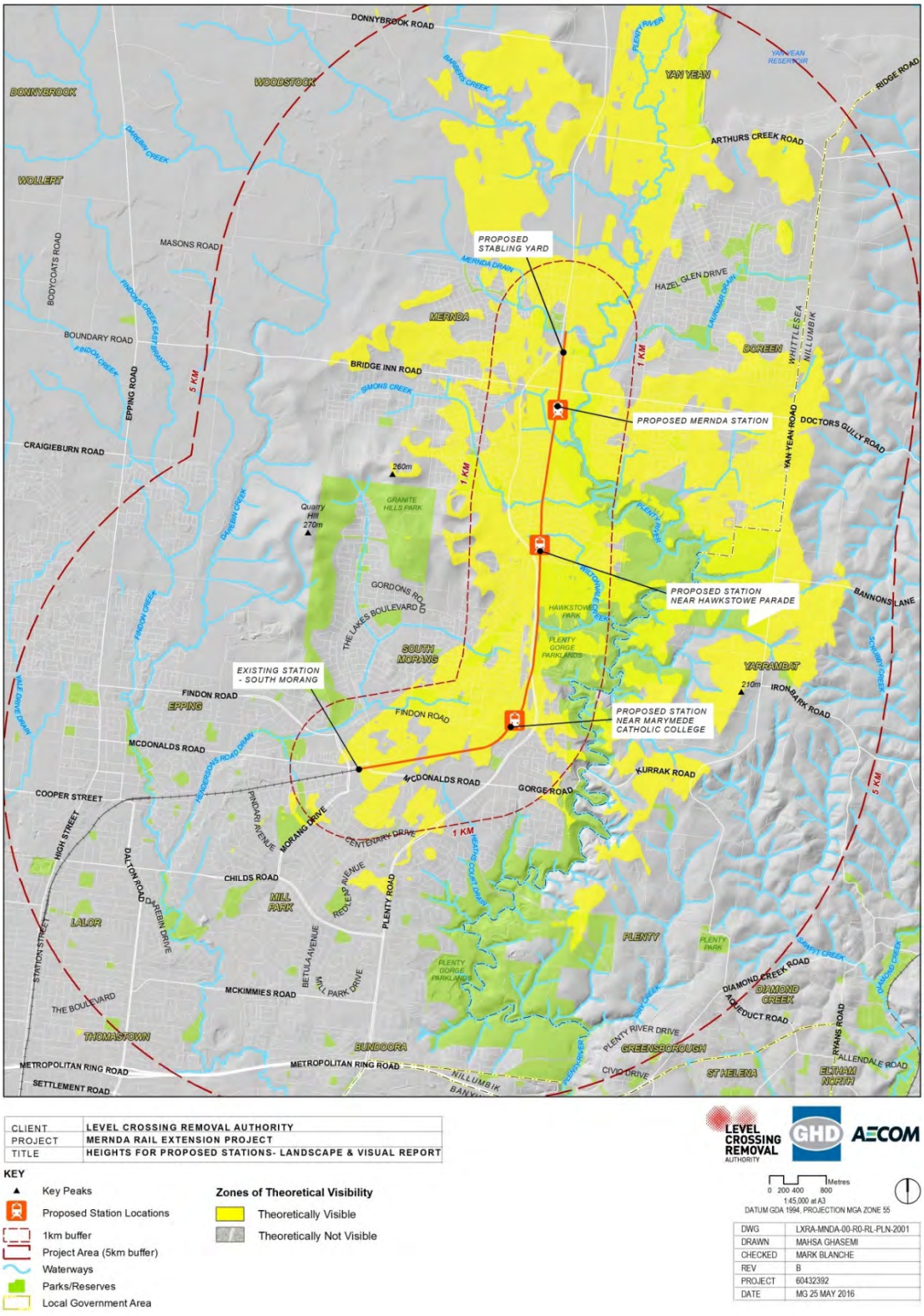


Figure 20 ZTV - Proposed Stations

6. Impact Assessment

6.1 Impacts on Landscape Values

Landscape character refers to a distinct and recognisable pattern of elements that occur consistently in a particular type of landscape. Particular combinations of geology, landform, soils, vegetation, land use and human settlement create character, which makes each part of the landscape distinct and gives each its particular sense of place or *genius loci* (Scottish Natural Heritage and the Countryside Agency, 2002).

Assessment of landscape effects deals with the effect of change and development on landscape as a resource.

The concern here is with how the proposal would affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character (Landscape Institute and Institute of Environmental Management and Assessment, 2013).

The consideration of potential impacts on landscape character is determined based on the sensitivity of the existing landscape to change and the magnitude of change that is likely to occur. The sensitivity of a landscape is judged on the extent to which it can accept change of a particular type and scale without adverse effects on existing landscape character. The level of sensitivity is determined based on:

- the landscape's inherent values (e.g. perceptual qualities, cultural importance) and any specific values that may apply such as landscape planning designations
- the landscape's ability to absorb changes associated with the project (e.g. the extent to which the project may fit or be absorbed into the landform, land use, pattern, scale or texture of the existing landscape).

The magnitude of change to landscape character depends on the nature, scale and duration of the change that is expected to occur. The magnitude of change also depends on the loss, change or addition of any feature to the existing landscape. It is based on that part of the landscape character type which is likely to be impacted to the greatest extent by the Project (i.e. worst case scenario), considering the application of any proposed mitigation measures.

Table 8 outlines a summary of the Landscape Character Impacts of the proposed rail extension.

Table 8 Landscape Character Impact Summary Table

LCT1 – Flat Residential
Summary description of landscape character LCT1 is a developing urban area located upon the relatively flat floodplain and adjoining foot slopes of the Plenty Valley. Land use comprises predominantly low density housing, with commercial areas including the established Epping Activity Centre, and the developing South Morang and Mernda/Doreen town centres. The landscape contains substantial areas of remnant and regrowth endemic tree cover, predominantly comprising River Red Gum (*Eucalyptus camaldulensis*), often within native grassland settings. These remnant / regrowth grassy woodland communities are a characteristic element of many areas within this LCT, in addition to that found to varying degrees within all of the other identified LCTs. This grassy woodland community provides a unifying landscape connecter between the lower lying LCTs, which comprises a defining element of the *genius loci* of this place. The landscape also contains heritage items that reflect the history and *genius loci* of the place, including: Berry Lane which comprises the remnants of a cobbled roadway, visually

LCT1 – Flat Residential
distinguished within the landscape by a hawthorn hedge planting; Yan Yean Pipe Track including: the metal piping, bluestone footings, basalt dry stone walls, and cultural row plantings of non-endemic Sugar Gum (*Eucalyptus cladocalyx*); South Morang Railway Station, South Morang 26: which includes an existing 1800's intact, rustic dwelling and associated curtilage planting used to house workers for the building of the original Whittlesea rail line; and a distinctive patterning and contrasting colour change of brickwork in many of the older buildings, as exemplified by 'Turner's Bakery' in Schotters Road.
Anticipated change to LCT Most of the rail reserve would be at or near-grade, although with significant sections: both in cutting passing under major roads (i.e. at McDonalds Road near South Morang Station, and under Plenty Road at the intersection with Gordons Road); on structure at two stations, and elevated crossings of Hawkstowe Parade, Simons Creek / The Parkway, and Bridge Inn Road. The project would result in the loss of a number of both mature endemic trees, and woodland areas with a diverse grassy understorey within the rail reserve, which currently provides an important component of the characteristic grassy woodland community within LCT's 1, 6 and 7. Given the various space and safety constraints within the rail reserve, it is likely there would be limited opportunities to reinstate this community within the rail reserve. The station precincts, including elements on structure, would create architecturally well-considered, urbanised places in what are currently semi-rural settings, creating a catalyst for a significant further nearby urban development, including the introduction new higher density elements within the landscape.
Sensitivity to change The sensitivity to change of LCT1 is considered to be Medium given that the proposed rail extension would: • remove a component of characteristic grassy woodland community with potentially limited opportunity for reinstatement within the reservation • introduce large new elements into the landscape including viaduct structures and noise walls, traversing through established low density residential areas, within currently open grassy and woodland settings, and • potentially introduce extensive areas of car parking with little provision for landscape tree cover and associated broader landscape integration outcomes. Notwithstanding the above, the project: • broadly aligns with the existing residential subdivision pattern and main road alignment north of the proposed station near Marymede Catholic College • is located within a substantially urban area in which rapid change is taking place, including alongside the rail reserve • elements, including station buildings, viaduct and associated retained wall structures, and noise walls, would be subject to well-considered architectural, urban design and landscape architectural inputs to help facilitate a well-integrated outcome.

LCT1 – Flat Residential

Magnitude of change

The magnitude of change for LCT1 is considered Medium within the context that:

- the project would create a major infrastructure corridor across the landscape, notwithstanding that the project is located within the Whittlesea rail reserve
- the project would substantially change the character of the rail reserve from that of a predominantly semi-rural / urban fringe landscape, to a security fenced infrastructure rail reserve with highly urbanised development nodes, and substantial infrastructure elements including: viaduct / retained wall structures, rail cuttings, noise walls, and security lighting.

However, the project also:

- has the capacity to be relatively well integrated within the context of the broader floodplain and foot slopes landscape, which includes substantial wooded and open space areas within visual proximity to the rail reserve
- comprises a contextual component of the overall rapid urban growth taking place within this LCZ.

Landscape Character Impact

The overall landscape character impact is therefore considered to be **Minor to Moderate**.

LCT6 – River Corridor

Summary description of landscape character

LCT6 is defined by the Plenty River which gently meanders across the floodplain landscape adjacent to the northern part of the project area, before gradually deepening and tracing a tightly convoluted and deeply dissected edge against the elevated Yarrambat landform to the east of the project. Here, the riparian corridor and adjoining steep Yarrambat hillslopes are densely forested. However, the riparian corridor quickly gives way to a cleared and relatively flat to gently undulating landform along the top of the eastern bank of the river gorge, with the vegetation characterised by open grasslands and scattered stands of River Red Gum. Both Hawkstowe Park and Plenty Gorge Park are included within this area.

The open floodplain provides a major landscape foil to the adjoining floodplain / urban edge for the northern and central parts of this LCT, before becoming a highly constrained, narrow edge in the southern part of the LCT where it adjoins the Plenty River Gorge. Additionally, the broader floodplain provides some formal recreational opportunities, generally confined to walking and cycling trails.

Anticipated change to LCT

The proposed rail extension runs alongside the edge of LCT6 following Plenty Road adjacent to Hawkstowe Park, and again further north, runs along the edge of Plenty Gorge Park.

Within the scale of the floodplain landscape, the project comprises a relatively minor edge condition. However, within the more confined context of Hawkstowe Park and Plenty Gorge Park, the project would create an incongruent edge condition with a visually prominent viaduct, retaining wall and noise wall elements.

Sensitivity to change

The sensitivity of LCT6 to the proposed change is considered to be Medium given that the project is introducing permanent elements of heavy rail infrastructure, along two boundary / park edge sections of the LCT.

LCT6 – River Corridor

Magnitude of change

The magnitude of change for LCT6 is considered Medium given that: the project immediately adjoins the LCT over an approximate length of 2 km, and introduces a noise wall viaduct element along the northern boundary edge of the LCT (between the southern end of Goulburn Street and the northern end of Berry Lane Estate); notwithstanding that the rail reserve is generally aligned with the existing main road / subdivision pattern; and comprises a relatively low / small and in part ephemeral element (moving trains), within the broad extent of this LCT.

Landscape Character Impact

The overall landscape character impact of the project on LCT6 is therefore considered to be **Minor to Moderate**.

LCT7 – Utility Reserves

Summary description of landscape character

LCT7 is located upon the flat landscape of LCT1, and defined by the existing utility services of the SP AusNet South Morang Terminal Station and Melbourne Water reserve, both of which are publically inaccessible. Large utility infrastructure of electricity stanchions, wires and tanks, visually dominate the LCT, within a predominantly open grassland setting.

Anticipated change to LCT

The proposed rail extension would run along the southern edge of LCT7 between the existing South Morang Station and proposed station near Marymede Catholic College. This is likely to result in a loss of endemic trees within the project rail reserve, in conjunction with a new elevated earthworks section crossing the Yan Yean Pipe Track.

Sensitivity to change

The sensitivity to the proposed change of LCT7 is considered to be Negligible within the context of the utilitarian nature, scale and form of the infrastructure.

Magnitude of change

The magnitude of the proposed change for LCT7 is considered to be Low within the infrastructure context of this LCT. The rail reserve earth embankment and associated infrastructure including gantries is visually contextual with the LCT.

Landscape Character Impact

The overall landscape character impact of the project on this LCT is therefore considered to be **Negligible**.

The remaining LCTs are not assessed as they are not directly impacted by the project, i.e. there is no change to those landscape character types.

6.2 Impacts on Visual Values

Assessment of visual impacts deals with the effects of change and development on the views available to people and their visual amenity. It assesses how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements (Landscape Institute and Institute of Environmental Management and Assessment, 2013).

Visual receptors have been considered in terms of the views it is considered they are likely to obtain from within the study area including consideration of any key vantage points, such as lookouts, where there is particular interest in the view. Visual receptors are identified based on:

- Proximity of the receptors to the Project, as the most affected visual receptors are anticipated to be located closest to the Project, unless located at an elevated vantage point
- Type of receptor (e.g. residents, those passing through the area by vehicle, pedestrians or workers) as different viewer types would have different perceptions of the change.

The evaluation of potential impacts on visual amenity was based on the sensitivity of the viewpoint, and the visual receptors it represents, to change and the magnitude of change that is likely to occur.

The sensitivity of each viewpoint is considered to be dependent on the:

- Importance of the view, its existing scenic qualities and the presence of other existing manmade elements in the view
- Type of visual receptor and their likely interest in the view
- Number of visual receptors and the duration of time they spend experiencing the view.

The magnitude of change to views and visual amenity depends on the nature, scale and duration of the change that is expected to occur. The magnitude of a change also depends on the loss, change or addition of any feature in the field of view of the receptor including an assessment of the level to which the change contrasts with the existing view or expected view of the landscape. This includes the degree of any change to the backdrop to, or outlook from, a viewpoint.

The assessment considers the likely impacts of the project with moderately well executed mitigation measures being implemented. The level of effects on a view depends on factors such as the extent of visibility, degree of obstruction of existing features, degree of contrast with the existing view, angle of view, duration of view and distance from the Project. These factors are considered in relation to the selected representative viewpoints presented in Table 9 to Table 19.

Visually sensitive receptors are described below.

6.2.1 Residents

Residents would in most cases be considered as the most sensitive visual receptors. Existing residents adjacent to and in the vicinity of the proposed Mernda Rail Extension Project may regularly experience views of long duration and have the greatest knowledge of the rail reservation's appearance and its form within the landscape. Thus, they are most likely to notice and experience any changes at the site, and can be considered to have a proprietary interest in these changes.

Residents adjacent to and facing the rail reserve, and those in the vicinity of the proposed bridge over Simons Creek, near The Parkway, would experience the greatest level of change to the view, due to the proximity of the railway; the height of the alignment rising to the bridge over Simons Creek, and associated noise walls. Residences more likely affected by this include proprieties on Mount Eccles Way, St Leonard Drive, Huntingfield Drive, Chamonix Parade, Grattan Street, The Parkway, Carriageway Pass, Goulburn Street and Mango Crescent.

Residents that are likely to be affected by changes to views as a result of the removal of vegetation include those properties adjoining the rail reserve including Arilla Village near Plenty Road, Mount Eccles Way and The Parkway.

Residents that are likely to be affected by changes to views as a result of the proposed Stabling Yards and carpark include Schotters Road and Stations Road.

The implementation of proposed landscape and urban design measures can be expected to provide some mitigation of these impacts.

6.2.2 Recreational Users

Recreational users include cyclists, walkers and runners. Recreational users of Hawkstowe Park, Simons Creek, Goulbourn Park and Mernda Reserve, or those using the shared use path along the Yean Yan Pipe Track and in Plenty Gorge Park near to the proposed Mernda Station can be expected to have relatively long periods of viewing of the project, and often in substantial levels of detail. Removal of vegetation along Plenty Road near Hawkstowe Park would reduce the amenity of this area. Recreational receivers in the vicinity of the proposed bridge over Simons Creek would experience the greatest level of visual change from the existing due the height of the elevated rail bridge and associated elevated formation.

The implementation of proposed landscape and urban design measures can be expected to provide some mitigation of these impacts.

6.2.3 Schools and Community

There are three schools located along the rail reserve, comprising the existing Saint Mary College and Marymede Catholic College, adjacent to each other and opposite the proposed station near the Marymede Catholic College, and Mernda South School at The Parkway, currently under construction.

Community sites include The Little White Chapel on Plenty Road and Kids Palace Learning Centre (child care) on corner of Bridge Inn Road and Schotters Road. Both these community sites predominantly have internal facing views, with the child care centre having large walls, and the chapel which is currently under repair from a fire and has a fence along its rear boundary screening views towards the proposed station near the Marymede Catholic College.

Additionally, there are numerous Aged Cared homes in the project area. Of these, only the Arilla Village retirement community has direct views to the rail reserve; which would be impacted by a reduction in the extent of the open woodland community currently present within the rail reserve, and the provision of noise walls. Along with the provision of sufficient vegetation setbacks in front of the noise walls, conservation / reinstatement of this open woodland character and well-considered architectural detailing of the noise walls would assist in mitigating these visual impacts.

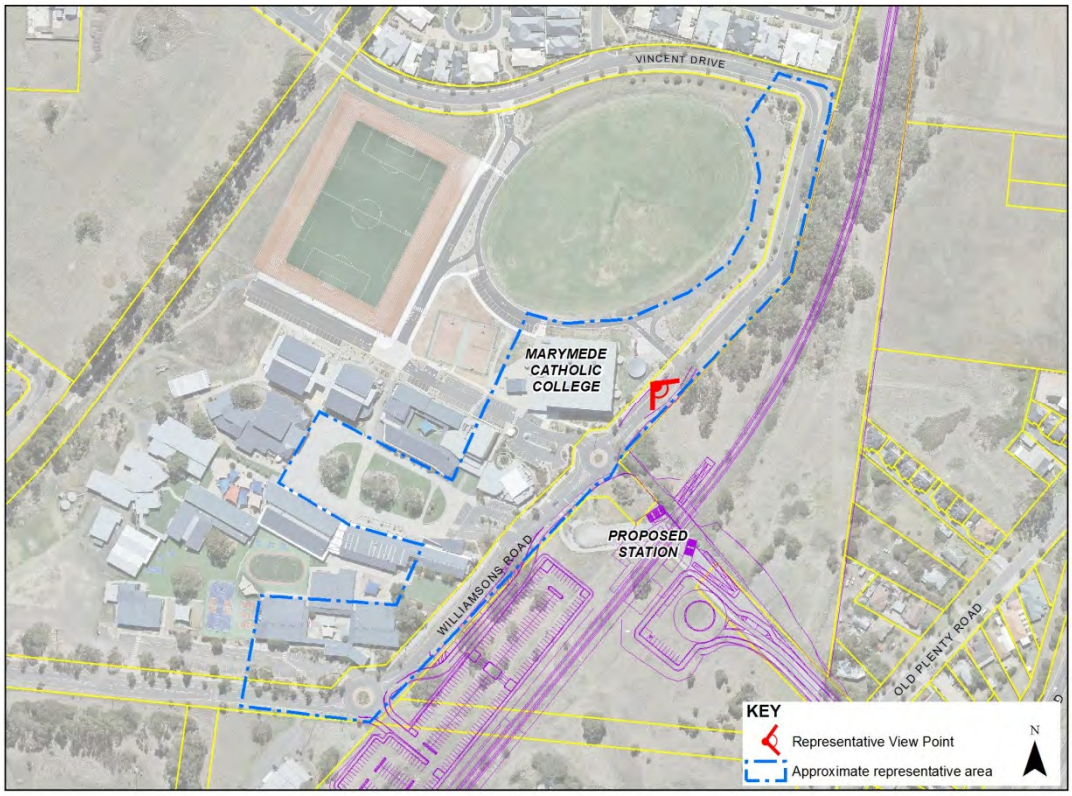
6.2.4 Representative Receiver Locations

Representative receiver locations are assessed below:

- VP1 – Marymede Catholic College, 65 Williamsons Road, South Morang
- VP2 – Arilla Village, 60A Williamsons Road, South Morang
- VP3 – Hawkstowe, Plenty Road, South Morang
- VP4 – Foxtail Park, 16 Foxtail Terrace, South Morang
- VP5 – 95A McArthurs Road, South Morang
- VP6 – Winton Vale Creek Park, 28 Mount Eccles Way, South Morang
- VP7 – Barmah Drive Bridge over Simons Creek, South Morang
- VP8 – 45 Hathfelde Boulevard, Mernda
- VP9 – Mango Crescent, Mernda
- VP10 – 6 Station Road, Mernda
- VP11 – Playground, Park on Towerhill Avenue, Doreen.

Table 9 VP1 – Marymede Catholic College

VP1 – Marymede Catholic College, 65 Williamsons Road, South Morang

View South-East (Elevation - 150m AHD)

Description of current view VP1 is located at Marymede Catholic College on Wiliamsons Road looking in a south-east direction. The view generally comprises an extensive , open grassed area with scattered mature and regrowth eucalypts, the old Whittlesea rail line earthen track formation in the middle ground, and low density residential development in the background. The view has a rural-urban fringe character. The key receptors for this view are the School and the Community.

VP1 – Marymede Catholic College, 65 Williamsons Road, South Morang

Anticipated change to the view

The view would change from the above open rural urban fringe character, to that of a highly urbanised setting with the station and car parking sitting relatively high in the landscape upon a fill landform, with a modern station building and architectural sculptural covered platform areas sitting atop. The rail line would sit elevated about four metres above the existing landform. This would result in the view from this receiver location effectively terminating at the current middle ground line of the existing old Whittlesea rail track formation. The main entry to the station would comprise a well landscape terraced setting stepping down to road level, with street tree planting further south along Williamsons Road. Few if any of the existing mature eucalypts adjacent to the college buildings would be retained. Beyond the street tree planting, the view would be across an extensive car parking area (500 commuter vehicles) with minimal provision for trees within it, and a rail reserve fence.

Much of the existing open area opposite the oval is proposed for future development, in addition to proposed future infill development adjoining Old Plenty Road and Plenty Road on the south-east side within and adjoining the rail reserve (GHD / AECOM 2016c).

Lighting

The proposed station, platforms and associated car parking / 'kiss and ride' would have a level of lighting sufficient to meet safety and security requirements. These lighting levels are anticipated to be high. Given the size of the main car park (approx. 375 m x 35 m), and the proposed station and associated entry areas on both sides of the station, the extent of lighting is anticipated to be substantial. Lighting would include cut-off fittings and would be directed to reduce light trespass.

Light from moving trains on the elevated rail formation would be visible at regular intervals.

Sensitivity to change

The sensitivity of this receiver group to the proposed change is considered to be Low as students and teachers are expected to be primarily focused on their schooling tasks, playing sport, personal interactions in the playground, etc. The change in the landscape setting of the college from that of 'rural / urban fringe' to a highly urbanised setting is consistent with the on-going urban development of this area. Given the application of urban design and landscape principles within the station environs adjacent to the main area of buildings within the college, and potential for conservation of many of the mature trees opposite the college oval, the project would provide well-considered streetscape amenity for the Marymede Catholic College, notwithstanding the lack of tree planting within the car parking area which is generally elevated above the college ground plane.

Magnitude of change

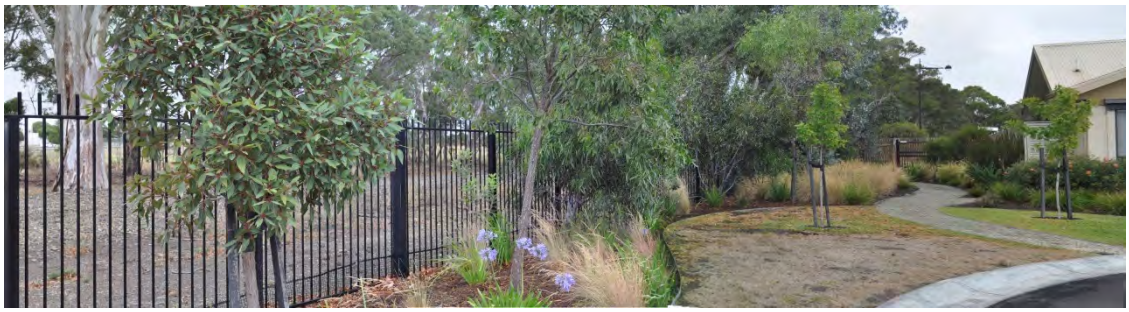
The magnitude of change is considered to be High given the change in the landscape setting of the college from that of 'rural / urban fringe' to that of a highly urbanised setting. However, notwithstanding the extent of change in landscape character, the project would generally provide a well-considered architectural and landscape outcome, including the anticipated conservation of a considerable number of the mature eucalypts in a grassland setting adjacent to the college oval.

Visual impact rating

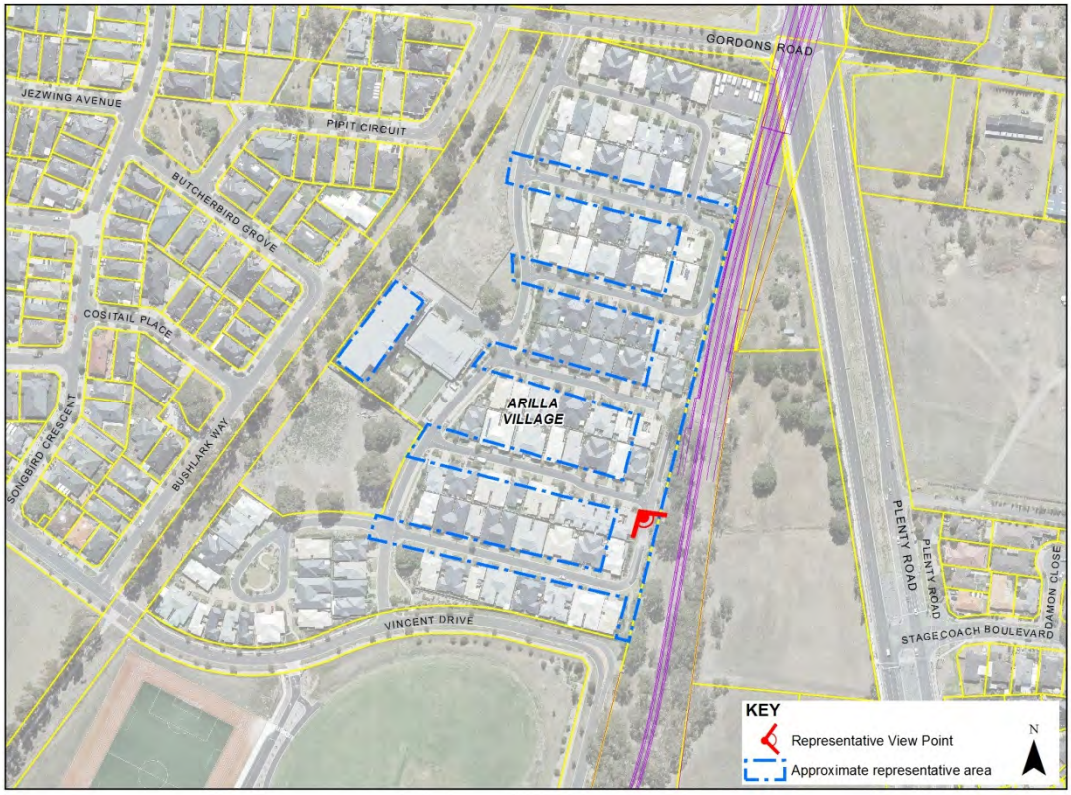
The overall rating of visual impact for VP1 is therefore assessed as **Minor to Moderate**.

Table 10 VP2 – Arilla Village

VP2 – Arilla Village, 60A Williamsons Road, South Morang



View South-East (Elevation - 150m AHD)



Description of current view

VP2 is located at Arilla Village midway along the site boundary, looking south-east towards the rail reserve. Views to the rail reserve are available at two locations where an internal road adjoins the boundary, comprising about half of the boundary length. The remaining boundary edge comprises the rear garden spaces of single storey housing backing onto the rail reserve, with a timber paling fence along the boundary that provides privacy to these spaces.

The permeable fencing and narrow garden bed treatment along this shown section of the boundary gives residents relatively clear views through to a remnant / regrowth linear woodland edge with a significant number of mature and semi-mature trees. The northern half of the site boundary has very little in the way of adjacent tree cover, comprising slashed, rough-grassed area which banks up to Plenty Road, which sits about in the order of 2 – 3 metres above level of the village.

The predominant type of receptor for this view is Residents.

VP2 – Arilla Village, 60A Williamsons Road, South Morang

Anticipated change to the view

The rail line would be descending along the village boundary from the proposed station near Marymede Catholic College, into cutting to pass under Plenty Road. A 2.5 m high noise wall is proposed to be installed along the village / rail reserve boundary, blocking views into the rail reserve and to the open space beyond which is zoned General Residential. The noise wall would be located on the boundary at the northern end of the village, gradually splaying out to a distance of less than 1.0m off the boundary at the southern end of the village. Given the proximity of the existing trees within the rail reserve to the proposed rail line, it would seem unlikely that there would be adequate room to conserve / reinstate a landscape treatment characteristic of the regrowth woodland community within the rail reserve, with most if not all of the adjacent trees within the rail reserve likely to be removed due to root damage, and/or for operational safety reasons. On the basis of the existing planting within the village along this boundary, the noise wall would be moderately screened in some locations and visually prominent in others. Adjusting / supplementing the existing planting scheme would be expected to provide a moderate to high level of screening of the noise wall from within the village.

The existing open area opposite the southern end of the Arilla Village and east of the rail reserve is proposed for future development (GHD / AECOM 2016c).

Lighting

The proposed station near Marymede Catholic College is about 400 m from this location. Additionally, trains would be predominantly unseen due to the proposed noise walls and the rail line descending into cutting. Lighting from the project is therefore not anticipated to be visually prominent from this location. It is therefore unlikely that lighting spill would be an issue here.

Sensitivity to change

The sensitivity of these residential receivers is considered to be High as some of the properties have windows facing towards the rail reserve, and residents strolling through the village would have relatively clear, pleasant views to an existing ‘woodland’ along part of the southern rail reserve boundary edge setting In this regard, it is likely that the fencing and landscape design of this boundary has been undertaken to facilitate views into the rail reserve. Further, residents can be expected to have a proprietary interest in their village and it’s immediate environs.

Additionally, aged residents can be expected to be at home for much of the time, i.e. they would in most cases be retired, and have the time to stroll through the village, including along parts of the rail reserve boundary. In this regard, the number of receivers can be expected to be of a moderate to potentially large number.

Magnitude of change

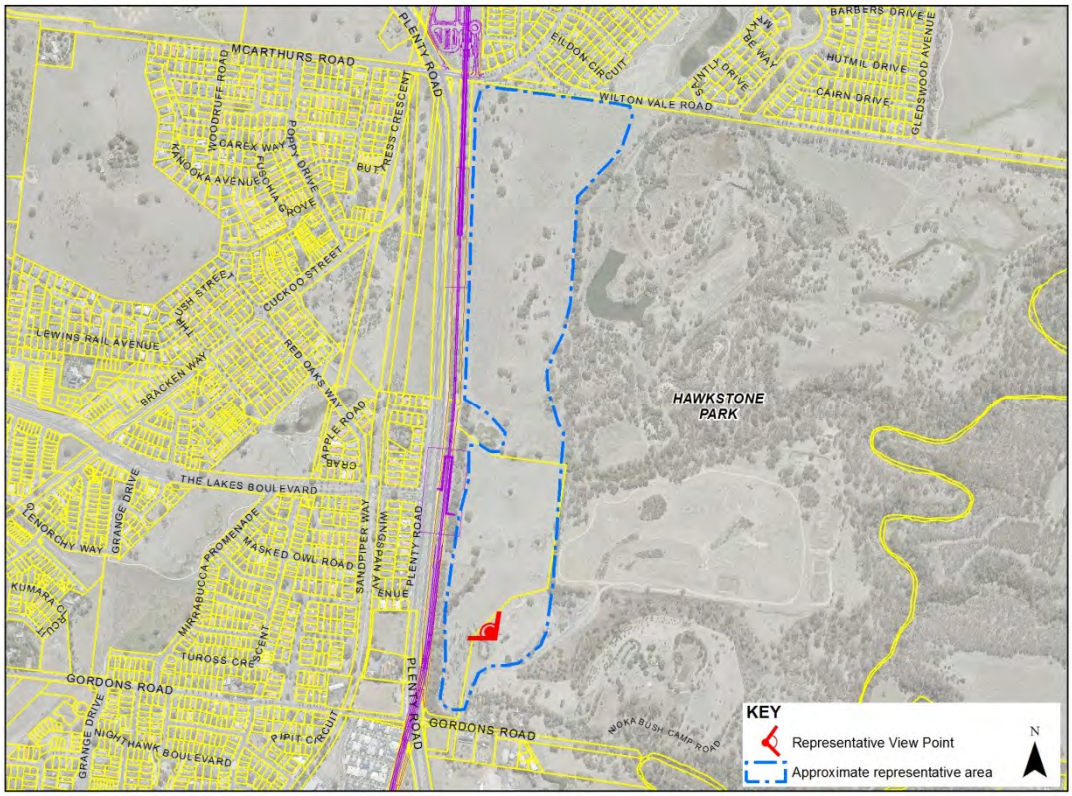
The magnitude of change is considered to be Very High assuming the above noted location of the noise wall, and the potential for loss of trees within part of the rail reserve.

Visual impact rating

The overall rating of visual impact for VP2 is therefore assessed to be **Major**.

Table 11 VP3 – Hawkstowe Park

VP3 – Hawkstowe Park, Plenty Road, South Morang

View North (Elevation – 155 m AHD)


Description of current view

VP3 is located in Hawkstowe Park looking north from an area of picnic tables and playground. The park is currently predominantly open in character with substantial linear stands of remnant / regrowth vegetation along the Plenty Road and rail reserve frontage. Additionally, from this vantage point, a diagonal line of trees runs across the landscape, providing a visually well-defined vegetated boundary to this area of the park.

The predominant receptor type for this view is Recreational Users.

Anticipated change to the view

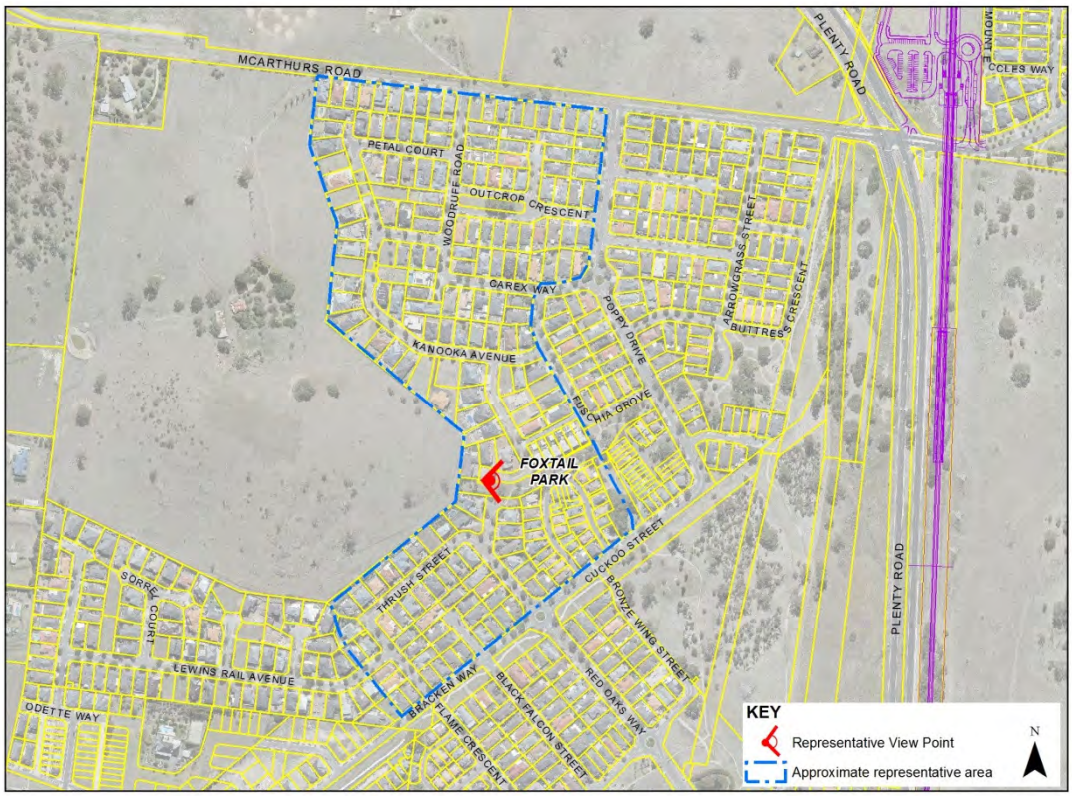
The project would be in cutting up to 8 m deep for the south part of this area. Much of the vegetation along the Plenty Road frontage has the potential to be conserved with the rail cutting running between the road and the line of trees. The trees within this area would provide substantial screening of any nearby rail infrastructure when viewed from this location. By the time the rail line moves onto structure, it is unlikely to be visually prominent from this location.

VP3 – Hawkstowe Park, Plenty Road, South Morang
A proposed pedestrian crossing of the rail reserve at The Lakes Boulevard is unlikely to be visible from this vantage point due to intervening vegetation, but would be visible from other locations within Hawkstowe Park. The proposed future Hawkstowe sports grounds and associated planting may further reduce the visibility of the project from this location. The existing open area south of Wingspan Avenue on the eastern side of the rail reserve is proposed for future development (GHD / AECOM 2016c).
Lighting The proposed Hawkstowe Station and carpark is 1.6 km+ from this location. It is therefore unlikely that lighting from the station and associated car parking areas would be visually prominent from this viewpoint. Where lights from trains were visible through the screening vegetation, this may be similar to that of car headlights on Plenty Road.
Sensitivity to change The sensitivity of park users from this viewpoint is considered to be High, as the location provides sweeping views across Hawkstowe Park and towards the rail reserve, and this receiver group is likely to spend relatively prolonged periods of time at the location, e.g. picnicking or sitting and watching children at play, etc. **Magnitude of change** The magnitude of change is considered to be Low, given that: • much of the alignment would be substantially screened by rows of existing trees along the Hawkstowe Park / rail reserve edge • the rail alignment would be in cutting for the area within proximity to this view point, and • the long viewing distance to that part of the alignment further north that would be elevated on retained wall sections and viaduct, would preclude detailed views of this infrastructure. **Visual Impact Rating** The overall rating of visual impact for VP3 is therefore assessed to be **Minor to Moderate.**

Table 12 VP4 – Foxtail Park

VP4 – Foxtail Park, 16 Foxtail Terrace, South Morang

View East (Elevation - 170m AHD)



Description of current view

VP4 is located near the upper end of Foxtail Park, and is considered to be broadly representative of views available from elevated locations of residential development in this area, particularly double storey development. There is a significant cover of mature endemic trees downslope of this location and adjacent to Hawkstowe Park, which is located 600m east of this point. Much of this tree cover is located within land zoned Rural Conservation or within the Yan Yean Pipe Track.

The predominant receptors for this view are residents, with an expected low number of recreational users given the lack of facilities such as seating in the park.

VP4 – Foxtail Park, 16 Foxtail Terrace, South Morang

Anticipated change to the view

Removal of trees within the rail reserve is considered unlikely to be readily discernible from this location due to the extent of mature intervening tree cover with streets, gardens and the endemic bushland remnants between the housing and Plenty Road. However, the elevated rail line may be visible from some residences or from Foxtail Park, but is unlikely to be visually prominent within the above context and the viewing distance. The canopy structures associated with the elevated station platforms which are proposed to be clad in materials with muted colour may be more visually prominent, but would constitute a relatively small element within the broader landscape setting when seen from this distance (700 m).

Lighting

The proposed station, elevated platforms and associated canopy structures, car parking / 'kiss and ride' would have a level of lighting sufficient to meet safety and security requirements. These lighting levels are anticipated to be high. Therefore, residential receivers with views to the station may be able to distinguish an increased level of lighting from the station precinct, potentially including lines of platform lighting and parts of the platform canopy structures. This view would be likely to be seen within the context of both: partial views to the well-lit dual carriage Plenty Road, traversing across the landscape, and immediately in front of the proposed station, but also adjacent substantial 'dark' areas of Hawkstowe Park, and the farm land north of McArthurs Road.

Light from moving trains on the elevated rail formation would be visible at regular intervals.

Lighting would include cut-off fittings and would be directed to reduce light trespass.

Sensitivity to change

The sensitivity of receivers to the project is considered to be Medium within the context of intervening mature tree cover and distance to the project, which would be seen as a relatively small part of the view across the Plenty River valley, which increasingly opens up above the floodplain tree-line to the forested ranges in the north through to the south-east.

Magnitude of change

The magnitude of change is considered to be Low due to the extent of intervening tree cover and the viewing distance, notwithstanding the potential for a relatively small point source of increased illumination for some receivers, associated with the station at night.

Visual Impact Rating

The overall rating of visual impact for VP4 is therefore assessed to be **Minor.**

Table 13 VP5 – McArthurs Road

VP5 – 95A McArthurs Road, South Morang

View East (Elevation – 205 m AHD)

Description of current view

VP5 is the highest publically accessible elevation within 1km of the rail reserve (viewing distance to proposed station near Hawkstowe Parade from this location is about 1 km). A panoramic view from this location extends across the well-wooded Plenty River floodplain to the Kinglake Ranges in the north through to the substantially wooded slopes of Yarrambat, with more distant ranges visible beyond through to the south-east.

This view point is also broadly representative of views from Granite Hills Park which is proposed to substantially encircle this location from the north-east, through west to the south-east, i.e. much of this area currently appears to still be in private ownership / inaccessible to the general public, even though it is zoned as Rural Conservation Zone and noted on the zoning plan as 'Granite Hills Park' (refer Figure 16), and is identified as Significant Landscape Overlay 2 in the Whittlesea Planning Scheme (refer Figure 17). Views from the park would generally be from a higher elevation which would reveal a greater extent of the ground plane than seen from this location. Currently, the publically accessible southern portion of Granite Hills Park (Topaz Grove entry, South Morang), provides extensive views from select locations predominantly south to the project at a distance of some 3 km, and beyond to the Melbourne CBD on the skyline.

VP5 – 95A McArthurs Road, South Morang

Anticipated change to the view

The project may be visually prominent from this location where it sits above the floodplain tree-line, comprising: the proposed station and associated elevated structure near Hawkstowe Parade; viaduct across Simons Creek and The Parkway with associated ramp structures; Mernda Station with associated ramp structures; and to a lesser extent, the proposed pedestrian / cycle crossing at The Lakes Boulevarde. Further, these elevated structural elements would be seen against a relatively extensive and visually homogenous tree cover across much of the floodplain landscape, causing the differently coloured, architectural elements to visually stand-out in contrast.

However, due to the 1km viewing distance, where the project is seen, it would generally be within a relatively low level of detail, other than elevated structures. Further, these elements would be seen within the context of an extensive panoramic view.

There is potential for other sections of the rail reserve to be moderately visually prominent from elevated locations such as this, given the relatively narrow rail reserve and consequent potential for limited tree planting within the rail reserve. Should this inability to plant a substantial number of trees within the rail reserve be realised, there is potential for parts of the rail reserve to read as a visually uncharacteristic straight line cutting across the landscape, particularly from more elevated areas within Granite Hills Park.

Much of the open area within the foreground of this view is proposed for future residential development, i.e. east of the above mapped approximate representative area, and including the triangle of land between Plenty Road, the Yan Yean Pipe Track and Rush Lily Reserve (GHD / AECOM 2016c).

Lighting

The elevated sections of the rail reserve are likely to be visually prominent at night from elevated locations such as this. However, the number of receivers likely to be in the park at night within its current form is very low. A future proposed sporting facility at the southern end pf Hawkstowe Park may be lit at night.

Sensitivity to change

The sensitivity of receivers to the project is considered to be Medium as rural residents and recreational users in Granite Hills Park have substantial high amenity views across the landscape. However, the number of receivers within the existing rural dwellings is very low, and there are currently no readily / publically accessible locations within the park that have substantial views to the north and east. The number of receivers within Granite Hills Park at this period in its development is considered likely to be very low.

Magnitude of change

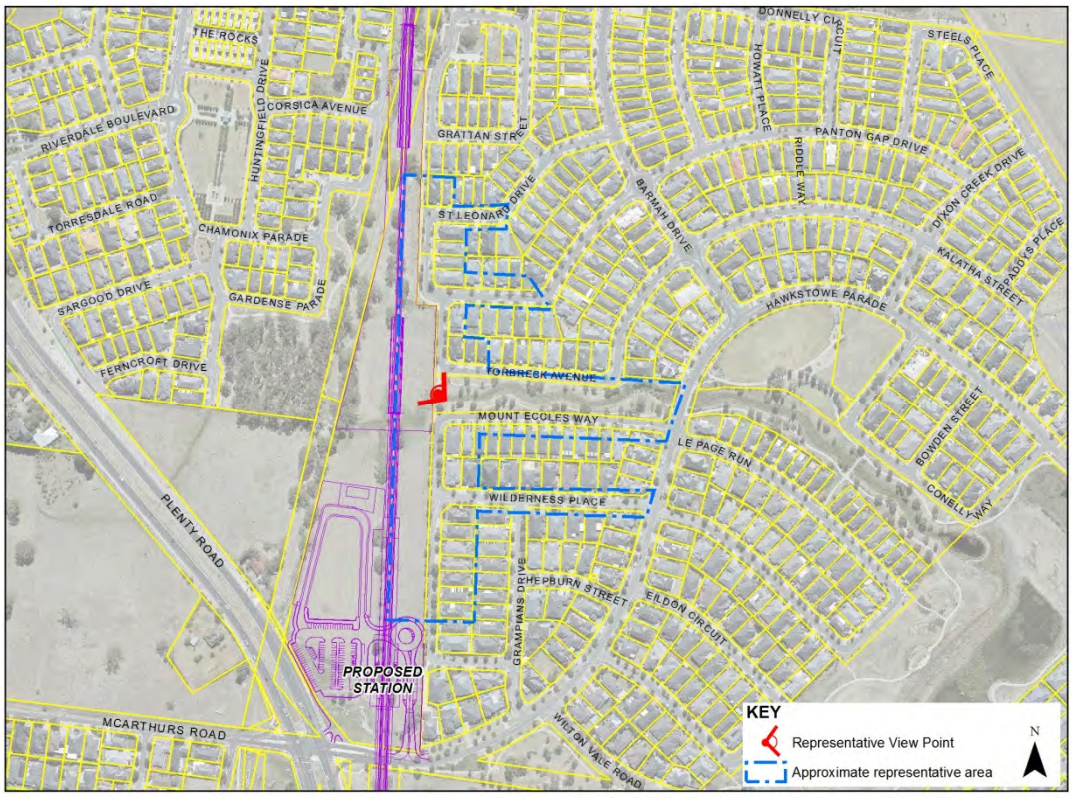
The Magnitude of change is considered to be Medium, given the viewing distance, and the broad, panoramic landscape within which the project would be viewed, but also recognising the likelihood that elevated sections of the proposed stations and the viaduct crossing of Simons Creek would potentially be clearly visible from elevated locations such as this one, and that the level of visibility may be enhanced due to the architectural elements being seen against a substantially homogenous forested backdrop.

Visual Impact Rating

The overall rating of visual impact for VP5 is therefore assessed to be **Minor to Moderate**.

Table 14 VP6 – Winton Vale Creek Park

VP6 – Winton Vale Creek Park, 28 Mount Eccles Way, South Morang

View North-West (Elevation – 155 m AHD)


Description of current view

VP6 is located on the corner of Mount Eccles Way near where Winton Vale Creek Park meets the rail reserve, and highlights the existing scenic amenity within this area. Residential houses facing the rail reserve have views to remnant vegetation at Chamonix Park and Rush Lily Environment Reserve and the Yan Yean Pipe Track.

Immediately south of this view point is the proposed station near Hawkstowe Parade (about 250 m beyond left of frame above).

The predominant receptors for this view are residents and recreational users.

VP6 – Winton Vale Creek Park, 28 Mount Eccles Way, South Morang

Anticipated change to the view

The above view would incorporate viaduct to the left of the frame descending to a free-standing concrete retaining wall structure which would continue the descent down to ground level towards centre-right of frame. No noise walls would be in place for this section. The alignment would then travel at grade for a short period (no noise walls) before again rising on structure with noise walls to cross Simons Creek and The Parkway. All of the tree cover in the background of the above photo would be retained, providing a canopy backdrop to this part of the project. All of the vegetation towards the middle of the rail reserve would be removed.

Most of the area between Mount Eccles Way / the southern end of Saint Leonard Drive and the proposed rail alignment is identified as a future development site (by others), potentially comprising built-form such as one to two storey town houses.

Lighting

Looking north from this viewpoint, minimal levels of lighting would be associated with the alignment, e.g. signalling, etc.

The on-structure sections of the alignment would be anticipated to include noise walls. Lights from trains would be visible until the commencement of noise walls at the ascent to the Simons Creek crossing.

Lighting would include cut-off fittings and would be directed to reduce light trespass.

Sensitivity to change

The sensitivity of receivers is considered to be High as residents at this location look directly from their homes facing onto the rail reserve, and can be expected to have a high level of proprietary interest in changes to the immediate environment of their homes. The proximity of the project (less than 50 m) would provide views with a high level of detail. Recreational users would have moderately close, detailed views of the Project, which would be in strong visual contrast to the existing open, semi-natural rail reserve setting at this location. Receiver numbers can be expected to be high for recreational receivers given the existing shareway that runs alongside the rail reserve, and the proposed shareway that will run along the Yan Yean Pipe Track and then along the western boundary of the rail reserve. Additionally, there would be a moderate number of residences that face into the rail reserve.

Magnitude of change

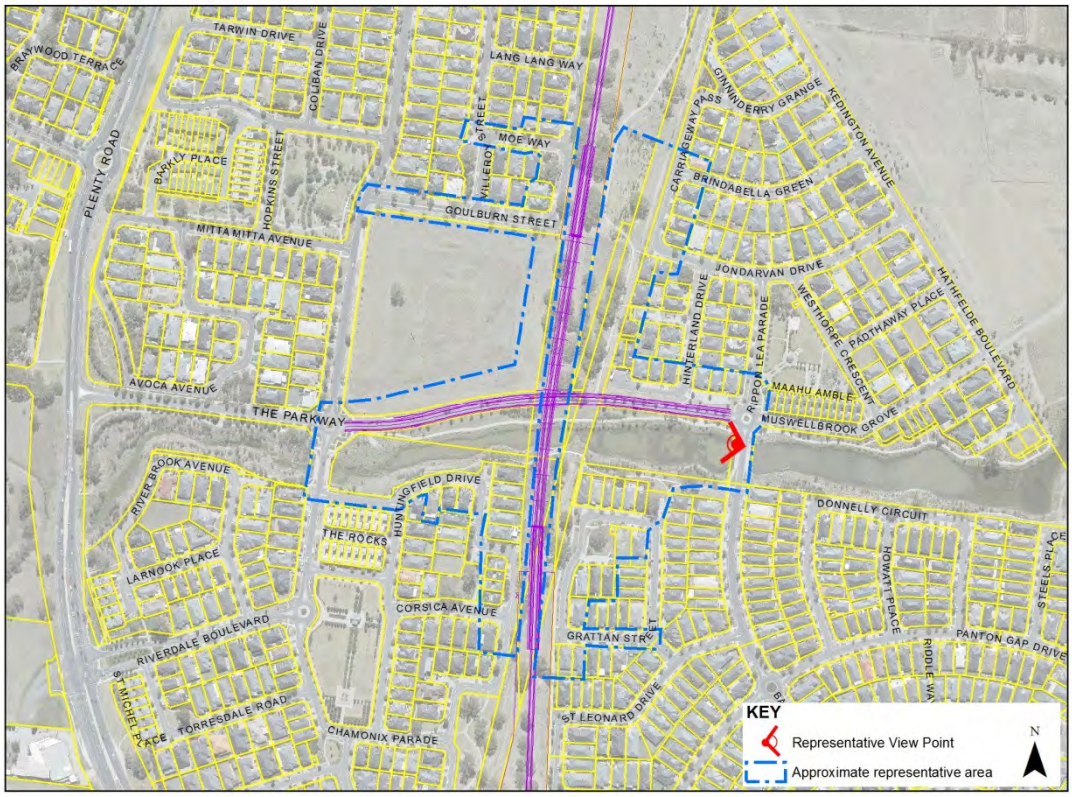
The magnitude of change is considered to be Very High due to the elevated, highly proximate, visually prominent, and highly visually contrasting nature of the proposed infrastructure.

Visual Impact Rating

The overall rating of visual impact for VP6 is assessed to be **Major**.

Table 15 VP7 – Simons Creek

VP7 – Barmah Drive Bridge over Simons Creek, South Morang

View West (Elevation – 155 m AHD)


Description of current view

VP7 looks west across Simons Creek from the Barmah Drive bridge. The existing scenic setting around this wetland provides receivers including recreational walkers, joggers and cyclists on the shared user path, and residents in properties facing the wetland (as seen in contextual view below of Huntingfield Drive), with high levels of visual amenity. Additionally, the proposed school between Goulburn Street and The Parkway (currently under construction) will have detailed views to the project along the eastern and southern boundaries. The predominant receptors for this view are residents, recreational users and to a lesser degree schools and community.

VP7 – Barmah Drive Bridge over Simons Creek, South Morang

Anticipated change to the view

Views from this location would experience a high level of visual change, with an elevated rail viaduct incorporating noise walls spanning the wetland and the Parkway from south to north (left to right in image above, and at the furthest seen point of the wetland), with the viaduct rising to about 11 m above ground level. The bridge would be likely to be visually prominent within the central 1/3 of the above image. Additionally, a long ramping retaining wall structure with noise walls atop to either side of the viaduct would be partially visible from this location, with the structure likely to rise up to a height of about 8m above ground level.

Lighting

Lights from trains would be visible from the southern commencement of the actual watercourse crossing travelling north given there would be no noise walls at the watercourse crossing point, and only a short section of noise wall on the western side of the viaduct after crossing the watercourse. It is not anticipated that any fixed lighting would be required within the rail reserve at this point other than rail signalling equipment.

Sensitivity to change

The sensitivity of receivers to the proposed change is considered to be High as residents in double storey homes and numerous recreational users at this location have scenic views across Simons Creek and associated parklands in the area. Adjacent residential users in particular can be expected to have a very high level of proprietary interest in the project.

The viaduct crossing would be particularly visually prominent from adjacent housing in Yering Drive facing onto the Simons Creek rail reserve, although the extent of tree planting that has been undertaken along this edge of Simons Creek should provide a significant level of screening over time.

Magnitude of change

The magnitude of change is considered to be Very High due to the addition of a major piece of elevated rail reserve infrastructure being inserted into this landscape, which is characterised by very low topographic relief in this area. The viaduct structure incorporates long elevated sections of viaduct and retaining wall structure leading up to and from the bridge.

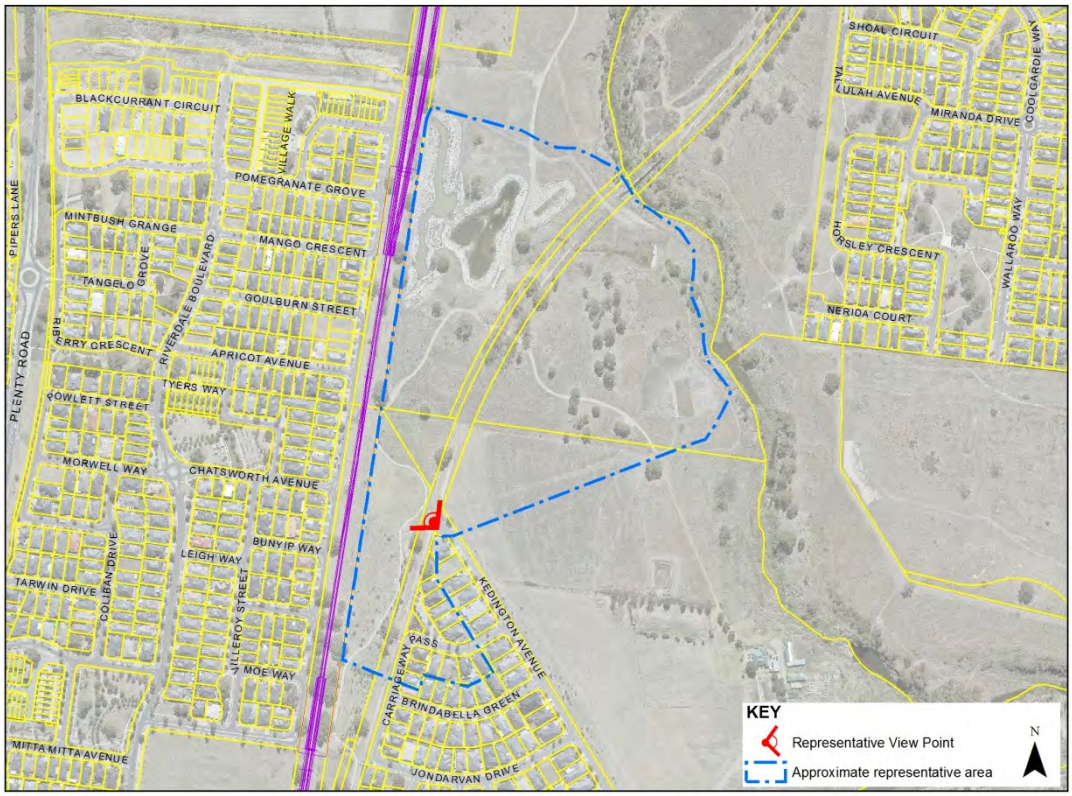
Visual Impact Rating

The overall rating of visual impact for VP7 is assessed to be **Major.**

Contextual View

Table 16 VP8 – Hathfelde Boulevard

VP8 – 45 Hathfelde Boulevard, Mernda

View North-West (Elevation – 155 m AHD)


Description of current view

VP8 is located at the end of Hathfelde Boulevard, facing north-west towards residential properties on Goulburn Street, located on the other side of the rail reserve. The viewpoint is about 100 m from the rail alignment.

The triangular Goulburn Park to left of frame joins with the northern section of Plenty Gorge Park to right of frame. The parks comprise substantially of open plains with a significant number mature endemic eucalypts, most of them along the far side of the rail reserve.

The predominant receptors for this view are residents and recreational users.

Anticipated change to the view

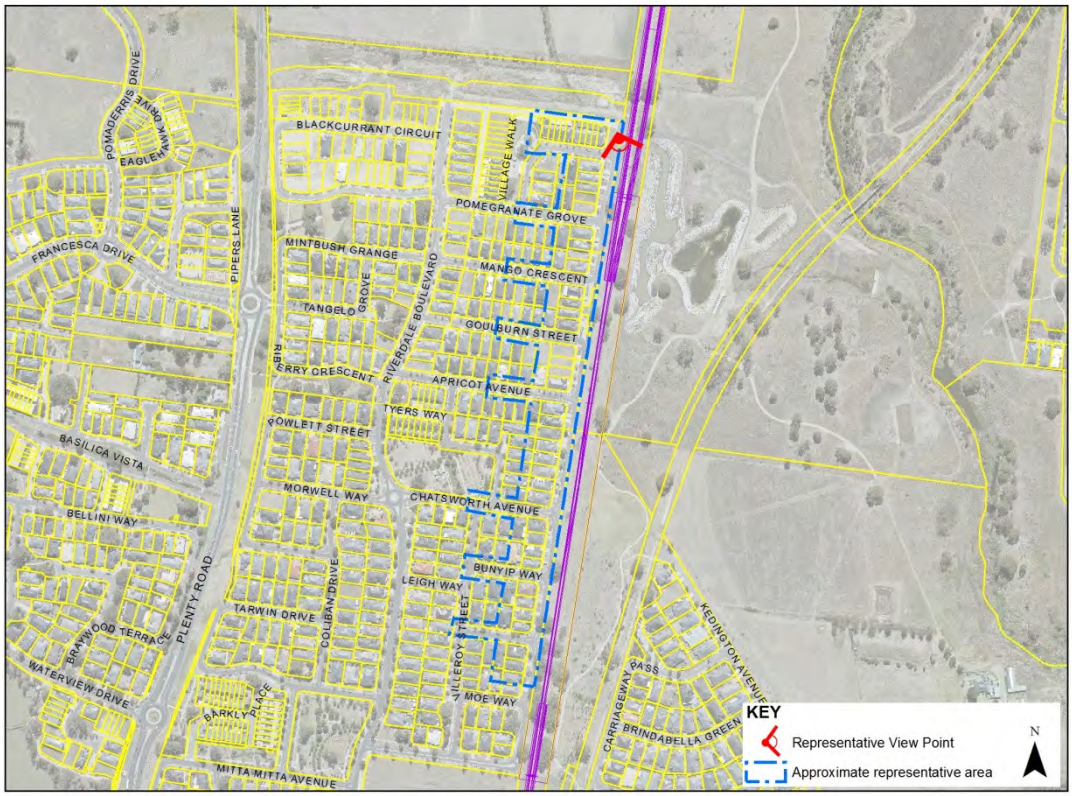
The rail alignment would predominantly be close to (above) grade as seen from this viewpoint, and close to the opposite Goulburn Street / Mango Crescent side of the rail reserve, with a noise wall proposed for that side of the rail reserve only.

VP8 – 45 Hathfelde Boulevard, Mernda
The mature trees along the far side of the rail reserve broadly comprise a discontinuous ‘avenue’ with the alignment running broadly midway between them. The project is likely to require the removal of either one or both lines of trees (each row contains in the order of 15 mature trees), depending on the final design setback from the Goulburn Street / Mango Crescent residential edge, e.g. whether a shared use path is provided between the kerb and noise wall. The great majority of these trees are located between The Parkway and the southern end of Goulburn Street (south of Bunyip Way). The rail reserve width suggests the potential for the provision of tree planting within and along much of the eastern edge. the rail reserve would have security fencing that is likely to be visible from this location.
Lighting The proposed Mernda Station is about 1 km north of this location. No significant fixed lighting elements are likely to be associated with this section of the rail reserve. Lights from passing trains would be visible from this side of the rail reserve, although this has the potential to be reduced by landscaping within the reserve.
Sensitivity to change The sensitivity of receivers is considered High as at this location as many residences have prolonged and substantially uninterrupted, broad views across Goulburn Park to the rail reserve, including to the regular passage of trains. Further, given the distance of the rail alignment from facing residences of between 90 and 130 m, the project would be viewed in a considerable level of detail by this sensitive receiver group. A recreational trail with fun and fitness equipment also runs through this corridor, which is anticipated to have moderate to high levels of usage, and the potential for substantial periods of prolonged viewing of the rail reserve. **Magnitude of change** The magnitude of change is considered to be High due to the extent of change from a currently broad, substantially open rail reserve with facing housing (notwithstanding the rail reservation) visibility of the rail infrastructure, including the noise wall, and the regular passage of trains which would occur. Further, the structure rising towards Mernda Station and the station itself would be visible from this location. However, much of the park within the foreground of the view would be retained. **Visual Impact Rating** The overall rating of visual impact for VP8 is assessed to be **Moderate to Major.**

Table 17 VP9 – Mango Crescent

VP9 – Mango Crescent, Mernda

View South-East (Elevation – 155 m AHD)



Description of current view

VP9 is located at the northern end of Mango Crescent close to the proposed Mernda Town Centre site, looking south towards the rail reserve, with extensive views of Plenty Gorge Park beyond. The contextual view below illustrates the mix of single and double storey residences in this area looking towards the rail reserve and parkland. The predominant receptor for this view are residents.

Anticipated change to the view

Houses on Mango Crescent / Goulburn Street generally would look directly into a 2.5 m high noise wall that would run for most of the length of these two residential streets, over a distance of 600 m between Pomegranate Grove and Moe Way. Overhead power stanchions would be visible above the noise wall. The width of landscape planting between the kerb and the noise wall is proposed to be in the order of 3m wide, sufficient to provide an integrated landscape planting response, including tall shrubs which would potentially screen much of the noise wall.

VP9 – Mango Crescent, Mernda

From this northern-most view point on Mango Crescent, the noise wall would be attached to the elevated structures over a distance of about 230 m, finishing at the current northern end of Mango Crescent. The rail alignment would be seen climbing on concrete retaining wall structure from about the southern end of Mango Crescent, transitioning to viaduct with noise wall about 100 m from the view point, before attaining nearly full height at the northern end of Mango Crescent. Overhead power stanchions would be visible above the noise walls. Mernda Station would be located about 300 m north of this location, with the station platforms and canopy structures on viaduct.

Housing at the southern end of Goulburn Street would look towards the rail line descending from the viaduct crossing of Simons Creek and The Parkway on viaduct and then a concrete retaining structure.

The rail reserve edge may include a shared user path between the kerb and the noise wall, with a minimum 3m wide landscape edge between the shared user path and the noise wall, sufficient to provide a substantial level of screening to the noise wall as described above.

Lighting

The proposed station, elevated platforms and associated canopy structures, car parking and separate 'kiss and ride' area would have a level of lighting sufficient to meet safety and security requirements. These lighting levels are anticipated to be high. Looking north from this viewpoint, substantial levels of lighting would be visible from the Mernda Station precinct, however no significant fixed lighting elements are likely to be associated with the section of the rail reserve south of the station.

Lights from trains would be visible when looking north from this location as no noise walls would be provided for the remaining section of the project.

Lighting at the station precinct would include cut-off fittings directed to reduce light trespass.

Sensitivity to change

The sensitivity of receptors is considered to be High within the context of the existing open view to Goulburn Park and Plenty Gorge Park from facing housing; the proprietary interest that residents would have in changes to their immediate environment; the close, detailed views of the project available from the residences; and the opportunities for daily, and in some cases prolonged views of the project.

Magnitude of change

The magnitude of change is considered to be Very High due to the contrast in landscape character which provided long distance, broad, open, semi-natural views, to views into a noise wall which would remove broad and open views to Plenty Gorge Park and Goulburn Park from adjoining residential areas.

Visual Impact Rating

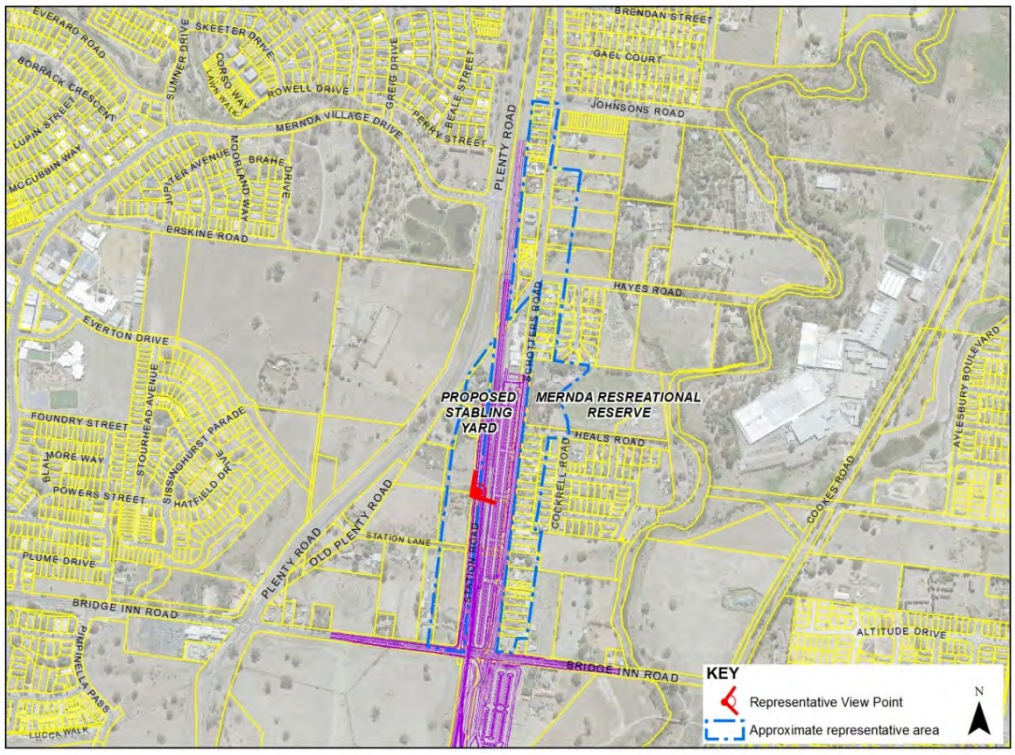
The overall rating of visual impact for VP9 is therefore assessed to be **Major**.

Contextual View

Table 18 VP10 – 6 Station Road

VP10 – 6 Station Road, Mernda

View North-East (Elevation – 165 m AHD)



Description of current view

VP10 is located on Station Road looking across a grassy paddock (the rail reserve), east to residential properties facing Schotters Road, and north towards Mernda Recreational Reserve (centre left of frame). The view is generally representative for both sides of the rail reserve. The predominant receptors for this view are residents and recreational users.

The landscape character of this area is rural / urban fringe, with a strong rural emphasis.

Anticipated change to the view

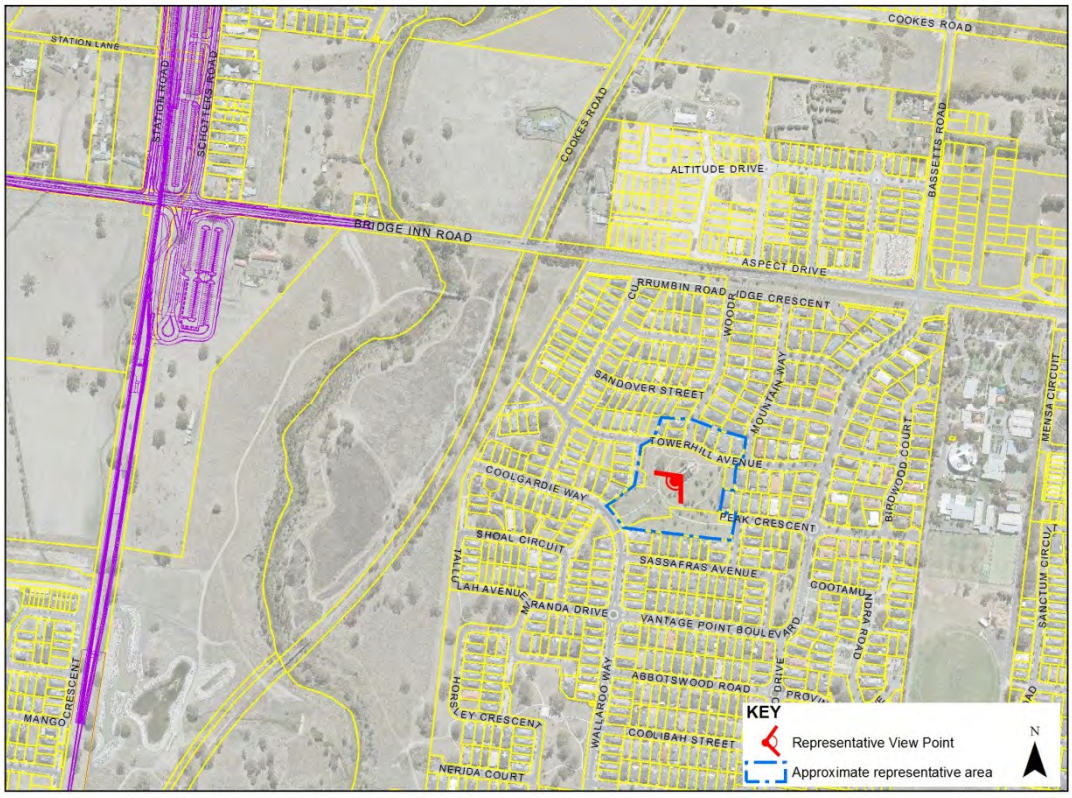
The proposed stabling yards and extensive commuter car parking on the other side of the rail reserve would be located within this view.

The 550 m length of the facility carpark would cause the quiet rural street character of Schotters Road from which the car park would be accessed to be subject to large vehicle movement numbers. A notable aspect of the proposed commuter car parking and roadworks to Station Road and Schotters Road is the lack of trees, which would be in strong visual contrast to the adjacent areas, and provide little or no landscape or environmental amenity, e.g. shade.

VP10 – 6 Station Road, Mernda
A single rail line on viaduct would cross Bridge Inn Road from Mernda Station descending to at-grade opposite Station Lane, then traveling a further 200m before forking in three train stabling lines terminating at a point in line with Hayes Road.
Lighting The Stabling Yard would have safety and security lighting, much of it mounted to overhead gantries at regular and relatively close intervals. The commuter car park would also have would have lighting sufficient to meet safety and security requirements. These lighting levels are anticipated to be high, with the stabling yard and adjoining car park creating an extensive, brightly lit infrastructure facility. The car park lighting would comprise a strongly contrasting night-time environment for the residences on Schotters Road, which currently adjoin a quiet and 'dark' environment. Additionally, lighting from a potential future extension of the stabling yard to the north and running alongside the rear fences of houses on Schotters Road, would be likely to be visible from the back / rear gardens of these dwellings. The lighting would also create a substantial change in character for the night time environment of the intrinsically dark Mernda Recreational Reserve.
Sensitivity to change The sensitivity of residents is considered High as this location is in clear view for all of the residences on Schotters Road opposite the commuter car park (about 24 houses). **Magnitude of change** The magnitude of change is considered to be Very High given the existing view as shown above, including views from the housing in Schotters Road would look directly onto an extensive commuter car parking area with minimal provision for tree planting. **Visual Impact Rating** The overall rating of visual impact for VP10 is assessed to be **Major**.

Table 19 VP11 – Towerhill Avenue

VP11 – Playground, Park on Towerhill Avenue, Doreen

View South-West (Elevation – 170 m AHD)

Description of current view VP11 is taken from an elevated playground and park located on the Towerhill Avenue looking towards the proposed Mernda Station, which is located about 800 m west of this park. The predominant receptors for this view are residents and recreational users.
Anticipated change to the view The riparian corridor along Plenty River in conjunction with vegetated parts of the Yan Yean Pipe Track and maturing street tree planting in the intervening housing development, is anticipated to substantially screen the project from this location. However, given that Mernda Station would have platforms with associated canopy structures on viaduct, it is possible that this element could be partially or fully visible from this location. Additionally, viaduct and trains travelling on viaduct entering and leaving the station may be partially visible.

VP11 – Playground, Park on Towerhill Avenue, Doreen
Lighting Given the above potential for Mernda Station to be visible from this location, and the extent of car parking and stabling yard, lighting of this precinct has the potential to be visible from this location. Lighting would be sufficient to meet safety and security requirements, and is anticipated to be bright, particularly within the dark environment of the Plenty River Park and the undeveloped Mernda town centre area.
Sensitivity to change The sensitivity of receivers is considered High as the site is located in an elevated position used by recreational users and residents, and likely to have moderate to high receiver numbers. **Magnitude of change** The magnitude of change is considered to be Low due to distance of the alignment from this viewpoint, the extent of screening currently in place between the park and the station, and the increased levels of screening that can be expected over time as street trees and riparian vegetation along the Plenty River increases over time. **Visual Impact Rating** The overall rating of visual impact for VP11 is therefore assessed to be **Minor to Moderate**.

6.3 Summary of Impacts

A summary of landscape, visual, lighting and heritage impacts follows.

6.3.1 Summary of landscape impacts

Table 20 provides a summary of landscape impacts.

Table 20 Summary of landscape impacts

Viewpoint	Receiver	Sensitivity to change	Magnitude of change	Overall rating
LCT1	Flat Residential	Medium	Medium	Minor to Moderate
LCT6	River Corridor	Medium	Medium	Minor to Moderate
LCT7	Utilities	Negligible	Low	Negligible

Note: LCTs 2-5 and 8 not assessed given the project would not pass through or alongside these.

6.3.2 Summary of visual impacts

Table 21 provides a summary of viewpoint visual impacts.

Table 21 Summary of viewpoint visual impacts

Viewpoint	Receiver	Sensitivity to change	Magnitude of change	Overall rating
VP1	Marymede Catholic College, 65 Williamsons Road, South Morang *Schools and Community*	Low	High	Minor to Moderate
VP2	Arilla Village, 60A Williamsons Road, South Morang *Residents*	High	Very High	Major
VP3	Hawkstowe, Plenty Road, South Morang *Recreational Users*	High	Low	Minor to Moderate
VP4	Foxtail Park, 16 Foxtail Terrace, South Morang *Residents and Recreational Users*	Medium	Low	Minor
VP5	95A McArthurs Road, South Morang *Residents*	Medium	Medium	Minor to Moderate
VP6	Winton Vale Creek Park, 28 Mount Eccles Way, South Morang *Residents and Recreational Users*	High	Very High	Major
VP7	Barmah Drive Bridge over Simons Creek, South Morang *Residents and Recreational Users*	High	Very High	Major
VP8	45 Hathfelde Boulevard, Mernda *Residents and Recreational Users*	High	High	Moderate to Major
VP9	Mango Crescent, Mernda *Residents*	High	Very High	Major
VP10	6 Station Road, Mernda *Residents and Recreational Users*	High	Very High	Major
VP11	Playground, Park on Towerhill Avenue, Doreen *Residents and Recreational Users*	High	Low	Minor to Moderate

6.3.3 Summary of lighting impacts

Lighting impacts from the project are considered generally to be relatively minimal, except where development would be located adjacent to station precincts and the train stabling yard, as follows:

- Lighting would need to be sufficient to meet safety and security requirements within station precincts and the train stabling yard. These lighting levels are anticipated to be high
- All Lighting would include cut-off fittings and would be directed to reduce light trespass
- Lighting from passing trains would be visible from some sensitive receivers, particularly where trains are on viaduct, including from vantage points such as Granite Hills Park. However, this would be expected to reduce as proposed landscaping matured. Tree planting within and adjoining the rail reserve would assist in reducing lighting impacts
- Lighting impacts would generally be increasing mitigated by increasing distance from the project.

A potential area of lighting impacts is associated with the station commuter car parks which appear generally to have low levels of provision for tree planting, which could assist in reducing the intensity of this lighting to adjacent areas.

6.3.4 Response to key considerations

Below is a list of key considerations identified in s.4.4, and the extent to which these have been addressed:

Environmental Sustainability

Key considerations under this heading can be summarised as:

- The need to protect, conserve and improve the natural environment
- Avoiding, minimising and offsetting harm to the local environment, including through the loss of biodiversity
- To enhance environmental values along the rail reservation.

It is unclear the extent to which these issues would be addressed given there is currently no landscape concept design in place for the project (including those parts of the rail reserve between the stations), other than at a very high level within the station precincts.

Notwithstanding the above, the provision of a mass transit system comprises an inherently sustainable outcome.

Environmental sustainability will be considered further during the ongoing design stages, with the potential to meet the above key considerations through that process.

Sense of Place

Key considerations under this heading can be summarised as the need to:

- Reinforce a sense of place and cultural identity and contribute positively to local urban character
- Conserve the pattern of existing vegetation
- Maintain the existing low density rural character of the Plenty Valley.

Notwithstanding that much of the Plenty River Valley is subject to, or proposed for future urban development, substantial tracts of the valley are anticipated to conserve the existing rural landscape character including Plenty Gorge Parklands, Hawkstowe Park and Granite Hills Park.

The same comments as above apply with regard to the likely loss of endemic tree planting within the rail reserve. In this regard, tree plantings would be lost, including where these are situated in association with identified significant features within the 'Rural Land Character Areas, Siting, Use and Development Policy (Whittlesea City Council, 1997)' such as the Plenty River Floodplain.

Additionally, within the station precincts, there is generally a limited amount of proposed tree planting within the car parking areas in particular, but also within the general station environs. In addition to a lack of trees contributing to issues such as those of glare and urban heat island effect, visually unrelieved expanses of carpark do not reinforce a sense of place and cultural identity as expressed through the Whittlesea City Council 'Rural Land Character Areas, Siting, Use and Development Policy', e.g. rural character and informal patterns of endemic remnants / regrowth, particularly of River Red Gum (*E. camaldulensis*), attributes which the existing rail reserve makes a tangible contribution towards.

Sense of place sustainability will be considered further during the ongoing design stages, with the potential to meet the above key considerations through that process.

Heritage

Key considerations under this heading can be summarised as the need to:

- Protect neighbourhood character and sense of place with regard to heritage elements
- Conserve and enhance heritage places of natural or cultural significance.

With regard to the heritage items identified within this report as contributing to the sense of place for landscape setting within which the project sits, and comprising elements that have the potential to be conserved and viewed from the rail reserve (refer s.4.4.3), the following comments are provided:

- Berry Lane: To 'protect neighbourhood character and sense of place' for Berry Lane would in large measure need to be in response to the design of the adjoining Mernda Town Centre development (not applicable to this study). However, the capacity for the project to 'conserve and enhance' the heritage item could also be considered, e.g. to provide a pedestrian and cycle connection along the Berry Lane alignment, and over the project to the 'Thomas' Mill' site (HO12), which also then connects with the Plenty River and Yan Yean Pipe Track (GHD / AECOM 2016a)
- Yan Yean Pipe Track (including Yan Yean Water Supply System): The capacity of the project 'to protect … the sense of place' of the Yan Yean Pipe track where crossed by the project is considered to be achievable within the constraints of the project (refer s.7 Mitigation Measures)
- South Morang Railway Station, South Morang 26: The curtilage planting associated with the existing 1800's dwelling in addition to potential archaeological remains associated with the original station would be visible from the Proposed station near Marymede Catholic College platforms and trains standing in the station. A proposed noise wall on the Up side of the rail reserve has the potential to preclude views of the dwelling from the rail reserve. A transparent noise wall in this location would the reveal dwelling to rail commuters, as well as conserve the open landscape outlook from the dwelling looking north-west, and reinforce the historic connection between the dwelling and the rail reserve. Within this context, a transparent noise wall in this location could be seen to 'conserve and enhance' the heritage item.

Therefore, within the context of landscape character and visual amenity it is considered that at this stage in the design process, the matters arising under the heading of Heritage have the potential to be met.

Landscape Amenity

Key considerations under this heading can be summarised as the need to:

- Improve the amenity of communities and minimise impacts of the transport system on adjacent land uses
- Provide a positive passenger experience through attractive rail reserve edges.

As described above for the key considerations of 'Environmental Sustainability' and 'Sense of Place', the likely loss of substantial levels of cultural and endemic tree plantings within the rail reserve, and constraints with regard reinstatement of a similar level or character of planting to much of the rail reserve is likely to result in reduced levels of visual amenity within it, particularly in the areas between the stations for which there is currently no landscape master plan in place. Additionally, the limited amount of tree planting indicated within the station car parking areas in particular is unlikely to 'improve the amenity of communities' or 'provide a positive passenger experience through attractive corridor edges'.

Landscape amenity will be considered further during the ongoing design stages, with the potential to meet the above key considerations through that process.

Views

Key considerations under this heading can be summarised as the need to:

- Consider important views and vistas
- Consider enhancement of view lines and visual connections across the rail reserve.

Key views identified in the Urban Design Concept Report (GHD / AECOM 2016a) include: views north to the Great Dividing Range; views east to the Plenty Gorge Parklands; views to Granite Hills Park; and views to open farmland and grasslands with scattered River Red Gum stands. To this list could be added views associated with the above identified key heritage items, including: Berry Lane; the Yan Yean Pipe Track; and South Morang Railway Station, South Morang 26.

The identification of site specific view lines to these elements would be an important component of a future landscape master plan for the project. Subject to this level of analysis being undertaken, within the context of landscape character and visual amenity it is considered that at this stage in the design process, the matters arising under the heading of Views have the potential to be met.

7. Mitigation Measures

Following are recommended mitigation measures that respond to issues arising within this assessment, and that have the potential to adversely impact on:

- The character of the landscape within which the project is set
- Views to or from the project
- Views to or from heritage items.

7.1 Landscape Master Plan

Prepare a Landscape Master Plan (LMP) for the project, including those sections of the rail reserve that lie between the station precincts, and the station precincts including the commuter carparks. The LMP is to include the following:

- An integrated rail reserve landscape treatment that reflects The Plenty Valley rural landscape setting, and draws upon the Plains Grassy Woodland (EVC 55_61) community with regard to species and character (refer s.7.3)
- In collaboration with the project designers, looks at means to:
    - Move the security fence in as tightly as practicable within the rail reserve, to maximise the opportunity for endemic landscape treatments beyond the live rail reserve, which can be then be readily managed (i.e. locations which are within the overall area of the rail reserve, but are outside the fenced operational area of the rail reserve)
    - Where there is insufficient room within the rail reserve to undertake a substantial level of landscape restoration, look for opportunities to undertake landscape character / amenity restoration measures outside the rail reserve that help to integrate the project into the landscape, in consultation with adjoining land owners / managers
- Identify and make provision for key views to be retained
- Incorporate Water Sensitive Urban Design (WSUD) or water harvesting measures to increase the sustainability of the landscape (GHD / AECOM 2016a), including within the commuter car parks
- Consider increasing the extent of landscape treatments within the vicinity of Hawkstowe Park and Plenty Road to protect the scenic amenity of recreational users, including beyond the rail reserve (refer s.7.2).

7.2 Landscape Character

The characteristic vegetation community type associated with the project is Plains Grassy Woodland (EVC 55_61). Identified high quality habitat zones of this community within the project area were characterised by a healthy sward of native grasses such as Common Wallaby-grass *Rytidosperma caespitosum*, Kneed Spear-grass *Austrostipa bigeniculata*, Kangaroo Grass *Themeda triandra* and Common Tussock-grass *Poa labillardieri*. The native herbs Chocolate Lily *Arthropodium strictum* s.l., Milkmaids *Burchardia umbellata*, Bulbine Lily *Bulbine bolbosa* and to a lesser extent the endangered Matted Flax-lily *Dianella amoena*, were particularly abundant in the south of the project area. River Red Gum *Eucalyptus camaldulensis* forms the overstorey of the Plains Grassy Woodland patches (AECOM / GHD, 2016b).

Recommendations to mitigate impacts to landscape character include:

- That the landscape development / restoration of the rail reserve and adjoining areas seeks to reinstate a plant association characteristic of Plains Grassy Woodland, to reinforce the existing rural landscape character of those areas within both the project boundary, and adjoining areas
- To those areas of the rail reserve between the station precincts where it is too narrow to allow for a significant landscape restoration outcome, including stands of trees, e.g. River Red Gums, consider undertaking landscape restoration to land adjoining the project in collaboration with the land owner, to facilitate a continuous and consistent corridor of Plains Grassy Woodland landscape treatment to the rail reserve.

7.3 Landscape Management

To facilitate the replacement and augmentation of a Plains Grassy Woodland landscape character both lost to the project, and present within adjoining areas, it would be desirable to implement a robust, self-replicating and low maintenance landscape.

The following landscape management measures are recommended:

- Prepare a Vegetation Management Plan for all rail reserve landscape restoration / station precinct landscape planting
- Design Plains Grassy Woodland landscape restoration areas to facilitate a low maintenance, robust, self-replicating plant association characteristic open woodland community that conserves the existing landscape characteristic of this community, as found within the project corridor and adjacent rural areas (refer s.7.2)
- Consider the implementation of landscape restoration techniques such as topsoil stripping and re-use, provenance seed collection for both growing on of plant material and direct seeding, and management of the rail reserve using bush regeneration techniques, as appropriate
- For those parts of the operational rail reserve (i.e. within the security fence) that are to be subject to landscape restoration, consider the use of a robust, self-replicating native grassland landscape similar to that currently in place within the rail reserve, to minimise the potential for weed invasion within the operational area (which may be subject to only infrequent landscape maintenance due to associated safety issues), and thereby prevent an on-going source of weed colonisation to the rail reserve landscape ‘outside the fence.’ Explore opportunities for long-term landscape management of Plains Grassy Woodland restoration areas ‘outside the fence’, including the potential for management by the local community with Council or VicTrack coordination / support.

7.4 Station Car Parking

The following measures are recommended for station car parking areas:

- Consider the provision of a substantial cover of tree planting within the proposed station carparks to reduce the visual prominence of exposed hardstand areas from adjoining urban areas, and provide landscape and environmental amenity
- Consider the use of tree species from the Plains Grassy Woodland community for tree planting within the station precincts generally, but particularly within the car parking areas
- Consider tree planting within car parking areas at nominal centres of 8.0-10.0 m to reflect the Plains Grassy Woodland community (e.g. River Red Gum), and to mitigate the loss of the existing open woodland character within the rail reserve
- Car parking to include WSUD initiatives, including water harvesting to trees / other landscaping within and surrounding the car park (GHD / AECOM 2016a).

The car parks provide the project with the opportunity to:

- Reinstate an urban form of the substantial areas of grassy woodland community that would be lost from the rail reserve, and unlikely to be reinstated in substantial measure within other areas of the project
- Reflect and visually reinforce a defining characteristic element of the existing landscape
- Provide native fauna habitat opportunities
- Functionally integrate well with water harvesting and WSUD initiatives within the car park
- Improve landscape amenity and provide shade for rail patrons
- Minimise urban heat island effects.

7.5 Urban Design

The following urban design measures are recommended:

- Minimise adverse visual and landscape impacts on areas close to project works through high quality landscape and urban design to integrate the new rail line and stations with existing landscape elements. Where possible, capitalise on the opportunities offered by the project to enhance urban design and landscape amenity, e.g. the bridge crossing of Simons Creek should comprise an elegant structure, informed by well-considered architectural / urban design inputs, which should commence at the concept phase of the bridge design process
- Seek to minimise the visual mass of the bridge at Simons Creek, ensuring it is evenly proportioned with a simple, unified, slender and visually light weight structure with customised urban design treatments for throw screens, parapets and piers that respond to the local setting
- Consider community engagement in the design of artwork and urban design of structures at proposed stations, Hawkstowe Park and the bridge crossing at Simons Creek / The Parkway to assist in reflecting community identity within the project's design
- Incorporate landscaping, urban design and public art treatments into project works. These measures are required for streetscape improvements and pedestrian links, new noise barriers and new bridge/overpass structures
- Carefully consider measures to minimise or manage graffiti, particularly where pedestrians have ready access to bridge columns or noise barriers such as adjacent to the Shared Use Path and Simons Creek, but also within the operational rail reserve to retaining walls or shotcrete batters.

7.6 Treatment of Cuttings

Given that some of the rail reserve would be in cutting, it would be important to plan for appropriate batter and/or retaining wall treatments including:

- Where practicable, stand cutting walls using in-situ rock
- Vegetated batters are inherently graffiti resistant, whereas retaining walls, shotcrete batters and noise walls are regularly subject to graffiti, which detracts from the amenity of the rail reserve for rail users in particular. Additionally, the on-going management of graffiti can comprise a substantial cost as opposed to a well-considered, robust and self-replicating natural plant association. Where retaining walls or shotcrete are proposed for cuttings, careful consideration needs to be given as to how to avoid an ongoing graffiti problem
- Where possible, batters proposed to be revegetated should have a slope of 1H:4V or flatter to facilitate a successful and maintainable revegetation approach that visually integrates with natural ground surface revegetation within the rail reserve, and landscape treatments adjoining the rail reserve, e.g. the existing well vegetated Hawkstowe Park edge.

7.7 Sensitive Visual Receiver Locations

7.7.1 Arilla Village, South Morang (VP2)

This location was assessed as being subject to a 'major' level of visual impact. Key issues from the perspective of the elderly residents were the loss of an open view along the project boundary including areas of woodland, much of which is likely to be removed. Additionally, a noise wall is proposed to be built along this boundary, and there is likely to be little in the way of replacement tree planting given the constrained width of the project rail reserve at this point. With regard to the noise wall, this would potentially create a 'dead space' between the Arilla boundary fence and the noise wall at the southern end of the village.

To mitigate potential impacts the following measures are recommended:

- That particular design attention be paid to the treatment of this edge, including retention of trees where possible, and reinstatement of Plains Grassy Woodland species, to provide a canopy backdrop above the noise wall when viewed from the village
- That consideration be given to locating the noise wall as far as practicable away from the receiver, and then extending the existing garden edge of the village up to the wall. This area could then become an extension of the village garden and potentially incorporate elements of the proposed Plains Grassy Woodland canopy species
- Assuming neither of the above measures are able to be achieved, that consideration be given to provision of:
    - a well-considered urban design response to the noise wall
    - at-receiver landscaping within the Arilla Village along the rail reserve boundary, including augmentation of existing planting areas closer to / to the kerb edge, facilitating increased screening of the noise wall, and additional tree planting to reduce visual prominence of electricity gantries seen above the wall.

7.7.2 Winton Vale Creek Park, 28 Mount Eccles Way, South Morang (VP6)

This location was assessed as being subject to a 'major' level of visual impact. The key issue from the perspective of both residential and recreational receivers is the change in the view from that of a substantial grassy open space area with some mature stands of trees to that of a fenced, primarily elevated rail corridor including both viaduct and free-standing concrete retaining wall structure, with regular, highly visible train movements.

To mitigate potential impacts

- Provide a temporary, quick growing landscape integration planting between the rail infrastructure and the adjacent residential development on Mount Eccles Way and Saint Leonard Drive (refer s.7.2 - Landscape Character), if the future intervening development is not proposed to occur for a considerable period of time
- Provide well-considered urban design inputs to the rail infrastructure, with particular emphasis on the viaduct and free-standing concrete retaining wall structures.

7.7.3 Barmah Drive Bridge over Simons Creek, South Morang (VP7)

This location was assessed as being subject to a 'major' level of visual impact. Key issues from the perspective of the recreational and residential receivers are that the bridge would comprise a large and visually uncharacteristic infrastructure element, within the parkland and low rise residential setting of the wetland. Additionally, there is likely to be limited opportunities for substantial tree planting to the edges of the area of the elevated approaches to the bridge, and the bridge abutments.

To mitigate potential impacts the following measures are recommended:

- Refer to all recommendations above in s.7.5 Urban Design
- Pull the bridge abutments back as far as practicable to provide a visually clear span across the wetland, such that abutments are unseen when viewed from this location.

7.7.4 Hathfelde Boulevard (VP8)

This location was assessed as being subject to a 'moderate to major' level of visual impact. The rail reserve between The Parkway and the end of Hathfelde Boulevard has a substantial number of mature endemic eucalypts in close proximity to the rail alignment which comprise a defining element of the area's *genius loci*. The trees broadly form a discontinuous 'avenue' with the alignment running midway between them. The project is likely to require the removal of both lines of trees (about 30 mature trees). However, moving the rail alignment as far east as possible potentially leaves sufficient room for retention of some or all of the western line of trees (closest to the residential edge).

It is recommended that if the distance of the line of trees from the works is sufficient to not require removal, pruning or other management requirements to meet VicTrack safety requirements with regard to proximity of trees to rail infrastructure, then an arborist be engaged to determine an appropriate offset distance / tree protection zone (TPZ) for the rail alignment to ensure the long-term health of these trees. If the works fall within the designated TPZ, consideration should be given to moving the alignment east to keep the works outside of this zone.

Alternatively, there also appears to be potential for the planting of a 'grassy woodland' landscape treatment community within / along the eastern edge of the rail reserve (refer s.7.2 - Landscape Character). It is recommended that if the distance of this type of tree planting from the rail infrastructure could be sufficient to not require removal, pruning or other management to meet VicTrack safety requirements for proximity of trees to rail infrastructure, then an arborist be engaged to determine an appropriate offset distance / tree protection zone (TPZ) for a planting of this nature to ensure the long-term health of these trees.

7.7.5 Mango Crescent, Mernda (VP9)

This location was assessed as being subject to a 'major' level of visual impact. Key issues from the perspective of the residential receivers are that the proposed noise wall and elevated rail would comprise a substantial visually uncharacteristic infrastructure element, in place of existing open views to parkland. Additionally, there is likely to be limited or potentially no opportunities for substantial tree planting to the residential edges of these structures.

To mitigate potential impacts the following measures are recommended:

- Consider maximising the available landscape space between the road kerb and the noise wall, with no boundary fencing between them, and supplementing the existing roadside planting to this area
- Make every effort to provide an avenue planting or similar along the kerb / noise wall edge
- Pay particular attention to addressing the potential for graffiti to noise walls
- Consider a 'grassy woodland' tree planting to the northern end of Mango Crescent where the noise wall moves away from the residential edge (refer s.7.2 - Landscape Character).

7.7.6 6 Station Road, Mernda (VP10)

This location was assessed as being subject to a 'major' level of visual impact. Key issues from the perspective of the residential receivers are that their existing 'rural' open view would be replaced by a securely fenced stabling facility that would be lit at night. A further issue for residents on Schotters Road is a carpark stretching over a length of some 500m. To mitigate potential impacts the following measures are recommended:

- Provision be made for a continuous avenue of planting along the western side of Schotters Road, between Bridge Inn Road and Hayes Road
- Measures as outlined in s.7.4 – Station Car Parking.

7.8 Other Receiver Locations

7.8.1 7.8.1 Hawkstowe Park (VP3)

The rail reserve passes this vantage point below ground between Plenty Road and a parallel running line of native trees within Hawkstowe Park. The retention of this line of trees comprises an important landscape consideration. It is recommended that:

- an arborist be engaged to determine an appropriate offset distance / tree protection zone (TPZ) for the rail cutting to ensure the long-term health of these trees. If the works fall within the designated TPZ, consideration should be given to adjusting the alignment to keep the works outside of this zone
- the distance of the line of trees from the works be of sufficient distance to not require removal, pruning or other management requirements to meet VicTrack safety requirements with regard to proximity of trees to rail infrastructure. If the works fall within a tree safety zone, consideration should be given to adjusting the alignment to keep the works outside of this zone.

Much of the Hawkstowe Park / Plenty Road boundary area is subject to these linear stands of remnant / regrowth trees, which are situated at varying distances from Plenty Road. This includes sections that form an 'avenue' of trees. These natural associations of tree species in these stands provide substantial landscape character qualities, including reflecting the *genius loci* of the area. Consideration should be given to adjusting the alignment of the rail line in response to the differing setbacks of the trees from Plenty Road, to facilitate their long-term conservation, including implementation of the above listed arboricultural and safety assessments.

If it is found that the alignment cannot be sufficiently moved:

- consider implementation of landscape restoration within one or both edges of the rail reserve as per Mitigation Measures s.7.1 and s.7.2
- where there is insufficient room within the rail reserve to provide landscape restoration, consider undertaking landscape restoration to areas adjoining the rail reserve as per Mitigation Measure s.7.2.

8. Conclusions

8.1 Landscape Character Impacts

There are no significant landscape character impacts arising from the project.

8.2 Visual Impacts

Significant visual impact ratings of 'Major', and 'Moderate to Major' were assessed for six representative receiver locations as follows:

- VP2 – Arilla Village (Major): On the basis of the current design, there appears to be limited opportunity for retention of existing trees within the rail reserve. However, there is potential for a moderate to high level of screen planting mitigation of the noise wall within the existing village boundary landscape setback (refer Mitigation Measures - s.7.7.1).
- VP6 – Winton Vale Creek Park (Major): This section of the rail reserve will be subject to proposed future development along the Mount Eccles Way / southern end of Saint Leonards Drive frontage. In conjunction with a temporary landscape treatment if required until this occurs, this has the potential to significantly reduce the level of visual impact for this receiver location (refer Mitigation Measures - s.7.7.2).
- VP7 – Barmah Drive Bridge over Simons Creek, South Morang (Major): A significant level of mitigation is possible for this impact based on the extent to which bridge design / urban design initiatives are realised for the project (refer Mitigation Measures - s.7.7.3)
- VP8 – Hathfelde Boulevarde (Moderate to Major): A moderate to high level of mitigation could potentially be achieved by moving the alignment east along this edge, and either retaining mature eucalypts along the residential edge, or providing a 'grassy woodland' landscape treatment within the eastern edge of the rail reserve (refer Mitigation Measures - s.7.7.4)
- VP9 – Mango Crescent, Mernda (Major): The provision of a 3 m landscape area between the residential edge and the noise wall ensures the capacity to provide a significant level of screening to the noise wall. The landscape design of this edge needs to be carefully considered, including opportunities for the incorporation of trees along this residential edge to assist in the provision of a well-integrated landscape planting outcome, e.g. in conjunction intermittent existing wider landscape beds within the road reserve (refer Mitigation Measures - s.7.7.5)
- VP10 – 6 Station Road, Mernda (Major): A significant level of mitigation is possible for this impact based on the extent to which tree planting is incorporated into the 500m long car park which adjoins a residential receiver, in conjunction with streetscape measures to Schotters Road (refer Mitigation Measures - s.7.7.6).

8.3 Lighting Impacts

Lighting levels for the project are associated with the station precincts and stabling yard, and are considered generally to be high, with the potential to impact on nearby sensitive residential receivers, in addition to creating strongly illuminated areas within intrinsically 'dark' landscapes, e.g. the proposed station near Hawkstowe Parade which closely adjoins Hawkstowe Park.

A potential area of lighting impacts is associated with the station and stabling yard carparks which have low levels of provision for tree planting within them. A significant level of tree planting to these areas could assist in reducing the intensity of lighting in these areas, and their visual prominence from adjacent urban areas, including from elevated areas either side of the Plenty Valley.

8.4 Key Considerations

Key landscape character and visual considerations resulting from a review of planning documents were grouped under the headings of: Environmental Sustainability; Sense of Place; Heritage, Landscape Amenity; and Views.

Those considerations listed under Environmental Sustainability; Sense of Place; and Landscape Amenity would benefit from further consideration. The linking factors relevant to each of these three considerations comprise:

- The potential substantial loss of the characteristic woodland landscape within the rail reserve. This could be mitigated through the implementation of a Landscape Master Plan that provided direction as to how and to what extent the rail reserve landscape would be restored (refer Mitigation Measures – s.7.1, s.7.2, s.7.3 and s.7.4)
- The likelihood that a substantial restoration of the woodland landscape character across the project would be limited by the width of the rail reserve in many areas, potentially in association with safety issues such as the distance from the operational rail infrastructure within which tree planting can take place
- The relatively low level of tree planting shown within station and stabling yard car parks, which has the potential to provide a significant component of a reinstated 'woodland' character, in addition to environmental benefits, particularly if using key tree species such as River Red Gum. This issue could be addressed as described in Mitigation Measure s.7.4 – Station Car Parking.

9. References

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