REGIONAL RAIL FLEET PROJECT

DUBBO MAINTENANCE FACILITY

VISUAL IMPACT ASSESSMENT

PREPARED BY ENVISAGE CONSULTING

ON BEHALF OF TRANSPORT FOR NSW

REGIONAL RAIL FLEET PROJECT
DUBBO MAINTENANCE FACILITY
VISUAL IMPACT ASSESSMENT

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1 Introduction

1.1 Purpose of this report

This report has been prepared to assess the visual impacts associated with Transport for NSW's (TfNSW) proposed Regional Rail Maintenance Facility at Dubbo (the Project). The assessment considers the visual impact on the existing landscape character and key viewpoints that surround the Project.

The assessment is to inform the Review of Environmental Factors prepared for the Project under Part 5, Division 5.1 of the *NSW Environmental Planning and Assessment Act 1979*.

1.2 Project overview

Government-owned land in Dubbo has been identified by the NSW Government as the preferred location to build a new maintenance facility for trains operating on the regional rail network (the 'Site'). The Site is approximately 25 hectares (ha) and is located on the Main Western Line east of Dubbo Railway Station. The Site is accessed from White Street, Dubbo, and is within the Dubbo local government area (LGA).

The Project includes:

- Earthworks to provide a large flat yard for a new maintenance facility and maintenance tracks
- A new maintenance facility approximately 13 metres (m) in height, 30m in width, and 220m in length located within a cutting up to 7m deep
- Realignment of the Main Western Line through the Site, to the northern side of the new rail maintenance facility
- Decommissioning of the existing Main Western Line near the southern boundary of the Site
- Lathe and train wash buildings (approximately 11m high)
- A new Site entrance on the southern side of the Site
- An administration building, stores building and loading dock, fuel storage tanks and car park, and
- An electrical substation.

The Project provides for 24-hour use; however, maintenance would primarily occur during daytime hours.

Further detail on the Project is provided at **Section 4.**

1.3 Report format

The report is set-out in the following format:

- **Section 2**: Defines the methodology for the assessment
- **Section 3**: Establishes baseline conditions and describe the context of the site, including the visual environment and site visibility
- **Section 4**: Describes the main visual changes associated with the Project
- **Section 5**: Assesses the likely effects to landscape character
- **Section 6**: Assesses the likely effects on surrounding key viewpoints
- **Section 7:** Presents visual representations (photomontages) of the proposed view
- **Section 8**: Describes design and mitigation measures that have been, and could be, incorporated into the design to improve the visual outcome
- **Section 9**: Conclusion.

2 Assessment methodology

This section of the report outlines the methodology for the assessment, which is based on the NSW Road and Maritime Services' Environmental Impact Assessment Practice Note: *Guideline for Landscape Character and Visual Impact Assessment EIA-N04*, March 2013 (Roads and Maritime, 2013).

2.1 Desktop analysis

2.1.1 Literature review

Prior to inspecting the site, a search and review of literature relevant to local visual issues was undertaken. This included the Dubbo Local Environmental Plan (LEP), Council strategies/masterplans, and State Government reports.

2.1.2 Preliminary viewshed

The approximate potential geographic area which may have views of the Site was determined using desktop analysis of aerial photography and elevation. The desktop analysis established the geographic extent of the area to be assessed and potentially-sensitive private viewpoints, such as residences, and publicly accessible viewpoints such as local roads, lookouts and public recreation areas.

Desktop analysis, however, does not take into account features such as vegetation and built elements which may obstruct views, and therefore, preliminary analysis must be verified on site during the site inspection.

2.2 Field survey

The Site was inspected 13 February 2018 under the supervision of TfNSW staff. The inspection included a walk-over of the Site. The day of the inspection was dry and sunny. The surrounding area was further assessed over 13 and 14 February 2018 to verify viewpoints, with photographs taken over both days.

During the site inspection, the preliminary viewshed and the extent of potentially sensitive viewpoints was modified or confirmed based on site findings (such as the screening effects of vegetation and buildings). Confirmed sensitive viewing locations were inspected to determine their sensitivity to change, and the potential visual impact of the Project on each viewpoint.

2.3 Assessment

Under the Roads and Maritime 2013 EIA-N04 guideline, two main types of visual effects (or impacts) were assessed:

- effect on the landscape character
- effect on key viewpoints (visual impact).

The determination of the effect on landscape character and viewpoints were based on the combination of two criteria – the sensitivity and the magnitude of change, defined by Roads and Maritime (2013) as:

- *Sensitivity - The sensitivity of a landscape character zone or view and its capacity to absorb change. In the case of visual impact this also relates to the type of viewer and number of viewers.*
- *Magnitude - The measurement of the scale, form and character of a development Project when compared to the existing condition. In the case of visual assessment this also relates to how far the Project is from the viewer.*

The guidelines describe these impacts as follows:

> *"Landscape character and visual assessment are equally important. Landscape character assessment helps determine the overall impact of a project on an area's character and sense of place. Visual impact assessment helps define the day to day visual effects of a project on people's views."*

Therefore, sensitivity and magnitude has been determined to assess the effect on the character of the landscape, as well as the visual effects on people's views.

For the purposes of this assessment, the project-specific criteria developed to determine sensitivity are listed in **Table 2-1,** and those to determine magnitude are listed in **Table 2-2.** These criteria have been defined for sensitivity and magnitude of change for both the assessment of landscape character and the visual impact to viewpoints. The combination of sensitivity and magnitude provide the rating of the level of impact, as shown in

Table 2-3 (from Roads and Maritime, 2013).

Table 2-1: Sensitivity Ranking Criteria

Sensitivity	Criteria (general guide only, some or all may apply)
High	• Landscape or heritage of high to very high conservation value or • Public views with a high to very high number of users or • Viewers are in close proximity or • The site has a high visual prominence or • Viewers have opportunity for prolonged or stationary views
Moderate	• Landscape or heritage of moderate conservation value or • Public views with a moderate to high number of viewers or • Viewers are in close or moderate proximity or • The site is visually prominent or • Private views in close proximity with mostly unimpeded views
Low	• Some landscape or heritage conservation value but of lower visual value or • Public views for a small number of users or • Viewers at a more distant proximity and • Site is less visually prominent • Viewers have short-time period to view / transitory views

Sensitivity	Criteria (general guide only, some or all may apply)
Negligible	• Landscape has no or very little heritage or visual value • Very few people can view • Viewers are long distance from site • Site is not visually prominent • Viewers have short time period to view or no private/stationary views

Table 2-2: Magnitude of Change Ranking Criteria

Magnitude	Criteria (general guide only, some or all may apply)
High	• Significant size and extent of area affected • Permanent and irreversible change • The Project forms a significant and immediately apparent part of the scene, and one that significantly contrasts in scale and character (either existing or planned) and is severely detrimental to the quality of the scene.
Moderate	• Moderate in size and extent of area affected • Temporary, or if permanent, effects reduced over time • The Project becomes the dominant feature of the scene to which other elements become subordinate, and one that significantly contrasts in scale and character (either existing or planned), possibly reducing the quality of the scene.
Low	• Small in size and extent of area • Temporary, or if permanent, visual effects able to be reduced substantially • The Project forms a visible and recognisable new element within the overall scene, yet one that is relatively compatible with the surrounding character (either existing or planned).
Negligible	• The Project constitutes only a minor component of the wider view, which might be missed by the casual observer or receptor. Awareness of the Project would not have a marked effect on the overall quality of the scene.

Table 2-3: Landscape character and visual impact grading matrix

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High	High impact	High-moderate impact	Moderate impact	Negligible
	Moderate	High-moderate impact	Moderate impact	Moderate – low impact	Negligible
	Low	Moderate impact	Moderate – low impact	Low impact	Negligible
	Negligible	Negligible impact	Negligible impact	Negligible impact	Negligible

2.4 Photomontages

Key viewpoints which were assessed to have a higher visual impact, and those that are representative (typical) of the variety of locations which may view the Project, were identified for preparation of photomontages. The photomontage is an indicative image which illustrates the likely visual changes from the key viewpoints if the Project were to proceed. Photomontages are presented at **Section 7.**

2.5 Mitigation measures

Where relevant and possible, mitigation measures have been included to reduce potentially adverse visual impacts. Mitigation measures include planting and design guidelines (refer **Section 8**).

3 Existing landscape character

This section of the report describes the existing landscape character within the vicinity of the Project site.

3.1 Context

3.1.1 Location

The Site at White Street, Dubbo, is identified on **Figure 3-1.** The Site is in an industrial area near the urban centre of Dubbo, east of Dubbo Railway Station. The Site is on the Main Western Line (the main railway line from Sydney to Bourke). It is bound by a residential area to the south, further industrial land to the north, and Dubbo Showground to the west. The City Centre of Dubbo is within 1 kilometre (km) of the Site. A closer image of the Site and its surroundings is shown at **Figure 3-1**.

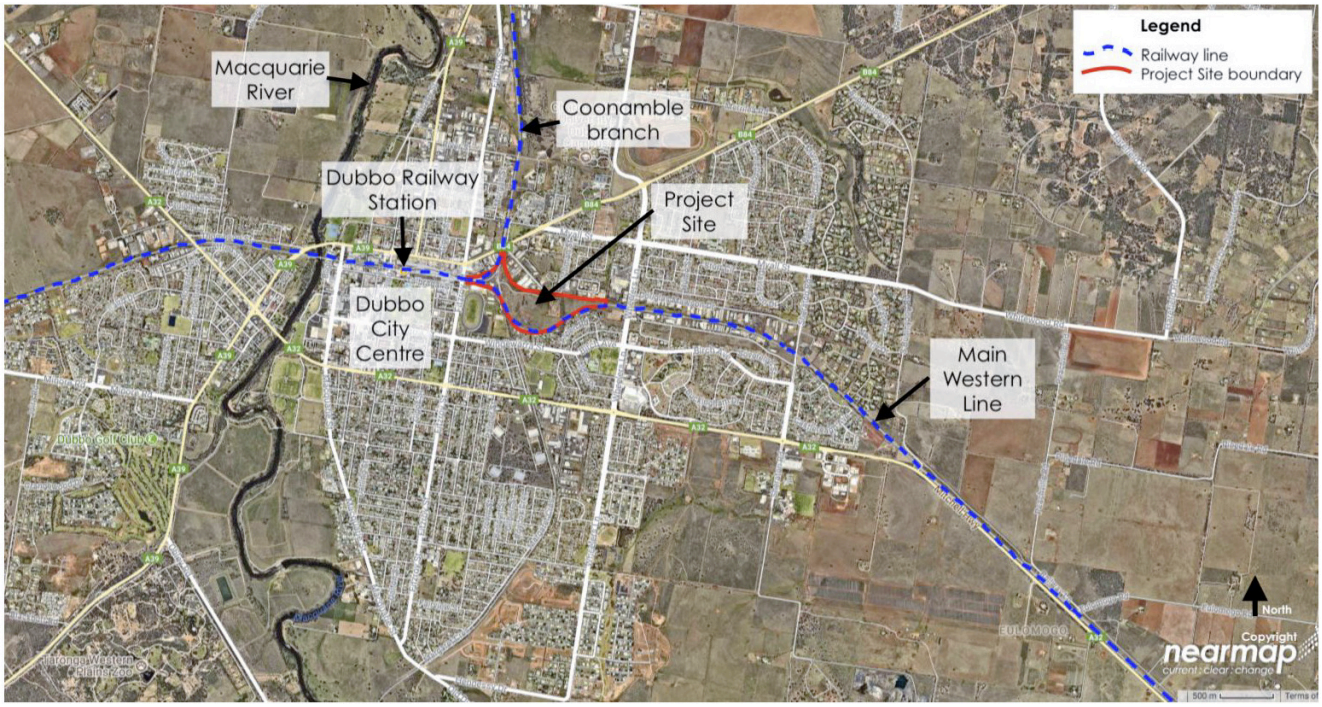


Figure 3-1: Visual context of Project location

Figure 3-2: Vicinity of Project Site

3.1.1 Character

The industrial and business development areas north of the Site comprise large fenced allotments with large warehousing/sheds, and hard-paved yards for vehicles and stock. Generally, the industrial/business area is well-kept and neat in appearance. It is also relatively flat, restricting views within the area to the viewer's immediate location and their surroundings at close range.

The industrial warehouses are generally 6-10m high and up to 150m long. There are also several silos, storage tanks and stacks in the area. Heights of the silos and narrower structures reach up to 20m high or more. Images showing the typical form of the industries and businesses are shown at **Figure 3-3.**

Figure 3-3: Character of industrial/business area

At night, the industrial/business area is lit with street lighting and security lighting at each premise, yet it is not brightly lit. In the night sky beyond the industrial area, flood lighting from nearby sporting fields was seen during the evening, with the light appearing brighter and much more intense than the lights of the industrial area.

The sports fields are approximately 1km west of the Site boundary. Their tall flood lights can be seen in the background of the image from the Site shown at **Figure 3-4.** A daytime image showing the tall sporting field flood lights is shown at **Figure 3-5**.

Figure 3-4: View from within the Site looking west

Figure 3-5: Sporting field flood lights from Darling Street

Also seen in the background of **Figure 3-4** are the nearby showground/paceway lights. These tall flood lights would be in use during events at the grounds and are approximately 120m from the Site boundary. Another image showing the showground flood lights can be seen at **Figure 6-7.**

Within the industrial area, off White Street, is a small residential community centred on Darby Close. The residential community comprises single-level villas. An image of the Darby Close residences taken from the Site is shown at **Figure** 3-6.

Figure 3-6: View from within Site looking north

The residential area to the south of the Site comprises low-density detached houses. The existing Main Western Line traverses the southern Site boundary approximately 20m from the back fences of the residential properties. An image from the Site of residences along the southern Site boundary is shown at **Figure 3-7.**

Figure 3-7: View from within Site looking south

3.2 Site description

The Site is approximately 25ha in area - much larger in scale than the surrounding industrial lots. The Site is currently used for stockpiling former rail equipment and materials; and is traversed by transmission poles and overhead wires. The existing Main Western Line which runs along the southern boundary of the Site, defines the southern extent of the industrial area.

An image of the Site is shown at **Figure 3-8** to illustrate the character of the property and its neighbours to the east. As shown in the figure, the Site is a largely vacant property, generally cleared of trees and shrubs, relatively low-lying, and flat to gently sloping. The surrounding industrial and residential areas are on a similar grade to the Site.

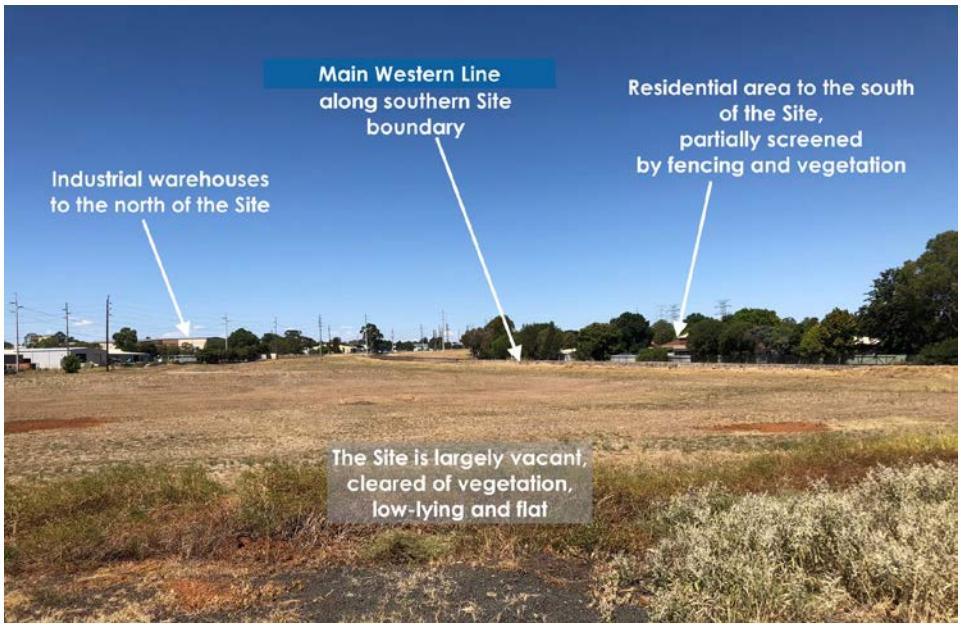


Figure 3-8: View from within the Site looking east

The characteristics of the Site and its surroundings are outlined below.

3.2.1 Landform

The Site is generally flat and low lying. It is adjacent to the alluvial river plain of the Macquarie River, the region's major waterway, which is less than 2km west of the Site. The Site rises gently from its western boundary to its eastern boundary by approximately 10m in elevation, resulting in an approximate 1 in 60 cross-fall over the Site.

Historically, the area was swampy (it was known as the Wingewarra Swamp in the nineteenth century[1]). The Swamp was cleared in the late 1800s as part of the development of Dubbo. Concrete drainage channels and drains were installed to enable the property to be used for railway purposes.

There are no existing water bodies at the Site, however, a portion of the Site is used for stormwater detention during heavy rainfall periods.

3.2.2 Ecology

The Site and vicinity are part of an urban landscape. The area has generally been cleared of trees and shrubs, and highly modified due to its use as a railway yard.

[1] OzArk Environmental & Heritage Management, Heritage Ecology Assessment, May 2018

An ecological assessment was prepared for the Site by OzArk Environmental & Heritage Management (Ecological Assessment, OzArk, 2018). The assessment found that about 9.2 hectares of derived grassland of the NSW south western slopes would be cleared for the Proposal. This derived grassland would have supported the Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions which is listed as an endangered ecological community (EEC) under the *Biodiversity Conservation Act 2016*.

Native flora was predominant in some areas of the Site. Species included plants typical of grassy woodland communities in the region. There were few remaining trees on Site due to past clearing. The few remnant trees that were present provided an indication of the original native woodland overstorey. The most notable native trees species were a single Fuzzy Box (*Eucalyptus conica*) tree near the southernmost point of the site and scattered Kurrajong (*Brachychiton populneus*) trees. The shrub layer was largely absent across the site, except for a few isolated individuals.

Weeds were predominant in areas of the Site where there had been extensive soil disturbance. Some additional planted or naturalised native trees were also present, including a line of planted eucalypts along the southeastern edge of the Site behind residential properties, presumably for visual screening.

The OzArk assessment did not record threatened fauna species at the Site, however, several common birds were recorded, and three threatened bat species were predicted to possibly occur at the Site.

3.2.3 Heritage

OzArk has also completed a heritage assessment of the Site (Aboriginal and Historic Heritage Assessment, OzArk, 2018). The assessment found that high levels of disturbance across the Site is likely to have impacted any Aboriginal sites that may have been present. As such, Aboriginal sites are unlikely to remain extant.

A number of heritage items and potential heritage items were identified, although none were within the study area boundary. These include the Boradze depot which may be of local heritage significance, possible remains of a fettlers' camp and a signalman's cottage (unlikely), and the erroneously mapped Dubbo Local Environmental Plan (LEP) listing of the Macquarie River Rail Bridge.

3.3 Planning and Legislative Requirements

The Site is within the Dubbo LGA; however, the Project is subject to the *Infrastructure SEPP (ISEPP)* and, therefore, does not require Council consent. Regardless, the aims and objectives of the *Dubbo Local Environmental Plan 2011 (Dubbo LEP)* were considered in this assessment[2].

[2] the provisions of the Dubbo LEP do not apply to the extent that they are inconsistent with the provisions of the ISEPP

3.3.1 Dubbo Local Environmental Plan 2011

Under Dubbo LEP 2011, four zones apply over the Site (refer to **Figure 3-9**):

- The largest portion of the Site is zoned IN2 Light Industrial
- The narrow railway corridor is zoned SP2 Infrastructure
- To the east, the Site is zoned RE1 Public Recreation, and
- A narrow strip along the railway corridor which connects through to White Street is zoned RE2 Private Recreation.

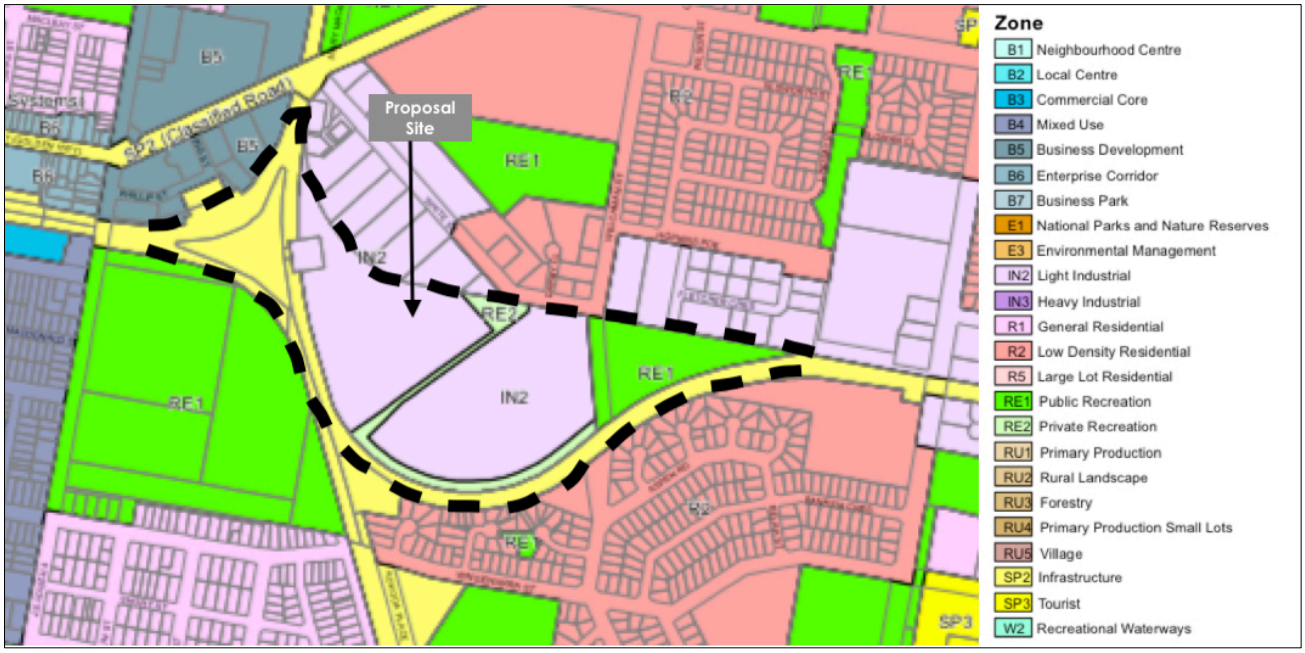


Figure 3-9: Dubbo LEP 2011 Land Zoning Map (extract of Sheet LXN_008B)

Objectives concerning visual amenity, design or setting of each zone are set out in **Table 3-1.**

Table 3-1: Zone and objectives

Zone	Objectives relevant to visual assessment
IN2 Light Industrial zone	• To provide a wide range of light industrial, warehouse and related land uses. • To minimise any adverse effect of industry on other land uses.
SP2 Infrastructure	• To provide for infrastructure and related uses. • To prevent development that is not compatible with or that may detract from the provision of infrastructure.
RE1 Public Recreation	• To enable land to be used for public open space or recreational purposes. • To provide a range of recreational settings and activities and compatible land uses. • To protect and enhance the natural environment for recreational purposes. • To provide for facilities and amenities to enhance the use of public open space.

Zone	Objectives relevant to visual assessment
RE2 Private Recreation	• To enable land to be used for private open space or recreational purposes. • To provide a range of recreational settings and activities and compatible land uses. • To protect and enhance the natural environment for recreational purposes.

3.3.2 Dubbo Development Control Plan 2013

Dubbo Development Control Plan 2013 (DCP) includes objectives and design considerations for industrial development so that it is compatible with the surrounding locality, accessible, well-designed and functional. Where relevant, these DCP objectives and design measures have been the basis for determining design principles for the Proposal. Design objectives and principles are provided in **Section 8.2.**

3.3.3 Dubbo Street Tree Masterplan

Dubbo Regional Council prepared the *Dubbo Street Tree Masterplan* to ensure a strategic and holistic approach to tree planting across the city, and recommended replacement tree species for each street. For the two streets closest to the Site (White Street to the north and Wingewarra Street to the south), the tree species recommended are:

- White Street: *Brachychiton populneus* and *Brachychiton populneus x acerifolius* 'Jerilderie Red'.
- Wingewarra Street: The above two species plus *Zelkova serrata* 'Wireless', *Zelkova serrata* 'Green Vase' and *Fraxinus pennsylvanica* 'Cimmaron'.

An image of the recommended species is provided at **Appendix A**.

4 Project description

This section describes the main components of the Project and the main visual changes that are likely to have visual impact during construction and operation.

4.1 The Project

The Project would be a 24-hour facility that would provide for the maintenance and housing of the proposed new train fleet. It would cover an area of approximately 220,000 square metres and comprise eight rail lines in total:

- Two lines would be through tracks:
    - the realigned Main Western Line (which would relocate from the southern boundary to run though the Site and connect to Dubbo Railway Station)
    - a branch to connect the Main Western Line to the Northern Line (Coonamble Branch)
- Six rail tracks would be installed for maintenance purposes:
    - three of the tracks would enter the proposed maintenance facility
    - The remaining three tracks would remain external to the maintenance facility and be used for minor train maintenance and stabling.

In addition to the rail lines, the main features of the Project are:

- A rail maintenance facility
- A storage and loading area:
    - Loading dock
    - Stores building
- Wheel lathe
- Train wash
- Administration building
- Road vehicle infrastructure:
    - A new Site entrance south of the site with small security building
    - An internal access road throughout the Site
    - A new staff car park
- Fuel storage:
    - A roofed fuel delivery area with open sides
    - Two round fuel storage tanks
- Perimeter fencing, lighting and power supply.

Significant earthworks would occur. A cutting (to maximum depth of 7m) would be created centrally within the Site to house the maintenance facility, maintenance lines, lathe, train wash, stores and loading dock. The Site detention basins would also be extended.

The key features of the Project are identified on **Figure 4-1** and are described in more detail below.

4.1.1 Rail infrastructure

The Main Western Line near the southern boundary of the Site is proposed to be decommissioned. Two new through tracks would be installed (to replace the decommissioned track) on the northern side of the maintenance facility on raised embankments 1-2m high. The new tracks would connect the Main Western Line to Dubbo Railway Station and to the Coonamble Line.

Six new rail tracks are proposed for maintenance purposes at the Site. Three of the tracks would provide access into the proposed maintenance facility and three would remain external to the maintenance facility. The external tracks would be used to access the lathe and train wash and would also be used for train storage ('stabling'), inspection and cleaning of the new fleet. Each train stabling track would be capable of accommodating 200m long trains.

The maintenance tracks would be laid within a large cutting to be created within the Site. The cutting would have a maximum depth of 7m at its eastern end. Within the cutting, the ground would be levelled and made suitable for the proposed new rail tracks and proposed new buildings.

4.1.2 Maintenance facility

The fleet maintenance facility would be a single covered enclosure comprised of a structural steel frame clad with insulated steel sheeting. The roof would support solar panels which would generate energy for the facility.

The size of the maintenance facility would be approximately 220m long, 30m wide, and approximately 13m high. The facility would be located within the large cutting which would be 7m deep at maximum at its eastern end. The purpose of the maintenance facility would be to enable off-track work on passenger trains, which would be up to 200m long. Three rail tracks would provide access into the facility which would be open at the western end of the building.

Within the facility, under each rail line, would be a maintenance pit. Maintenance tasks would vary from light duty works such as window replacement to heavy duty works such as bogie replacement. The facility would be fitted with extraction fans, overhead cranes, a weighbridge and other equipment to allow for the proposed level of maintenance.

The maintenance facility would be approximately 30m from the closest residence which is located southeast of the facility on the southern side of the Site.

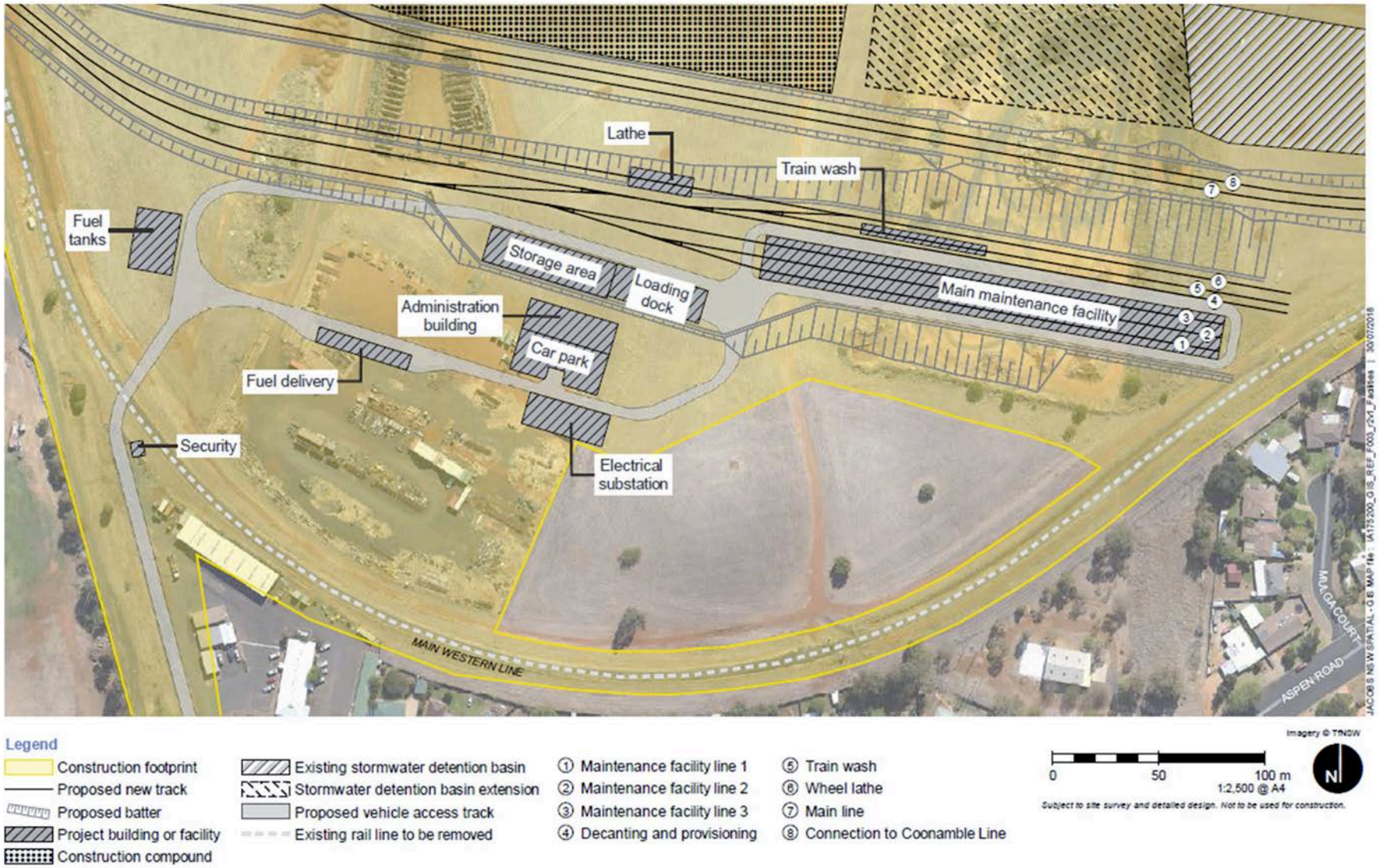


Figure 4-1: Maintenance Facility layout

Associated with the maintenance facility, and also within the cutting, would be:

- Wheel lathe: a separate building allowing for train wheels to be periodically machined using an underfloor wheel lathe
- Train wash: an enclosed structure located adjacent to the maintenance facility, comprising automated wash equipment for train sets with nearby waste water treatment plant
- Decanting and provisioning infrastructure.

4.1.3 Stores and loading dock

West of the maintenance facility, within the broad levelled area of the cutting, the proposed stores building and loading dock would be constructed. The maximum height of the cutting at the stores and loading dock are would be 2.5m. The stores and loading dock buildings would be single storey.

The stores and loading dock area would be used for the delivery and housing of spares and consumables. It would be accessible via delivery trucks as well as trains, and would include an overhead crane to load stock into the stores building.

4.1.4 Administration building

A single storey building is proposed as an administration office. The administration building would be located at the existing Site grade and be accessible from the proposed new vehicular entrance on the southern side of the Site.

The administration building would comprise office facilities, kitchen, dining area and amenities. It would occupy an area of approximately 2000m^2.

4.1.5 Road vehicle infrastructure

A new Site entrance is proposed on the southern side of the Site. The entrance would be accessed from Wingewarra Street via the Australian Rail Track Corporation (ARTC) Centre. The Main Western Line currently runs near the ARTC Centre boundary. Once the Main Western Line is decommissioned, minor earthworks would be undertaken to construct a driveway across the former line into the Site.

Improvements to the Wingewarra Street access into the ARTC Centre would be required to suit heavier vehicles.

During construction, access into the Site would be from the existing Site access on the northern side of the Site off White Street.

Internal vehicular access roads (approximately 2000m^2 in area) and pedestrian walkways would provide access into the Site for workers, delivery trucks and overload vehicles. The internal roads would provide access to the stores and loading dock area, the maintenance facility, administration building, and a proposed fuel delivery and storage area (located at existing grade). Fuel would be stored in tanks with sufficient capacity to hold enough fuel for two weeks of operation of the proposed new train fleet.

A staff car park with sufficient space for at least 50 vehicles would be located adjacent to the administration building.

4.1.6 Fencing and security

Security fencing would be installed around the perimeter of the Site. A 24-hour security building would be located at the entrance to the Site to manage pedestrian and vehicular access to the site.

A CCTV system would be installed across the site.

4.1.7 Lighting

The proposal provides for 24-hour operations at the Site. Therefore, lighting would be required for the safe movement of train drivers and rail workers.

There would be a four to six (4 to 6) hour window during the arrival of the last train at night, and departure of the first train of the day. During this period, routine train maintenance would be undertaken, such as washing, vacuuming and inspections.

Heavy maintenance work would not occur in the maintenance facility at night. However, the facility entrance on the western end of the building would be open to allow for train movements in and out, and the tracks leading into the facility would be illuminated.

Lighting proposed outside of the maintenance facility would be sufficient to provide for pedestrian accessibility. At key security points, high intensity security lighting would be installed. This lighting would illuminate the perimeter, rolling stock, and key access and egress points along the perimeter to the minimum prescribed in the *RailCorp Security Standard*.

Lighting poles may also be used to mount CCTV cameras. Lighting would be sufficient to ensure optimal optical resolution for the camera image.

4.1.8 Power supply

The existing overhead high-voltage powerlines would remain in their existing position. However, there may be additional overhead power lines or poles required to connect with to a proposed electricity substation. The single storey substation would have a footprint of approximately 50m x 20m (or smaller). The substation would be located near the car park and administration building, on the southern side of the Site.

4.2 Construction

Subject to planning approval, construction is expected to commence in 2019 and take around two years to complete.

Where possible, work would be undertaken during standard construction hours, typically 7am to 6pm Monday to Friday and 8am to 1pm Saturday. However, night work may be required for works that require shutdowns of the Main Western Line; heavy vehicle delivery of oversize equipment/materials; and rail delivery of construction equipment/material (to avoid impacts to freight timetables).

An image showing the construction footprint and compound area is provided at **Figure 4-2.** Following is a description of the visual changes that would occur during construction.

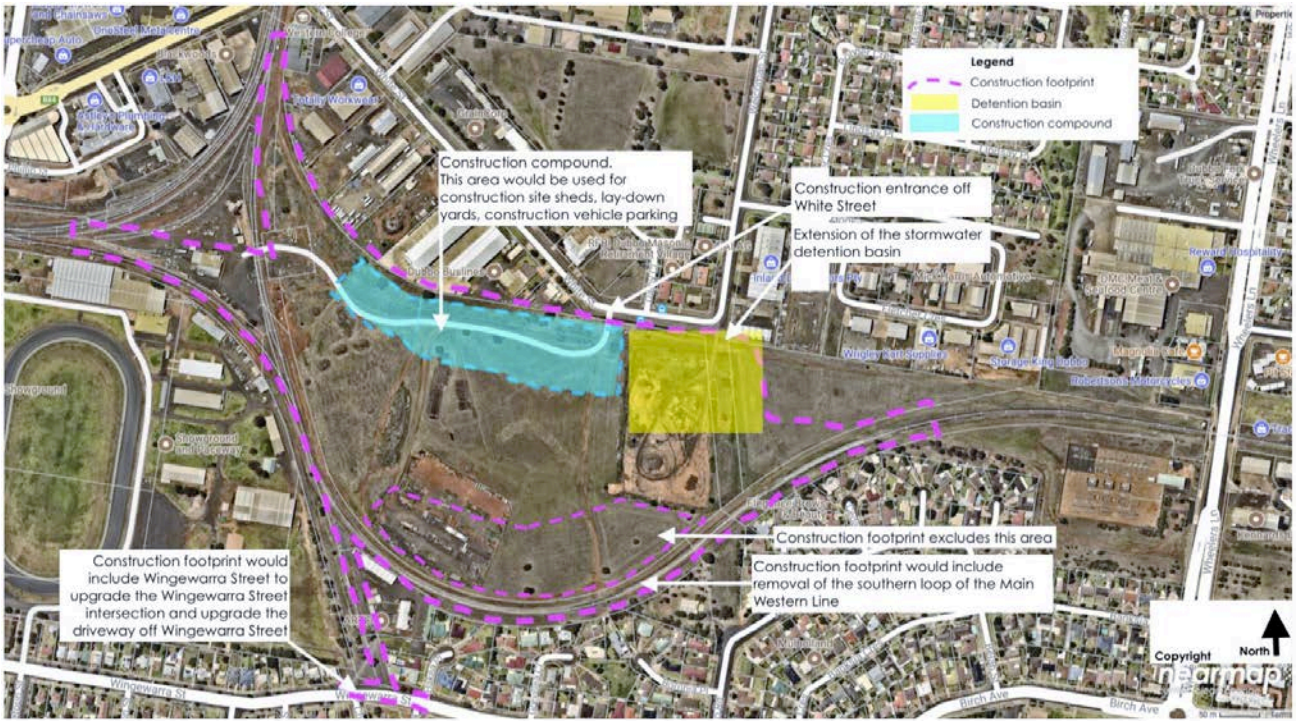


Figure 4-2: Construction footprint

4.2.1 Site establishment

Construction access would be off White Street, through the existing access gate. Prior to starting construction, a construction compound would be established on the northern side of the Site. The compound would include at least two containers to be used for offices and amenities, an off-street car parking area, equipment laydown area and materials storage area.

The construction compound would be made secure with fencing, with pedestrian and vehicular access controlled.

The construction area within the Site would be demarcated. Non-construction areas would be identified as environmental protection zones.

4.2.2 Vegetation removal

Vegetation within the footprint of the construction area would be removed. OzArk (Ecological Assessment, 2018) has identified that the Project would remove approximately 9.2ha of native grassland.

Approximately 1.88ha of habitat in the south of the Site, around and including, the scattered Fuzzy Box trees, would be protected. This area is considered to be part of the Fuzzy Box woodland. It has high conservation significance and has potential for assisted natural regeneration.

Several trees are likely to be removed at the proposed Site entrance off Wingewarra Street. Ground covers and shrubs within the proposed formalised access road to the Site would also be removed.

4.2.3 Earthworks

Significant earthworks are proposed. A cutting (maximum depth 7m) would be created centrally within the Site to accommodate the proposed maintenance facility, stores area, wheel lathe, train wash and maintenance tracks. The cutting would require two retaining walls. The first, adjacent to the stores and loading dock, would be a maximum of 2.5m deep to meet grade. The second, adjoining the maintenance facility, would be approximately 7m deep at its eastern end to meet grade. The cutting would create a large flat area which varies in width.

An extension to the detention basin located at the eastern end of the Site is also proposed. The basin would be extended toward the west (the extended location is shown on **Figure 4-2**) and connected to the existing network. Regrading of the existing basin is unlikely to be required.

Due to the Site functioning as a detention basin during heavy rain periods, a fill embankment is required from east to west across the Site at the location of the through rail lines, to create a flood-free level area on which to construct the tracks. The embankment would be approximately 1 to 2m high including ballast and rails.

Early works therefore, are likely to involve piling to construct the retaining walls, followed by excavation. Around 90,000 cubic metres of excess spoil is anticipated. Earthworks would require numerous truck movements, use of earthmoving equipment, and possibly generate dust.

4.2.4 Installation

Installation/construction works would require use of cranes and other heavy lifting equipment. Large transport would be required to deliver pre-fabricated site materials. Concrete trucks would deliver pre-mix concrete.

In addition to the buildings, roads, car parking, footpaths, lighting, fencing, signage and system controls would be installed.

4.2.5 Decommissioning

The Main Western Line along the southern Site boundary would be removed following the commissioning of the new alignment of the Main Western Line through the centre of the Site. Decommissioning would involve the use of machinery to remove the lines and ballast. Excess spoil may be used to fill the cutting for the line.

4.2.6 Planting

Planting is proposed as a mitigation measure to reduce the extent of views of the Project. Taller shrubs are proposed along the White Street boundary, and trees and shrubs are proposed within the decommissioned rail corridor. Proposed planting measures are described at **Section 8.2.1.**

4.3 Project elements visible at operation

Post construction, the elements of the Project most likely to be visible are:

- The 220m long, 13m high maintenance facility. At the eastern end of the maintenance facility where the cutting is deepest, the maintenance facility would extend approximately 6m in height above the 7m deep cutting. At the western end of the facility where the cutting is shallower, approximately 8-9m of the building would be seen above the cutting
- The train wash. Although, as the train wash runs alongside the maintenance building, would be seen as a lower extension of the maintenance facility rather than a separate building
- The wheel lathe. Approximately 8-9m of the lathe would be visible above the cutting
- The storage and loading dock buildings. These buildings would extend approximately 3.5m above the 2.5m deep cutting and retaining wall
- The single storey administration building, fuel delivery and fuel tanks
- Electrical substation
- Night lighting for 24-hour use
- The improved access on the southern side of the Site
- The new through rail tracks on the 1-2m raised embankment.

Buildings at the Site would have a consistent design theme with steel frame, skillion roof and colourbond steel cladding.

The visible changes and impact of the Project are discussed in **Section 5.**

5 Assessment of landscape effects

Landscape character has been described at **Section 3**. This section of the report assesses the likely impact of the Project on landscape character, based on the combination of two criteria: sensitivity and magnitude of change:

- Sensitivity refers to the nature of the receptor – the type and number of receptors, how sensitive the existing character of the setting is to the proposed change, and the value attached to the landscape.
- Magnitude refers to the nature of the effect – how much change is likely to occur, the size and scale of the change, the extent of the area over which it occurs, whether it is reversible or irreversible, and whether it is short or long term in duration.

5.1 Sensitivity

The Site is in an existing industrial area and is currently used for railway purposes - it carries the route of the Main Western Line and is used for storage of railway stock. The flat topography of the Site combined with industrial and private properties adjoining the Site along most of its boundary, reduce opportunity for the public to view the Site. Generally, the Site is not visible to the public except within very close proximity. From locations where the Site is visible, it is seen in its industrial context, contained by rail lines and industrial buildings.

Using the criteria listed in **Table 2-1,** landscape character is rated as having **low** sensitivity:

- The industrial landscape includes large scale warehouses, silos, existing rail yards and rolling stock and is therefore of a type not sensitive to change
- Viewers within the industrial area have limited views restricted to the immediate proximity due to the level landform
- The Site is not visually prominent and has little landscape or heritage conservation value
- Generally, views are available for a short-time period and transitory, as people move through the industrial area

The residential area to the south and north of the Site provides permanent viewpoints for residents. These private viewpoints are considered at **Section 6.**

5.2 Magnitude of change

Construction

Using the criteria listed in **Table 2-2,** the magnitude of change to landscape character during construction is rated as **moderate**. There would be:

- Large extent of area affected (about 25ha)
- Construction activities would involve large machinery (including transport deliveries, excavation equipment, piling rigs)
- However, visibility would be restricted to limited locations adjacent the Site over a two-year period

Operation

Using the criteria listed in **Table 2-2**, the magnitude of change to landscape character during operation is rated as **moderate**. The changes would be:

- Relatively compatible with the adjoining industrial character
- The proposed Project elements would be larger, but not dissimilar in scale, to the existing building form of the industrial area.

5.3 Level of Impact to landscape character

Construction

The low sensitivity ranking, combined with the moderate magnitude of change during construction, leads to an overall moderate-low level of impact.

Operation

The low sensitivity ranking, combined with the moderate magnitude of change post-construction, leads to an overall moderate-low level of impact.

6 Assessment of visual effects

This section identifies key viewpoints in the area from which people would be likely to see the Project. It describes the existing private and public views and assesses the likely impact of the Project on each view.

The same methodology combining the two criteria - sensitivity and magnitude of change – is used to determine level of impact.

6.1 General visibility

Direct views into the Site are limited due to the flat terrain. The following potentially sensitive public and private viewpoints (VPs) were identified for this visual impact assessment:

- VP1 - White Street/Welchman Street intersection (representative of Darby Close residential community)
- VP2 – Dubbo Amateur Theatre Society (DATS) (representative of the southern residential area)
- VP3 – Bunglegumbie Road, West Dubbo (representative of West Dubbo residential area)
- VP4 - Fitzroy Street/Church Street intersection (Showground entrance)
- VP5 - Wheelers Lane rail crossing
- VP6 - Cobbora Road rail crossing
- VP7 – Wingewarra/Chelmsford Street intersection.

Viewpoint locations are identified on **Figure 6-1.**

Figure 6-1: Assessed viewpoints

Photomontages have been included in this report for VP1, VP2, and VP7 to illustrate the changes and the anticipated view following construction. The photomontages are located at **Section 7.**

Viewpoints are described below. Access to private property was not possible during the inspection, therefore, visibility was assessed from the closest public access to each viewpoint. In general, the publicly-accessible areas provided sufficient information for the assessment.

6.2 VP1: White Street/Welchman Street

Existing view

Direct views from the residential community of Darby Close into the Site are currently obstructed by shrubby vegetation (approximately 2m high) within the road reserve along the White Street Site boundary. A typical view from the Darby Close/White Street intersection toward the Site is shown at **Figure 6-2**.

Figure 6-2: View from Darby Close/White Street intersection

However, 75m west and east of Darby Close along White Street there are views into the Site. Residents of Darby Close would see the Site at these locations as they access their homes. A view at the intersection of White Street and Welchman Street (east of Darby Close), is shown at **Figure 6-3**.

Figure 6-3: Existing view from White Street/Welchman Street intersection

Sensitivity

Using the criteria listed in **Table 2-1**, the sensitivity of the viewpoint is rated as **moderate**:

- The Darby Close residential community is located within an industrial area and has existing industrial warehousing at its boundaries
- Residents are in close proximity of the Site; the Site boundary is on the opposite side of White Street from the community (approximately 35m from the closest residence)
- Views are primarily transitory. Views into the Site are possible for short-time periods while travelling to and from Darby Close along White Street.

Magnitude

Construction

The construction site compound would be located near the existing Site entrance on White Street. The construction compound buildings and stores may be visible above existing vegetation (depending on the height and location of the compound).

Movement of vehicles and machinery into and out of the construction site would be visible. Transport would be likely to include delivery of large infrastructure.

Proposed construction activities associated with the Project (which could include cranes, excavators, and other large machinery) would also be visible above existing White Street vegetation.

Using the criteria listed in **Table 2-2**, the magnitude of change to the view during construction is rated as **moderate**. From this viewpoint, the construction would be:

- Moderate in size and extent of area affected
- Close to the residents who use White Street to access their community (the Site boundary is approximately 35m from the nearest Darby Close residence)
- Temporarily detract from the orderly visual quality of the industrial area.

Operation

Most of the proposed Site infrastructure would be located centrally (within the proposed cutting) or on the southern side of the Site at existing grade.

The largest new element seen from VP1 would be the maintenance facility. The proposed maintenance facility is very long at 220m. Approximately 6m of the 13m height of the building would be seen above the cutting at its eastern end (where the cutting is deepest) and approximately 8-9m of the height would be seen at the western end (where the cutting is shallower).

The maintenance facility would be approximately 170m from the nearest Darby Close residence. The facility's skillion roof and solar panels, as well as the top of the open entrance into the western end of the building are likely to be visible above the existing vegetation along White Street. The train wash (which would be located on the northern side of the maintenance facility) would be closer to residents (approximately 160m away), however, as the train wash would have a lower roof height and is shorter in length, the train wash would appear to be an extension of the maintenance facility.

The wheel lathe would also be prominent. The building is approximately 40m long and approximately 8-9m of the height of the wheel lathe would be visible above the cutting. The wheel lathe is approximately 190m from the closest Darby Street resident.

Smaller buildings would be visible in the background, such as the loading dock and stores roof, and the administration building. The cutting would be likely to entirely conceal the maintenance lines and trains undergoing maintenance from view.

The realigned Main Western Line would be closer to residents at approximately 115m from the nearest Darby Close residence. The tracks on the proposed 1-2m high raised embankment are unlikely to be seen due to the screening provided by existing White Street vegetation. However, trains using the trains would be seen above the existing vegetation, which would be a new, although intermittent, change to the view which may be disturbing to residents.

There would be lighting of the Site at night, however, additional lighting is anticipated to be no brighter than existing lighting from the surrounding industrial area. Existing power lines along the northern Site boundary would remain following construction and would continue to be seen from this viewpoint.

The White Street Site entrance would not be used routinely during operations as the main Site access would be on the southern side of the Site.

To reduce views into the Site following construction, additional shrub planting is proposed along the White Street Site boundary (refer to **Section 8.2.1**).

Photomontage images of the proposed view are shown **Figure 7-1** to **Figure 7-4, Section 7**. The photomontage at **Figure 7-3** shows (from left to right) the train wash, maintenance facility with solar panels, administration building in background, and wheel lathe.

Using the criteria listed in **Table 2-2,** the magnitude of change to the view during operation is rated as **moderate,** reducing to **low** 3-5 years post-construction:

- Post-construction the Site would be similar in character to the existing industrial allotments around the community. The proposed buildings (including the maintenance facility) are similar in height and form to existing warehouses in the industrial area
- Existing vegetation along White Street and the cutting would screen maintenance activities within the Site following operation
- The Site entrance would be relocated from White Street to the southern side of the Site
- However, it's likely that trains would be visible on the relocated Main Western Line which may be a disturbing new visual element for residents, and not likely to have been anticipated by residents living in this area
- There would be night lighting of the Site, however, lighting is not intended to be brighter than surrounding industrial sites and is more likely to have been anticipated by residents living in this area.

Impact

Construction

The moderate sensitivity ranking, combined with the moderate magnitude of change during construction, leads to an overall moderate level of impact.

Operation

The moderate sensitivity ranking, combined with the moderate magnitude of change post construction, leads to an initial moderate level of impact following construction.

The moderate sensitivity ranking, combined with the low magnitude of change 3-5 years post construction, would reduce impact over time to a moderate-low level.

6.3 VP 2: DATS (Southern residential area)

Existing view

Five cul-de-sacs run off Wingewarra Street and Aspen Road south of the Site (Cedar Court, Mulga Court, Boronia Place, Hakea Place and Grevillea Close), with properties at the end of each cul-de-sac backing onto the Site. Views of the Site are possible from within the backyards of these private residences lining the railway corridor.

The homes are oriented toward the cul-de-sac on which they are located, not toward the Site, and many of the homes have significant tree plantings within their backyards to reduce views of the existing Main Western Line (located approximately 20m from the back fence) and provide privacy. The image of private homes along the southern boundary at **Figure 3-7** indicates the closeness of the backyard fences and houses to the Site.

Public views are not possible from the cul-de-sacs. A view from Mulga Circuit toward the Site is shown at **Figure 6-4**. It is not possible to see into the existing Site from this public viewpoint.

Figure 6-4: Existing view from Mulga Circuit

Public views of the Site are available, however, from the Dubbo Amateur Theatre Society (DATS) which also borders the Site to the south. The view from DATS is generally representative of what could be expected to be seen from the residences described above. A view from the DATS property is shown at **Figure 6-5.**

Figure 6-5: Existing view from DATS

Sensitivity

Using the criteria listed in **Table 2-1,** the sensitivity of the viewpoint is rated as **moderate**. This viewpoint:

- Provides private views from backyards of approximately 22 residential homes
- Viewers are in very close proximity of the Site (adjoining boundary)
- Views from the backyards of these properties are currently compromised by the existing rail line and views of the industrial area beyond the Site.

Magnitude

Construction

Most construction work would occur centrally within the Site and would be in close proximity to the residences (approximately 30m from the fence line of the closest residence in Mulga Court).

Earthworks would be significant and residents on the southern side of the Site would see excavators, trucks and piling rigs undertaking site shaping. Earthworks and construction of the maintenance facility would occur very close to the adjoining residents of Cedar Court and Mulga Court.

The decommissioning of the existing alignment of the Main Western Line would be the closest construction activity to all properties lining the southern Site boundary. Decommissioning would involve cranes and lifting equipment, trucks and earthworks in close proximity to backyards.

Using the criteria listed in **Table 2-2**, the magnitude of change to the view during construction is rated as **high**. From this viewpoint, the construction would be:

- Very close and large in extent of area affected
- Be apparent from the backyard of properties adjoining the Site

- However, construction works would be temporary and not inconsistent with activities in the existing industrial area.

Operation

Post-construction, adjoining residents would see the proposed facilities and infrastructure, some at very close proximity. The most significant new element seen from VP2 would be the maintenance facility.

Although a significant proportion of the maintenance facility would be concealed within the cutting, the building is very long (220m) and would be located very close to the adjoining residents of Cedar Court and Mulga Court (approximately 30m from the fence line of the closest residence in Mulga Court). The height of the proposed maintenance facility would extend above the cutting by approximately 6m at the facility's eastern end (where the cutting is deepest) and approximately 8m at the western end (where the cutting is shallower).

The maintenance lines and trains undergoing maintenance are unlikely to be visible due to the depth of the cutting and distance from the viewer. Solar panels on the skillion roof would not be visible (as they would be on the northern side of the maintenance facility, and trains operating on the relocated through rail lines north of the maintenance facility would also not be visible.

Southern residents would be likely to see the proposed administration building, fuel unloading area, fuel tanks, the car park, and vehicles accessing and driving through the Site. However, these proposed buildings are located approximately 170m from the closest residences.

A significant benefit of the Project for southern residents is the decommissioning of the existing Main Western Line. Once the existing alignment is decommissioned, residents would no longer see trains at close proximity. Further, planting could be undertaken within the former railway corridor to screen views to the Site (as recommended in design measures at **Section 8.2.1**). When vegetation planted within the former rail corridor is tall and dense enough to screen the Site (approximately 3-5 years), the view for most adjoining residents is likely to improve as the proposed infrastructure would be less visible and residents would have a more leafy, green outlook.

In addition, over time, the approximately 1.88ha of protected Fuzzy Box woodland habitat would begin to regenerate. The regeneration area would provide further screening for residents.

Lights from the trains and maintenance facility would be seen. However, anticipated light levels are intended to be similar to surrounding industries. Overtime, the proposed vegetation to be planted within the former Main Western Line corridor would reduce the impact of light spill from the Site.

Photomontage images of the proposed view are shown **Figure 7-5** to **Figure 7-8, Section 7.** The photomontage at **Figure 7-7** shows the maintenance facility approximately 160m from the location of VP2.

Using the criteria listed in **Table 2-2,** the magnitude of change to the view during operation is rated as **moderate,** reducing to **low** 3-5 years post-construction:

- The introduction of the new buildings within the Site would be a visual change. While the change would not be unexpected or incompatible with the industrial area, the maintenance facility would be very close to southern residents, particular residences within Mulga Court (it is approximately 30m from the closest residence)
- Maintenance tracks and trains being maintained would not be visible, although lighting would be seen
- The decommissioning of the existing southern alignment of the Main Western Line would be a positive visual change for residents
- Further, the decommissioned line provides opportunity to plant trees and shrubs within the former rail corridor to screen views of the Site (as recommended in design measures at **Section 8.2.1**).

Impact

Construction

The moderate sensitivity ranking, combined with the high magnitude of change during construction, leads to an overall moderate-high level of impact.

Operation

The moderate sensitivity ranking, combined with the moderate magnitude of change post construction, leads to an initial moderate level of impact following construction.

The moderate sensitivity ranking, combined with the low magnitude of change 3-5 years post construction, would reduce impact over time to a moderate-low level.

6.4 VP 3: West Dubbo

Existing view

There are elevated residential areas to the west of the city. These areas are over 3km from the Site, at which distance, the Site is barely distinguishable from surrounding industrial uses. A typical view from the West Dubbo residential area toward the Site is shown at **Figure 6-6**. It is difficult to see the Site from this viewpoint.

Figure 6-6: Existing view from Bunglegumbie Road, West Dubbo

Sensitivity

Using the criteria listed in **Table 2-1**, the sensitivity of the viewpoint is rated as **low**. This viewpoint:

- Provides public views for a moderate number of users
- However, viewers are distant from the Site
- The outlook from West Dubbo is wide, and the Site is not prominent or the central focus.

Magnitude

Construction

At this distance construction activities at the Site would not be discernible from nearby industrial activities.

Using the criteria listed in **Table 2-2**, the magnitude of change to the view during construction is rated as **low**. From this viewpoint, the construction would be:

- Small in size and extent of area
- Barely distinguishable from other industrial activity
- Temporary.

Operation

Post-construction, the proposed maintenance facility is unlikely to be seen from these elevated residential locations. Neither the maintenance facility located within the 7m deep cutting, nor the administration building would be seen above the existing industrial buildings visible from West Dubbo.

Using the criteria listed in **Table 2-2,** the magnitude of change to the view during operation is rated as **negligible**:

- The scale of the proposed maintenance facility is larger than surrounding industrial buildings (the longest building existing within the industrial area is approximately 150m)
- However, the maintenance facility would be located within a cutting, would be typical in character to existing buildings within the industrial area, and would not be seen from this distance
- The view from this residential area would be unchanged.

Impact

Construction

The low sensitivity ranking, combined with the low magnitude of change during construction, leads to an overall low level of impact.

Operation

The low sensitivity ranking, combined with the negligible magnitude of change post construction, leads to an overall negligible level of impact.

6.5 VP 4: Fitzroy Street/Church Street intersection

Existing view

From the intersection of Fitzroy Street and Church Street, the vicinity of the Site is visible through the Showground entrance gates. A view from the intersection toward the Site is shown at **Figure 6-7**. It is not possible to see into the existing Site from this public viewpoint.

Figure 6-7: Existing view from Fitzroy Street/Church Street intersection

Sensitivity

Using the criteria listed in **Table 2-1**, the sensitivity of the viewpoint is rated as **low**. This viewpoint:

- Provides public views for a moderate number of users
- However, viewers are distant from the Site (approximately 800m from the boundary)
- There are intervening buildings and vegetation between the viewer and the Site
- The activities and events at the Showground would be closer and larger in scale and prominence to the viewer.

Magnitude

Construction

Using the criteria listed in **Table 2-2**, the magnitude of change to the view during construction is rated as **low.** From this viewpoint, the construction would be:

- Small in size and extent of area
- Barely distinguishable from other industrial activity
- Temporary.

Operation

Post-construction, the proposed maintenance facility may be visible above existing vegetation and buildings in the view. It is unlikely that other proposed Project elements would be visible from this viewpoint.

Using the criteria listed in **Table 2-2,** the magnitude of change to the view during operation is rated as **low**:

- The top of the maintenance facility may be visible above surrounding vegetation and buildings
- Other proposed buildings and Site activities are unlikely to be visible
- From this location, the view would continue to be principally focussed on the middle ground during events at the Showground.

Impact

Construction

The low sensitivity ranking, combined with the low magnitude of change during construction, leads to an overall low level of impact.

Operation

The low sensitivity ranking, combined with the low magnitude of change post construction, leads to an overall low level of impact.

6.6 VP 5: Wheelers Lane, and VP6: Cobbora Road

Existing view

The Site is visible from two rail crossings –Wheelers Lane east of the Site, and Cobbora Road north of the Site. From each crossing, a high number of potential public viewers can potentially see the Site. However, the use of the rail crossings is temporary, while road users are in transit, and views are not directed toward the Site.

A typical view from Wheelers Lane toward the Site is shown at **Figure 6-8**. A typical view from Cobbora Road toward the Site is shown at **Figure 6-9**.

Figure 6-8: Existing view from Wheelers Lane rail crossing

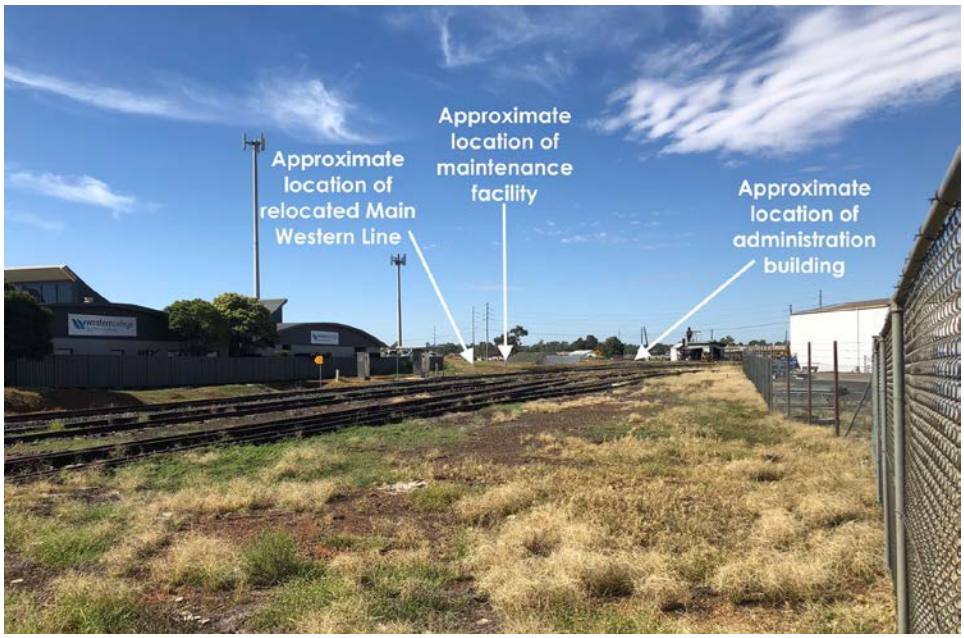


Figure 6-9: View from Cobbora Road rail crossing

Magnitude

Construction

Using the criteria listed in **Table 2-2**, the magnitude of change to the view during construction is rated as **low**. From these two viewpoints, the construction would be:

- Small in size and extent of area
- Barely distinguishable from surrounding rail and industrial activity
- Temporary.

Operation

From Wheelers Lane, the proposed maintenance facility would be visible above the 7m deep cutting approximately 600m away.

From Cobbora Road, the proposed maintenance facility would be visible at approximately 650m from the viewer. From this angle, the viewer may see the western opening of the maintenance facility and trains on the maintenance tracks.

Using the criteria listed in **Table 2-2,** the magnitude of change to the view during operation is rated as **low**:

- The scale of the proposed maintenance facility would not appear dissimilar to the building character of the surrounding industrial area
- The maintenance facility would not be visually prominent and is not central to the view
- From these locations, viewers are focused on the road and safety at the rail crossing.

Impact

Construction

The low sensitivity ranking, combined with the low magnitude of change during construction, leads to an overall low level of impact.

Operation

The low sensitivity ranking, combined with the low magnitude of change post construction, leads to an overall low level of impact.

6.7 VP7 – Wingewarra/Chelmsford Street intersection

The intersection of Wingewarra and Chelmsford Streets is on the southern side of the Site. From this viewpoint, the entrance to the ARTC Centre is visible. A narrow, distant view of the Site is possible from this viewpoint.

The existing entrance to the ARTC Centre is informal, featuring a gravel road within a grassed open space and tall native trees. A typical view from the intersection of Wingewarra Street/Chelmsford Street toward the Site is shown at **Figure 6-10.**

Figure 6-10: Existing view from Wingewarra/Chelmsford Street

Sensitivity

Using the criteria listed in **Table 2-1**, the sensitivity of the viewpoint is rated as **moderate.** This viewpoint:

- Provides public views for a moderate number of users (Wingewarra Street is a major local road)
- Provides private views for residents in close proximity to the proposed Site entrance (the nearest residence is approximately 20m from the Wingewarra Street entry)
- The view of the ARTC Centre entrance provides a leafy, green informal 'park-like' outlook.

Magnitude

Construction

Using the criteria listed in **Table 2-2**, the magnitude of change to the view during construction is rated as **moderate**. From this viewpoint, the construction would be:

- Close and directly in view of residents and road users
- Would involve removal of trees
- Involve large machinery to form the new entrance
- Temporary.

Operation

Post-construction, a new, wider, formalised vehicular driveway would be seen running from Wingewarra Street into the Site. The driveway would likely comprise a bitumen road and concrete gutters and involve removal of several trees. Although initially, the loss of trees would be noticed, the Project provides an opportunity to plant new trees and create an attractive entrance to the Site.

At the end of the driveway, a distant view of the proposed small security building would be seen at the entry point to the Site; and behind that, proposed fuel storage tanks would be seen. The buildings are approximately 260m away from Wingewarra Street.

Photomontage images of the proposed view are shown **Figure 7-9** to **Figure 7-11, Section 7.** The photomontage at **Figure 7-11** only shows the proposed view of infrastructure within the Site, and not the proposed upgrade that would occur at the entrance off Wingewarra Street. Details regarding the road upgrade are yet to be determined. Consequently, a post-mitigation view is not shown for VP7.

Using the criteria listed in **Table 2-2,** the magnitude of change to the view during operation is rated as **moderate** reducing to **low** 3-5 years post-construction:

- Initially, the loss of trees may be viewed as a negative visual change
- However, the intersection upgrade provides opportunity to plant new trees within the entrance which would enhance Wingewarra Street as well as creating an attractive Site entrance
- The maintenance facility and other proposed buildings are unlikely to be visible.

Impact

Construction

The moderate sensitivity ranking, combined with the moderate magnitude of change during construction, leads to an overall moderate level of impact.

Operation

The moderate sensitivity ranking, combined with the moderate magnitude of change post construction, leads to an initial moderate level of impact following construction.

The moderate sensitivity ranking, combined with the low magnitude of change 3-5 years post construction, would reduce impact over time to a moderate-low level.

6.8 Summary of Visual Impact to Key Viewpoints

The assessment results of impact to viewpoints are summarised in the tables below.

Table 6-1: Summary of Visual Impact to Viewpoints, Construction

Viewpoints: Construction	Sensitivity	Magnitude of change	Impact level
1. White Street/Welchman Street (Darby Close residential community)	Moderate	Moderate	Moderate
2. DATS (Southern residential area)	Moderate	High	Moderate-high
3. Bunglegumbie Road, West Dubbo	Low	Low	Low
4. Fitzroy Street/Church Street (Showground entrance)	Low	Low	Low
5. Wheelers Lane rail crossing	Low	Low	Low
6. Cobbora Road rail crossing	Low	Low	Low
7. Wingewarra Street/Chelmsford Street	Moderate	Moderate	Moderate

Table 6-2: Summary of Visual Impact to Viewpoints, Operation

Viewpoints: Operation	Sensitivity	Magnitude of change	Initial impact level	Impact level 3-5 years post-construction
1. White Street/Welchman Street (Darby Close residential community)	Moderate	Moderate	Moderate	Moderate-low
2. DATS (Southern residential area)	Moderate	Moderate	Moderate	Moderate-low
3. Bumblegumbie Road, West Dubbo	Low	Negligible	Negligible	No change
4. Fitzroy Street/Church Street (Showground entrance)	Low	Negligible	Negligible	No change
5. Wheelers Lane rail crossing	Low	Low	Low	No change
6. Cobbora Road rail crossing	Low	Low	Low	No change
7. Wingewarra/Chelmsford Street	Moderate	Moderate	Moderate	Moderate-low

7 Photomontages

Photomontages have been included for VP1 (White Street/Welchman Street intersection), VP2 (DATS), and VP7 (Wingewarra/Chelmsford Street intersection) to illustrate the anticipated view following construction. The photomontages were independently prepared by Cambium Group.

Four images are provided for each viewpoint showing:

- the existing view toward the Site
- analytical view showing the proposed Project infrastructure in yellow
- the proposed view following construction, and
- the proposed view five years post-construction when proposed mitigation planting has established (VP1 and VP2 only).

Note that the photomontage for VP7 only shows the proposed view of infrastructure within the Site, and not the proposed upgrade that would occur at the entrance off Wingewarra Street, as details regarding the road upgrade are yet to be determined. Consequently, the post-mitigation view is also not shown for VP7.

Figure 7-1: VP1 (White Street/Welchman Street intersection) - Existing view

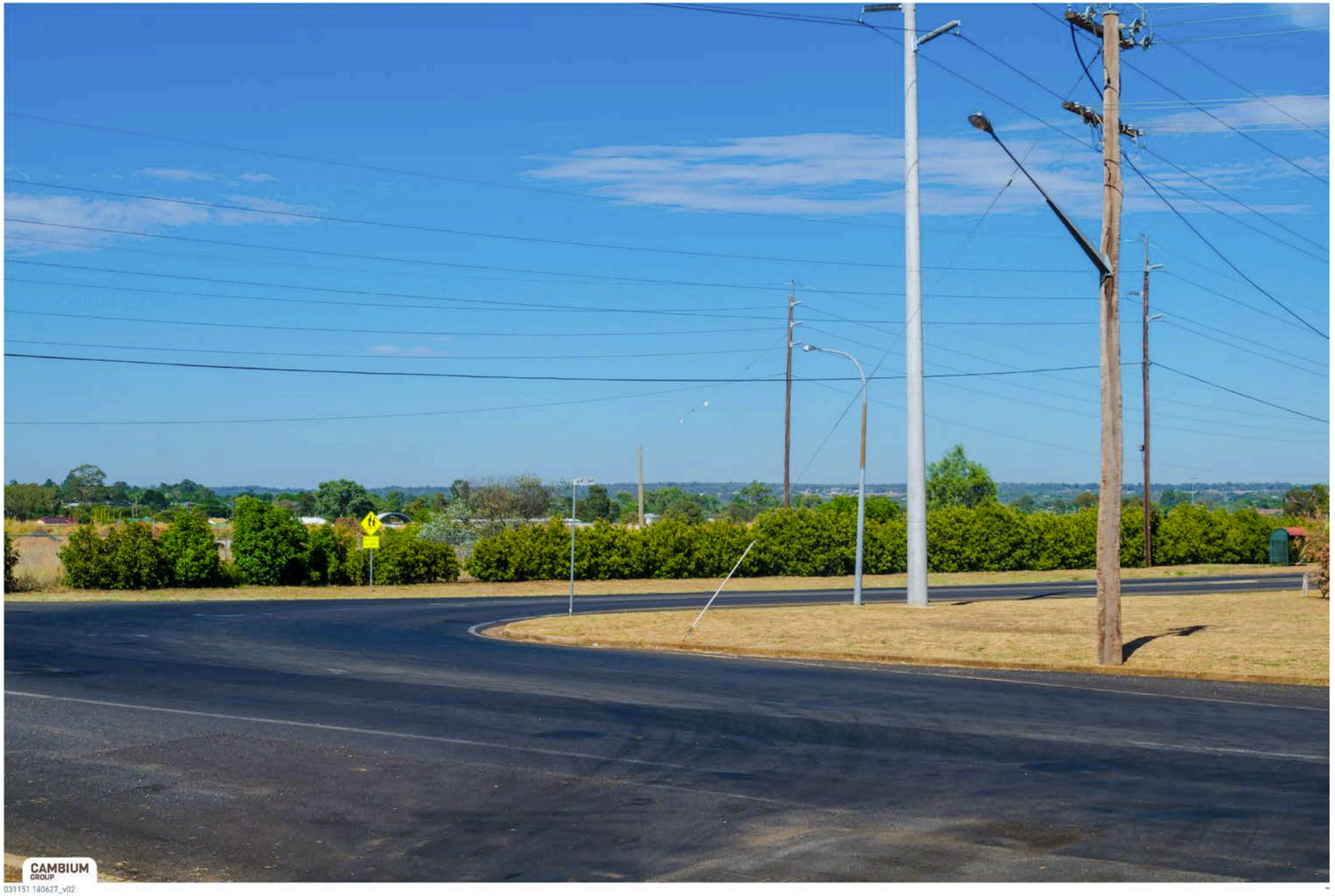


Figure 7-2: VP1 (White Street/Welchman Street intersection) - Analytical view

Figure 7-3: VP1 (White Street/Welchman Street intersection) - Proposed view

Figure 7-4: VP1 (White Street/Welchman Street intersection) - Proposed view with mitigation

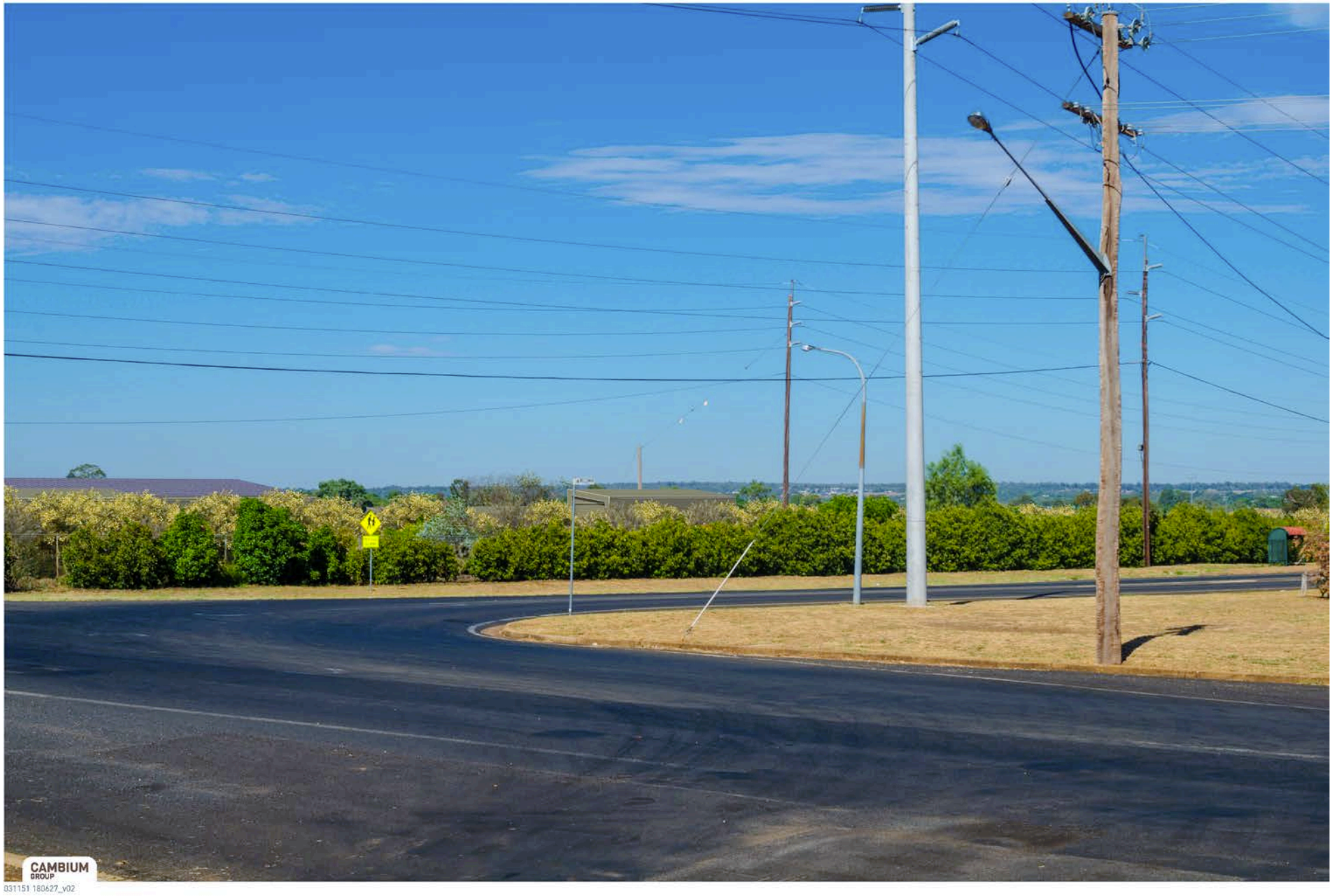


Figure 7-5: VP2 (DATS) - Existing View

Figure 7-6: VP2 (DATS) – Analytical view

Figure 7-7: VP2 (DATS) - Proposed view

Figure 7-8: VP2 (DATS) - Proposed view 5 years following construction

Figure 7-9: VP7 (Wingewarra/Chelmsford Street intersection) - Existing View

Figure 7-10: VP7 (Wingewarra/Chelmsford Street intersection) – Analytical view

Figure 7-11: VP7 (Wingewarra/Chelmsford Street intersection) - Proposed view

8 Design objectives and principles

This section of the report describes design measures that are recommended to be incorporated into the Project, to improve the visual outcome by:

- Designing a structure that integrates with the character of the area
- Contributing to urban structure
- Creating minimal visual disturbance during construction and
- Retaining positive Site features (such as existing vegetation).

Although Council's consent is not required, relevant design requirements from Council's DCP 2013 have been included among the design objectives and principles.

8.1 Positive visual attributes of the Project

The Project already incorporates a number of positive design measures which mitigate potential landscape character and visual impacts:

- The Site is located within an industrial area
- The Project is not dissimilar in character to the existing the industrial area (typified by large fenced allotments with large, single envelope, warehousing and yards for vehicles and stock)
- The Site and surrounding landform is generally flat, limiting views to close proximities
- The 13m high proposed maintenance facility building is located within a cutting (up to 7m deep)
- The proposed maintenance tracks, stores and loading dock are also located within the cutting
- Building height is maintained at a scale appropriate to the location – not adversely impacting on the visual amenity of the locality or the city
- The colour of the maintenance facility would be recessive.
- Existing shrub vegetation along White Street screens views into the Site (and would be retained)
- Approximately 1.88ha of habitat in the south of the Site would be protected. This area is considered to be part of the Fuzzy Box woodland and has potential for assisted natural regeneration
- Proposed night use is only for routine train maintenance in the stabling yard, and as such, only low-level pedestrian lighting is proposed sufficient for the purposes of security and essential emergency night works

- TfNSW incorporates Crime Prevention Through Environmental Design (CPTED) - the concept that good design and effective use of the physical environment can lead to a reduction in the fear and incidence of crime against people or property.

8.2 Additional design objectives and principles

Together, with the existing positive design measures, the following additional design objectives and principles would support the integration of the Project into the surroundings.

8.2.1 Landscape improvements

The following landscape improvement principles are recommended to support the integration of the Project into the surroundings:

- Prepare a landscape plan for the site (a draft concept landscape plan is provided at **Appendix B** – note the concept landscape plan does not extend to the Wingewarra Street entrance as details of the entrance are yet to be determined)
- Along White Street:
    - Protect existing shrubs along White Street prior to the commencement of construction (if they would be potentially impacted by construction activities) in accordance with Australian Standard *Protection of trees on development sites* AS4970-2009 and TfNSW's *Vegetation Management (Protection and Removal) Guideline,* 2015 (*Vegetation Management*, TfNSW, 2015)
    - Plant shrubs within the Site along the White Street boundary to create a denser, taller screen to reduce views into the Site
    - Plant quick growing native shrubs with a mature height of 3.5m (height is limited due to overhead power lines)
    - Planting area to be a minimum of 5m wide on ground
- Decommissioned rail corridor:
    - In consultation with an ecologist, undertake tree and shrub planting within the decommissioned alignment of the Main Western Line to screen the Project from residents located to the south of the Site.
    - Plant species associated with the Fuzzy Box woodland (seek advice from ecologists regarding appropriate species). Plant an even mix of tall shrubs and trees to create a dense, tall screen
    - Planting area to be approximately 10-15m wide on ground
- Wingewarra Street Site entrance:
    - Protect existing trees that are outside of the construction zone

    - Create an attractive Site entrance at Wingewarra Street to enhance street appeal
    - Consider planting tree species recommended by Council Wingewarra Street: *Brachychiton populneus*m *Brachychiton populneus x acerifolius* 'Jerilderie Red', *Zelkova serrata* 'Wireless', *Zelkova serrata* 'Green Vase' and *Fraxinus pennsylvanica* 'Cimmaron' (refer to Appendix A)
    - Trees to be 1.5m in height at planting
- Within the Site:
    - Protect existing vegetation to be retained (the approximately 1.8ha of Fuzzy Box woodland) prior to commencement of construction in accordance with Australian Standard *Protection of trees on development sites* AS4970-2009 and TfNSW's *Vegetation Management (Protection and Removal) Guideline,* 2015 (*Vegetation Management*, TfNSW, 2015)
    - Consult with a qualified arborist to minimise impact on the long-term health of trees to be retained within the construction zone
    - Note: The nature of the proposed use of the Site prevents the introduction of further planting within the Site grounds, as open space is required for train security and functionality of maintenance.
- Weeds:
    - Remove weeds and dispose in accordance with TfNSW's *Weed Management and Disposal Guide*
    - Actively remove weeds during operation and maintain landscaping and grounds within the Site to a high standard.

8.2.2 Building materials and signage

The following measures regarding building integration are recommended:

- Materials to be non-reflective including:
    - External walls and roofing materials are to be of a non-reflective material, such as brick, concrete block, rendered concrete or masonry, metal or fibre cement cladding systems, or pre-coloured metal sheeting
    - All external building materials including roofing shall be of a neutral colour appropriate to the site that promotes the sense of a unified, planned industrial park.
- If additional or alternative colours are selected for the building, choose recessive colours to reduce visual dominance, or base colour scheme on the colour palette typical of the surrounding industrial area
- Limit signage in terms of size and garish colours and rationalise to minimise number of signs.

8.2.3 Construction measures

To reduce the visual impact during construction, the following construction measures are recommended:

- Ensure that the construction compound and construction parking areas are located away from direct residential views where practical
- Cover perimeter security fencing with shadecloth, in particular near the back fences of residential properties along the southern boundary of the Site, to reduce the views of construction activities
- Reduce potential dust impacts by:
    - Not undertaking demolition or earthworks on windy days
    - Misting active work areas and exposed ground to avoid dust plumes
    - Installing shade cloth to perimeter security fencing near the properties along the southern boundary of the Site
    - Avoid temporary light spill beyond the construction site (when night work is required) by directing light source down and installing shields around the light source
- Rehabilitate disturbed areas as soon as possible following construction
- Remove graffiti if it occurs at the construction site in accordance with TfNSW standard requirements.

9 Conclusion

The key visual features of the Project are: a rail maintenance facility up to 13m in height, 30m in width, and 220m in length, located within a cutting up to 7m deep; maintenance tracks, stores building and loading dock located within a cutting up to 2.5m deep; a new Site entrance on the southern side of the Site off Wingewarra Street; decommissioned alignment of the Main Western Line along the southern boundary; and a relocated Main Western Line on a raised embankment running through the middle of the Site.

Heavy maintenance would be undertaken in the proposed maintenance facility and would only be undertaken during the daytime; however, the Project provides for 24-hour use of the Site.

The Project Site is about 25 ha of vacant land within an industrial area. The surrounding industrial/business uses comprise large fenced allotments with large warehousing/sheds (generally 6-10m in height and up to 150m in length). The Project is consistent with the existing use and character of the surrounding industrial area, and overall, there would be a moderate-low level of impact to landscape character.

Due to the Site and surrounds being generally flat, there are few vantage points to view the Site. Two residential areas have been identified which are sensitive in terms of viewpoints that could be impacted: a small residential community to the north centred on Darby Close; and a larger residential area to the south with properties that border the Site.

From Darby Close, existing shrubby vegetation along White Street screens direct views into the Site, however, while construction is underway, residents are likely to be visually affected by the movement of vehicles, delivery of large-scale infrastructure, construction machinery and construction activities which would be visible above the existing vegetation. Post-construction, the maintenance facility would be visible above the cutting (up to 7m deep) and the existing 2m high vegetation along White Street. The building would appear approximately 6m above ground level at the eastern end, and approximately 8-9m at the western end. The 220m long roof of the building and the roof-top solar panels would be visible.

From the southern residential area, views of the Site are possible from the backyards of private residences lining the railway corridor. Most houses have trees planted within their backyards to reduce views of the existing rail line and provide privacy. During construction, the existing rail line would continue to operate. Residents would see large-scale earth moving and construction activities in close proximity to backyard fences.

Following construction, the proposed maintenance facility would be very close to some residents (approximately 30m from backyard fences at its closest point). Residents would be likely see the bulk of the proposed maintenance building unless existing vegetation within their own property prevents views.

However, over time, the view for adjoining residents would improve. Once the existing alignment of the Main Western Line is decommissioned, residents would no longer see trains on the Main Western Line at close proximity. Further, planting could be undertaken within the former railway corridor to screen views to the Site and new Project infrastructure.

The view for residents in the vicinity of the proposed new Site entrance on the southern side of the Site would be adversely affected by the loss of trees. However, over time, planting undertaken at the upgraded intersection would provide an attractive entrance to the Site and enhance street appeal.

The Project incorporates a number of positive design measures which mitigate potential landscape character and visual impacts. Further design objectives and principles have been recommended, including landscape improvements and construction measures, to improve visual outcome over time.

Overall, when operational, the Proposal would represent a moderately-low level of impact to landscape character and a moderate and acceptable impact to private and public viewpoints.

References

Dubbo Regional Council, (date not identified) *Street Tree Master Plan – Dubbo*

Dubbo Regional Council, (date not identified) *Trees by Street*

Dubbo Regional Council, (date not identified) *Trees for the City of Dubbo*

Landscape Institute and Institute of Environmental Management and Assessment, 2013 (3RD edition). *Guidelines for Landscape and Visual Impact Assessment*. Spoon press, United Kingdom.

NSW Road and Maritime Services, 2013. Environmental Impact Assessment Practice Note: *Guideline for Landscape Character and Visual Impact Assessment EIA-N04*, March 2013.

OzArk Environmental & Heritage Management, May 2018, *Aboriginal and Historic Heritage Assessment: Regional Rail Maintenance Facility.*

OzArk Environmental & Heritage Management, May 2018, *Ecological Assessment: Regional Rail Maintenance Facility.*

Transport for NSW, 2015, *Vegetation Management (Protection and Removal) Guideline.*

Transport for NSW, 2015, *Weed Management and Disposal Guide* 3TP-SD-110/2.0

Appendix A

Botanical name:

Brachychiton populneus

Common name:

Kurrajong

Origin:

Eastern Victoria, tablelands and slopes of New South Wales, north to south eastern Queensland Occurs in a wide range of habitats and soils, from deep sandy loams on plains, to skeletal types on rocky hilltops.

Typical height:

10 20 metres

Typical width:

5-7 metres

Growth rate:

Slow

Typical form:

A tree which usually has a relatively short bole and a densely-foliaged crown. Some trees are semi-deciduous in early summer.

Characteristics:

Site requirements:

Tolerates a wide range of soils - clay loam, heavy clay (greater than 50% clay), light to medium clay (35-50% clay) or loam, sandy loam, sandy clay loam.

Requires well-draining soils – Sensitive to water logging. Prefers full sun.

Tolerances:

High drought tolerance. Frost: tolerates frosts in the 0° to -5°C range. Tolerates both acid and alkaline soils.

Notes:

Above tree was planted in Jerilderie in 2000. Images courtesy of Humphris Nursery Pty. Ltd.

Botanical name:

Brachychiton populneus x acerifolius 'Jerilderie Red'

Common name:

Brachychiton **'Jerilderie Red'**

Origin:

Cultivar of hybrid of *B. populneus* & *acerifolius*

Typical height:

6-8 metres

Typical width:

3-5 metres

Growth rate:

Moderate to slow

Typical form:

Pyramidal to narrow-domed on stout trunk

Characteristics:

Small evergreen tree. Dense canopy of simple, dull-green, lanceolate leaves with an acuminate apex. The leaves vary somewhat in size but have a long, slender petiole. Clusters of dense, red bell-shaped flowers in spring/summer.

Site requirements:

Suits sandy or heavy soils, lime. Drought and frost resistant. Fire retardant.

Tolerances:

Drought tolerant.

Notes:

Ensure good quality grafted stock. Could also use B. 'Bella Pink', which is reportedly a little taller than 'Jerilderie Red'.

Botanical name:

Zelkova serrata ‘Green Vase’

Common name:

Zelkova Green Vase

Origin:

Hybrid

Typical height:

14 metres

Typical width:

10 metres

Growth rate:

Moderate to Fast

Typical form:

Medium sized vase-shaped, upright branching.

Characteristics:

Bright green, ovate leaves with distinctly serrate margins. The autumn colours are yellow, coppery-bronze to red.

Site requirements:

Very hardy and adaptable to urban environments. Prefers full sun but will tolerate partial shade. Highly adaptable to different soil types.

Tolerances:

Tolerates heat, compacted soils, air pollution and once established, low levels of drought and wind.

Notes:

This cultivar shows very good resistance to pests and diseases. Resents wet sites.

Botanical name:

Zelkova serrata 'Wireless'

Common name:

Japanese Elm wireless

Origin:

Hybrid

Typical height:

7 metres

Typical width:

9 metres

Growth rate:

Moderate to Fast

Typical form:

Low, spreading. Broad vase-shaped

Characteristics:

Medium green during summer producing subtle orangey-bronze to red tones during autumn.

Site requirements:

Adapts to most soils, good urban tolerances. Grows in full sun to part shade.

Tolerances:

High drought and frost tolerance. Tolerant to winds.

Notes:

As the name implies this cultivar has been selected for its low height chararcteristic and broad spreading shape making it ideally suited under power lines or areas where height restrictions apply

Botanical name:

Fraxinus pennsylvanica ‘Cimmaron’

Common name:

Cimmaron Green Ash

Origin:

Variety

Typical height:

15-20 metres

Typical width:

8-10 metres

Growth rate:

Moderate

Typical form:

Large, narrow domed deciduous tree

Characteristics:

Dense, lustrous foliage, turns burgundy to red-orange in autumn. Reported seedless variety. Attractive dark grey bark.

Site requirements:

Transplants readily & adapts to most soils, although performs best in moist well drained soils.

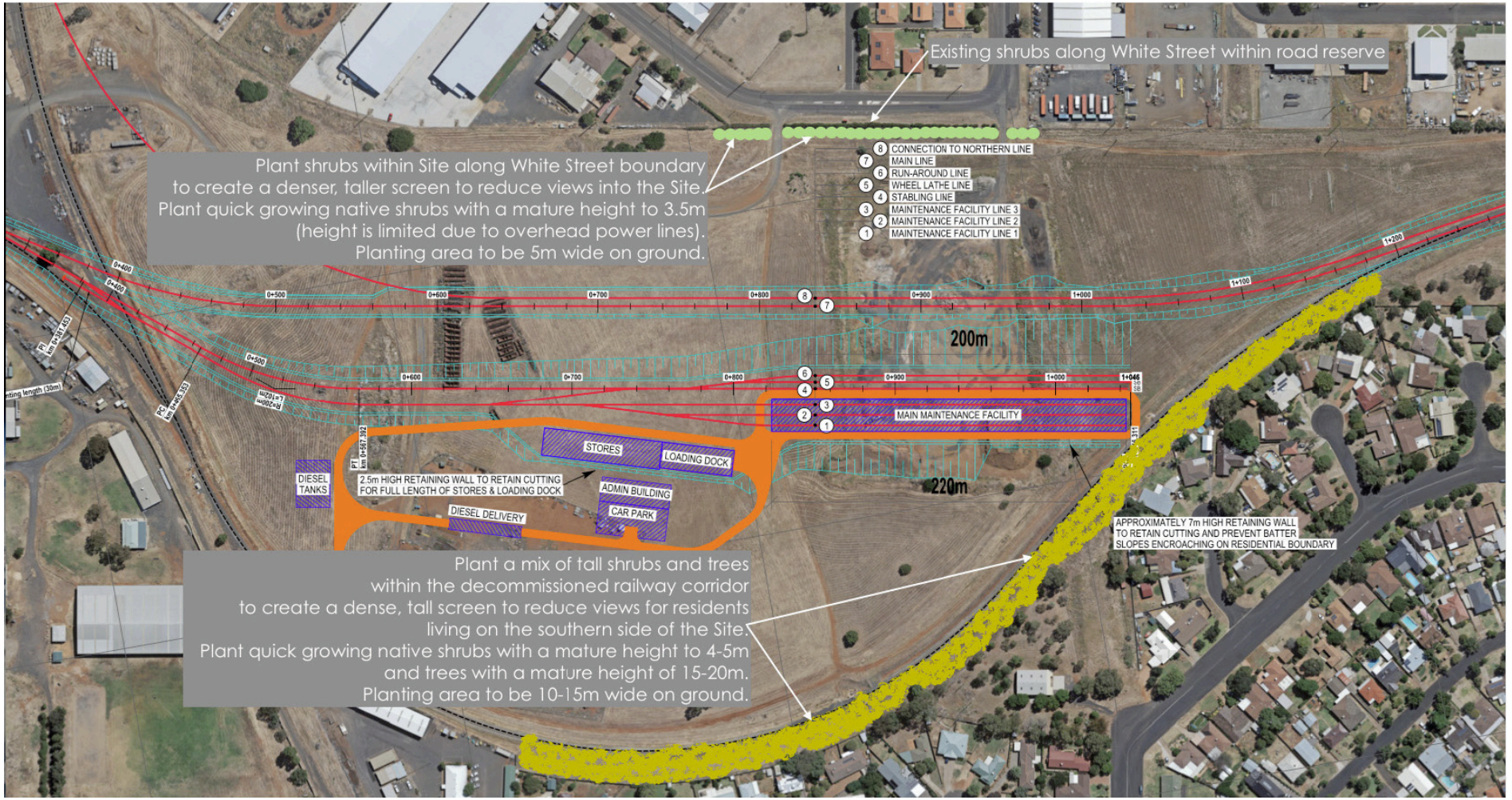
Tolerances:

High wind and frost tolerance. Moderate to high tolerance of water logging.

Notes:

Formative prune to develop strong structure. Research indicates tree has good potential for street planting

Appendix B


Existing shrubs along White Street within road reserve
Plant shrubs within Site along White Street boundary
to create a denser, taller screen to reduce views into the Site.
Plant quick growing native shrubs with a mature height to 3.5m
(height is limited due to overhead power lines).
Planting area to be 5m wide on ground.
8 CONNECTION TO NORTHERN LINE
7 MAIN LINE
6 RUN-AROUND LINE
5 WHEEL LATHE LINE
4 STABLING LINE
3 MAINTENANCE FACILITY LINE 3
2 MAINTENANCE FACILITY LINE 2
1 MAINTENANCE FACILITY LINE 1
200m
220m
MAIN MAINTENANCE FACILITY
STORES
LOADING DOCK
ADMIN BUILDING
CAR PARK
DIESEL DELIVERY
DIESEL TANKS
2.5m HIGH RETAINING WALL TO RETAIN CUTTING
FOR FULL LENGTH OF STORES & LOADING DOCK
APPROXIMATELY 7m HIGH RETAINING WALL
TO RETAIN CUTTING AND PREVENT BATTER
SLOPES ENCROACHING ON RESIDENTIAL BOUNDARY
Plant a mix of tall shrubs and trees
within the decommissioned railway corridor
to create a dense, tall screen to reduce views for residents
living on the southern side of the Site.
Plant quick growing native shrubs with a mature height to 4-5m
and trees with a mature height of 15-20m.
Planting area to be 10-15m wide on ground.