

Chapter 16

Landscape and visual

16 Landscape and visual

16.1 Introduction

This chapter summarises the landscape and visual impacts associated with the proposal's construction and operation. A Landscape and Visual Impact Assessment (LVIA) has been prepared and included as **Technical report L**.

The methodology for the LVIA included:

- Gaining a clear understanding the existing environment that may be impacted by the proposal, by recognising the landscape character of the proposal site and the surrounding area and representative locations from which the proposal may be visible. This involved a review of the relevant legislation and policies and an analysis of local landscape features.
- Assessing the impacts of the proposal on the existing landscape character and representative views by:
 - Completing a landscape assessment on seven landscape character areas, assessing the sensitivity of the receiving environment and the magnitude of change to determine the overall impact
 - Completing a visual assessment of 15 viewpoints, assessing the sensitivity of the receiving environment and the magnitude of change to determine the overall impact from construction and operation of the proposal
 - An assessment of night-time lighting impacts
 - An overshadowing analysis
- Developing measures to mitigate landscape and visual impacts, including working with the design team to embed measures into the proposal design.

The LVIA has been prepared following the below guidelines:

- NSW Roads and Maritime Services Practice Note – Guideline for Landscape Character and Visual Impact assessment EIA-N04 (2018)
- The Guidance for Landscape and Visual Impact Assessment, Third Edition, 2013, prepared by the Landscape Institute and Institute of Environmental Management and Assessment, UK
- UK's Guidance Notes for the Reduction of Obtrusive Light GN01:2011, Institution of Lighting Professionals.

16.2 Existing environment

16.2.1 Landscape overview

The proposal site is located in the Wallgrove Precinct of the Western Sydney Parklands (WSP) Plan of Management. The area immediately surrounding the site is characterised by commercial, industrial and transport infrastructure land uses, set within a wider landscape of the Western Sydney Parklands (WSP) to the north, south and east. The site is bounded by the Westlink M7 Motorway to the west, with the Eastern Creek industrial area located farther west. The SUEZ Eastern Creek Waste Management Centre, comprising the now-closed landfill site and operational organics recycling facility, is located to the north and north-east, with the operational Global Renewables waste management facility located immediately to the east. To the south, the site is bounded by the Warragamba Pipeline Corridor, with the Austral Bricks facility located farther south. The site was previously used as a poultry farm, and disused sheds and ancillary buildings are still occupying the site. The characteristics of the site hold limited landscape value other than the aesthetic amenity of the remnant woodland.

The site is screened and removed from residential and other sensitive areas, which reduces its zone of visual influence. This was one of the main factors in selecting the site. The nearest residential areas are located at least 1km away to the south. The closest receivers are road users traveling along the M7 Motorway, recreational users along the shared path adjacent to the western boundary of the site and to a lesser extent people working at the nearby commercial facilities.

16.2.2 Topography

The site is gently sloping from the south west to the north-east to an overland flow path along the eastern boundary. The topography in and around the study area is mostly influenced by the low-lying open landscape of the Cumberland Plain.

16.2.3 Vegetation

The site has undergone high levels of disturbance due to historical land clearing and adjacent industrial land uses, so the biodiversity values are limited to regenerating Cumberland Plain Woodland in the northeast of the site and existing aquatic environments (the farm dam and overland flow path). Exotic grassland is scattered across the site, and sedge community (aquatic grass) associated with the farm dam is located near the eastern boundary.

16.3 Assessment

16.3.1 Assessment method

The LVIA considers two separate impacts:

- Landscape impacts – the assessment of impact on the area’s built, natural and cultural character or sense of place¹
- Visual impacts – the assessment of impact on views.²

The assessment considers the sensitivity of the receiving environment and the magnitude of change to determine the overall impact from the proposal.

Sensitivity is *‘the sensitivity of a landscape character zone or view and its capacity to absorb change of the nature of the proposal. In the case of visual impact this also relates to the type of viewer and number of viewers.’*³

Magnitude of change is *‘the measurement of the scale, form and character of a development proposal when compared to the existing condition. In the case of visual assessment this also relates to how far the proposal is from the viewer.’*⁴

Sensitivity and magnitude are combined to arrive at an overall impact rating of negligible, low, moderate-low, moderate, high-moderate, or high, as shown in the table below.

Where sensitivity or magnitude can’t be recognised using objective measures, professional expertise is used to make assessments about sensitivity and magnitude of a proposal.

Table 16.1: Landscape and visual impact assessment matrix

Sensitivity	Magnitude				
		High	Moderate	Low	Negligible
	High	High	High-Moderate	Moderate	Negligible
	Moderate	High-Moderate	Moderate	Moderate-Low	Negligible
	Low	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

¹ RMS, 2018.

² RMS, 2018.

³ RMS, 2018.

⁴ RMS, 2018.

The visual assessment also considers the impacts of proposal lighting on the environment. The same matrix applies for lighting impacts, with the sensitivity depending on the existing level of brightness of the surrounding viewpoint (intrinsically dark, low brightness, medium brightness and high brightness).

Table 16.2: Lighting impact assessment matrix

Sensitivity	Magnitude				
		High	Moderate	Low	Negligible
	High (Intrinsically dark)	High	High-Moderate	Moderate	Negligible
	Moderate (Low brightness)	High-Moderate	Moderate	Moderate-Low	Negligible
	Low (Medium brightness)	Moderate	Moderate-Low	Low	Negligible
	Negligible (High brightness)	Negligible	Negligible	Negligible	Negligible

An overshadowing analysis is also completed, which models the potential overshadowing from the proposal on the adjacent environment.

Visual privacy impacts have not been assessed in the LVIA, as the proposal is located within an existing industrial and commercial area away from residential receivers. So, any visual privacy impacts are negligible. Further to this, there are no habitable rooms on the western, northern and southern sides of the building, so no overlooking from these elevations. The operations rooms, administration areas and visitor and education centre are positioned on the eastern side of the building and overlook the landscaped areas of the site.

The Architectural and Landscape Design Strategy Report (**Appendix B**) details the proposed building height, stack height, bulk and scale all of which have been considered when completing the landscape character and visual impact assessment.

16.3.1.1 Landscape impact assessment

Landscape character areas (LCAs) or landscape character zones divide the landscape into distinct units with defining characteristics (RMS, 2018). Seven LCAs have been defined as shown in **Figure 16.1**. For LCA 1: Western Sydney Parklands, seven subcategory areas have been defined. All LCAs are described in detail in Section 5 of **Technical report L**.

The LCAs include:

- LCA 1: Western Sydney Parklands
 - 1A – Wallgrove productive areas
 - 1B – Motorsport park
 - 1C – Prospect Reservoir
 - 1D – Passive recreation
 - 1E – Active recreation
 - 1F – Sports facilities
 - 1G – Rural living
- LCA 2: Power and industrial estates
- LCA 3: Horsley Park Rural Residential
- LCA 4: Minchinbury local community
- LCA 5: Bungarribee local community
- LCA 6: WestLink M7 highway corridor
- LCA 7: Bush Creek Corridor.

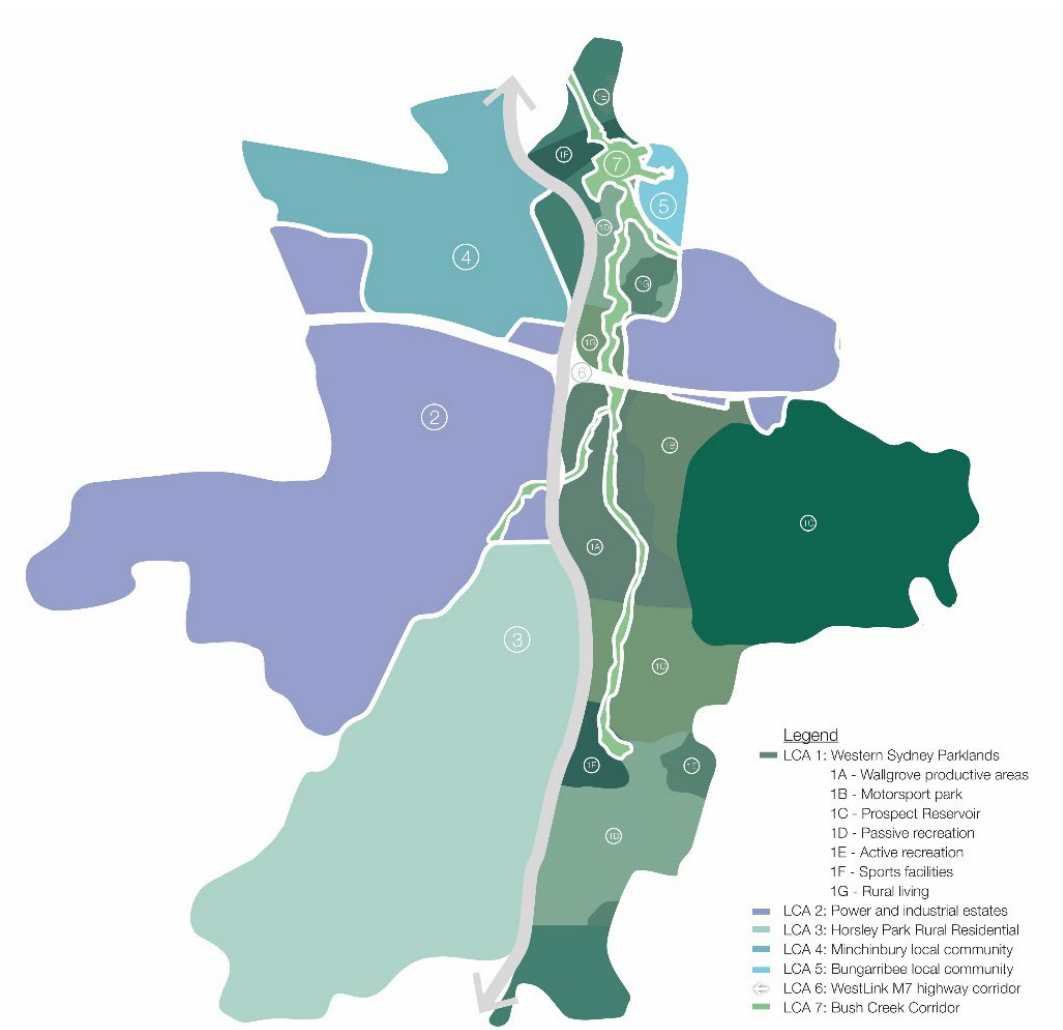


Figure 16.1: Landscape character areas

The landscape impact assessment considers impacts on the five LCAs that are directly impacted by the proposal. These are the LCAs that intersect with the proposal site or where the proposal has the potential to influence the setting of the LCA, and they include:

- LCA 1A: Wallgrove productive landscapes
- LCA 2: Power and Industrial estates
- LCA 3: Horsley Park Rural Residential
- LCA 6: WestLink M7 highway corridor
- LCA 7: Bushland creek corridor.

Table 16.3 describes these LCAs.

Table 16.3: Summary of the LCAs that are directly impacted by the proposal

LCA	Features
1A: WSP – Wallgrove productive landscapes	This LCA is associated with the areas located within the WSP boundary and includes the immediate site extent. The Wallgrove productive landscape contains a diverse range of interim land uses, such as landfill, waste recycling, brick making and quarrying. The area comprises warehouse style buildings and areas of disturbed land (from quarrying). Traffic movement is characterised by heavy machinery and large trucks entering the commercial and/or industrial worksites regularly.
2: Power and Industrial estates	This LCA is associated with areas to the west of the M7 corridor and the proposed site boundary. This LCA is defined by large warehouse buildings with wide road corridors and formal planting arrangements such as manicured hedging and wide streets. The LCA is experienced mostly by industrial and commercial workers and visitors located within the vicinity.
3: Horsley Park Rural Residential	This LCA is associated with the areas located south-west of the site boundary. This LCA is experienced by the nearest residential receivers from the proposal site, being 1km to the south at Horsley Park Rural Residential area. The LCA is defined by undulating plains, mostly cleared for agricultural land uses. It includes large plots of rural land with a coherent pattern of features, scattered patches of vegetation, residential buildings and agricultural structures. The surrounding productive and industrial land uses in neighbouring LCAs, indirectly influence the sensitivity of this LCA.
6: WestLink M7 highway corridor	This LCA is associated with the highway corridor located directly adjacent to the site boundary and extending north to south. The highway corridor has two north and south bound lanes separated by a wide grassed median strip.
7: Bushland creek corridor	This LCA includes the necessary habitat to the local flora and fauna. However, it meanders through the adjoining industrial and commercial areas and is split by the highway corridor. This indirectly influences the sensitivity of the ecological corridor which is experiencing construction as development continues to influence the edges of the riparian LCA.

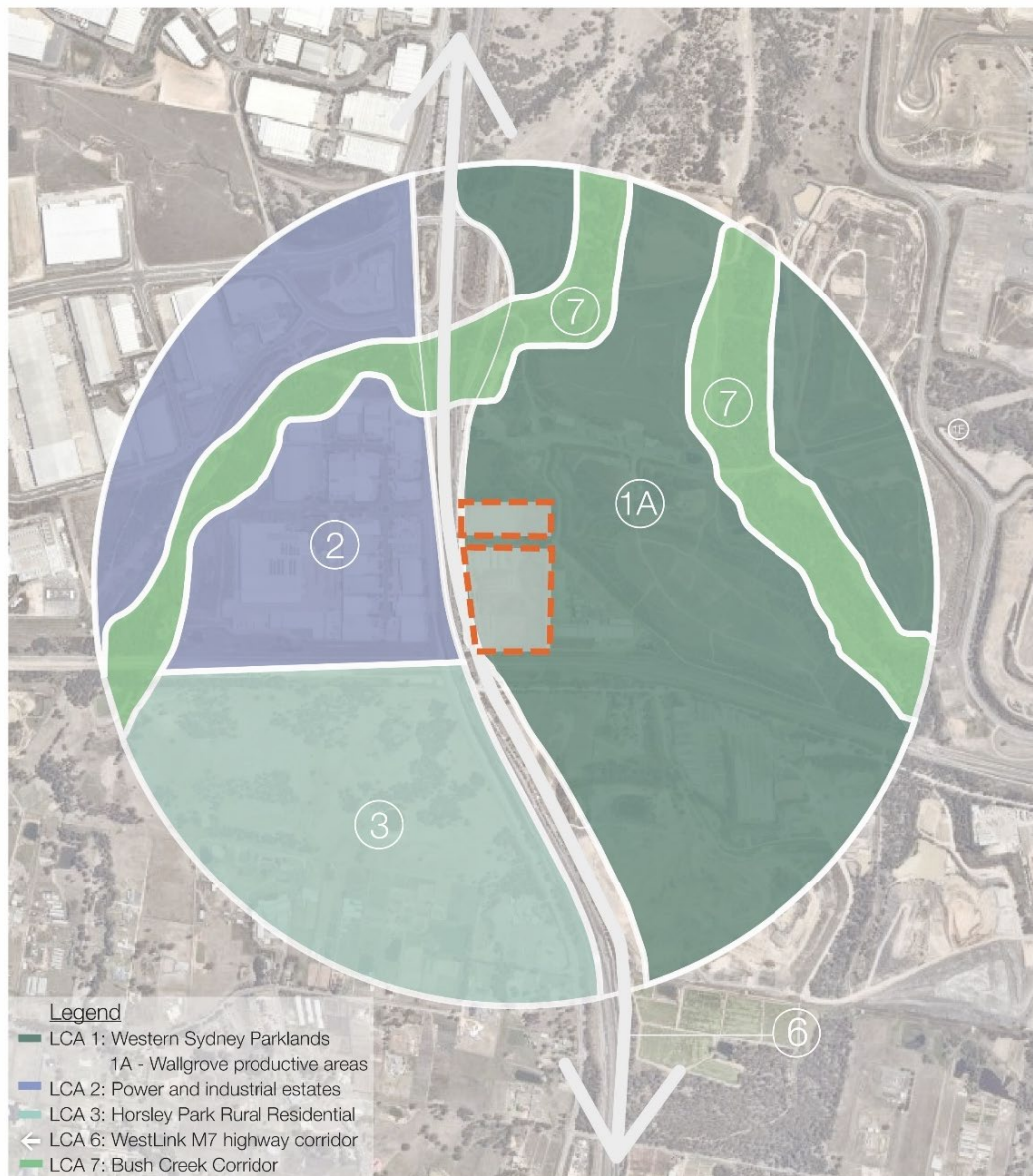


Figure 16.2: LCAs for impact assessment

16.3.1.2 Visual impact assessment

To assess the visual amenity of the proposal area, 15 viewpoints have been selected. Following site visits and desktop studies, the viewpoints were selected as they are within the visual envelope map (VEM) of the proposal. This means the proposal is visible from these viewpoints and they are representative of the type of views to the proposal. A description of each viewpoint and further details, including the sensitivity of each viewpoint, are available in section 5 of the LVIA.

Viewpoints were selected to illustrate:

- A range of receptor types including public and private domain views (residents, motorists and users of public open space)
- A range of view types including elevated, panoramic and filtered views
- A range of viewing distance from the proposal
- Main or protected views recognised within the planning literature.

The viewpoints are listed below and shown on **Figure 16.3**:

- Viewpoint 1 – Austral Bricks, Horsley Park
- Viewpoint 2 – Corner of Mini Link Road and Wallgrove Road
- Viewpoint 3 – Shared path – adjacent to Westlink M7
- Viewpoint 4 – Old Wallgrove Road, Eastern Creek
- Viewpoint 5 – Horsley Park Reserve
- Viewpoint 6 – Burley Road, Horsley Park
- Viewpoint 7 – Walworth Road, Horsley Park
- Viewpoint 8 – Ferrers Road, Lams Farm Fresh
- Viewpoint 9 – Sydney International Equestrian Centre
- Viewpoint 10 – Moonrise Lookout
- Viewpoint 11 – Prospect Reservoir
- Viewpoint 12 – Sydney Motorsport Park
- Viewpoint 13 – Sydney Zoo
- Viewpoint 14 – Bungaribee Homestead Park
- Viewpoint 15 – Pinegrove Memorial Park.

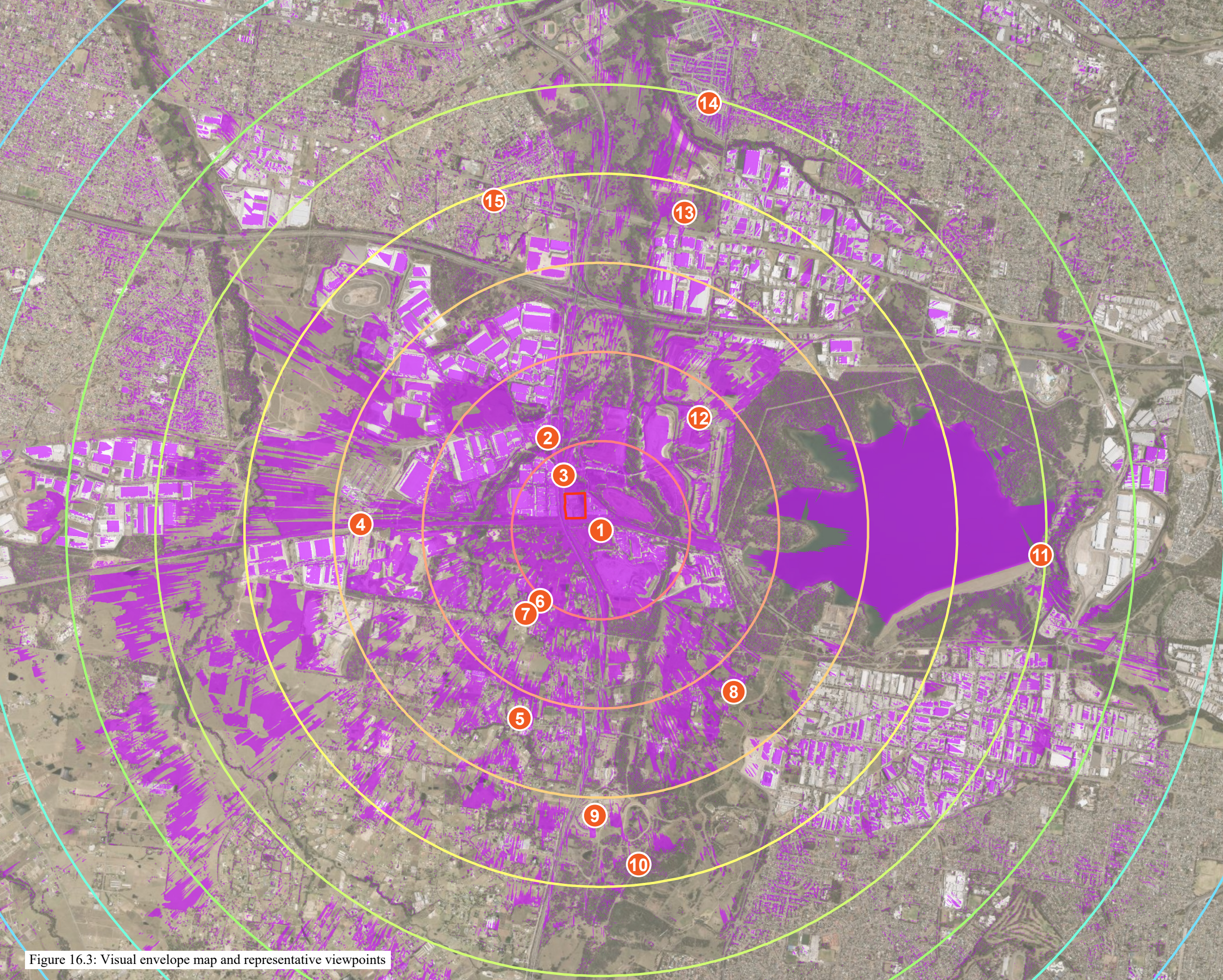


Figure 16.3: Visual envelope map and representative viewpoints

Figure 16.3 represents the VEM defining the visual catchment study area for the proposal and illustrates the theoretical area from which the building footprint, stack and plume (worst-case scenario) could be visible. Parameters for the plume representing ‘worst-case scenario’ included a visibility range from 100m wide to 100m high from the top of the stack.

Viewsheds from each individual viewpoint were generated to inform the analysis for the main infrastructure elements associated with the proposal. This included a viewshed with and without vegetation to represent the permeable nature of vegetation.

16.3.2 Construction impacts

16.3.2.1 Landscape impacts

The landscape impacts from the construction of the proposal are moderate-low, low or negligible as shown in **Table 16.4** below. The impacts to landscape character during construction will be concentrated in the area immediately surrounding the site and are consistent with existing industrial activities associated with the surrounding land uses of the area.

Table 16.4: Landscape impacts during construction

Landscape character area	Overall sensitivity	Construction	
		Magnitude of change	Impact
LCA 1A: WSP – Wallgrove productive landscapes	Low	Low	Low
LCA 2: Industrial and power estates	Low	Negligible	Negligible
LCA 3: Horsley Park Rural Residential	Moderate	Low	Moderate-Low
LCA 6: WestLink M7 highway corridor	Low	Low	Low
LCA 7: Bushland creek corridor	Moderate	Negligible	Negligible

16.3.2.2 Visual impacts

The visual impacts during construction are a result of the construction of the buildings and associated structures and construction machinery including cranes and vehicles. The construction impacts would be temporary in nature and only visible by people and businesses with direct sightlines of the construction site.

As shown in **Table 16.5**, the visual impacts during construction are anticipated to be low or negligible for Viewpoints 1, 2, 4, 5, 9, 13 and 15. The impact would be moderate or moderate-low for Viewpoints 8, 11, 12, and 14. However, Viewpoints 3, 6, 7, and 10 are considered to be impacted to a high-moderate extent.

Viewpoint 3 is only 200m from the perimeter of the proposal site, and the representative view from the shared path looks directly at the proposal site. Existing vegetation which currently screens the proposal site from view is likely to be removed, and the construction activities would become the dominant feature in this view. The view is representative of pedestrian and cyclists with a transient interest in the surrounding environment. In addition, any construction impacts on visual amenity will be temporary.

Viewpoints 6 and 7 have moderate sensitivity as they are from rural residential settings and would experience a high magnitude of change. During construction, the proposal would gradually emerge as a dominant structure within the viewpoint.

Viewpoint 10 has a high sensitivity due to its elevated position, and a moderate magnitude of change would be experienced at this viewpoint. Construction impacts on this viewpoint would be gradual as the taller structures of the proposal are built, such as the stack.

Table 16.5: Visual impacts during construction

Viewpoint	Sensitivity	Magnitude of change	Construction impact
1 Austral Bricks	Low	Low	Low
2 Corner of Mini Link Road and Wallgrove Road	Low	Low	Low
3 Shared cycle path – adjacent to Westlink M7	Moderate	High	High-Moderate
4 Old Wallgrove Road	Low	Negligible	Negligible
5 Horsley Park Reserve	Moderate	Negligible	Negligible
6 Burley Road, Horsley Park	Moderate	High	High-Moderate
7 Walworth Road, Horsley Park	Moderate	High	High-Moderate
8 Ferrers Road, Lams Farm Fresh	Moderate	Moderate	Moderate
9 Sydney International Equestrian Centre	Moderate	Negligible	Negligible
10 Moonrise lookout	High	Moderate	High-Moderate
11 Prospect Reservoir	Moderate	Low	Moderate-Low
12 Sydney Motorsport Park	Moderate	Low	Moderate-Low
13 Sydney Zoo	Moderate	Negligible	Negligible
14 Bungaribee Homestead Park	Moderate	Low	Moderate-Low
15 Pinegrove Memorial Park	Moderate	Negligible	Negligible

16.3.3 Operation impacts

16.3.3.1 Landscape impacts

Once operational, the impacts of the proposal on all LCAs are assessed to be low to negligible, except for LCA 3: Horsley Park Rural Residential which is assessed to have a moderate-low impact.

LCA 3: Horsley Park Rural Residential has a moderate sensitivity rating due to it being a residential area. The proposal would result in additional built form near this LCA, including the introduction of the stack and the consequential plume. This would result in the incremental expansion of industrial characteristics that define the northern edge of this LCA.

Table 16.6: Landscape impacts during operation of the proposal

Landscape character area	Overall sensitivity	Operation	
		Magnitude of change	Impact
LCA 1A: WSP – Wallgrove productive landscapes	Low	Low	Low
LCA 2: Industrial and power estates	Low	Negligible	Negligible
LCA 3: Horsley Park Rural Residential	Moderate	Low	Moderate-Low
LCA 6: WestLink M7 highway corridor	Low	Low	Low
LCA 7: Bushland Creek corridor	Moderate	Negligible	Negligible

16.3.3.2 Visual impacts

Visual impacts during operation (daytime)

The proposal includes large visual elements, such as the stack and plume which would result in a noticeable change for several viewpoints. The impact on these viewpoints is greater where the surrounding landscape has higher sensitivity, being within the Western Sydney Parklands and viewpoints that are in closer proximity to the proposal. Visual impacts are typically reduced with increased distance from the site.

Table 16.7: Visual impacts during operation of the proposal

Viewpoint	Sensitivity	Magnitude of change	Operation impact
1 Austral Bricks	Low	Low	Low
2 Corner of Mini Link Road and Wallgrove Road	Low	Low	Low
3 Shared cycle path – adjacent to Westlink M7	Moderate	High	High-Moderate
4 Old Wallgrove Road	Low	Negligible	Negligible
5 Horsley Park Reserve	Moderate	Negligible	Negligible
6 Burley Road, Horsley Park	Moderate	High	High-Moderate
7 Walworth Road, Horsley Park	Moderate	High	High-Moderate
8 Ferrers Road, Lams Farm Fresh	Moderate	Moderate	Moderate
9 Sydney International Equestrian Centre	Moderate	Negligible	Negligible
10 Moonrise lookout	High	Moderate	High-Moderate
11 Prospect Reservoir	Moderate	Low	Moderate-Low
12 Sydney Motorsport Park	Moderate	Low	Moderate-Low
13 Sydney Zoo	Moderate	Low	Moderate-Low
14 Bungaribee Homestead Park	Moderate	Low	Moderate-Low
15 Pinegrove Memorial Park	Moderate	Negligible	Negligible

The greatest visual impacts would be experienced at Viewpoint 3, 6, 7 and 10. The impacts on these viewpoints are discussed below.

Viewpoint 3: Shared path, adjacent to Westlink M7 has a moderate sensitivity as the view represents users from the shared path and there is a mix of vegetation and major road infrastructure within this view. The magnitude of change is high for this viewpoint due to the proximity of the viewpoint to the proposal site. The proposal would result in the removal of vegetation, replaced with large scale buildings.



Figure 16.4 Viewpoint 3



Figure 16.4: Viewpoint 3 with proposal (note, vegetation is transparent to show building extent)

Viewpoints 6 and 7 both have a moderate sensitivity as representative views from residential properties, with transmission lines and powerlines within the view. The proposal would become a dominant feature for both viewpoints, and the plume would introduce a new element to this otherwise predominantly rural setting, resulting in a high magnitude of change.



Figure 16.6: Viewpoint 7



Figure 16.7: Viewpoint 7 with proposal

Viewpoint 10: Moonrise lookout is elevated and highly sensitive to change. While the proposal is nearly 4km from this viewpoint, the elevated nature of the viewpoints means that the proposal would be visible within the viewpoint vista. The plume would be visible from the viewpoint location and would be clear to a receptor at this viewpoint.



Figure 16.8: Viewpoint 10



Figure 16.9: Viewpoint 10 with proposal

Lighting impacts (night-time)

The lighting design is proposed to achieve a dim glow from localised areas of the proposal such as the flue gas treatment hall. Lighting will not be directed at building facades, rather it will portray a glow within the building. The stack would also be lit in line with Federal Aviation Administration guidelines.

Table 16.8: Night-time lighting impacts from the proposal

Viewpoint	Sensitivity	Magnitude of change	Operation impact (Night-time)
1 Austral Bricks	Moderate	Low	Moderate-Low
2 Corner of Mini Link Road and Wallgrove Road	Low	Negligible	Negligible
3 Shared cycle path – adjacent to Westlink M7	Low	Moderate	Moderate-Low
4 Old Wallgrove Road	Low	Negligible	Negligible
5 Horsley Park Reserve	Moderate	Negligible	Negligible
6 Burley Road, Horsley Park	Moderate	Moderate	Moderate
7 Walworth Road, Horsley Park	Moderate	Moderate	Moderate
8 Ferrers Road, Lams Farm Fresh	Moderate	Moderate	Moderate
9 Sydney International Equestrian Centre	Moderate	Negligible	Negligible
10 Moonrise lookout	High	Low	Moderate
11 Prospect Reservoir	High	Negligible	Negligible
12 Sydney Motorsport Park	Low	Low	Low
13 Sydney Zoo	Low	Low	Low
14 Bungarabee Homestead Park	Moderate	Low	Moderate-Low
15 Pinegrove Memorial Park	Moderate	Negligible	Negligible

For each viewpoint, the existing brightness of the area was assessed against the expected light emitted from the proposal. Viewpoints with an existing high-brightness area or further away from the proposal would be less impacted by lighting from the proposal. Those viewpoints which are intrinsically dark (having a high sensitivity) would be more impacted by lighting from the proposal. Overall lighting impacts are assessed to be moderate to negligible for all viewpoints.

Those viewpoints with the highest impact rating of moderate, are Viewpoints 6, 7, 8 and 10. All these viewpoints have a moderate or high sensitivity – they are areas with existing low levels of lighting due to their semi-rural nature or landscaped setting. The lighting emittance from the proposal will be visible from these viewpoints.

The lighting will be designed to achieve a dim glow in localised areas and as such would not cause lighting impacts which would distract or compromise the safe operation of the surrounding road network, including the M7.

16.3.3.3 Overshadowing

An assessment of the potential overshadowing impacts of the proposal on nearby properties was carried out. This assessed the shadow cast by the building footprint, form, scale and roof heights, based on the winter solstice (21 June), which marks the shortest period of daylight during the year. This represents the worst-case scenario in terms of potential overshadowing impacts. **Figure 16.10** shows the modelled overshadowing from the proposal.

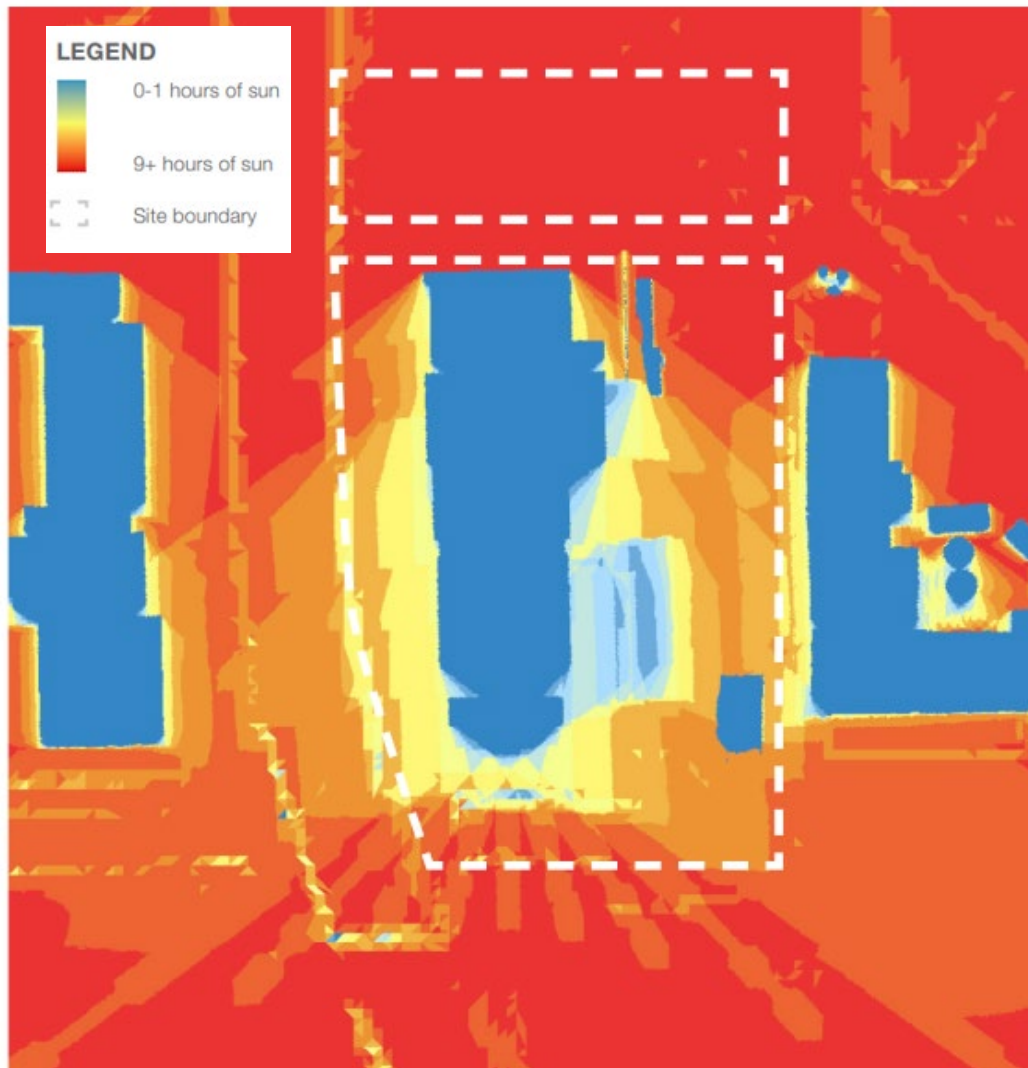


Figure 16.10: Modelled overshadowing from the proposal

Overshadowing to the west of the site would be experienced by users of the footpath and motorists on the M7. However, this overshadowing is not considered to adversely impact the experience for these users as the overshadowing is of a localised nature and receptors would be transient.

The existing vegetation on the M7 embankment to the west of the proposal site would likely experience a reduction in daily sun exposure from 9+ hours to 5-7 hours. The reduction of direct day light hours on existing vegetation is not anticipated to adversely impact the survival and growth of existing vegetation.

Immediate landscaping surrounding the proposal site to the south and southeast would be impacted by a reduced sun exposure from full day sun to 7–8 hours daily. As above, this reduction in sunlight exposure is not anticipated to adversely impact the vegetation.

Overshadowing to the east of the proposal site would impact the Global Renewables property perimeter. Sun exposure at this location would reduce from 7–8 hours daily to 5–6 hours daily.

16.4 Mitigation

The design of the proposal includes features which contribute to mitigating landscape character and visual impacts, as described in **Table 16-9**.

Table 16.9: Mitigation measures

ID	Impact	Proposed mitigation
Design embedded mitigation measures		
LV1	Visual impacts of stack	Integrating the design of the stack and blade wall to mitigate visual impact where possible. Careful consideration of the choice of colour and material properties and/or introducing designed elements into the physical design of the stack.
LV2		Material selection will involve careful selection of colour and low-reflective material to make sure the stack appears recessive above the skyline.
LV3	Bulk of building	Incorporation of a green wall (vegetated system grown vertically) to the northern and southern extent of the building and a green roof to the Visitor and Education Centre. The Urban Green Cover in NSW Technical Guidelines (OEH, 2015) will be referred to during detailed design of the green walls and roof.
LV4		The architecture has been designed to reduce the building bulk and locate the greatest massing height in the centre of the built form, to mitigate abrupt change in scale. Positioning the built form towards the south western boundary aligns with exiting local developments and is orientated on a north-south axis to align with the M7.
LV5	Lighting impacts	Limit lighting spill to the stack by careful placement of lighting columns. Lighting would be designed to achieve a dim glow in localised areas such as the flue gas treatment hall. Any lighting treatments will not be directed at the building's facades.
LV6	Loss of vegetation	Increase density of planting across the site, which will help to screen ancillary infrastructure and enhance the landscape character within the proposal site.
Construction mitigation measures		
LV7	Visual impacts	Visual barriers around the site will be created and maintained throughout the construction period, to minimise visual impacts during construction.