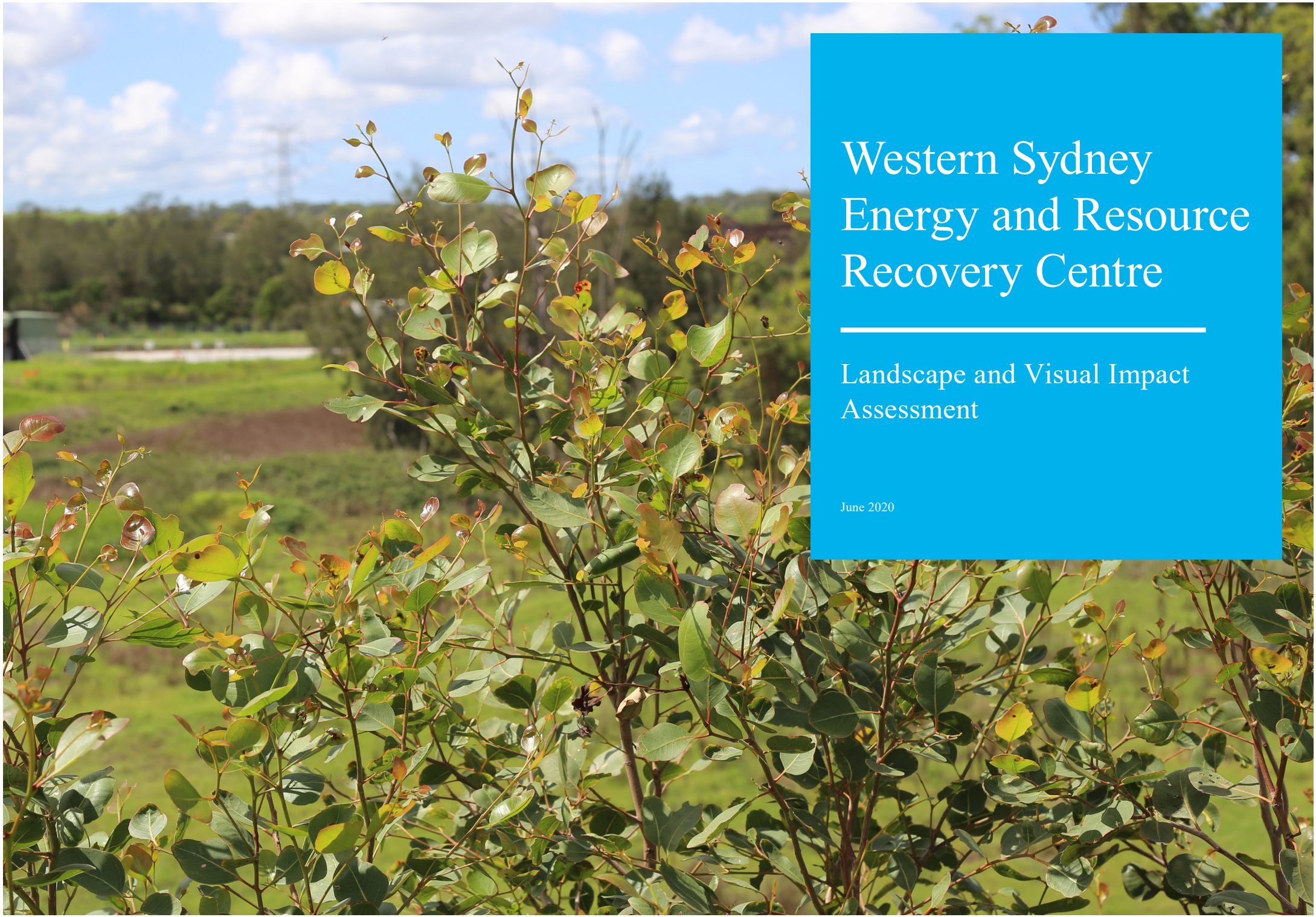
Technical report L

Landscape and visual impact assessment



Western Sydney Energy and Resource Recovery Centre

Landscape and Visual Impact Assessment

June 2020

Prepared for

Cleanaway and Macquarie Capital

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Contents

01
Introduction

Purpose of this report

The purpose of this report is to present the assessment of the landscape and visual impacts associated with the Western Sydney Energy and Resource Recovery Centre (WSERRC) (the proposal) during its construction and operation.

The results of this assessment will be used to support the required environmental and planning approvals for the proposal as required under the *Environmental Planning and Assessment Act 1979*. It will also identify landscape and visual features that need to be considered during the design development phase of the proposal.

Background

The Proposal

Cleanaway and Macquarie Capital are jointly developing an energy-from-waste (EfW) facility known as the Western Sydney Energy and Resource Recovery Centre (WSERRC) (the proposal).

The proposal will be designed to thermally treat up to 500,000 tonnes per year of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams that would otherwise be sent to landfill. This process would generate up to 58 megawatts (MW) of base load electricity some of which would be used to power the facility itself with the remaining 55MW exported to the grid. The proposal involves the building of all onsite infrastructure needed to support the facility including site utilities, internal roads, weighbridges, parking and hardstand areas, storm water infrastructure, fencing and landscaping.

The proposal site is located at 339 Wallgrove Road in Eastern Creek, NSW (Lot 1 DP 1059698) which is in the Blacktown local government area (LGA). The site is in the Wallgrove Precinct of the Western Sydney Parklands (WSP) Plan of Management.

The 8.23ha site is divided by a small strip of land not part of the proposal site, resulting in a 2.04ha northern section and a 6.19ha southern section. This dividing strip is part of the adjacent lot and includes a right of carriageway benefitting the proposal site allowing vehicles to move between the two parts of the site. The proposal area will be fully contained in the 6.19ha portion of the site.

Works to occur on the 2.04 ha northern section of the site include the clearing of weeds and exotic vegetation within the existing overland flow channel which is confined to the eastern section of this parcel of land. The northern section will also be used temporarily to support construction works. It is not currently expected that any other works will occur on the 2.04 ha northern section of the site as part of this proposal.

Proposal site

The area immediately surrounding the site is characterised by industrial and transport infrastructure. The site has good access to Wallgrove Road which connects to the wider road network, including the M7, with Cleanaway's Erskine Park Resource Recovery Facility located around 6 km to the west. The (now closed) Eastern Creek landfill is located to the north and north-east of the site with the operational Global Renewables waste management facility located immediately to the east. The Warragamba pipeline corridor adjoins the southern boundary of the site with the Austral Bricks site located to the south.

The site has been extensively cleared and approximately two hectares of the northern part of the site is currently paved. Disused poultry sheds and ancillary buildings currently occupy the site, with mature vegetation along the eastern boundary and a detention basin occupying the eastern part of the site. The Westlink M7 Shared Path borders the site to the west, with intermittent tree planting bounding the road corridor.

Study objectives & report structure

Broadly summarised, the report is structured with reference to the following tasks:

- Section 01 ‘Proposal Overview’ (page 8):
  Establishes an understanding of the proposal relevant to the landscape and visual impact assessment; namely the location, form and scale of the proposal and the relative physical differences between the current conditions and that which is proposed both during construction and during operation.
- Section 02 ‘ Methodology’ (page 14):
  Provides the methodology against which the potential impacts are assessed, including the proposal assumptions and limitations.
- Section 03 ‘Legislation and Policy’ (page 24):
  Identifies both physical and statutory components of the landscape and visual baseline which influence character and associated sensitivities.
- Section 04 ‘Context’ (page 30) and Section 05 ‘Baseline’ (page 44):
  Understands and describes the existing landscape and visual character of the study area, via desktop studies and site work, as a means of establishing a baseline against which impacts associated with the proposal can be assessed.
- Section 06 ‘Proposal’ (page 68):
  Provides a description of the key elements relevant to the LVIA within the proposal.
- Section 07 ‘Impact Assessment’ (page 74):
  Provides an assessment of the identified key landscape characters areas, representative viewpoints and impacts associated with lighting. This section includes suggested mitigation measures considered to reduce and manage the impacts of the proposal on the landscape, views and visual amenity.
- Section 08 ‘Overshadowing’ (page 122):
  Provides an assessment of the impacts associated with overshadowing.
- Section 09 ‘Conclusion’ (page 126):
  Provides a summary of the landscape and visual impacts measured throughout the report.

Proposal overview

Overview

The following proposal description is based on the proposed design developed in the EIS by Arup and an early understanding of key construction, testing, commissioning, operation and maintenance activities and includes:

- An energy from waste facility to thermally treat up to 500,000 tonnes per annum of residual municipal solid waste and commercial and industrial waste that would otherwise be sent to landfill.
- A visitor centre to help educate and inform the community on the circular economy, recycling, resource recovery and energy from waste.
- Site infrastructure needed to support the proposal including internal roads, weighbridges, parking and hardstand areas, storm-water infrastructure, fencing and landscaping.

Site Layout

Chapter 06: Proposal (refer to page 68) explains the site layout and design intent in further detail however, the main components of the energy from waste facility would include a(n):

- Fully-enclosed waste receiving hall and access ramp.
- Bunker to temporarily store the waste feedstock, which would include overhead cranes to mix and load the process lines.
- Boiler hall comprising the process lines, a moving grate, furnace, boiler, flue gas treatment plant and stack.
- Air cooled condenser.
- Visitor centre to facilitate tours and to help educate and inform the community on the circular economy, recycling, resource recovery and energy from waste.

The supporting infrastructure would include:

- Administrative buildings.
- Service roads and car parks.
- A dedicated site access off the unnamed road located off Wallgrove Road that provides access to the Austral Bricks site. The access may be upgraded to handle the volume of waste vehicles arriving and leaving site every day.
- Storm-water and drainage infrastructure.

Construction

The proposed construction staging, timing and activities will be developed while preparing the EIS. Pending approval, construction is expected to take around three years. The proposal would be built and managed by a contractor under a Construction Environmental Management Plan (CEMP) prepared and approved in response to a condition of consent, and in accordance with relevant safety management plans.

The proposal would be likely built in five phases to reflect contractor requirements, material and equipment availability, and program and delivery schedules. The indicative construction method would be:

Phase 1. Demolition includes:

- Initial site enabling works to be undertaken including; environmental planning and management activities, construction of site perimeter fencing and security, sediment and erosion control measures and establishment of initial site sheds.
- Demolition and removal of the existing structures and facilities on the site.

Phase 2. Site establishment and enabling works includes:

- Site establishment including construction of site compounds, hardstand and laydown areas, temporary internal and external roads and car parks.
- Bulk earthworks across the site.
- Piling and foundations.
- New external site entrance including a new access bridge to the east of the existing site entrance and crossing over the existing Warragamba pipelines.

Phase 3. Main construction works include:

- Structures works (concrete and structural steel), process halls (process plant delivery, installation, testing and commissioning), materials handling (conveyors) and the construction of the stack and visitor centre.
- Finishes including facades, roofing and internal finishes
- Ancillary services including mechanical, electrical, HCAC, external sub-station and in-ground services.

Phase 4. Testing and commissioning works include:

- Preparation of a Proof of Performance Plan
- Commissioning of individual pieces of equipment, systems and functional testing of the whole facility
- Proof of performance trials.

Phase 5. Finishing and landscaping works include:

- Completion of internal roads and carparks
- Truck coupling and decoupling areas
- Landscaping.

Operations

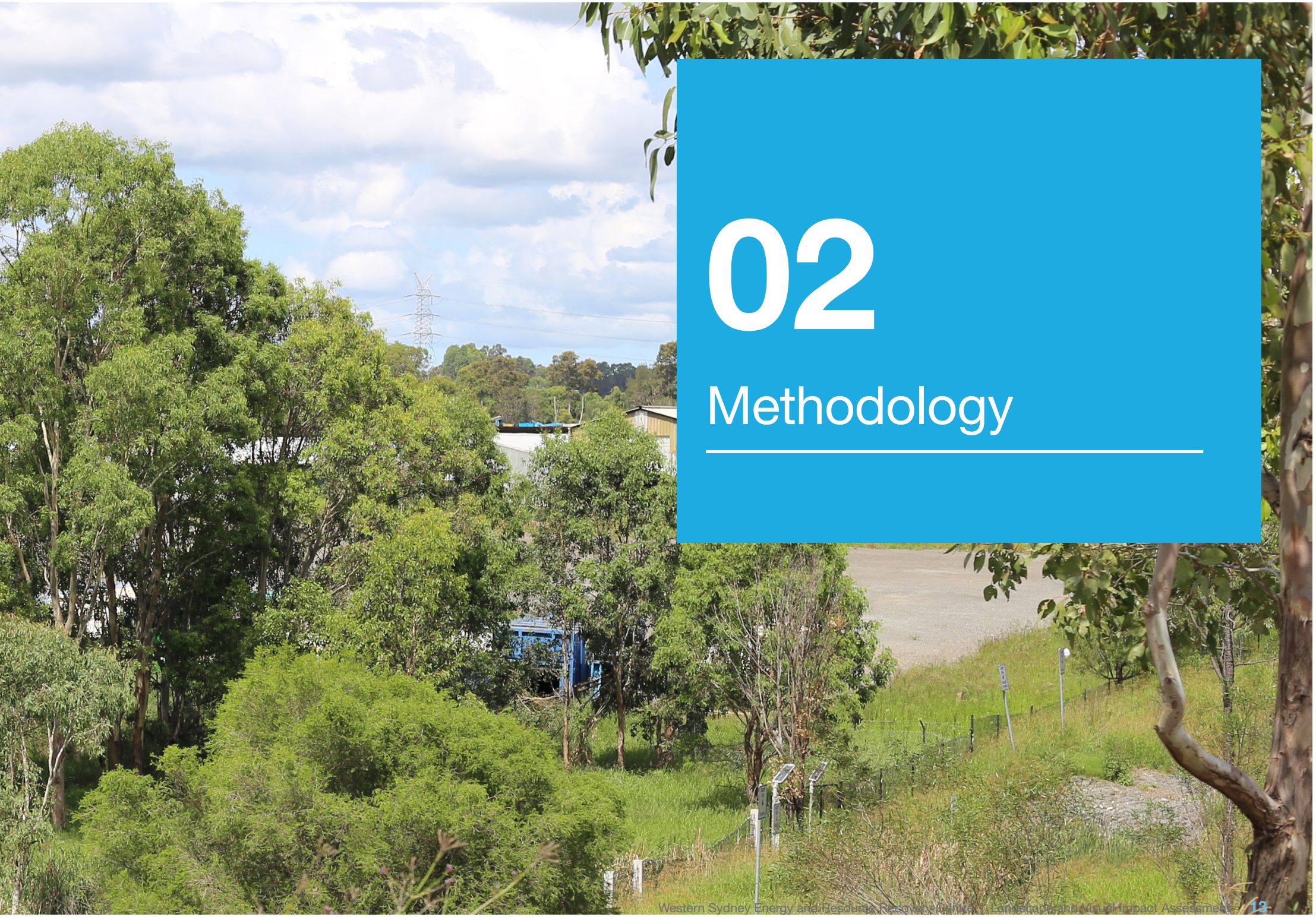
Steps in a typical energy from waste operational process include:

1. Waste deliveries - waste will be delivered to site by enclosed waste delivery vehicles. Vehicles would enter the site via the site entrance off the Austral Bricks access road.
2. Waste receival, intake and storage - waste will be unloaded into chutes which convey the waste to the storage bunker.
3. Combustion process - waste combustion will take place as it slowly moves along a grate.
4. Energy recovery process - gases will pass through a heat recovery boiler where they will be gradually cooled while the excess heat is used to superheat steam.
5. Ash/residue management - ash from the combustion process will be discharged into a water bath and then to the bottom ash bunker.
6. Flue gas treatment residues.
7. Water use - the steam leaving the turbine will be cooled and condensed to water in a condenser. The condensate will then be returned to the boiler feed water system.
8. The plant will utilise a wet scrubber as the last flue gas cleaning stage. The low temperature of the flue gas on exit of the stack, due to the presence of the wet scrubber, means that the flue gases will condense in the air and cause a visible plume to be formed. This plume is expected to be visible for the majority of the year; only when the ambient air is hot and dry will a plume not be formed.
9. Lighting is to be developed in further detail in the following phases of design. In the absence of local guidance, the Federal Aviation Administration's (FAA) AC 70/7460-1L: Obstruction Marking and Lighting advises that the stack should be lit in accordance with Chapter 5: Red Obstruction Light System and Chapter 6: Medium-Intensity Flashing White Obstruction Light Systems. This is anticipated to take the form of a red aviation warning light. It is also anticipated that all roadways up to the site perimeter will be lit.

Relevant SEARs and Agency Requirements

	DPIE SEARs:	SECTION:	
1.	A landscape character and visual impact assessment that includes a description of the visual catchment and considers the potential visual impacts of the development on the amenity of the surrounding area particularly from nearby public receivers and significant vantage points of the broader public domain.	Refer to 05 Baseline chapter for Landscape and Visual conditions. Refer to 06 Proposal chapter for design components of the proposal. Refer to 07 Impact Assessment for Landscape and Visual impacts and embedded mitigation.	43 67 73
2.	Consideration of the proposed building height, stack height, bulk and scale, signage, lighting and the emissions plume within the context of the locality.	Refer to 06 Proposal chapter for design components of the proposal.	67
3.	Details of architectural design measures to ensure a high-quality design.	Refer to Architectural & Landscape Design Strategy Report.	n/a
4.	Justification for the positioning and height of the stack, including consideration of options for stack design and height.	Refer to Architectural & Landscape Design Strategy Report.	n/a
5.	Details of materials and finishes and all proposed mitigation measures.	Refer to 06 Proposal chapter for landscape strategy. Refer to 07 Impact Assessment for Landscape and Visual impacts and embedded mitigation. Refer to Architectural & Landscape Design Strategy Report.	67 73 n/a
6.	A detailed photo-montage based analysis of the visual impacts of the development and emission stack.	Refer to 07 Impact Assessment - Viewpoint 3, for Photomontage 1. Refer to 07 Impact Assessment - Viewpoint 7, for Photomontage 2. Refer to 07 Impact Assessment - Viewpoint 10, for Photomontage 3. Refer to 07 Impact Assessment - Viewpoint 14, for Photomontage 4.	88 98 106 116
7.	Details of landscape works that will complement and screen the development showing the use of high-quality landscaping material.	Refer to 06 Proposal chapter for design components of the proposal. Refer to Architectural & Landscape Design Strategy Report.	67 n/a
8.	Consideration of the use of green walls, green roof or cool roof design having regard to the 'Urban Green Cover in NSW Technical Guidelines' (OEH 2015).	Refer to 03 Legislation and policy for reference to the guidelines. Refer to Architectural & Landscape Design Strategy Report for details on the green infrastructure components.	23 n/a

	Blacktown City Council requirements:		
	AMENITY:	**SECTION:**	
1.	Provide information detailing the impact on overshadowing, noise, visual privacy, view loss and wind impacts. A high level of environmental amenity must be demonstrated.	Refer to 08 Overshadowing chapter for overshadowing impacts. Refer to 07 Impact Assessment for Landscape and Visual impacts and embedded mitigation.	121 73
	BUILT FORM AND URBAN DESIGN:	**SECTION:**	
1.	Address the height, bulk and scale of the proposed development within the context of the locality.	Refer to 06 Proposal chapter for design components of the proposal.	67
2.	Assess the visual impact of the proposed building's height, scale, signage and lighting, particularly from nearby public receivers and significant vantage points of the broader public domain.	Refer to 05 Baseline chapter for Landscape and Visual conditions. Refer to 06 Proposal chapter for design components of the proposal. Refer to 07 Impact Assessment for Landscape and Visual impacts and embedded mitigation.	43 67 73
3.	Consideration of any impact on flight paths.	NOT COVERED IN THIS REPORT	n/a
4.	Details of design measures to ensure the proposal has a very high design quality and is architecturally designed.	Refer to 06 Proposal chapter for design components of the proposal.	67
5.	Details of materials and finishes.	Refer to Architectural & Landscape Design Strategy Report.	n/a
6.	Details about any bulk earthworks, including the extent of cut and fill works, provision of retaining walls or importation of fill material.	NOT COVERED IN THIS REPORT	n/a
7.	Submission of a landscape strategy detailing screen planting and fencing.	Refer to 06 Proposal chapter for landscape strategy.	67
8.	A detailed photomontage based analysis of the visual impacts of the development.	Refer to 07 Impact Assessment - Viewpoint 3, for Photomontage 1. Refer to 07 Impact Assessment - Viewpoint 7, for Photomontage 2. Refer to 07 Impact Assessment - Viewpoint 10, for Photomontage 3. Refer to 07 Impact Assessment - Viewpoint 14, for Photomontage 4	88 98 106 116



02

Methodology

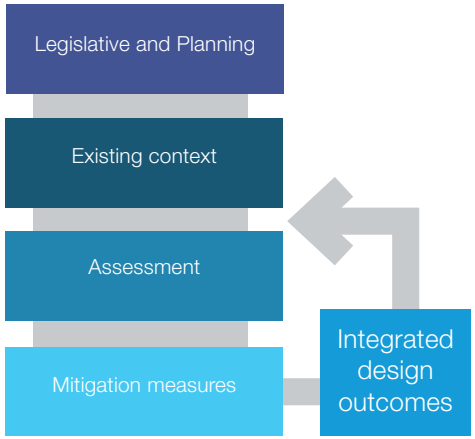
Assessment methodology

Guidelines and policy

The following documents have influenced the methodology for this study and are considered best practice within the industry. They set out a clear and systematic approach in documenting the baseline landscape and visual conditions, potential impacts and mitigation. The assessment conforms with the direction offered by the following guidance documents:

- NSW Roads and Maritime Services Practice Note – Guideline for Landscape Character and Visual Impact assessment EIA-N04.
- The Guidance for Landscape and Visual Impact Assessment, Third Edition, 2013, prepared by the Landscape Institute and Institute of Environmental Management & Assessment, UK.

As there is no prescribed assessment method for assessing the impacts of lighting on visual amenity, guidance and terminology has been based on the UK's GN01 *Guidance notes for the reduction of obtrusive light* published by the Institution of Lighting Professionals in 2011 (refer to Table 7, page 19).



Report approach

The Landscape and Visual Impact Assessment (LVIA) approach follows an iterative process where key issues, constraints and mitigation related to the landscape character and visual assessment are integrated into the proposal. The approach, as outlined in *Chapter 01: Introduction,* consists of the following steps:

- Legislative and planning context | A review of state, regional and local planning policy to gather information on the planning objectives and aims that are relevant to the LVIA.
- Existing context | An analysis of the local context is undertaken with a focus on landscape and urban features, visual amenity through a selection of representative views, and landscape character. Determination of the sensitivity of the landscape and visual amenity is undertaken. Sensitivity is defined further on page 15.
- Assessment | Landscape character area and visual impact are assessed individually. The impact is assessed on the combination of sensitivity of the existing area or view to change and the magnitude (scale, contrast, quality, distance) of the proposal on that area or view. Magnitude of change is defined further on page 15 along with the landscape and visual assessment matrix table.
- Integrated design outcomes | Review of the proposal and the potential impacts that may arise are fed back in to the design development process to embed mitigation measures within the proposal design.
- Mitigation measures | Where potential impact cannot be resolved through the embedded design process, additional measures are to be explored and discussed further within the landscape strategy.

Sensitivity

According to the EIA-N04 *Guideline for landscape character and visual impact assessment,* sensitivity refers to "the value of an area, the number and type of receivers and how sensitive the existing character of the setting is to the proposed nature of change", (Roads and Maritime Services, 2018). It is informed by the analysis of the existing context, for example, the number of people experiencing a view, the analysis of landscape and visual features and their settings, together with the value placed on these locations by the community or by legislation or policy.

Sensitivity is described as either negligible, low, moderate or high. Refer to pages 18 and 19 for a description of components that inform the analysis of sensitivity and definitions for the levels of sensitivity.

The sensitivity of each representative viewpoint to changes in lighting are based on the categories established in the GN01 *Guidance notes for the reduction of obtrusive light* published by the Institution of Lighting Professionals in 2011 (Zones E0: Protected, Dark, E1: Natural, Intrinsically dark; E2 Rural, Low district brightness; E3 Suburban, Medium district brightness; E4 Urban, High district brightness).

Magnitude of change

The magnitude of change refers to the nature, scale and duration of the change that is expected to occur. It is described within the EIA-N04 *Guideline for landscape character and visual impact assessment* as "the physical scale of the project, how distant it is and the contrast it presents to the existing condition", (Roads and Maritime Services, 2018). It is informed by an analysis of the loss, change or addition of any feature to the existing landscape or visual amenity.

Magnitude of change is described as Negligible (barely perceptible change), Low (noticeable change), Moderate (considerable change) or High (dominant change). Refer to pages 18 and 19 for a description of components that inform the analysis of the magnitude of change and definitions for the assessment categories.

To enable the judgment of the magnitude of changes in lighting, Table 2 considers the existing condition against the potential condition.

Landscape approach

Landscape character assessment

Landscape character can be defined as the "aggregate of built, natural and cultural aspects that make up an area and provide a sense of place", (Roads and Maritime Services, 2018). It includes all aspects of a tract of land – built, planted and natural topographical and ecological features.

To enable the assessment of impacts on landscape character, Landscape Character Areas (LCAs) have been defined for the study area. LCAs are defined as areas having a distinct, recognisable and consistent pattern of elements making one landscape character area different from another.

Impact

The overall impact rating of the proposal on any given LCA is based on themes of magnitude and sensitivity. The severity of these impacts are calculated, as outlined on page 15, using the matrix illustrated in *Table 1* (page 17). The landscape magnitude and sensitivity criteria that are used to inform the assessment are illustrated in Table 3 and 4 on page 18.

Visual approach

Viewpoint selection

Following a thorough desktop study, review of the VEM plans and site visits, representative viewpoints with the potential to be visually affected by some element of the proposal are identified and selected for further analysis.

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
- Key or protected views identified within the planning literature.

Impact

Consistent with the landscape approach, the overall impact rating of the proposal on any given viewpoint is based on themes of magnitude and sensitivity. The severity of these impacts are calculated using the matrix illustrated in *Table 1* (page 17). The visual magnitude and sensitivity criteria that are used to inform the assessment are illustrated on pages 18 and 19.

Assessment of night time impacts

The assessment of night time impacts has been undertaken in a similar methodology. However, rather than assessing particular viewpoints, this assessment draws upon the UK's GN01 *Guidance notes for the reduction of obtrusive light* published by the Institution of Lighting Professionals in 2011. This guidance note identifies environmental zones, useful for the categorising of night time landscape settings. These zones have been developed in the UK, and are described as follows, annotated with Australian examples:

- E0: Dark - Protected, UNESCO Starlight Reserves, IDA Dark Sky Parks.
- E1: Intrinsically dark – National Parks, State Forest, undeveloped bushland, etc.
- E2: Low district brightness – Rural, small township, or relatively dark urban locations
- E3: Medium district brightness – Motorway, small town centres or suburban locations
- E4: High district brightness – Towns and city centres with high levels of night time activity.

For the purposes of this LVIA, the E0: dark category has not been considered for the purposes of this report.

Specific features of the lit landscape are then described in terms of:

- Sky glow – the brightening of the night sky above our towns, cities and countryside
- Glare – the uncomfortable brightness of a light source when viewed against a dark background
- Light Trespass – the spilling of light beyond the boundary of the property or area being lit.

From this analysis, the level of impact (refer to *Table 2,* page 17) is assessed according to the impact levels identified in the Visual magnitude of change criteria (refer to page 19, Table 7).

Table 1: Landscape and visual impact assessment matrix

Sensitivity \ Magnitude	High	Moderate	Low	Negligible
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	Negligible	Negligible	Negligible

Table 2: Night time visual impact assessment matrix

Sensitivity \ Magnitude	High	Moderate	Low	Negligible
E1: Intrinsically dark (High)	High Impact	High- Moderate Impact	Moderate Impact	Negligible
E2: Low district brightness (Moderate)	High-Moderate impact	Moderate Impact	Moderate - Low Impact	Negligible
E3: Medium district brightness (Low)	Moderate Impact	Moderate - Low Impact	Low Impact	Negligible
E4: High district brightness (Negligible)	Negligible	Negligible	Negligible	Negligible

Landscape assessment approach

Landscape sensitivity

A record of the inherent and intrinsic sensitivity of the landscape and the degree to which it can accommodate change.

- Value | The importance of the landscape to society
- Components | Contributing components, such as trees, woodlands, land use, heritage
- Characteristics | Patterns, scenic quality, tranquility etc.
- Landscape Character Areas | Homogeneous areas with defining characteristics
- Replacement or substitution | The degree to which inherent components or characteristics can be reserved
- Trends of change | An account of the natural or human activities that may alter the landscape

Table 3: Landscape sensitivity level definitions

High sensitivity	Landscapes which by nature of their character would be unable to accommodate change of the proposed type. Typically these would be: • Of high value of high value with distinct elements and features making a positive contribution to character and sense of place • Likely to be designated, but the aspects which underpin such value may also be present outside designated areas, especially at the local scale • Areas of special recognised value, through use, perception or historic and cultural associations. • Likely to contain features and elements that are rare and could not be replaced
Moderate sensitivity	Landscapes which by nature of their character would be able to partly accommodate change of the type proposed. Typically these would be; • Comprised of commonplace elements and features creating generally unremarkable character but with some sense of place. • Locally designated, or their value may be expressed through non-statutory local publications. • Containing some features of value through use, perception of historic and cultural associations. • Likely to contain some features and elements that could not be replaced.
Low sensitivity	Landscapes which by nature of their characteristics would be able to accommodate change of the type proposed. Typically these would be; • Comprised of some features and elements that are discordant, derelict or in decline, resulting in indistinct character with little or no sense of place. • Not designated. • Containing few, if any, features of value through use, perception or historic and cultural associations. • Likely to contain few, if any, features and elements that could not be replaced.
Negligible sensitivity	Landscapes which by nature of their characteristics would be able to accommodate change of the type proposed. Typically these would be; • Comprised of features and elements that are discordant, derelict or in decline, resulting in indistinct character with little or no sense of place. • Not designated. • Containing no features of value through use, perception or historic and cultural associations. • Likely to contain features and elements that could be readily replaced.

Magnitude of change

The scale, nature and duration of the change and the degree to which the effect can be mitigated

- The scale | Small, medium or large
- Nature | Negative (adverse) or positive (beneficial)
- Duration | Short, medium, long term permanent or temporary
- The mitigation | The degree to which mitigation would reduce the effect

Table 4: Landscape magnitude of change level definitions

High adverse	Total loss or large scale damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic conspicuous features or elements.
Moderate adverse	Partial loss or noticeable damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic noticeable features and elements.
Low adverse	Slight loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features or elements.
Negligible adverse	Barely noticeable loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements.
No change	No noticeable loss, damage or alternation to character or features or elements.
Negligible beneficial	Barely noticeable improvement of character by the restoration of existing features, and/or the removal of uncharacteristic features, or by the addition of new characteristic features.
Low beneficial	Slight improvement of character by the restoration of existing features, and/or the removal of uncharacteristic features, or by the addition of new characteristic features.
Moderate beneficial	Partial or noticeable improvement of character by the restoration of existing features, and/or the removal of uncharacteristic features, or by the addition of new characteristic features.
High beneficial	Large scale improvement of character by the restoration of features, and/or the removal of uncharacteristic features, or by the addition of new distinctive features.

Visual assessment approach

Visual sensitivity

A record of the visual receptors within the study area and an analysis of the visual sensitivity

- Define visual study area | The areas within which the view is expected to be of concern of importance
- Identify the representative viewpoints | Record important public and provide view points.
- The expectation and occupation or activity to inform level of sensitivity | The most sensitive receptors may include residential and public outdoor facilities. Industrial areas may have a low level of visual sensitivity
- The importance of the view | Views that may be designated to safeguard their value or locations that are valued by the communities

Table 5: Visual sensitivity level definitions

High sensitivity	Examples may include: • Residential properties • Users of public footpaths or other recreational trails (e.g National Trails) • Users of recreational facilities where the purpose of that recreation is the enjoyment of the landscape (e.g. National Parks and designated scenic lookouts) • Users of designated tourist routes • Large numbers of viewers
Moderate sensitivity	Examples may include: • Outdoor works • Users of scenic roads, railway corridors or waterways • Schools and other institutional buildings, and their outdoor areas • Moderate number of viewers
Low sensitivity	Examples may include: • Indoor workers • Users of main roads or arterial roads • Users of recreational facilities where the purpose of that recreation is not related to the views
Negligible sensitivity	Examples may include: • Limited numbers of viewers or infrequently accessed view points • Passing interest in their surroundings • Users of minor roads and views from the air

Magnitude of change

The scale, nature and duration of the change and the degree to which the effect can be mitigated

- Scale | With respect to the loss or addition of features in the view and changes in its composition
- Degree of contrast or integration | Form, scale and mass, line, height, colour, texture
- Nature of view in relation to the proposal | Angle, distance and extent
- Mitigation | The degree to which mitigation would reduce the effect

Night time environmental zones

The categorised environmental zone demonstrating the degree of exterior lighting experienced within the landscape.

Table 6: Visual magnitude of change level definitions

High	The proposal, or part of it, would become the dominant feature or focal point of the view.
Moderate	The proposal, or part of it, would form a noticeable feature or element of the view which is readily apparent to the receptor.
Low adverse	The proposal, or part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view.
Negligible adverse	Only a very small part of the proposal would be discernible, or it is at such a distance that it would form a barely noticeable feature or element of the view.
No change	No part of the proposal, or work or activity associated with it, is discernible.

Table 7: Examples of environmental zones

E1: Intrinsically dark landscapes	National Parks, Areas of Outstanding Natural Beauty, etc.
E2: Low district brightness areas	Rural, small village, or relatively dark urban locations.
E3: Medium district brightness areas	Small town centres or urban locations.
E4: High district brightness areas	Town/city centres with high levels of nighttime activity.

Photomontages

Three photomontages were prepared for the proposal based on the proposed development. These photomontages are intended to act as artist's impressions, illustrating the general location, scale, and relationship of key visual elements with the surrounding landscape. These simulations were created using site photographs, computer modeling and photo editing as follows:

1. A 3D computer model was developed based on a digital terrain model with one metre contour data. The digital terrain model includes buildings and vegetation.
2. The model was positioned over the existing photograph using the GPS coordinates of the location, and a minimum of three existing elements within the photograph as reference points.
3. The photographs have been edited using Photoshop to reflect the likely changes to the view. There is an element of judgment used in the changes shown in these photo-montages. The location of these visual simulations was selected to illustrate the range of impacts likely for the proposal.

Photography

A number of photographs were taken to record key views to the site. These photographs were taken with a digital camera at a 50mm equivalent focal length. Where multiple shots were taken in the same location, each photograph was taken with a minimum 40 per cent to maximum 70 per cent overlap to allow for merging into panoramas.

Overshadowing

The process for undertaken the overshadowing analysis is as follows:

1. A 3D terrain model was generated from raw LiDAR. The LiDAR was processed to obtain a 0.5m resolution raster which was then optimised by resampling the raster by 50% by calculating a simple average from the sixteen nearest cells.
2. A 3D model of the proposal, including building footprint, form, scale and roof heights was created and combined with the terrain data.
3. A 3D model of near buildings was generated from raw LiDAR. Building footprints were derived from the LiDAR and an extrusion was created using the average height for points classified as buildings within the footprints.
4. Rhino, in conjunction with Grasshopper and the Ladybug plugin, was used to undertake the overshadowing analysis. The time frame used was June 21 from 6am to 8pm to capture all the daylight hours on the shortest day of the year to enable reporting of the worst case scenario.

Assumptions and technical limitations

The following assumptions and technical limitations have informed this study:

- The assessment is based on the EIS Proposal Description Chapter which would be further developed during future design stages. The final design may vary from that described within.
- The photo simulations are based on the concept engineering design. The end built form may differ from that portrayed in the images and, therefore, these images are purely indicative at this stage.
- No detailed night time assessment has been undertaken. However, impacts associated with the likely lighting requirements have been considered and a commentary provided. As mentioned in Chapter 01: *Introduction* (refer to page 9, section Operations) lighting design will be further refined in the following design phases.
- The Digital Terrain Model (DTM) developed for topographic mapping was based on a 25m grid derived from LiDAR model.
- The viewshed analysis or Visual Envelope Map (VEM) for the entire design was based on a 50m DTM.
- It is important to consider the conclusions of this assessment in the context of these limitations however; it is not considered that any of these limitations would have a significant effect on the assessment of impact.


USING A WATERCRAFT
ON PROSPECT RESERVOIR
PLEASE DO NOT BLOCK
ACCESS TO BOAT RAMP
BEFORE LEAVING
UPON RETURN
GATE
K1

03
Legislation and Policy

Legislation and Policy

The planning and legislative framework provides an indication of the land use policies and objectives that relate to the study area for the proposal. This section explores the zones, regional and state overlays which are of relevance to this landscape and visual technical assessment, particularly the Local Environmental Plan (LEPs) of Blacktown local government area (LGA), and the relevant State Environmental Planning Policies (SEPPs) for the study area.

From a planning perspective, potential effects of relevance to the LVIA include:

- Potential impacts / effects on landscape values of areas of environmental or conservation significance to the east of the study area, as identified in the Western Sydney Parklands (2009) SEPP.
- Potential loss of native vegetation and / or threatened species.

NSW legislation

Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act (EPA) 1979 establishes the framework under which planning and land use management take place in New South Wales, supported by the EPA Act Regulation. It identifies the environmental planning instruments or statutory plans that should be produced to guide development and land use at the local, regional and state level. These plans include SEPPS and LEPs.

Zones

LEPs are used to regulate land use and development at the local level, and land is zoned for particular uses and purposes. While the study area falls within the Blacktown LGA, it is not covered by land use zoning with the Blacktown LEP 2015, as all land within the study area is covered by the Western Sydney Parklands. As per Part 2 Clause 9 of the SEPP any land within the area that is subject to the SEPP is classified as unzoned.

The Western Sydney Parklands (2009) SEPP

The study area falls entirely within the land covered by this SEPP, refer to Chapter 04: *Context* (page 31, under 'Existing character') for specific WSP precinct details. The aim of the SEPP is to put in place planning controls that will enable the WSP Trust to develop the Western Parklands into a multi-use urban parkland for the region of western Sydney. Particular aims of relevance to landscape and visual assessment include:

- Allowing for a diverse range of recreational, entertainment and tourist facilities in the WSP.
- Allowing for a range of commercial, retail, infrastructure and other uses consistent with the Metropolitan Strategy, which will deliver beneficial social and economic outcomes to western Sydney.
- Protecting and enhancing the natural systems of the WSP, including flora and fauna species and communities and riparian corridors.
- Protecting and enhancing the cultural and historical heritage of the WSP.
- Maintaining the rural character of parts of the WSP by allowing sustainable extensive agriculture, horticulture, forestry and the like.
- Facilitating public access to, and use and enjoyment of, the WSP.
- Facilitating use of the WSP to meet a range of community needs and interests, including those that promote health and well-being in the community.
- Encouraging the use of the WSP for education and research purposes, including accommodation and other facilities to support those purposes, and
- Ensuring that development of the WSP is undertaken in an ecologically sustainable way.

Where possible, these aims of the Western Sydney Parkland (2009) SEEP have informed the development of the landscape strategy. Refer to Chapter 4 (Statutory Context) Section 1.4.3 (Relevant State Environmental Policies) of the EIS for further information and the Architecture and Landscape Strategy for further information on the design response.

The SEPP sets out the type of development that might be permitted within the WSP, as set out in *Table 3* below:

Table 8: Permitted land uses

Permitted without consent	Amenity facilities; community facilities; depots; entertainment facilities; environmental facilities; environmental protection works; function centres; information and education facilities; kiosks; public administration buildings; recreation areas; recreation facilities (outdoor); restaurants or cafes; roads; signage (for directional, informative, or interpretative purposes); ticketing facilities.
Permitted with consent	Any development not specified above or below.
Prohibited	Development for the purposes of residential accommodation.

The SEPP also involves provisions with relation to vegetation, heritage and water supply which are of relevance to this study:

- Clause 13 relates to Bulk Water Supply infrastructure and states that development should not impact (or improve) quality, integrity and security of bulk water supply infrastructure. The proposal does not fall within this, but the Prospect Reservoir to the east is identified as bulk water infrastructure.
- Clause 14 refers to development in or near nature reserves or environmental conservation areas and prohibits development in these areas. The proposal does not fall within one of these areas, but the Prospect Reservoir, approximately 1.5km to the east is identified as an Environmental Conversation Area.
- Clause 19A relates to preservation of trees and vegetation with the aim to preserve the amenity of the WSP, including biodiversity values, through the preservation of trees and other vegetation.

There are a number of identified State and Local heritage assets and areas within the SEPP (Clause 15), with the aim to conserve the environmental heritage of the WSP, and to conserve the heritage significance of heritage items in the WSP including associated fabric, settings and views. There are no heritage assets within the study area, but there are a number of assets in proximity which have been considered in the assessment, including:

- Prospect Reservoir and surrounding area – State significance.
- Spotted Gum forest (in Fairfield) – Local significance.
- Wetherill park - Group of Hoop Pines – Local significance.

The following table addresses the aims of the WSP SEPP relevant to the LVIA:

Table 9: WSP SEPP aims

Aims	Relevance to proposal
Clause 2: Aim of Policy	
The aim of this Policy is to put in place planning controls that will enable the Western Sydney Parklands Trust to develop the Western Parklands into a multi-use urban parkland for the region of western Sydney by: (a) allowing for a diverse range of recreational, entertainment and tourist facilities in the Western Parklands, and,	The proposal is consistent with the future land uses identified for the Wallgrove Precinct including recycling and renewable energy.
(c) continuing to allow for and facilitate the location of government infrastructure and service facilities in the Western Parklands, and,	The Greater Sydney Region Plan and Central City District Plan emphasise the importance of developing a city that is serviced by infrastructure. The WSERRC will provide a critical infrastructure service to the people and businesses of Western Sydney by providing a waste management service and generating baseload energy, part of which is categorised as renewable. The WSERRC will provide a service to local councils who are responsible for the management of waste.
(d) protecting and enhancing the natural systems of the Western Parklands, including flora and fauna species and communities and riparian corridors, and,	The site is located on the western periphery of the Parklands in an area that is previously disturbed and is home to industrial and waste management facilities. Since acquisition of the site, the owners have arranged for cleaning of the site to address historical salmonella contamination associated with the previous use of the site as a poultry production facility. Development of the proposal will include clearing of weeds along the drainage channels in the site and realignment and planting of the overland flow path along the Eastern boundary to reflect natural conditions. Water quality treatment measures will improve the quality of water leaving the site, draining into Reedy Creek and Eastern Creek further north. Species within the threatened Cumberland Shale Plains Woodland vegetation class are indigenous to the proposal site. However, the existing site is degraded and dominated by exotic grass and weeds, with small patches of regrowth in poor to very poor condition. It is the aim of the planting design for the proposal to restore and celebrate this native vegetation by use of tree, shrub, grass and riparian species. A vegetation management plan (VMP) has been prepared to guide the revegetation works and restoration of the riparian corridor on site. Existing mature native trees will be retained where possible and safe to do so, particularly along the riparian corridor. In conjunction, a Landscape Strategy has been produced to form part of the design and capture embedded mitigation measures that have been acknowledged within the landscape and visual assessment process.
(e) protecting and enhancing the cultural and historical heritage of the Western Parklands, and	There are no known Aboriginal archaeological sites or areas of Aboriginal archaeological potential within the proposal area. There is still potential for the cultural and historical heritage of the WSP's to be interpreted and incorporated in detailed design, including, but not limited to plaques, murals, paving and visitors centre display.

(f) maintaining the rural character of parts of the Western Parklands by allowing sustainable extensive agriculture, horticulture, forestry and the like, and	The site has an industrial and agricultural history having previously been used for poultry production and is surrounded by waste infrastructure limiting the recreational and amenity value of the site. The site has been historically contaminated with the site having previously been detected for Salmonella Enteritidis (SE) due to past poultry activities (which has since been rectified by the applicant) and asbestos and lead was also found during the DSI which will need to be remediated prior to the land being used. By using a parcel of land with limited value due to adjoining industry and contamination, it is avoiding other areas in the Western parklands that are better suited for agriculture, horticulture and forestry.
(g) facilitating public access to, and use and enjoyment of, the Western Parklands, and	The proposal will include a visitor centre to provide education through a world-class visitor centre experience and facility tour which will encourage visitors to the WSP. The landscape design provides an attractive site for visitor experience, from the entrance and along the eastern area to the visitor's centre. The strategy includes the provision of a boardwalk that meanders over the bioretention basin with views towards proposed planting areas (including palettes featuring endemic species of the Cumberland Plains) inviting visitors of the site to enjoy.
(h) facilitating use of the Western Parklands to meet a range of community needs and interests, including those that promote health and well-being in the community, and	The proposal will include a visitor centre which will provide an educational resource on waste management, energy from waste and circular economy.
(i) encouraging the use of the Western Parklands for education and research purposes, including accommodation and other facilities to support those purposes, and	The proposal will include the construction of a visitor centre to help educate and inform the community on the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW.
(j) allowing for interim uses on private land in the Western Parklands if such uses do not adversely affect the establishment of the Western Parklands or the ability of the Trust to carry out its functions as set out in section 12 of the Western Sydney Parklands Act 2006	The Parklands has a long-term role in providing land with low environmental or recreational value, to meet the ongoing and expanding needs of the community for services infrastructure such as electricity, gas, telecommunications, water, and sewer. The proposal is for a development on private land, located on the western periphery of the Parklands in an area that is previously disturbed and is home to industrial and waste management facilities. The proposal is consistent with the future land uses identified for the Wallgrove Precinct including recycling and renewable energy.
(k) ensuring that development of the Western Parklands is undertaken in an ecologically sustainable way.	Details of how the ecologically sustainable development (ESD) principles have been considered and applied in the design of the proposal are provided in Chapter 25 Evaluation and conclusions.

Other SEPPs and Overlays

In addition to the WSP SEPP, the proposal is covered by a number of other overlays at the State policy level, including Vegetation in Non-Rural Areas, State and Regional Development and Infrastructure. A summary of the relevant objectives from this SEPPs in relation to the LVIA is provided below.

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

The study area is entirely within the area of land that is subject to this policy. The relevant aims of this policy are:

- To protect the biodiversity values of trees and other vegetation in non-rural areas of the State
- To preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation.

State Environmental Planning Policy (State and Regional Development) 2011

This SEPP relates to the entirety of NSW, with the aim of identifying State significant infrastructure and development. The proposed development would be classified as Electricity Generation works under Schedule 1 of the SEPP.

State Environmental Planning Policy (Infrastructure) 2007

This SEPP relates to the entirety of NSW. The proposed development would be classified as Electricity Generating Works and therefore subject to this SEPP.

The relevant aims of this policy are to facilitate the effective delivery of infrastructure across the State by:

(d) identifying the environmental assessment category into which different types of infrastructure and services development fall (including identifying certain development of minimal environmental impact as exempt development), and

(g) providing opportunities for infrastructure to demonstrate good design outcomes.

Greater Sydney Region Plan

The Greater Sydney Region Plan sets a 40-year vision (to 2056) and establishes a 20-year plan underpinning each of the five District Plans. The plan brings new thinking regarding land use, transport patterns and place-based outcomes to boost Greater Sydney's liveability, productivity and sustainability by spreading the benefits of growth. As the district plans are the means to implement the Region Plan, the relevant objectives of the Greater Sydney Region Plan are addressed in the discussion on the Central City District Plan below.

Central City District Plan

The Central City District Plan is a 20-year plan to manage growth in the context of economic, social and environmental matters for the local government areas of Blacktown, Cumberland, Parramatta and The Hills. The site is in the Central City, one of three Cities that make up the Greater Sydney Region. The District Plan sets out a vision for the Central City, which will be implemented through several objectives.

Please refer to the EIS Strategic Context (Section 1.5 Strategic policy, refer to page 14 - Table 3) for specific planning objectives that are being addressed through the proposal.

Urban Green Cover in NSW, Technical Guidelines

These guidelines offer built environment professionals working in state and local government and the private sector practical information and typical details to encourage best practice applications of green cover, so as to minimise urban heat impacts across NSW.

These guidelines complement the Department of Planning and Infrastructure's draft centres design guidelines, which encourage green cover in new centres, by promoting the protection of existing natural features and green links and increased green cover through street trees, green roofs and walls.

It has been highlighted within the SEARs to consider the use of green walls, green roofs or cool roof design, having regard to the 'Urban Green Cover in NSW Technical Guidelines' (OEH 2015).

The guidelines will be referred to during design concept phase and provide a suitable basis for the construction and implementation of green infrastructure interventions within the proposal.

Essential considerations highlighted within the guidelines include:

- Elements such as the building size, age (if retrofitting) and structural capacity, exposure to wind, solar access, micro-climate and the budget are important factors that may limit or inform the design need to be established prior to design and implementation.
- All design, construction and maintenance of green walls should be in accordance with all relevant Australian standards and the national Construction Code.
- As with all proposals, a maintenance plan and budget must be determined as part of the green wall design process.

04
Context

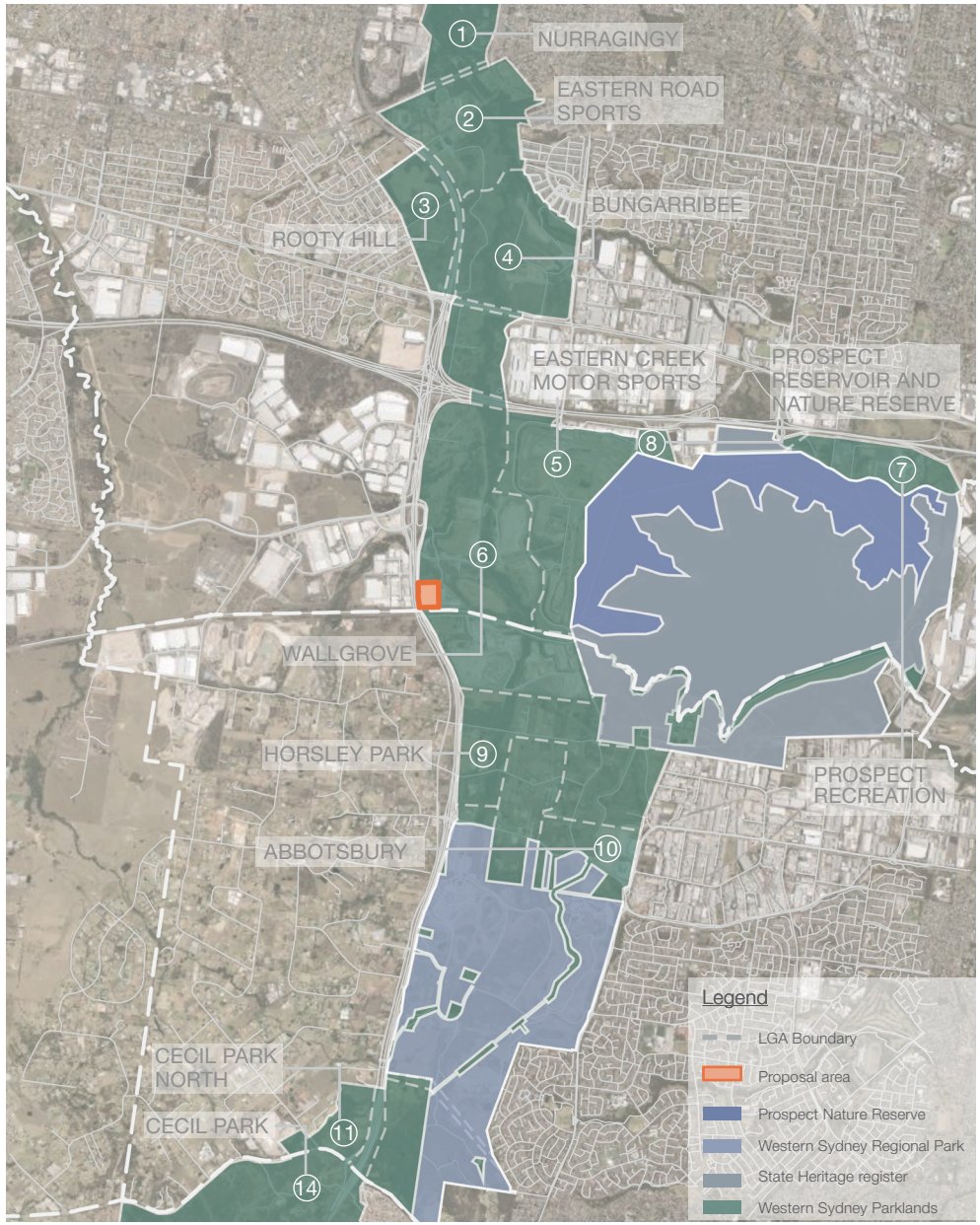


FIGURE 1 DESIGNATIONS

Designations

Western Sydney Parklands

The proposal is permissible under the Western Sydney Parklands (WSP) State Environmental Planning Policy (SEPP) (WSP SEPP) 2009 and the Infrastructure SEPP (ISEPP) 2007 and is the principal environmental planning instrument (EPI) controlling development and land use planning in the Parklands. Its aim is to put in place development controls that will enable the Western Sydney Parklands Trust (WSPT) to develop a multi-use urban parkland for Western Sydney.

The WSPT developed the Plan of Management 2030 that provides the strategic framework for the Parklands. The NSW Minister for the Environment and Heritage adopted the Plan of Management in December 2018.

Context

The WSP are one of the largest in the world, covering a total area of 5280 hectares and stretching over 27km. The parklands include 60km of trails and paths connecting a series of green spaces, picnic areas and sports grounds. The introduction of a North-South trail is a key initiative highlighted as part of the WSP Plan of Management.

The WSP has 16 precincts and 50 park areas. The park is around 27km long, starting from the suburb of Quakers Hill in the north, to Leppington (Liverpool) in the south, and is located in the heart of the Greater Western Sydney area. It features a conspicuous ridge that runs through it from north to south, providing panoramic views of Greater Western Sydney.

Every entrance to the parkland contains prominent planting accompanied by large signs to indicate access. The parklands contain the headwaters of Eastern Creek, as a tributary of the Hawkesbury-Nepean. The north-south ridge-line in the parklands is the catchment boundary between the Hawkesbury-Nepean, Georges River and Parramatta River catchments.

The park has around 135 hectares of woodland areas, which are remnants of Cumberland Plain Woodland. Most parts of the regional park are made up of 427 hectares of planted re-vegetation and cleared grassland areas. The Parkland's environment has remained very similar to how it was prior European contact. The park consists of 135 hectares of woodland, with the majority comprising 427 hectares of planted vegetation and cleared grassland areas.

The Plan of Management divides the WSP into sixteen precincts and includes a high-level Precinct Plan for each. The proposed site is in the Wallgrove Precinct (Refer to Figure 1). The Plan of Management describes the existing and desired future character for the Precinct as follows:

Existing character

The Wallgrove Precinct (309 hectares) contains a diverse range of urban services infrastructure such as recycling, brickmaking, quarrying and the former Eastern Creek Waste Management Centre, now being decommissioned. The precinct includes adjustment land adjacent to the Light Horse Interchange and the M7 Motorway.

Desired future character

The proposal incorporates both recycling and renewable energy and would be consistent with the Precinct's desired future character. The future character aims to be an evolving precinct that includes some of the current uses such as environmental monitoring, brickmaking, agriculture and recycling sites.

The precinct has potential for the development of renewable energy and recycling opportunities, agriculture, unstructured recreation and sport uses, and a potential WSPT Business Hub development.

The Plan of Management also identifies land use opportunities for the Precinct as:

- WSPT Business Hubs at sites designated by the Trust.
- Urban farming and associated facilities.
- Extraction, recycling and associated uses.
- Walking and cycling tracks.
- Unstructured recreation, sports and associated facilities.
- Sport, structured recreation and associated facilities.
- Environmental protection works.
- Potential Aboriginal and non-Aboriginal cultural and heritage interpretation.
- Utilities infrastructure.

The proposal would be consistent with the Plan of Management by using low environmental or recreational value land for utilities infrastructure and by providing employment. The desired future character for the Wallgrove Precinct includes retention of some current uses such as recycling sites and future uses such as recycling and renewable energy.

Western Sydney Regional Park

Western Sydney Regional Park Western Sydney Regional Park (Draft Plan of Management) Western Sydney Regional Park is a highly modified landscape, providing important open space and recreational opportunities in an urban setting. Historically the site of the regional park was used for agricultural purposes including intensive market gardening, dairy farming and grazing. In the late 1970s, the northern section of the regional park was subdivided for rural residential lots, however these lots were reclaimed by the Government to become the Western Sydney Regional Park in 1997.

Prospect Reservoir

State Heritage register

As outlined within the Statement of Significance (State Heritage Register criteria a) Prospect Reservoir is historically significant at the state level as it is a central element of the Sydney Water supply system. The Reservoir reflects three significant changes in municipal life during the late 19th century; the development of water and general public utility services; the importance of ensuring an adequate and dependable centralised water supply; and the collective bureaucratic response to the delivery of capital works of this nature.

It continues to regulate the release of water from Prospect Reservoir to the Lower Canal and the Sydney Distribution System. (Sydney Water Draft Heritage And Conservation Register). Refer to the Heritage chapter further information.

Prospect Nature Reserve

As outlined in the Prospect Nature Reserve Plan of Management, the reserve was established on 28 February 2007 and covers 325.3 hectares on the northern shore of Prospect Reservoir. Prospect Nature Reserve contains one of the largest remaining remnants of the critically endangered Cumberland Plain Woodland community, and therefore has a significant role in the conservation of regional biodiversity for western Sydney. The reserve also has cultural value to the Darug people. Refer to the Heritage Chapter and Ecological Chapter for further information.

FIGURE 2 SETTLEMENTS

Context

The commercial and industrial setting of the area, in conjunction with the site's location within the parkland setting, defines its landscape character. It is representative of the several large self-contained plots separated by remnant woodland. The site is contained and framed by the M7 Motorway to the west, the Warragamba pipelines to the south and remnant woodland to the east and north.

Settlements

Immediate Site Context

The site is located along Wallgrove Road, Eastern Creek, in the Blacktown Local Government Area (LGA). The area immediately surrounding the site is characterised by industrial and transport infrastructure.

Eastern Creek

Eastern Creek, the suburb of which the proposal is located within, is approximately 35km west of the Sydney central business district in the Blacktown LGA and forms part of the Greater Western Sydney region. Prospect Nature Reserve and the WSP are located to the east of the suburb. Eastern Creek is home to noteworthy motorsport parks such as the Sydney Motorsport Park, Drfit School Ausralia and the Western Sydney International Dragway.

Eastern Creek includes many industrial developments and is often described as the 'Eastern Creek Area', which includes other industrial estates within surrounding suburbs in close proximity such as Arndell Park and Huntingwood. The former Eastern Creek Waste Management Centre is being decommissioned.

Horsley Park

Horsley Park is a semi-rural suburb approximately 2km from the proposed site and is located within the LGA of the City of Fairfiled.

Aboriginal people from the Cabrogal tribe, a sub-group of the Gandangara tribe, have lived in the Fairfield area for over 30,000 years. European settlement began in Fairfield in the early 19th century. Horsley Homestead is one of the few remaining early colonial buildings in the Fairfield district today protected by The Australian Heritage National Trust.

Horsley Park Public School opened in 1931 and is the nearest education facility (approximately 2km) south of the site. A small cluster of shops are located along the main street, The Horsely Drive.

Blacktown

Blacktown is a suburb in the City of Blacktown, in Greater Western Sydney approximately 4.5km away from the proposed site. Blacktown is the largest township in NSW and is one of the most multicultural areas within Greater Sydney.

FIGURE 3 PHOTO LOOKING NORTH ACROSS HORLSEY PARK AGRICULTURAL FARMSTEADS

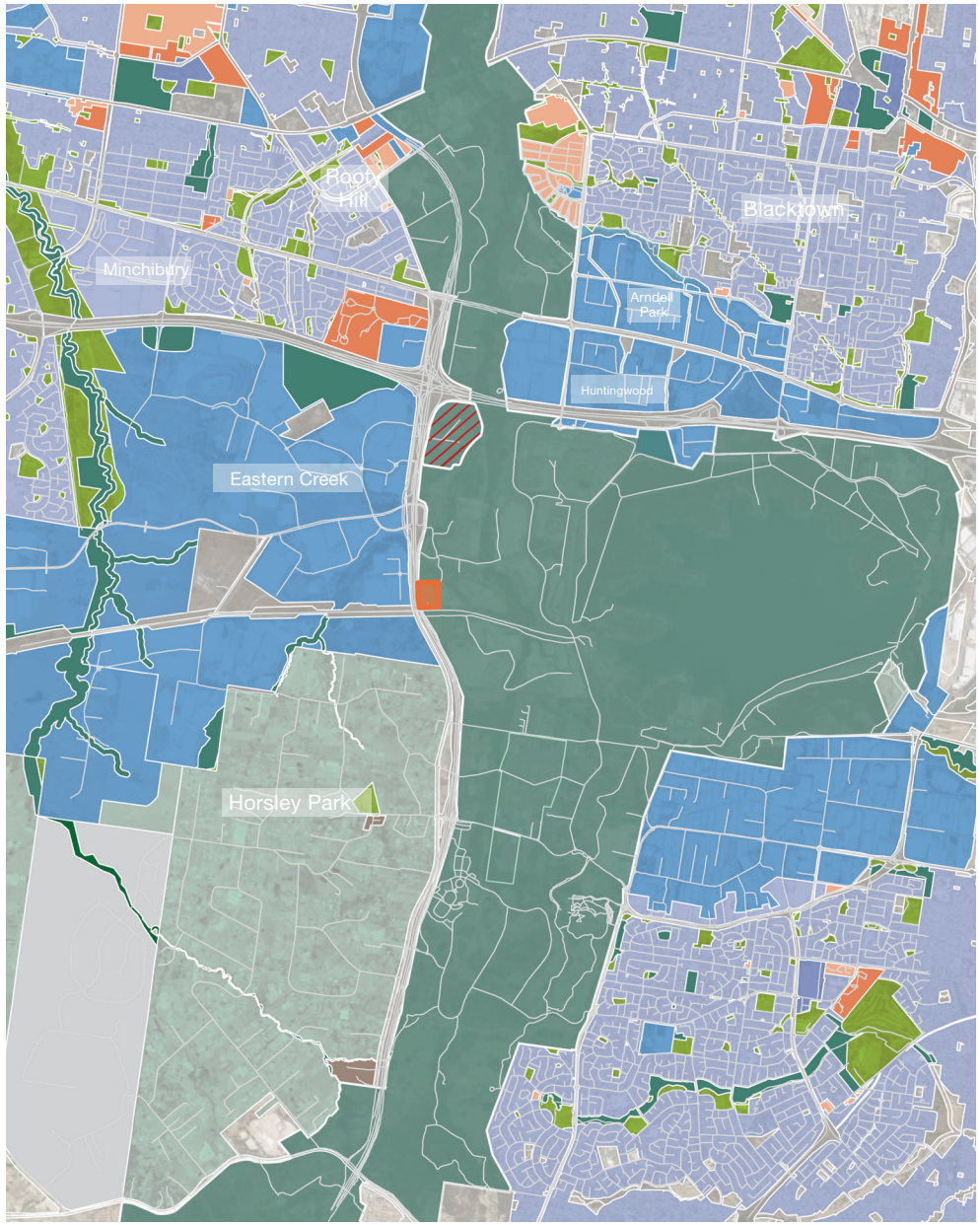


FIGURE 4 LAND USE

Land use

Proposal area and Immediate surroundings

As mentioned previously, the land within the site area is located within the designated WSP, within the Wallgrove precinct (precinct 6) and therefore, unzoned. Refer to page 26, *Designations*, for a description of the desired future character WSPT anticipate for the site. Currently, the precinct includes land uses such as service infrastructure (recycling, waste management), quarrying and brick-making facilities.

The site is considered to be of low environmental and recreational value (as indicated by the WSP Plan of Managment). The site is bounded by the M7 motorway to the west and Eastern Creek industrial area further west. The Warragamba Pipeline Corridor adjoins the southern boundary of the site with the Austral Bricks site located further south. The site was previously utilised as a poultry farm and disused sheds and ancillary buildings are still occupying the site.

Legend

- Suburb boundary
- Proposal area
- Proposed developement
- Western Sydney Parklands
- Industrial
- Infrastructure
- Rural residential
- Low density residential
- Medium density residential
- Open public space
- Vegetated areas
- Community use

Light and General Industrial Zone

Land directly to the west and further north of the proposed site is catergorised as a Light or General Industrial Zone. This area provides a wide range of industrial and warehouse land uses and to support other land uses that provide facilities or services to meet the day to day needs of workers in the area.

There is a proposed development for Light Horse Interchange Business Hub Eastern Creek for staged redevelopment of the site as an industrial business hub. The proposed 29.5 hectare business hub is being assessed by the NSW Department of Planning, Industry and Environment. Consultation commenced in November 2018 as part of an Environmental Impact Statement (EIS) for the proposed development.

Infrastructure

Amongst the general industrial land use to the east of the site, separate parcels of land are categorised as Infrastructure zones. This includes areas designated for the purposes of electricity transmission and distribution, water supply systems and classified roads.

These areas are defined by providing for infrastructure related uses, preventing development that is not compatible with or that may detract from the provision of infrastructure.

TransGrid Sydney West 330/132KV substation and switch yard is approximately 2km from the proposed site boundary. It includes large areas of cleared land that provide easements for the transmission pylons and associated transmission lines. Approximately 1.3km north-east from the perimeter of the TransGrid substation, the Eastern Creek Zone Substation is provided by Endeavour Energy. Included within this land zone is the Minchinbury Reservoir provided by Sydney Water which includes a 38 megalitre steel water reservoir and associated pipe work and valves.

The Westlink M7 is a major highway corridor that extends north to south and defines the western edge of the proposed site. The M7 is a major connecting road on Sydney's orbital motorway network. It runs for 40km and links the M5 South-West with the M4 and the Hills M2. The Western Motorway M4 connects west to east and is located 2km north of the site.

Primary Production Small Lots

Land located in the south, within the suburb of Horsley Park, is catergorised as Primary Production Small Lots. This area is defined by enabling sustainable primary industry and other compatible land uses and ensuring that development is sympathetic to the rural environment and minimises risks from natural and man-made hazards. It is characterised as supporting rural residential land uses and includes a small township within Horsley Park.

Additionally, there are areas within the WSP that are designated for agriculture however are unzoned due to their location within the parklands.

Medium and Low Density Residential

Low density residential land zones in moderate proximity to the site are included within the suburbs of Minchinbury, Rooty Hill and Blacktown. This area is defined by providing the housing needs of the community within a low density residential environment and to enable certain activities to be carried out within the zone that do not adversely affect the amenity of the neighbourhood.

Medium density development is located within the suburb Bungarribee approximately 4km from the site and aims to provide a variety of housing types within a medium density residential environment.

FIGURE 5 PHOTO LOOKING NORTH ACROSS SYDNEY INTERNATIONAL EQUESTRIAN CENTRE

FIGURE 7 HYDROLOGY + TOPOGRAPHY

Hydrology + Topography

Hydrology

The proposal is located within the Hawkesbury-Nepean River catchment and is situated on a lower hill slope land form. The site is gently sloping to a minor drainage line running south-north along the eastern boundary. Reedy Creek traverses the landscape approximately 900m east of the site and Eastern Creek flows approximately 1km to the west.

As mentioned previously, the Prospect Reservoir is located directly east to the site and is a heritage-listed storage reservoir storing water from the Warragamba Dam and the Upper Nepean Dams. It is located within the northern extents of the Georges River Catchment. The reservoir is a zoned earth embankment dam, 26m high and approximately 2.2 km long, with a storage capacity of 50,200 megalitres.

Topography

The topography in and around the study area is mostly influenced by the low lying open landscape of the Cumberland Plain. Topography is gently undulating to the north and west of the site, flattening where it passes through floodplains associated with South, Ropes, Reedy and Eastern Creek. Undulating hills define the southern and western extents on approach to Cecil Hills and the WSP. The ridgline peaks at approximately 150m, segregating the WSP (Sugarloaf Ridge) and reduces in elevation height north towards the reservoir.

Within the immediate site extents, ground elevations vary from about 62m AHD in the south-west to 54m AHD in the north-east.

FIGURE 8 VIEW FROM SUGARLOAF RIDGE - *WESTERNSYDNEYPARKLANDS.COM.AU/PLACES-TO-GO/SUGARLOAF-RIDGE-AND-MOONRISE-LOOKOUT/*

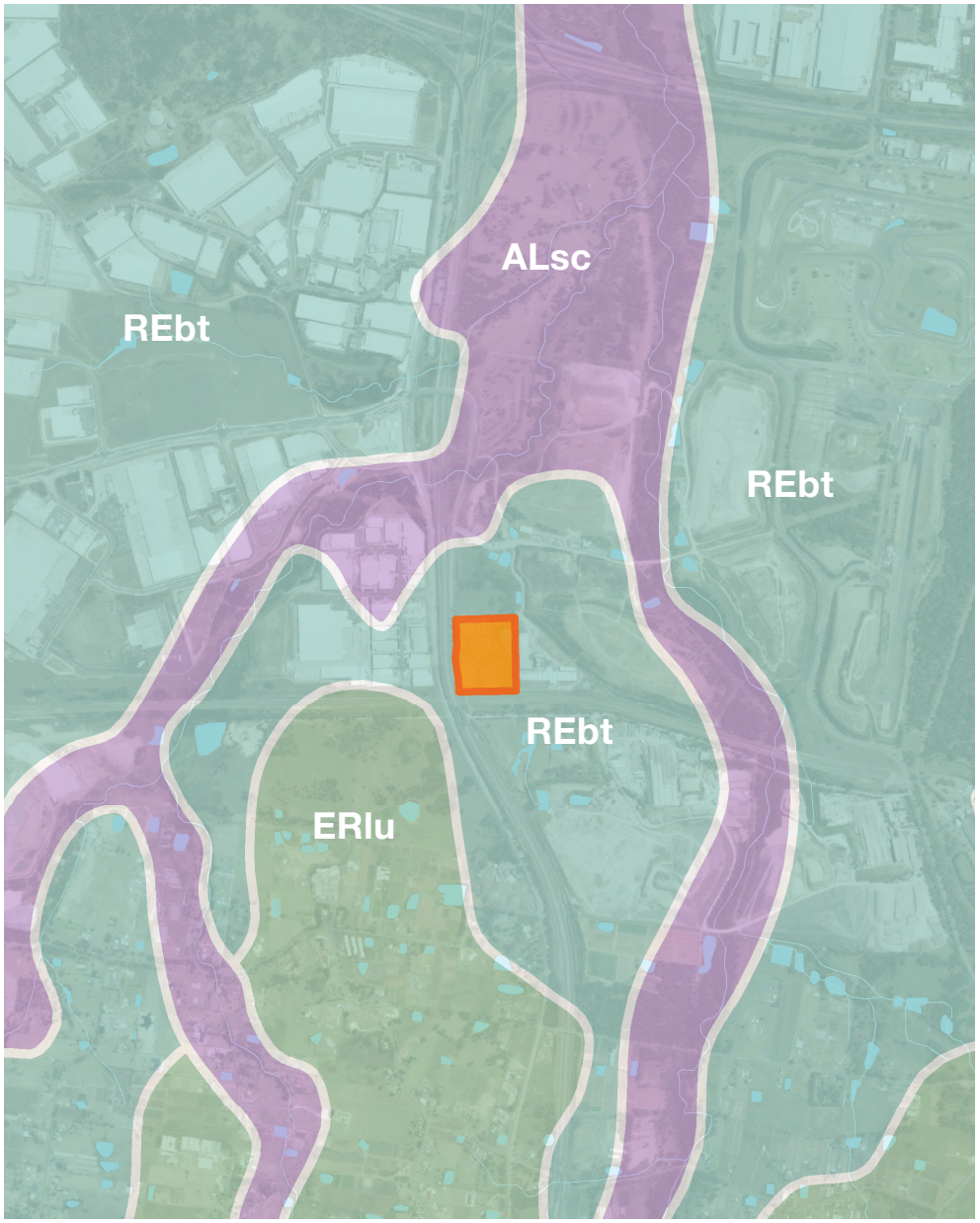


FIGURE 9 BIOREGIONS

Bioregions

IBRA is a biogeographic regionalisation of Australia developed by the Australian Government department formerly known as Department of Sustainability, Environment, Water, Population and Communities (Department of Agriculture, Water and the Environment, 2018). IBRA represents a landscape based approach to classifying the land surface of Australia. The IBRA data consists of two datasets: IBRA bioregions, which are a larger scale regional classification of homogeneous ecosystems; and sub regions, which are more localised.

Whilst bioregions have been defined mainly for the purposes of ecosystem planning and monitoring, the nominal attributes that make up IBRA are climate, lithology/geology, landform, vegetation, flora, fauna and land use, which are themes typically used to define landscape character at a high level.

As shown, one bioregion is present within the proposal area, including Blacktown bioregion. Information on these bioregions has been obtained from the Australian Government Department of Environment and Energy website.

Legend

- Proposal area
- REbt - Blacktown bioregion
- ALsc - South Creek bioregion
- ERlu - Luddenham bioregion

Blacktown bioregion

The Blacktown bioregion, occurs extensively on the Cumberland Lowlands including Blacktown, Mount Druitt, Glossodia and Leppington towns. It is characterised by gently undulating rises with broad and rounded crests and ridges on the Wianamatta Shale (located within the Sydney Basin) with a local relief of 10–30 m. Geology characteristics include Ashfield Shale consisting of laminite and dark grey siltstone, Bringelly Shale which consists of shale with occasional calcareous claystone, laminite and infrequent coal, and Minchinbury Sandstone consisting of fine to medium-grained quartz lithic sandstone.

Key management issues and features

Key features and issues of the Blacktown bioregion include the following:

- Minor sheet and gully erosion may be found where surface vegetation is not maintained.
- Blacktown soil materials have moderate erodibility. The topsoils are often hardsetting and they have high fine sand and silt content and high to moderate organic matter content.
- Calculated soil loss during the first twelve months of urban development for topsoil and exposed subsoil tends to be low.
- Landscape limitations include; seasonal water-logging, water erosion hazard and surface movement potential (localised).

South Creek

The South Creek bioregion occurs along the drainage network and riparian corridors within the active floodplains of the Cumberland Plain. The alluvial plain is flat to gently sloping with occasional terraces providing low relief.

Geology is defined by Quaternary alluvium derived from the Wianamatta Group shales and Hawkesbury Sandstone. The soil landscape is considered to be dynamic including many areas of erosion and deposotion. Streambank erosion and sheet erosion of floodplains is also common.

Key management issues and features

- Erodibility of these soil materials is high. The topsoil is moderately dispersible and has more than 50% fine sand.
- The erosion hazard for South Creek soil landscape is potentially very high to extreme. This is an active floodplain and is presently being reworked by fluvial processes. Apparent stability is probably short term.
- Landscape limitations include; flood hazards, seasonal water-logging, permanently high water-tables, water erosion hazards and localised surface movement potential.
- This bioregion is considered to not be capable of urban development due to flood hazard.

Luddenham

The Luddenham bioregion occurs predominately on the south and westen portions of the Cumberland Lowland on generally low rolling to steep low hills (50-80m relief). Geologically, this soil lanscape is underlain by Wianamatta Group Ashfield Shale and Bringelly Shale formations.

Moderate sheet erosion occurs on disturbed areas (e.g. cultivated lands). Small areas of moderate to severe sheet erosion occur in overgrazed paddocks on many hobby farms.

Key management issues and features

- The erosion hazard for non-concentrated flows ranges from moderate to very high.
- Soils are deep and have high clay content. Clay often has low to moderate shrink-swell potential.
- Landscape limitations include; water erosion hazard, steep slopes, mass movement hazard (localised), surface movement potential (localised).

FIGURE 10 VEGETATION

Vegetation

Proposal Area

The immediate site is mostly cleared and holds limited ecological value. There is a patch of critically endangered Cumberland Plain woodland and threatened (regrowth) eucalypt woodland located towards the north eastern property boundary, seen in Figure 10. There are scattered occurrences of exotic grassland scattered throughout the site and a sedge community associated with the stormwater detention pond also along the site's eastern boundary.

An initial site visit, undertaken by the environmental team, estimated there being 0.74 hectares of Cumberland Plain woodland and 0.35 hectares of regrowth eucalypt woodland on-site, which is sufficient to classify as a threatened ecological community under State legislation. However, neither community is in sufficient condition to meet the definition thresholds for classification and protection under Commonwealth legislation.

Legend

- Proposal area
- Cumberland Plain GT10pc - (Crown greater than 10%) Alluvial woodland.
- Cumberland Plain LT10pc - (Crown less than 10%) Shale Plains Woodland.
- Cumberland Plain West - Forest Red Gum - Rough barked Apple grassy woodland on alluvial flats.

Blacktown

This bioregion is almost completely cleared open-forest and open-woodland (dry sclerophyll forest). The original woodland and open-forest were dominated by Eucalyptus tereticornis (forest red gum), E. crebra (narrow-leaved ironbark), E. moluccana (grey box) and E. maculata (spotted gum) (Benson, 1981).

Further west near Penrith remnant stands of E. punctata (grey gum) occur. Between Liverpool and St Marys the dominant species are E. globoidea (white stringybark) and E. fibrosa (broad-leaved ironbark), with E. longifolia (woollybutt) as an understorey species. Individual trees or small stands of E. sideroxylon (mugga ironbark) are occasionally found on crests.

South Creek

The vegetation of this soil landscape reflects its frequent inundation. Common tree species include Angophora subvelutina (broad-leaved apple), Eucalyptus amplifolia (cabbage gum) and Casuarina glauca (swamp oak). Still water species such as Eleocharis sphacelata (tall spike rush), Juncus usitatus and 93 Polygonum spp. occur where channels are silted up.

On more elevated streambanks a tall shrubland of Melaleuca spp. (paperbarks) and Leptospermum spp. (tea trees) may occur. However much of this soil landscape has been previously cleared and is now dominated by exotic species such as Rubus vulgaris (blackberry) and other weeds.

Luddenham

Extensively cleared open forest (dry sclerophyll forest). Dominant tree species include Eucalyptus maculata (spotted gum) and E. moluccana (grey box). Lesser occurrences of E. fibrosa (broad-leaved ironbark), E.crebra (narrow-leaved ironbark), E. tereticornis (forest red gum) and E. longifolia (woollybutt) occur.

Understorey shrub species include Bursaria spinosa (blackthorn), Breynia oblongifolia (coffee bush), Allocasuarina torulosa (forest oak), Acacia implexa (hickory) and Clerodendrum tomentosum (hairy clerodendrum). Grasses are commonly Aristida vagans (speargrass), Entolasia marginata (bordered panic), Eragrostis leptostachya (paddock lovegrass) and Themeda australis (kangaroo grass) (Benson, 1981). Examples of natural vegetation can be found near Werombi and Floxton Park.

FIGURE 11 EXISTING ON-SITE VEGETATION

05
Baseline

Landscape character

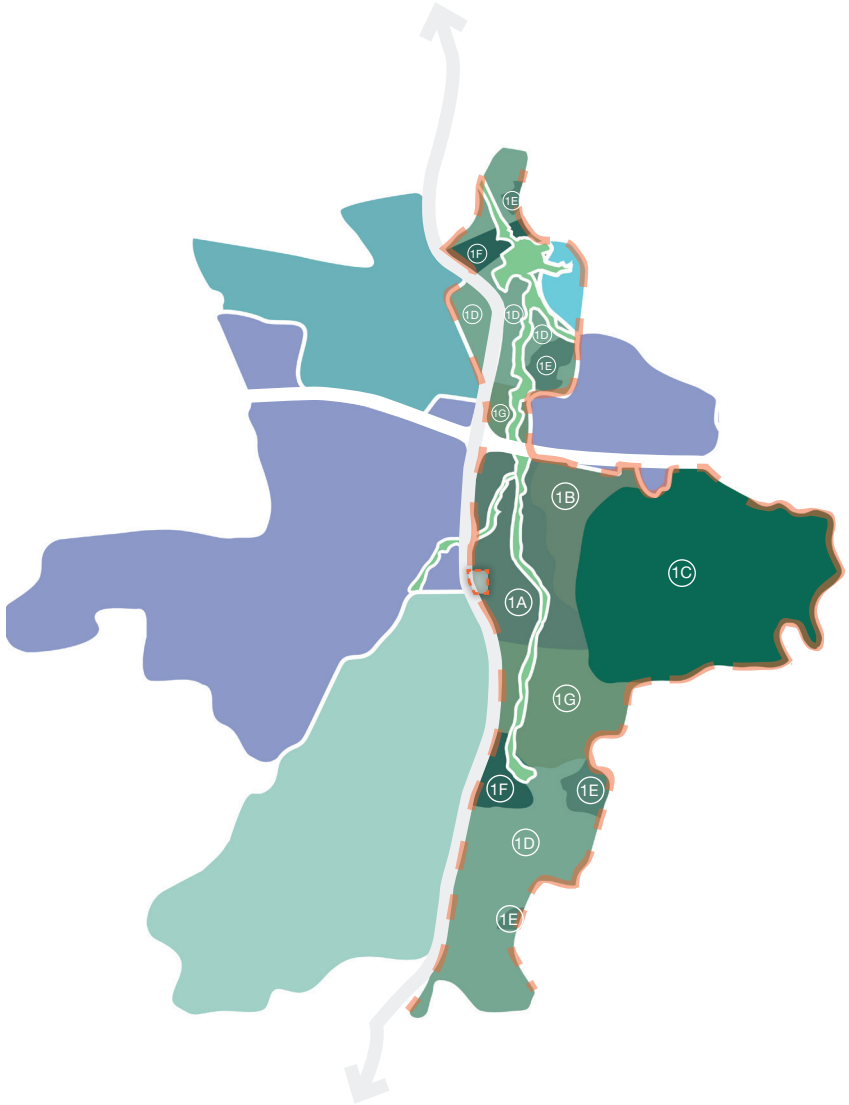


FIGURE 12 LANDSCAPE CHARACTER AREAS

Landscape character assessment seeks to divide the landscape into distinct, broadly homogeneous units with defining characteristics. In this way each character area should be distinct from an adjoining area which will be defined by a different set of key parameters.

The Landscape Character Areas (LCA) identified as part of this assessment have been derived from a review of planning policy, GIS baseline analysis and site investigations. The extent of character area analysis is informed by an understanding of potential perceived area of change that may arise from the proposal. This process included a review of the physical extent of the proposal and visual analysis, discussed in further detail on the proceeding pages, *Visual Context* (refer to page 44).

Legend

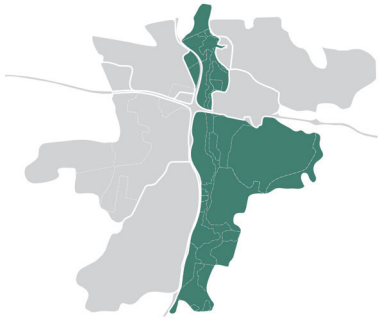
- Proposal area
- Western Sydney Parklands
- 1A - Wallgrove productive areas
- 1B - Motorsport park
- 1C - Prospect Reservoir
- 1D - Passive recreation
- 1E - Active recreation
- 1F - Sports facilities
- 1G - Rural living
- Power + Industrial estates
- Horsley Park Rural Residential
- Minchinbury Local Community
- Bungarribee Local Community
- Bush Creek Corridor
- M7 Motorway

In order to complete the landscape and visual baseline to inform the LVIA, as mentioned in *Chapter 02: Methodology,* (refer to page 14), the LCA baseline study area adopts the shape of the VEM in order to document the surrounding context to the site and assist with the selection of the viewpoint locations. The study area is refined further during the assessment stage to evaluate the direct or indirect impacts as a result of the proposal.

Seven distinct LCAs have been defined, as illustrated in Figure 12. Further detailed analysis and subdivision of these LCAs is provided.

The LCAs include:

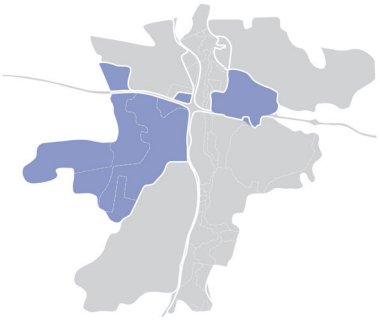
- LCA 1: Western Sydney Parklands
  - 1A - Wallgrove productive areas
  - 1B - Motorsport park
  - 1C - Prospect Reservoir
  - 1D - Passive recreation
  - 1E - Active recreation
  - 1F - Sports facilities
  - 1G - Rural living
- LCA 2: Power and industrial estates
- LCA 3: Horsley Park Rural Residential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



LCA 1: Western Sydney Parklands

This LCA encompasses Prospect Nature Reserve and Western Sydney Parklands that extends the entire length of the identified study area. The area is characterised by low lying, undulating terrain with a range of land-uses, including recreational parkland, heavy industrial to low density residential. The LCA is interspersed with vegetation, which contributes to unifying the character of the area. The large reservoir (Prospect Reservoir) defines the western edge and the parkland mosaic is severed by the highway corridors (M4 and M7) that extend north to the south and west to east.

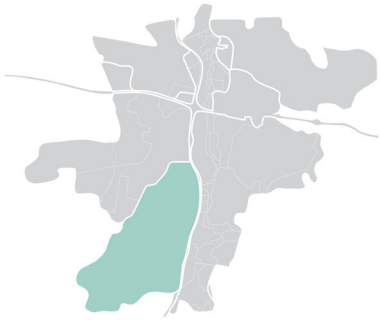
The topography rises towards the southern extents of the character area reaching towards Cecil and Carnes Hill (142m elevation). To the north the topography reduces in elevation forming undulating plains that extended further north and become low-lying on approach to the reservoir. Within the character area, vegetation lines Eastern creek that traverses in a north-south direction. The combination of varied land uses and the distribution of vegetation cover within the series of recreational, open spaces divides the character area further into subdivisions. These include; sports, open space, rural living, nature reserve and industrial uses.



LCA 2: Power + industrial estates

This LCA extends from the west of the study area towards the east and includes industrial and productive land-uses, often within a rural, agricultural setting. This includes cleared, flat plains that act as easements for transmission lines and industrial estates with a presence of larger buildings from an aerial perspective. The LCA is defined by large, warehouse structures with wide road corridors and formal planting arrangements such as manicured hedging and avenued streets. The LCA is experienced predominately by industrial workers located within the vicinity and commercial focused users.

Areas of vast open, cleared spaces, designated easements for the transmission lines, break up the developed industrial footprint of the character area. The vegetated creek corridors (Ropes and Reedy Creek) define the western and southern edges of the LCA. The building scale and form within the developed estate pockets reinforce the industrial and commercial nature of the character area.

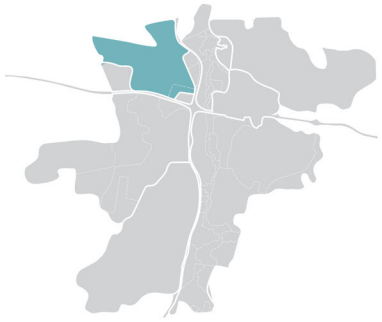


LCA 3: Horsley Park Rural Residential

This LCA is located to the southern edge of the study area and is defined by homogeneous, large parcels of semi-rural residential properties. 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 topography rises to the south towards Cecil Park and Kemps Creek with the southern edge of the LCA marked by Elizabeth Drive which traverses the elevated topography. The foothills define the southern edge of the LCA and provide a visual barrier for views extending across the study area from the north towards the south. Vegetation is dispersed evenly across the LCA.

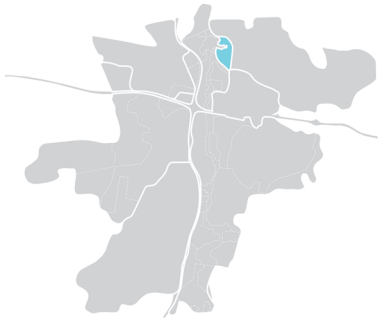
The LCA is located predominately within Horsley Park, Kemps Creek and Cecil Park and includes a local town centre on the eastern edge, adjacent to the M7. Horsley Park has a rich heritage with Indigenous Australians from the from the Cabrogal tribe, a sub-group of the Gandangara tribe, residing in the area for over 30 000 years. Horsley Homestead is one of the few remaining early colonial buildings in the Fairfield district today protected by The Australian Heritage National Trust. Development is catergorised as rural living properties and single story dwellings on large land parcels.



LCA 4: Minchinbury Local Community

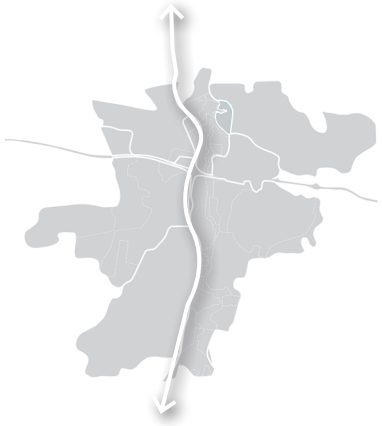
This LCA is located in the northwestern extents of the study area, defined by Rooty Hill mountain peak to the east and directly adjacent to the Western Sydney Parklands and the M7. The topography is characterised by its broad, rounded crests and ridges with gently inclined slopes. Vegetation is sparsely spatialised across the character area with small pockets of dense eucalyptus woodland and tall open-forest (dry schlerophyll forest) punctuating the residential landscape matrix.

The character area is predominantly a residential area with small clusters of commercial/retail areas. Culturally, the landscape is recognised for its vineyards and prize-winning wines.



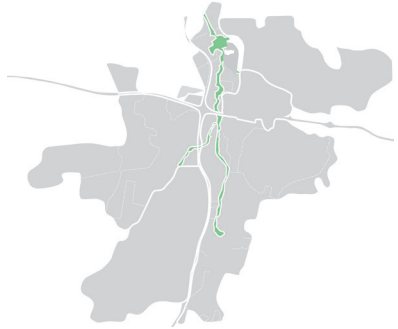
LCA 5: Bungarribee Local Community

This character area is defined by the medium density residential development in the northern extents of the study area. The western and southern edge is defined by Eastern Creek and Bungarribee creek valley flats and drainage depressions of the channels on the Cumberland Plain. The recently developed Bungarribee estate includes a local community centre and various parks with high recreational value. The Bungarribee Homestead complex



LCA 6: WestLink M7 Highway Corridor

This character area is defined by the highway corridor located directly adjacent to the site boundary and extending north to south throughout the study area. The high conduit corridor is charcterised by two lanes, traveling both north and south bound, separated by a wide, central, grassed median strip. The corridor passes through various LCAs and is defined by its transitional nature.



LCA 7: Bush Creek Corridor

This LCA is defined by the waterways that traverse through the landscape study area. Reedy Creek meanders through the site from the north to the west, while Eastern Creek defines the north eastern edge of the LCA study extents. The riparian corridors are supported by densely vegetated buffers along the low-lying drainage channels. Reedy Creek is transversed by the LCA 6: WestLink M7 highway corridor.

Visual context

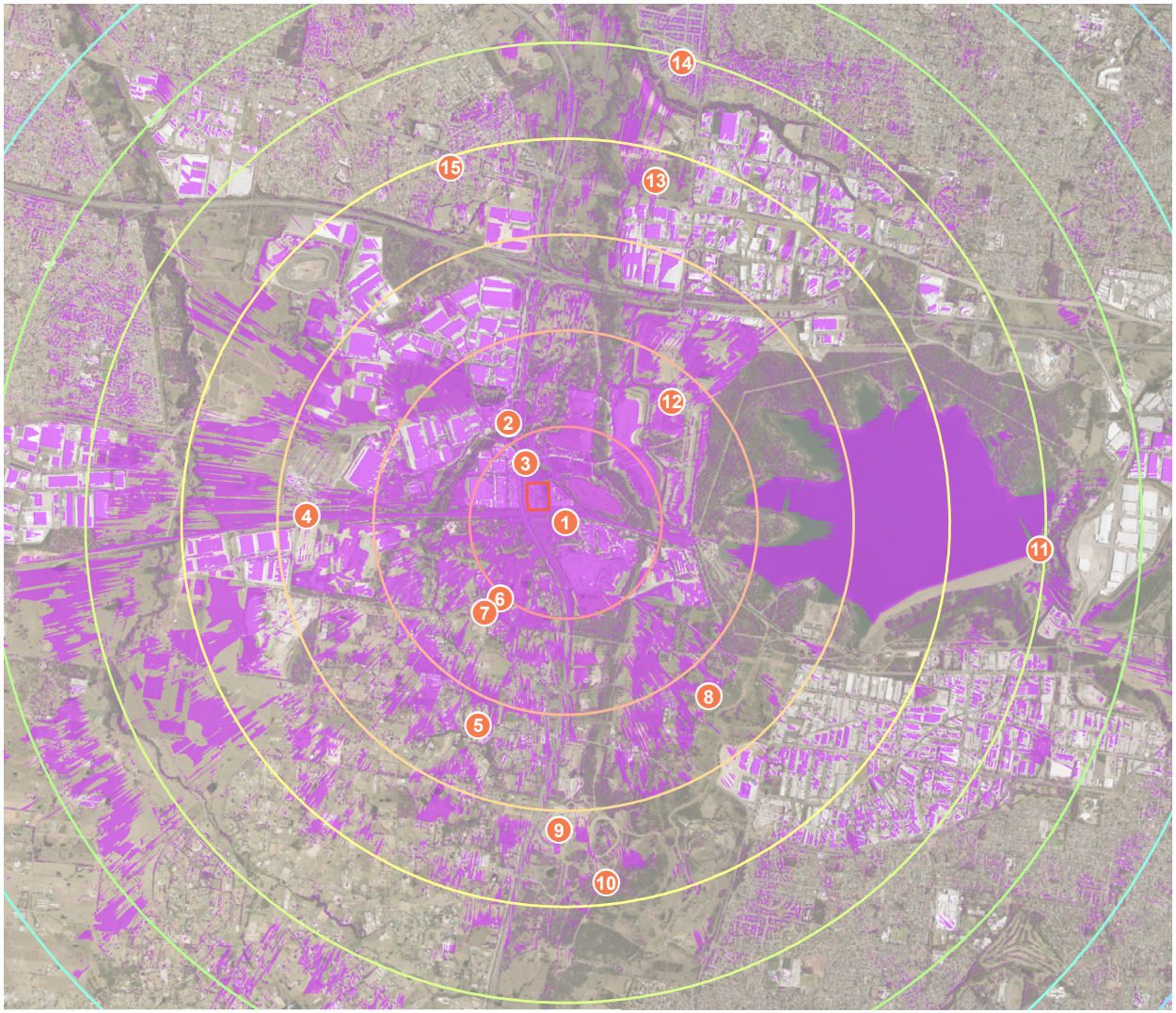


FIGURE 13 STUDY AREA AND VIEWPOINT LOCATION PLAN

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

Legend

- Proposal area
- VEM showing the plume visibility at worst case scenario
- 1km Buffers

Visual Catchment

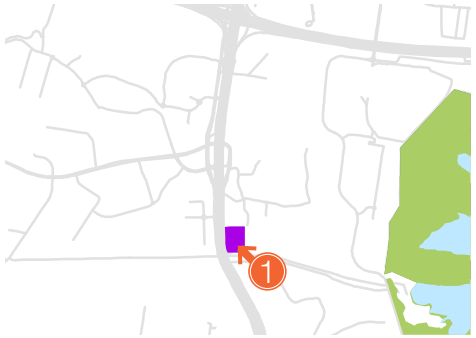
Figure 13 represents the VEM defining the visual catchment study area for the proposal and illustrating the theoretical area from which the building footprint, stack and plume (worst case scenario) could be visible.

Parameters for the plume representing 'worst case scenario' included a visibility range from 100m wide to 100m high from the top of the stack.

15 representative viewpoints have been selected to comprehensively illustrate and document the visual amenity of the study area. Refer to Figure 13 for the viewpoints locations. The representative viewpoints were selected based upon a three-stage process:

1. Identification within the VEM,
2. Desktop studies identifying places of significance or within close vicinity of potential sensitive receptors, and
3. Ground-truth of viewpoint area through site visit conducted on 12 February 2020.

In the proceeding pages, the representative viewpoints have been analysed to document the existing visual composition of the views and assess the viewpoints level of sensitivity



Viewpoint 1 - Austral Bricks, Horsley Park

Baseline description

A representative view from the boundary of the Austral Masonry Horsely Park display centre off Walgrove Road.

The view is directed north-west towards the Westlink M7 corridor where screening vegetation is located on the motorway embankments.

The view looks out across an open, low-lying grassed natural basin that often experiences surface ponding during, or after, a period of rainfall. Large trucks and construction machinery utilise the local road regularly.

Mature vegetation creates an ‘avenued’ local road corridor that connects the site entrance to surrounding industrial sites and obstructs views towards the proposal.

Sensitivity

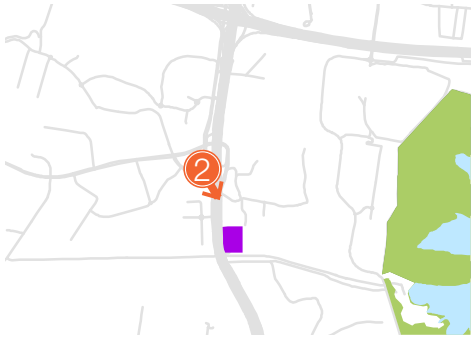
The sensitivity of the representative viewpoint is judged to be **Low** due to the following;

- The commercial focused nature of the visitors experiencing the view.
- The inward facing nature of the views from the industrial buildings with limited opportunities or focus on the surrounding environment.
- The contained nature of the view.

Night time environmental zone

The viewpoint is considered to be within a E2: Low district brightness zone (**Moderate** sensitivity).

This zone is situated adjacent to the M7, which is considered to be within an *E3: Medium district brightness zone* due to the highway lighting columns, cycle path lighting and lighting from vehicles in the evening.



Viewpoint 2 - Corner of Mini Link Rd and Wallgrove Rd

Baseline description

A representative view from the edge of an industrial character area and associated warehouses situated on Mini Link Road off Wallgrove Road.

View south-east towards the Westlink M7 corridor with road-side buffer vegetation screening views along the embankment. The foreground of the view is dominated by a large intersection and associated infrastructure.

Screening vegetation, the M7 elevated on-ramp and the road corridor infrastructure block direct views towards the proposal.

Sensitivity

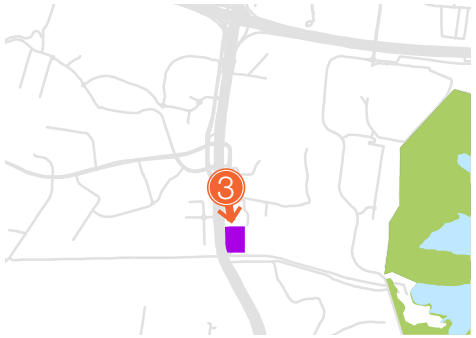
The sensitivity of the representative viewpoint is judged to be **Low** due to the following;

- Current view includes existing major road infrastructure
- The inward facing nature of the views from the industrial buildings with limited opportunities or focus on the surrounding environment.

Night time environmental zone

The viewpoint is considered to be within a E3: Medium district brightness zone (**Low** sensitivity).

This zone is dominated by existing lighting infrastructure seen in the foreground and background of the view.



Viewpoint 3 - Shared path - adjacent to Westlink M7

Baseline description

Parklands and mature vegetation dominate the fore, middle and back ground of the view. Industrial warehouse buildings are nestled in amongst the existing vegetation.

The transmission easement acts as a vertical visual cue rising from the dense vegetated backdrop. Lighting poles, including both the highway and shared path lighting columns, create a guiding line of sight along the corridors (towards the south) and is visible in the right of the viewpoint.

Major road corridors, separated by a concrete median and noise wall dominate the middle and the right side of the viewpoint. The landfill site (Global Renewables) located directly adjacent to the site boundary (left side of the view) is almost entirely concealed by the screening vegetation in the foreground of the picture.

Sensitivity

The sensitivity of the representative viewpoint is judged to be **Moderate** due to the following;

- View represents pedestrians and cyclist users with a transient interest in the surrounding environment.
- Current view includes existing major road infrastructure.

Night time environmental zone

The viewpoint is considered to be within a E3: Medium district brightness zone (**Low** sensitivity) due to the highway lighting columns, cycle path lighting, traffic lights and lights from vehicles in the evening, however the representative viewpoint illustrates a view across an *E2: Low district brightness zone.* Overall, *E3: Medium district brightness* is considered to influence/ determine the sensitivity of the viewpoint and category of the environmental zone.

Viewpoint 4 - Old Walgrove Road, Eastern Creek

Baseline description

A representative view looking east from Old Walgrove Road across a designated transmission easement reserve.

The natural rise in terrain blocks expansive views across the landscape. Mature trees and vegetation are experienced on the north and south side of the view (left and right side of the view). Low impact industrial infrastructure, such as chain fencing and signs is contained within the view.

Sensitivity

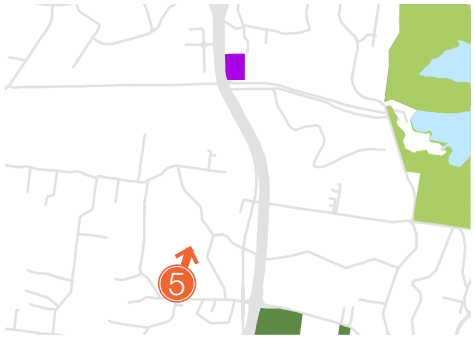
The sensitivity of the representative viewpoint is judged to be **Low** due to the following;

- Current view includes existing industrial infrastructure.
- Low amount of users anticipated to experience the view.
- Minimal focus on the surrounding environment and visual amenity.

Night time environmental zone

The viewpoint is considered to be within a E3: Medium district brightness zone (**Low** sensitivity).

This zone is in a rural setting with road-side lighting columns dispersed in regular intervals.



Viewpoint 5 - Horsley Park Reserve

Baseline description

A representative view from Horsley Park reserve and local town centre looking north east towards the proposal.

View across low lying, flat sports fields towards softly undulating agricultural plains. The topography slopes and views are opened up to reveal dense patches of vegetation as a backdrop. A transmission pylon is located in the foreground and create vertical visual cues as the structures continue towards the horizon at regular intervals.

Sports field and agricultural infrastructure such as fencing, lighting columns and signage are experienced within the view, obstructing expansive views across the landscape in combination with the patches of mature vegetation.

A row of mature trees are experienced along the fence line and boundary of the sports field and dominate within the foreground of the view.

Sensitivity

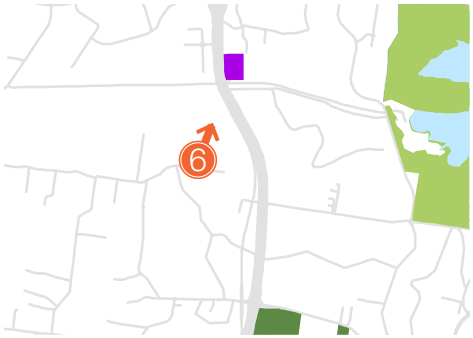
The sensitivity of the representative viewpoint is judged to be **Moderate** due to the following;

- Location within a local park reserve and close proximity to the local town centre.
- The scenic amenity experienced and recreational value of the reserve.
- The presence of powerlines and transmission pylons in the view

Night time environmental zone

The viewpoint is considered to be within a E2: Low district brightness zone (**Moderate** sensitivity).

This is due to the rural setting of the reserve including standard lighting columns in the adjacent parking lot.



Viewpoint 6 - Burley Road, Horsley Park

Baseline description

A representative view from rural residential properties along Burley Road, Horsley Park, looking north east towards the proposal.

View marked by low density residential properties scattered across the undulating agricultural fields experienced in the middle-ground and background of the view.

Transmission lines and pylons are located above the visual horizon line. The views open up across expansive agricultural fields and vegetated drainage channels looking directly north-east.

Sensitivity

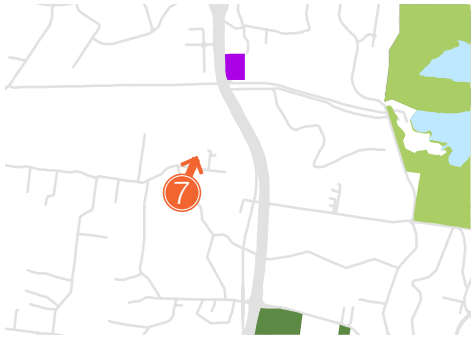
The sensitivity of the representative viewpoint is judged to be **Moderate** due to the following;

- Representative view from residential properties with a permanent interest in the surrounding environment.
- The presence of infrastructure, including transmission lines and powerlines.

Night time environmental zone

The viewpoint is considered to be within a E2: Low district brightness zone (**Moderate** sensitivity).

This zone is in a rural setting with road-side lighting columns dispersed sparingly and lighting associated with surrounding residential properties.



Viewpoint 7 - Walworth Road, Horsley Park

Baseline description

A representative view from rural residential properties along Walworth Road, Horsley Park, looking north east towards the proposal.

A view from an elevated location with expansive views across the agricultural landscape and dense patches of open forest. Established road-side, vegetation, screening residential properties, obstructs direct views across the plains (left side of the view).

Low density rural buildings and sheds break up the landscape matrix. Industrial buildings and transmission easements are visible in the distance.

Sensitivity

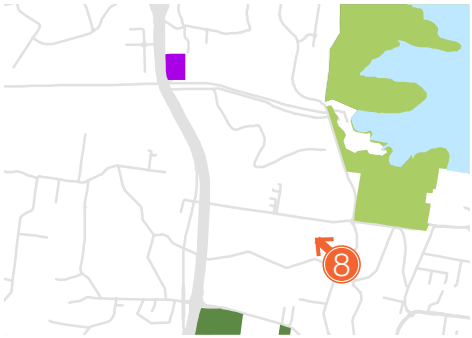
The sensitivity of the representative viewpoint is judged to be **Moderate** due to the following;

- Expansive and panoramic nature of the view.
- Representative view from residential properties with a permanent interest in the surrounding environment.
- The presence of infrastructure, including transmission lines and powerlines.

Night time environmental zone

The viewpoint is considered to be within a E2: Low district brightness zone (**Moderate** sensitivity).

This zone is in a rural setting with road-side lighting columns dispersed sparingly and lighting associated with residential properties.



Viewpoint 8 - Ferrers Rd, Lams Farm Fresh

Baseline description

A representative view from Ferrers Road looking north-west towards Lam's Farm Fresh.

A view experienced from an elevated road-side position with expansive views across the Western Sydney Parklands and industrial land uses with the Blue Mountains providing a backdrop. Dense, mature patches of vegetation define the view with industrial infrastructure, such as transmission easements and water towers, punctuating the flat, expansive view.

The entrance to Lam's Farm Fresh defines the right-side of the view and includes low density warehouse buildings directly adjacent to the roadside corridor seen in the foreground.

Sensitivity

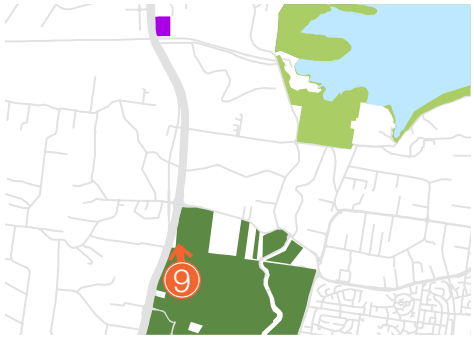
The sensitivity of the representative viewpoint is judged to be **Moderate** due to the following;

- Expansive and panoramic nature of the view with views towards the Blue Mountains.
- Viewpoint located within the designated Western Sydney Parklands.
- The presence of infrastructure, including transmission lines and powerlines.

Night time environmental zone

The viewpoint is considered to be within a E2: Low district brightness zone (**Moderate** sensitivity).

This zone is in a rural setting with road-side lighting columns dispersed sparingly and lighting associated with residential properties. The view looks out towards areas of forest that are considered *E1: Intrinsically dark landscape* (high sensitivity) however, this is not considered to affect the environmental zone category for this viewpoint location.



Viewpoint 9 - Sydney International Equestrian Centre

Baseline description

A representative view from the Sydney International Equestrian Centre looking north towards the proposal.

The view looks out over one of the main arenas located within the equestrian centre. The arena is enclosed by mature trees surrounding the perimeter of the site and within the greater parkland extents.

Infrastructure and buildings are of a similar nature to the character of the sporting/event site and location of the viewpoint.

Sensitivity

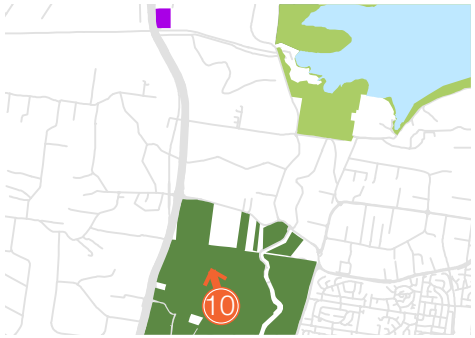
The sensitivity of the representative viewpoint is judged to be **Moderate** due to the following;

- Viewpoint located within the designated Western Sydney Parklands.
- Designated viewpoint area, promoted as a regional tourist destination
- Influx of people at one time due to the destination value of the area.

Night time environmental zone

The viewpoint is considered to be within a E2: Low district brightness zone (**Moderate** sensitivity).

This zone is in a rural setting with lighting columns associated with the sporting uses of the location and concentrated during periods of events or night-time use of the equestrian grounds.



Viewpoint 10 - Moonrise Lookout

Baseline description

A representative view from Moonrise Lookout located along Border Road looking north-west towards the proposal.

A view from a recreational trail within the Western Sydney Parklands – approximately 430m from Moonlight Lookout carpark, passing Ginger Meggs Memorial. The view is experienced from an elevated position, looking out across dense patches of open forest.

Flat, white industrial warehouses can be viewed in the distance (to the left of the view). Dry sclerophyll vegetation in the foreground defines the left edge of the view obstructing the continuous expansive views containing the view in the foreground. Infrastructure, such as powerlines, adjacent to the viewpoint is of a recessive nature and is congruous with the recreational character.

Sensitivity

The sensitivity of the representative viewpoint is judged to be **High** due to the following;

- Expansive and panoramic nature of the view with views towards the Blue Mountains.
- Viewpoint located within the designated Western Sydney Parklands.
- Situated within Western Sydney Regional Park.

Night time environmental zone

The viewpoint is considered to be within a E1: Intrinsically dark brightness area (**High** sensitivity).

This zone is in a highly rural setting with minimal to no lighting provided in, or in close proximity to this viewpoint location. The view looks out towards additional areas of forest that are also considered to be catergorised as *E1: Intrinsically dark landscape* (high sensitivity).

Viewpoint 11 - Prospect Reservoir

Baseline description

A representative view from the edge of Prospect Reservoir looking directly west.

A high quality, expansive view across the Prospect Reservoir towards the densely vegetated embankments on the western side of the water body (Prospect Reserve). The recreational site encompasses a certain degree of formality with designed monuments, avenue planting (date palms) and heritage structures.

The terrain is flat with open views across the landscape with the exception of mature trees and shrubs located within the adjoining recreational park and reservoir embankments.

Sensitivity

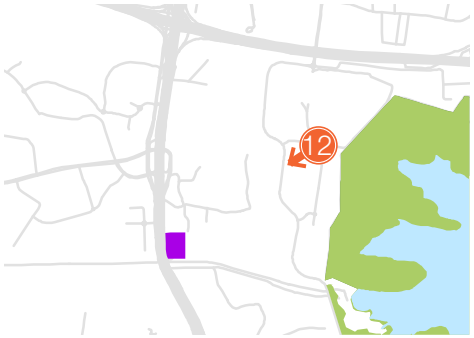
The sensitivity of the representative viewpoint is judged to be **High** due to the following;

- Situated within a State Heritage location.
- Proximity to protected Prospect Reserve.
- The scenic amenity experienced and recreational value of the area.

Night time environmental zone

The viewpoint is considered to be within a E1: Intrinsically dark landscape (**High** sensitivity).

This zone is in a rural setting with restricted access to the public. Existing lighting columns are associated with low-level security purposes on entrance to the reservoir. The view looks out towards Prospect Nature Reserve which is also considered to be within an *E1: Intrinsically dark landscape* (high sensitivity).



Viewpoint 12 - Sydney Motorsport Park

Baseline description

A representative view within the Sydney Motorsport Park looking south-west.

A view experienced from the boundary and main entrance to the motorsport park looking towards private industrial land uses. Views are contained by the rising earth mounds however open up as the view pans towards the north (right of the view) expanding across vegetation, industrial warehouses, flat, agricultural plains and the Blue Mountains in the distance. Motorsport associated infrastructure dominates the foreground.

Sensitivity

The sensitivity of the representative viewpoint is judged to be **Moderate** due to the following;

- Visitors experiencing the view have primary interest in the sporting activity.
- Viewpoint located within the designated Western Sydney Parklands.
- Expansive and panoramic portion of the view with views towards the Blue Mountains.

Night time environmental zone

The viewpoint is considered to be within a E3: Medium district brightness area (**Low** sensitivity).

This zone is in a rural setting with lighting columns associated with the sporting uses of the location and concentrated during periods of events or night-time use of the motorsport grounds.

Viewpoint 13 - Sydney Zoo

Baseline description

A representative view from the entrance to the Sydney Zoo looking south-west.

The view looks out towards the low-lying carpark, signalised road intersection (Great Western Highway and Rudders Rd) and the adjoining Eastern Creek industrial estate. The carpark is characterised by large, flat areas of asphalt and road markings, areas of median planting at regular intervals and low impact carpark associated infrastructure such as bollard and signage.

The terrain is flat across the entire view with only mature trees (left of the view) and lighting columns and telephone poles creating vertical visual cues in the background.

Sensitivity

The sensitivity of the representative viewpoint is judged to be **Moderate** due to the following;

- Designated viewpoint area, promoted as a regional tourist destination
- Location within the Western Sydney Parklands
- Influx of people at one time due to the destination value of the area, however with a primary interest in their destination as opposed to the surrounding commercial and industrial environment.

Night time environmental zone

The viewpoint is considered to be within a E3: Medium district brightness zone (**Low** sensitivity).

This zone is dominated by existing lighting infrastructure seen in the view associated with the road corridor intersection including street lighting columns, traffic signals, industrial building lighting and headlights from vehicles in the evening.

Viewpoint 14 - Bungarribee Homestead Park

Baseline description

A representative view from the Bungarribee Homestead Park looking south west.

The view looks out across a flat turfed landscape towards medium density residential properties. The views open (to the right of the view) and expand across dense vegetation patches and Eastern Creek. The view incorporates Exercise Workout park situated on a lower grade then the viewpoint location.

Particular vertical structures in the distance, such as the Minchinbury water tower and pylons, are visible elements that extend above the vegetation.

Sensitivity

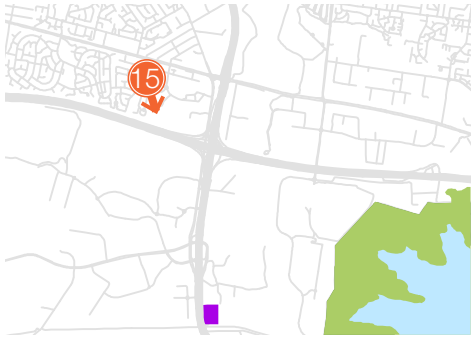
The sensitivity of the representative viewpoint is judged to be **Moderate** due to the following;

- The scenic amenity experienced and recreational value of the area.
- Representative view from residential properties with a permanent interest in the surrounding environment.

Night time environmental zone

The viewpoint is considered to be within a E2: Low district brightness area (**Moderate** sensitivity).

This zone is in a local park within a residential estate therefore, lighting consists of standard street lighting columns dispersed at regular intervals. The viewpoint looks towards areas of dense vegetation within the WSP and industrial estates. These areas are categorised as both *E1: Intrinsically dark landscape* (high sensitivity) and *E3: Medium district brightness zone* however, this is not considered to affect the environmental zone category for this viewpoint location.



Viewpoint 15 - Pinegrove Memorial Park

Baseline description

A representative view from the Pinegrove Memorial Park and edge of residential properties looking south-east.

The view is experienced from the north-west corner of the Pinegrove Memorial Park and is characterised by a local ring road, open areas of grass and turf, the combination of formal planting and mature vegetation and headstones/grave markers. Industrial warehouses are visible nestled amongst dense vegetation.

Sensitivity

The sensitivity of the representative viewpoint is judged to be **Moderate** due to the following;

- Destination value and sensitive nature of the viewpoint location.
- Representative view from residential properties with a permanent interest in the surrounding environment

Night time environmental zone

The viewpoint is considered to be within a E2: Low district brightness area (**Moderate** sensitivity).

This zone is in an urban park setting. Existing lighting columns are associated with security purposes on entrance to the memorial and are dispersed along the internal local roads in regular intervals. The zone is located adjacent to a residential area categorised as *E3: Medium district brightness area* (low sensitivity) however, this is not considered to affect the environmental zone category for this viewpoint location.

06

Proposal

Approach

The approach to architectural and landscape design is driven by the concept of integrating the proposed facility thoughtfully into the local and district wide context. The building is expressed as a series of vertical layers, which gradually rise from the landscape, mediating between the built form and the human scale.

The architecture is articulated through a series of key moves which inform every part of the design, these include:

1. Careful manipulation of the location, orientation and form of the building to mitigate visual impact and embed it in the landscape

2. Breaking down the physical bulk of the building through the deconstruction of the form. This creates a 'village' of smaller masses, each of which display a unique materiality which

3. The building is not conceived as an icon in any way, rather an extension of the landscape. Sensitive use of materials which are grounded in the local context. This includes the use of green walls, neutral colours and ethereal, veil-like materials to further blur the form and allow elements to 'blend' into the sky. The taller elements are designed to subtly reflect the changing weather and sky conditions, changing with the time of day and seasons.

4. Cleaning up and improving the biodiversity on a site which was has been historically neglected and contaminated. This includes rainwater collection and reuse, treatment local run-off water treatment through reed-beds, promoting diverse native flora and fauna through new planting strategies and improving local resilience to weather extremes.

5. Providing education through a world-class visitor centre experience and facility tour. The building embraces people, giving a real sense transparency, honesty and openness.

6. At dusk, the use lighting to achieve a dim glow is proposed in localised areas such as the FGT hall. It is expected that any lighting treatments will not be directed at the buildings facades, rather to portray a glow from within the building as a means of communicating occupancy and operation. A detailed approach to lighting will be further developed at the next stage with input from a specialist lighting designer.

Design components:

1. Substation
2. ACCs
3. Stack
4. FGT Hall
5. Boiler Hall
6. Waste Bunker
7. Tipping Hall
8. Rammed Earth Blade Wall
9. Visitor centre

Landscape design response:

A series of landscape design treatments have been developed to integrate the built form and sensitively respond to the landscape context, where possible. These treatments are considered to form part of the design and considered as embedded mitigation measures that have been acknowledged within the landscape and visual assessment process.

1. Arrival/ Gateway/ Wayfinding: the planting design assists with directing users to the Visitor Centre on arrival to the site. This includes mass native grass planting and maintained native grass lawn. The planting celebrates local identity with use of Cumberland Plains protected ecological community.

2. Shrub planting to the sites boundaries to mitigate visual impacts.

3. Green walls - palette to reflect appropriate species for orientation, integrated irrigation and structural design of the wall and attached planting medium.

4. Cumberland Open Woodland Revegetation and/or regeneration areas. To restore plant community the area will require weed removal, tubestock planting, monitoring.

5 Green roof - a native grassland species green roof is proposed to the top of the visitors centre.

6 Revegetation buffer to protect interior of the Cumberland Plain patch. Hardy species to minimse weed risk from visitors visiting the site and traffic entering and exiting.

7 Biorention basin(6a) and on-site detention basin (6b): Macrophytes/Grasses/Sedges introduced to improve water quality and create habitats where possible. Species to reflect local character, and appropriate for predicted water flows. Bioretention basin is a dry basin for most of the time - species with long roots to cater for inundation.

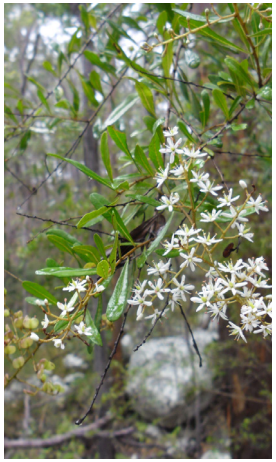
8 Offset revegetation: area for additional Cumberland Plain Woodland species after weed control treatment to area. The overland flow channel will continue to flow through this existing depression, planted with ephemeral grass species.

Indicative planting palette

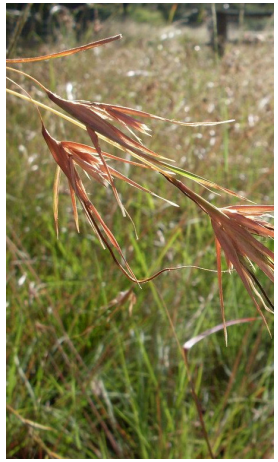
CUMBERLAND PLAIN OPEN WOODLAND SPECIES	
Eucalyptus moluccana | Grey Box	Tree | Canopy
Eucalyptus tereticornis | Forest Red Gum	Tree | Canopy
Eucalyptus crebra | Narrow-leaved Ironbark	Tree | Canopy
Corymbia maculata | Spotted Gum	Tree | Canopy
Eucalyptus eugenioides | Thin-leaved Stringybark	Tree | Canopy
Bursaria spinosa | Blackthorn	Understorey | Shrub
Themeda australis | Kangaroo Grass	Understorey | Grass
Microlaena stipoides var. stipoides | Weeping Meadow Grass	Understorey | Grass

E. moluccana, *ppnn.org.au*

E. tereticornis, *ppnn.org.au*



B. spinosa, *ppnn.org.au*



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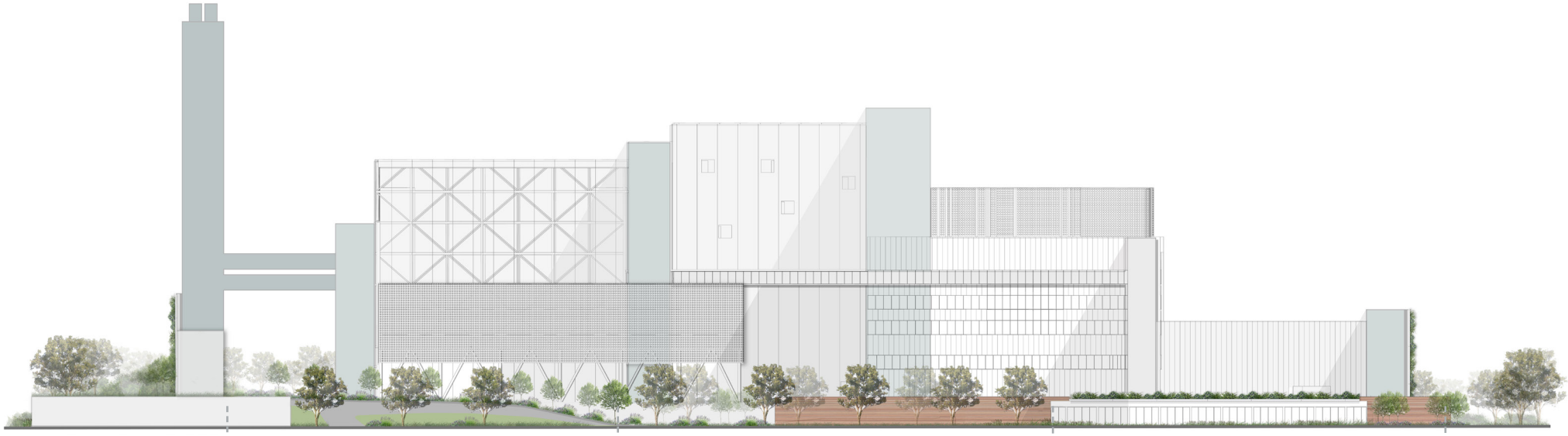

Perimeter screening

Planting mix that reflects the Cumberland woodland character.

Wayfinding

Attractive palette that directs users to the visitor centre.

Gateway/Arrival

Formal arrival and entrance framed by avenue trees.

Water Sensitive Urban Design

Planting to the biorention basin in front of the visitor centre. Species to improve water quality, including ephemeral and macrophyte species that can withstand submerged periods of time.

0 5 10 20m

07

Impact assessment

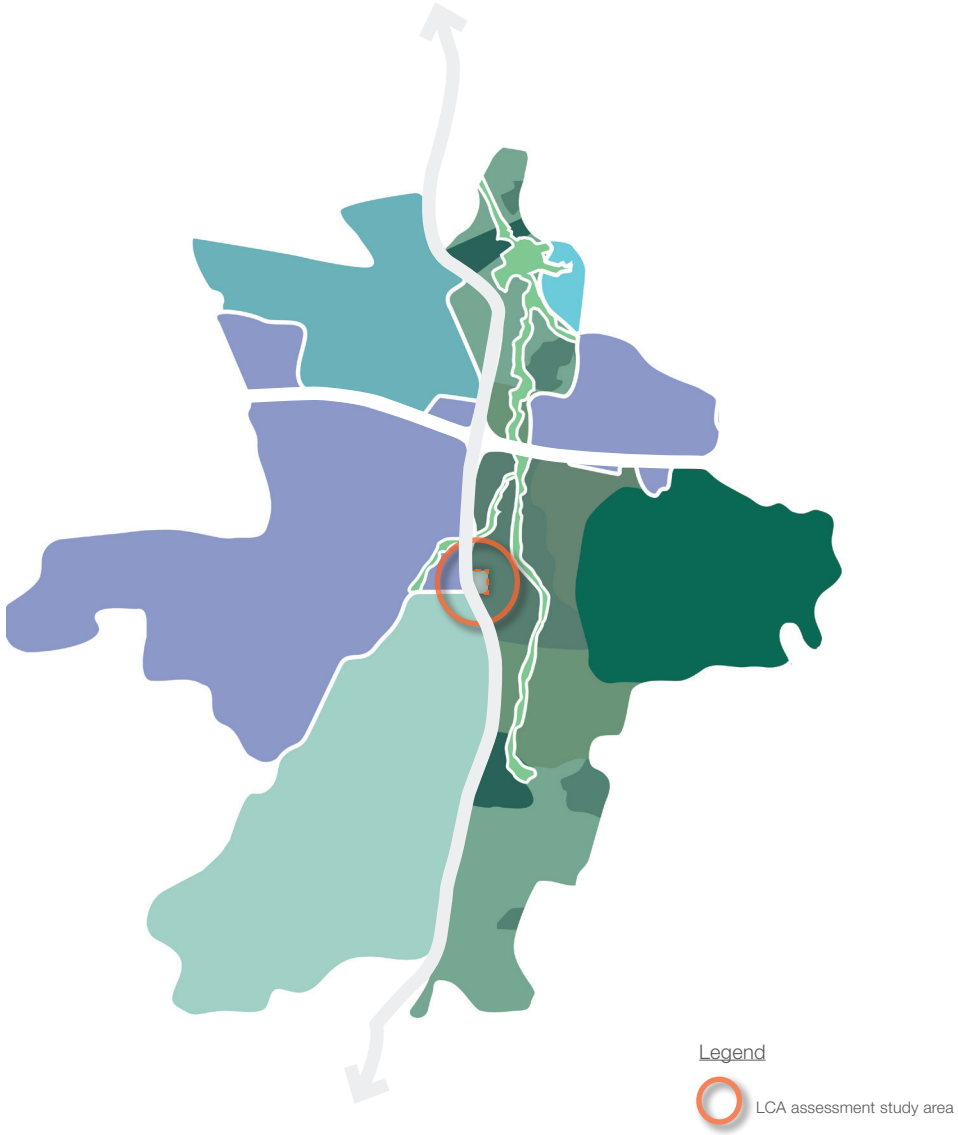

FIGURE 14 LANDSCAPE CHARACTER AREAS

Landscape assessment

This section documents the sensitivity of each LCA, the components that have the potential to change or influence the landscape (magnitude of change) and the potential impacts that may arise on the LCAs.

Two LCAs present in the wider area are not directly intersected by the proposal, including;

- LCA 4: Minchinbury local community
- LCA 5: Bungarribee local community

Sub-character areas present in the wider area which are not directly intersected by the proposal, include:

- LCA 1B: Motorsport park
- LCA 1C: Prospect Reservoir
- LCA 1E: Active recreation
- LCA 1F: Sports facilities
- LCA 1G: Prospect Reservoir

Potential impacts arising within these LCAs are considered to be of a visual nature and have been assessed within the visual assessment section of this report. For the purposes of the landscape assessment, these area are not considered further.

Five LCAs that the proposal will directly intersect include:

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

Impacts arising on these LCAs during construction and operation have been assessed.

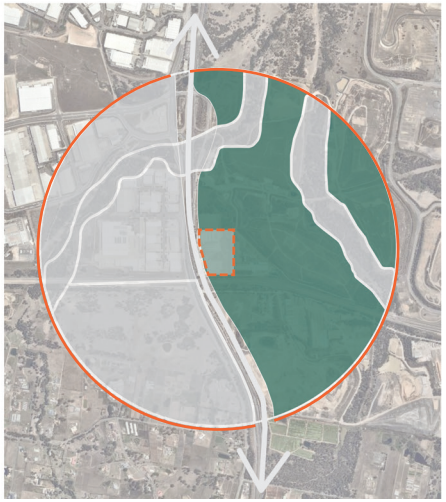

FIGURE 15 LCA 1A: WALLGROVE PRODUCTIVE LANDSCAPE

LCA 1A: Western Sydney Parklands

Wallgrove productive landscape

This LCA is associated with the area located within the WSP boundary and includes the immediate site extents. The character area is divided by LCA 7: *Busk creek corridor* (including Reedy and Eastern Creek).

The Wallgrove productive landscape contains a diverse range of interim land uses, such as landfill, waste recycling, brick making and quarrying. The area comprises of 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 work sites regularly.

The sensitivity of this LCA is judged to be **Low** due to the LCA containing few features of value that could not be replaced.

The magnitude of change to the Wallgrove productive LCA, are assessed during the construction and operational phase.

Construction phase

The magnitude of change is considered to be **Moderate** due to the following:

- Partial loss of existing character and features, specifically the mature vegetation that contributes to the parkland edge
- Introduction of construction phase related items, such as sites workshops, laydown areas and maintenance equipment
- Gradual replacement of the existing warehouse and introduction of the energy from waste facility.

The *Low* sensitivity and *Moderate* magnitude of change would result in a **Moderate-Low** landscape impact.

Operational phase

The magnitude of change arising from the proposal is assessed to be **Moderate** due to the following;

- The proposal is considered to be a prominent feature, however it is not considered to be incongruous with the current and adjoining existing uses.
- The facility is considered to result in an incremental increase in the scale of industrial facilities within parkland, including the introduction of a plume rising from the facility.
- Extension to the presence of infrastructure within this LCA.

The *Low* sensitivity and *Moderate* magnitude of change would result in a **Moderate-Low** landscape impact.

Landscape Character Type / Proposal phase	Impact	
Sensitivity	Low	
Magnitude of Change: Construction phase	Moderate	Moderate-Low
Magnitude of Change: Operational phase	Moderate	Moderate-Low

FIGURE 16 LCA 2: POWER + INDUSTRIAL ESTATE

LCA 2: Power and industrial sites

This LCA is associated with the area located to the west of the M7 corridor and the proposed site boundary. The character area is divided by LCA 7: *Busk creek corridor* (including Reedy and Eastern Creek).

The Power and Industrial estate LCA is defined by large, warehouse buildings with wide road corridors and formal planting arrangements such as manicured hedging and avenued streets.

The sensitivity of this LCA is judged to be **Low** due to the LCA containing few features of value.

The magnitude of change to the Power and Industrial estate LCA, are assessed during the construction and operational phase.

Construction phase

The magnitude of change is considered to be **Negligible** due to the following:

- Changes are not anticipated to result in direct physical impacts to this LCA
- Temporary construction related items, such as increased construction phase traffic, are considered to be indirect in nature and not considered to be incongruous with character of this area.

The *Low* sensitivity and *Negligible* magnitude of change would result in a **Negligible** landscape impact.

Operational phase

The magnitude of change arising from the proposal is assessed to be **Negligible** due to the following;

- The proposal is an extension to the presence of productive land-uses in the area, such as the landfill.
- The proposal is considered to result in a prominent feature, however it is not considered to result in a direct change to this LCA or the overall setting.
- Note, changes arising from a visual perspective have been discussed within the visual chapter.

The *Low* sensitivity and *Negligible* magnitude of change would result in a **Negligible** landscape impact.

Landscape Character Type / Proposal phase	Impact	
Sensitivity	Low	
Magnitude of Change: Construction phase	Negligible	Negligible
Magnitude of Change: Operational phase	Negligible	Negligible

FIGURE 17 LCA 3: HORSLEY PARK

LCA 3: Horsley Park rural residential

This LCA is associated with the area located south-west of the site boundary.

The productive and industrial characteristics of the adjoining LCAs to the northern edge indirectly influences the sensitivity of this LCA with consideration given to two aspects. Firstly, the ability for the proposal to absorb additional industrialisation and secondly, the potential for the development to further influence the LCAs rural residential setting.

The sensitivity is judged to be **Moderate** due to the LCA containing commonplace elements with some sense of place.

The magnitude of change to the Horsley Park rural residential LCA, are assessed during the construction and operational phase.

Construction phase

The magnitude of change is considered to be **Low** due to the following:

- The change is not anticipated to result in direct physical impacts to this LCA
- Gradual introduction of elevated components, such as the stack, that would result an in incremental expansion of the industrial characteristics the define the northern edge, influencing the setting of this LCA.

The *Moderate* sensitivity and *Low* magnitude of change would result in a **Moderate-Low** landscape impact.

Operational phase

The magnitude of change arising from the proposal is assessed to be **Low** due to the following;

- The change is not anticipated to result in direct physical impacts to this LCA.
- The introduction of the building, stack and plume which are considered to be an uncharacteristic feature in close proximity to this LCA. The plume is dynamic in its nature and will be perceived differently based on differing micro-climatic factors.

The *Moderate* sensitivity and *Low* magnitude of change would result in a **Moderate-Low** landscape impact.

Landscape Character Type / Proposal phase		Impact
Sensitivity	Moderate	
Magnitude of Change: Construction phase	Low	Moderate-Low
Magnitude of Change: Operational phase	Low	Moderate-Low

FIGURE 18 LCA 6: WESTLINK M7 HIGHWAY

LCA 6: Westlink M7 highway corridor

This LCA is associated with the highway corridor extending in a north-south direction. Adjacent to the proposal, the corridor is bound to the east by commercial builds and to the west, by the proposal site and the parklands.

The highway is characterised by two lanes, traveling both north and south bound, separated by a wide, central, grassed median strip.

The sensitivity of this LCA is judged to be **Low** due to the LCA containing few features of value.

The magnitude of change to the Westlink highway corridor LCA, are assessed during the construction and operational phase.

Construction phase

The magnitude of change is considered to be **Low** due to the following:

- The change is not anticipated to result in direct physical impacts to this LCA
- Gradual introduction of elevated components, such as the stack, that would result in an incremental expansion of the industrial characteristics that define the eastern edge of this LCA.

The *Low* sensitivity and *Low* magnitude of change would result in a **Low** landscape impact.

Operational phase

The magnitude of change arising from the proposal is assessed to be **Low** due to the following;

- The introduction of a plume, which is considered to be an uncharacteristic feature in close proximity to this LCA
- The scale of the facility has the potential to result in a noticeable feature adjacent to this LCA
- The degree to which the entire proposal will be mitigated is limited to the lower levels of the building and areas of proposed green walls.

The *Low* sensitivity and *Low* magnitude of change would result in a **Low** landscape impact.

Landscape Character Type / Proposal phase		Impact
Sensitivity	Low	
Magnitude of Change: Construction phase	Low	Low
Magnitude of Change: Operational phase	Low	Low

FIGURE 19 LCA 7: BUSH CREEK CORRIDOR

LCA 7: Busk creek corridor

This LCA provides necessary habitat to the local flora and fauna however, meanders through the adjoining industrial and commercial areas and is already truncated under the highway corridor.

The sensitivity is judged to be **Moderate** due to the LCA containing commonplace elements with some sense of place and some features that could not be replaced.

The magnitude of change to the Bush creek corridor LCA, are assessed during the construction and operational phase.

Construction phase

The magnitude of change is considered to be **Negligible** due to the following:

- The temporary construction phase related items such as site workshops, lay down areas, refueling areas and equipment maintenance, are limited to the construction area
- The change is not anticipated to result in direct or indirect impacts to this LCA.

The *Moderate* sensitivity and *Negligible* magnitude of change would result in a **Negligible** landscape impact.

Operational phase

The magnitude of change arising from the proposal is assessed to be **Negligible** due to the following;

- The proposal is considered to be of a sufficient distance that does not alter the existing characteristic balance of the LCA.
- Extension to the existing presence of infrastructure within this Landscape Character Area.

The *Moderate* sensitivity and *Negligible* magnitude of change would result in a **Negligible** landscape impact.

Landscape Character Type / Proposal phase	Sensitivity	Impact
	Moderate	
Magnitude of Change: Construction phase	Negligible	Negligible
Magnitude of Change: Operational phase	Negligible	Negligible

Visual assessment

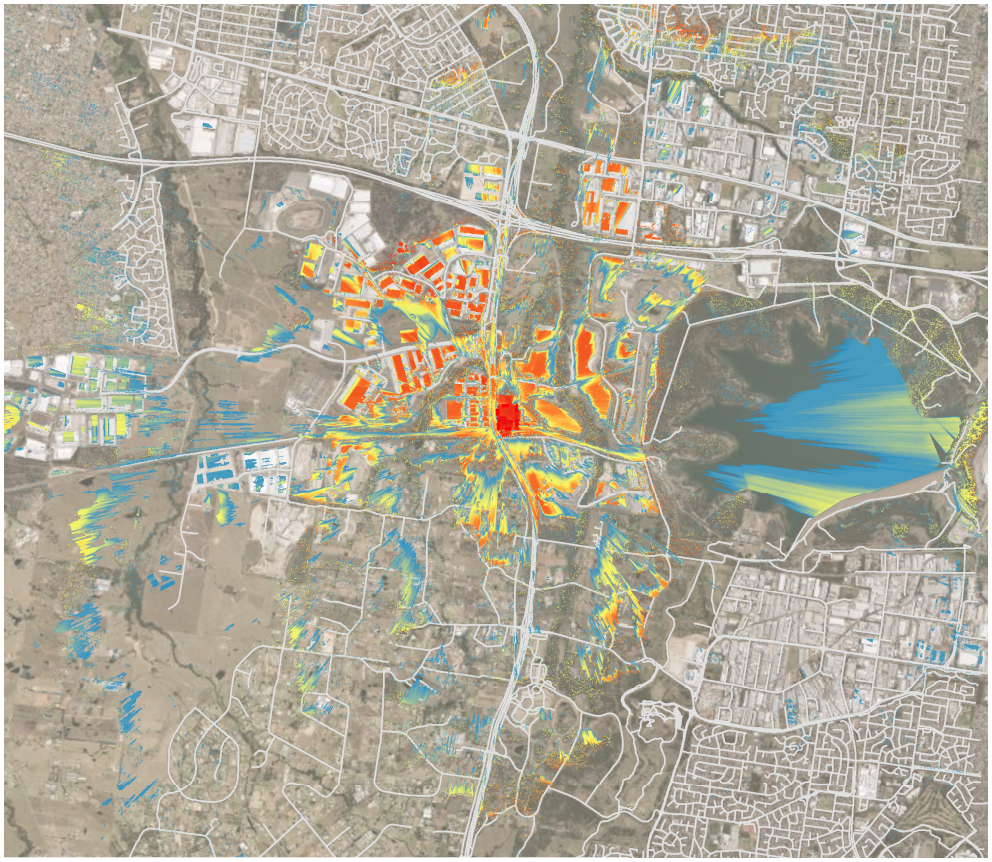

FIGURE 20 VIEWSHED BUILDING EXTENTS

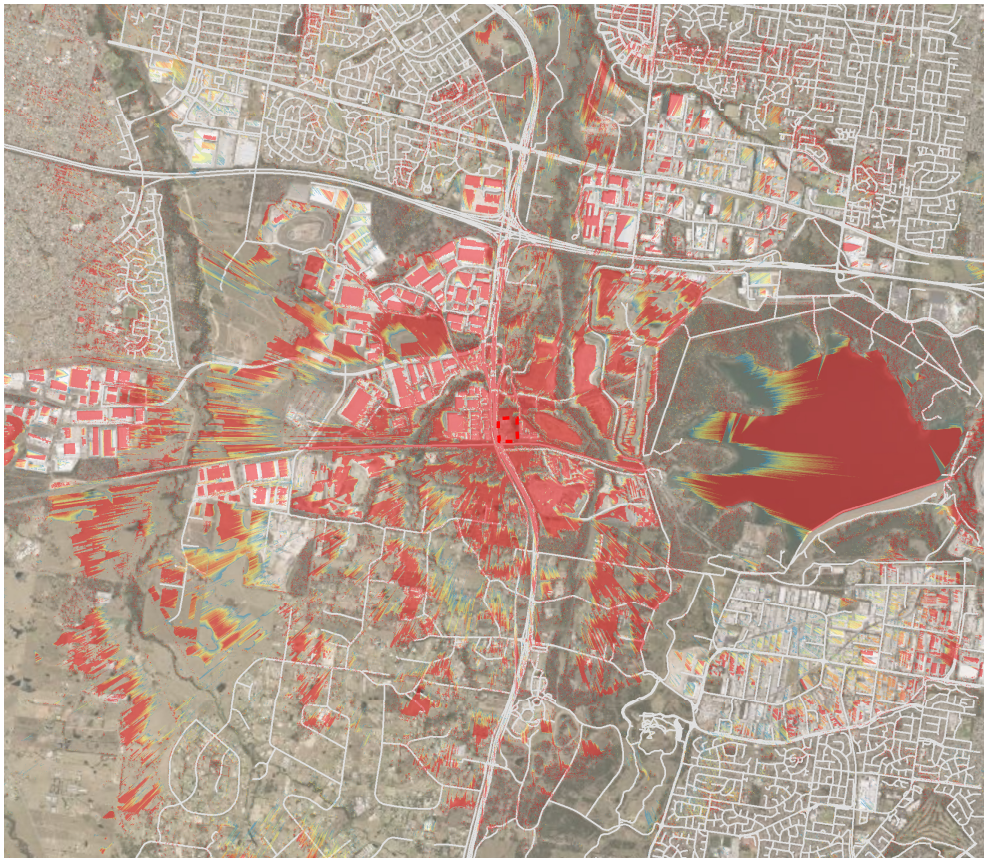

FIGURE 21 VIEWSHED 10M ANALYSIS PLUME VISIBILITY

Viewsheds

Following the VEM that was illustrated in *Visual Context* (refer to page 44), two further viewsheds were developed to assess the visual impacts of both the building footprint (refer to Figure 20) and the extent of visibility of the plume (refer to Figure 21).

Viewshed one, (Figure 20) has been generated from points on the top four corners of the building. Viewshed two (Figure 21) represents a more detailed analysis of visibility of the plume and has been generated using visibility points at 10m intervals above the stack to a height of 100m. This analysis has informed the visual impacts arising from the plume for each of the representative viewpoints.

As mentioned in Chapter 01: *Introduction* (refer to page 9 under section 'Operations') the plume is anticipated to be visible for the majority of the year with an exception on days where the air is very hot and dry.

Consistent with the baseline analysis, 15 viewpoints have been assessed to represent the potential visual impacts that may arise as a result of the proposal.

Viewsheds, from each individual viewpoints, have been generated to inform the analysis for the key infrastructure elements associated with the proposal (refer to Figures 23-53). This includes a viewshed with and without vegetation incorporated into the DTM model to capture the permeable nature of vegetation and the seasonal changes that may occur.

The viewpoints are illustrated on the proceeding pages and are accompanied by a description of the design components that have the potential to change the existing visual composition (magnitude of change) and the potential impacts that may arise.

A more detailed analysis of the individual viewsheds is also provided along with the embedded design mitigation strategies included within the design proposal.

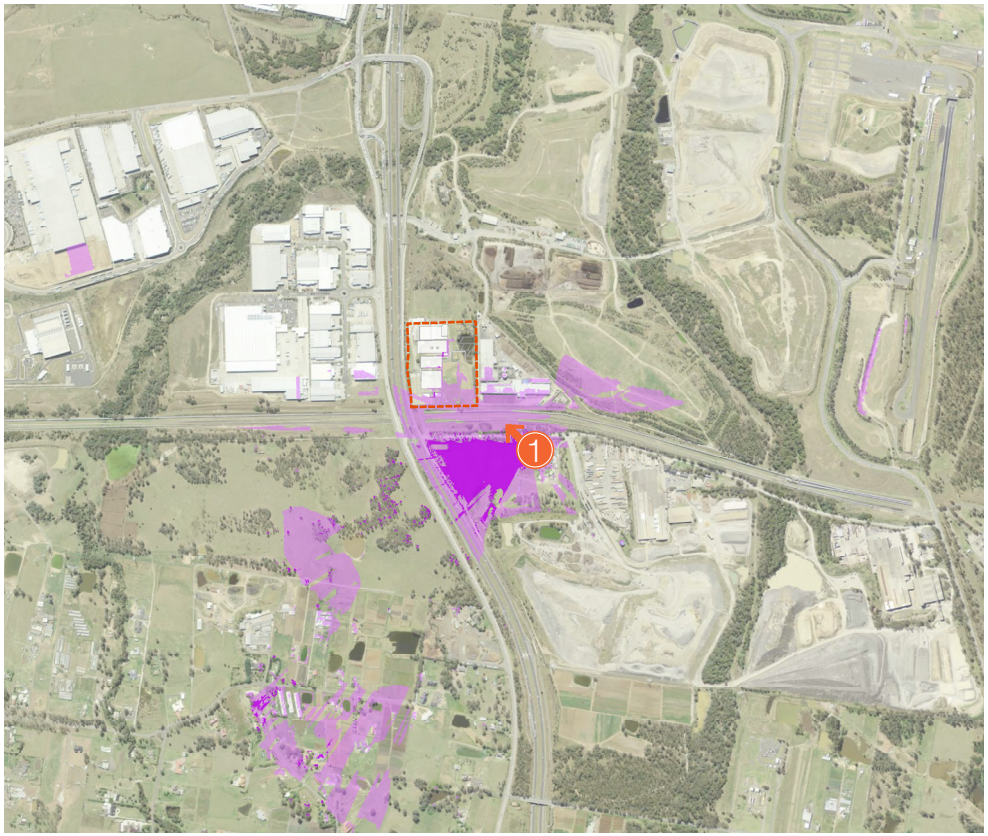

FIGURE 22 VIEWPOINT 1 VIEWSHED

Viewpoint 1 Austral Bricks

Magnitude of change

The representative viewpoint from the boundary of the Austral Masonry Horsely Park display centre is situated approximately 200m from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **Low** due to:

- The anticipated visibility of the stack and the southern face of the blade design that has been incorporated to support the design of the stack
- The stack would be a perceptible feature above the existing, mature vegetation
- The plume would introduce a degree of contrast against the dense vegetation, extending up to 100m above the stack.

Visual Impact

Day time operation

The *Low* sensitivity and *Low* magnitude of change is judged to result in a **Low** impact during operation.

Night time operation

The proposal will result in a *Low* magnitude of change in relation to night time light emittance. The E2: Low district brightness area (*Moderate* sensitivity) and *Low* magnitude night time change would result in a **Moderate-Low** night time impact.

Construction

Views are anticipated to be achievable towards mobile cranes during the construction and installation of the 80m stack and the two weighbridges. Depending on final design, a larger crawler crane may be required for some elements. For the purposes of gaining overall stability, erection and stabilising the stack structure cannot be completed within single working day and out-of-hours construction may be required.

The construction phase impacts are assessed to be of a temporary nature and resulting in a *Low* magnitude of change and a **Low** impact.

FIGURE 23 VIEWPOINT 1 VIEWSHED EMBEDDED MITIGATION

0 10 20m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Embedded design mitigation

Views towards the stack will require visual screening and embedded mitigation techniques.

Embedded mitigation:

- Integrated design of the stack and blade wall to mitigate visual impact where possible
- Careful selection of colour and material to allow the stack to appear recessive above the skyline. Incorporation of green wall to the southern extent
- Ensure limited light spill to stack through careful location of lighting columns.

Visual		Impact
Sensitivity	Low	
Magnitude of Change: Construction phase	Low	Low
Magnitude of Change: Operational phase	Low	Low

Visual - lighting	Sensitivity	Impact
Sensitivity	E2: Low district brightness	
Magnitude of Change: Operation phase	Low	Moderate-Low

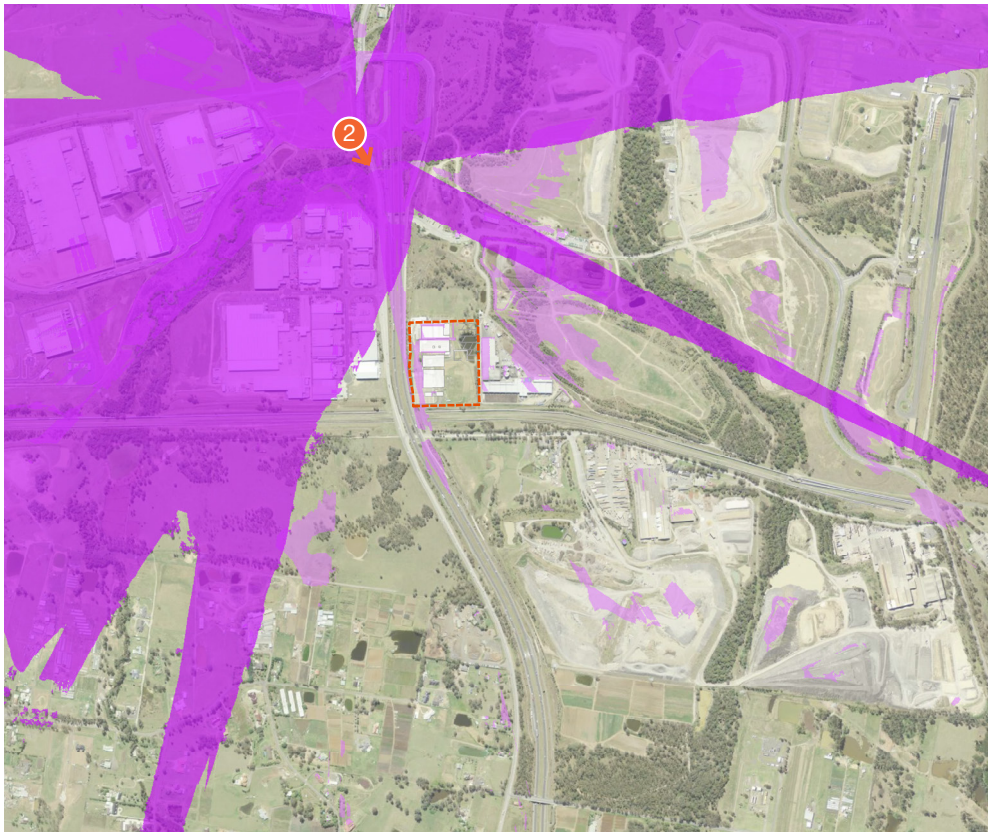

FIGURE 24 VIEWPOINT 2 VIEWSHED

Viewpoint 2 Corner of Mini Link Rd and Wallgrove Rd

Magnitude of change

The representative viewpoint from the boundary of the Austral Masonry Horsely Park display centre is situated approximately 600m from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **Low** due to:

- The northern and western building facade would be perceptible through roadside vegetation but not alter the overall balance of features and elements that comprise the existing view.
- The plume is anticipated to be visible above vegetation from the viewpoint location.

Visual Impact

Day time operation

The *Low* sensitivity and *Low* magnitude of change is judged to result in a **Low** impact during operation.

Night time operation

The proposal will result in a *Negligible* magnitude of change in relation to night time light emittance. The E3: medium district brightness area (*low* sensitivity) and *Negligible* magnitude night time change would result in a **Negligible** impact in night time views.

Construction

During construction, views towards the cranes and waste bunker hall may be experienced. The construction phase impacts are assessed to be of a temporary nature and consistent with the operational phase impacts, resulting in a *Low* magnitude of change and a **Low** impact during construction.

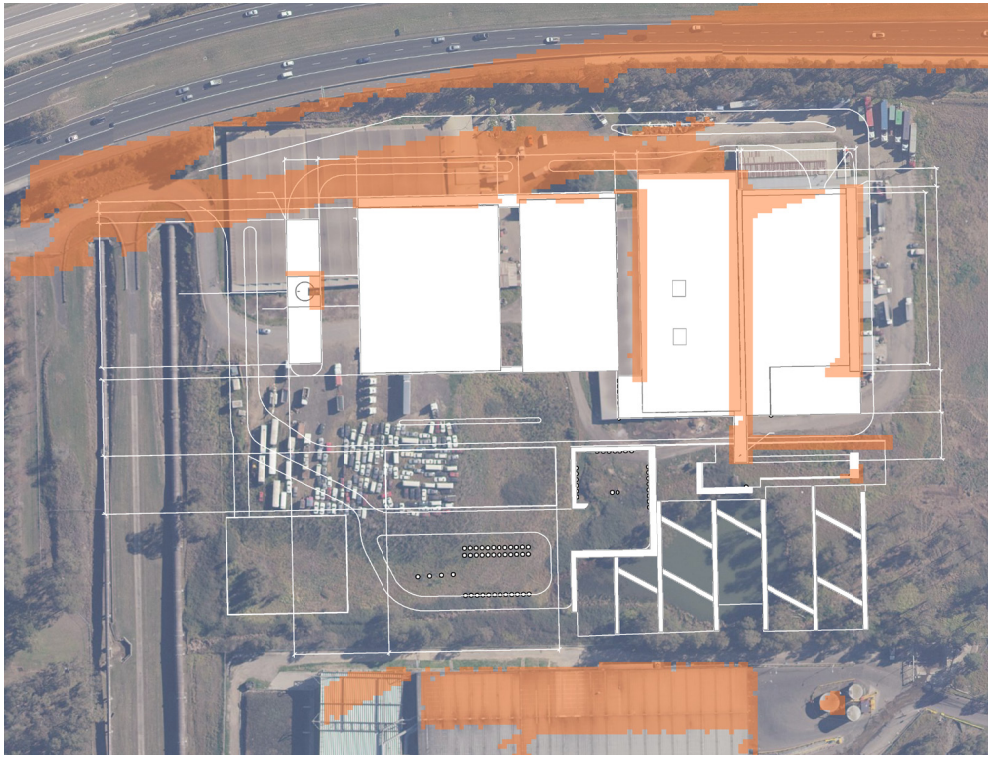

FIGURE 25 VIEWPOINT 2 VIEWSHED EMBEDDED MITIGATION

0 10 20m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Embedded design mitigation

Mitigation measures that have been embedded in the design development to mitigate impacts from this location.

Embedded mitigation:

- The incorporation of a green wall to the northern extent, blending the proposal into the vegetation
- Ensure limited light spill to stack through careful location of lighting columns
- Provide perimeter planting to screen views into the site.

Visual	Impact
Sensitivity	Low
Magnitude of Change: Construction phase	Low
Magnitude of Change: Operational phase	Low

Visual - lighting	Impact
Sensitivity	E3: Medium district brightness
Magnitude of Change: Operation phase	Negligible

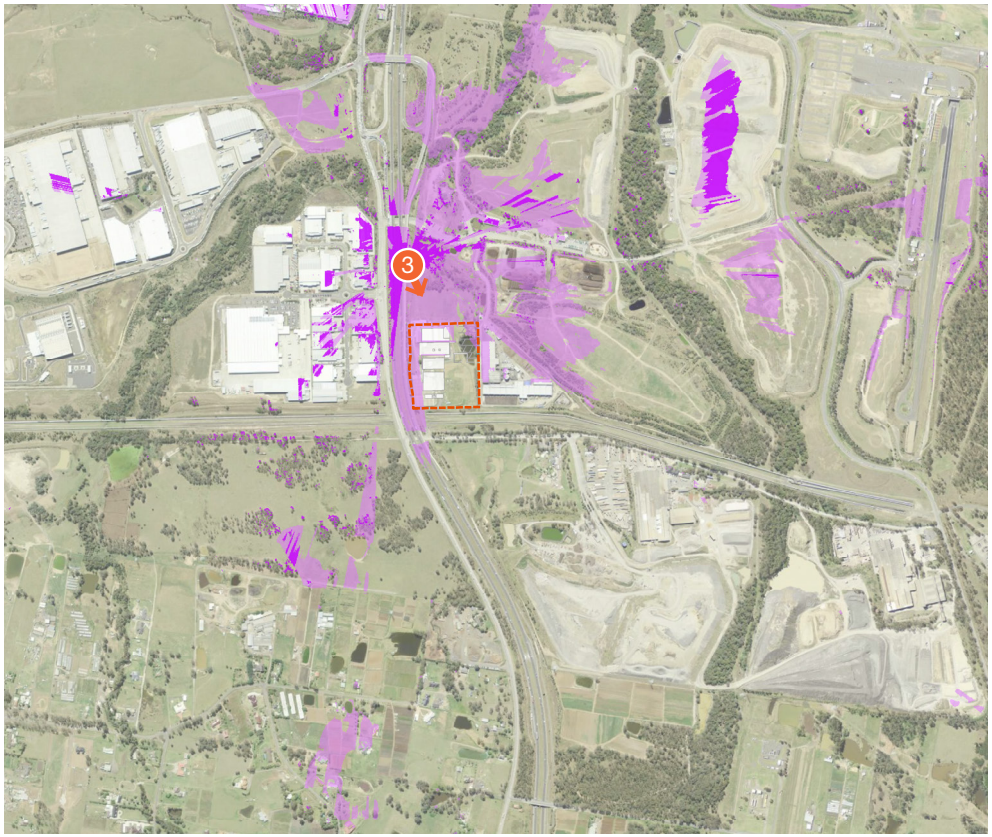

FIGURE 26 VIEWSHED

0 200 400m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Viewpoint 3 Shared cycle path - adjacent to Westlink M7

Magnitude of change

The representative viewpoint from the shared cycle path adjacent to the WestLink M7 highway corridor is looking directly towards the site boundary and is approximately 200m from the proposal perimetre.

The magnitude of change arising from this proposal is considered to be **High** due to:

- The large scale and high contrast of the proposal in comparison to the existing buildings seen on site from the view. The planting proposed as part of the landscape design response (page 68) will aim to improve the appearance and overall condition of the site, however, the scale of the proposal would be in contrast to the scale of the existing building on site.
- The proposal would become the dominant feature of the view
- The anticipated visibility of the plume from this view which would introduce a degree of contrast against the dense vegetation that obstructs direct views towards the proposal
- The planting proposed as part of the landscape design response (page 68) will aim to improve the appearance and overall condition of the site, however, the scale of the proposal would be in contrast to the scale of the existing building on site.

Visual Impact

Day time operation

The *Moderate* sensitivity and *High* magnitude of change is judged to result in a **High-Moderate** impact during operation.

Night time operation

The proposal will result in a *Moderate* magnitude of change in relation to night time light emittance. The E3: Medium district brightness area (*Low* sensitivity) and *Moderate* magnitude night time change would result in a **Moderate-Low** impact.

Construction

During construction, the source and nature of the effect will change. Views are anticipated towards the northern area of the site designated for site compounds, initial construction laydown and hardstand areas. The construction phase impacts are assessed to be of a temporary nature and consistent with the operational phase impacts, resulting in a *High* magnitude of change and a **High-Moderate** impact during construction.

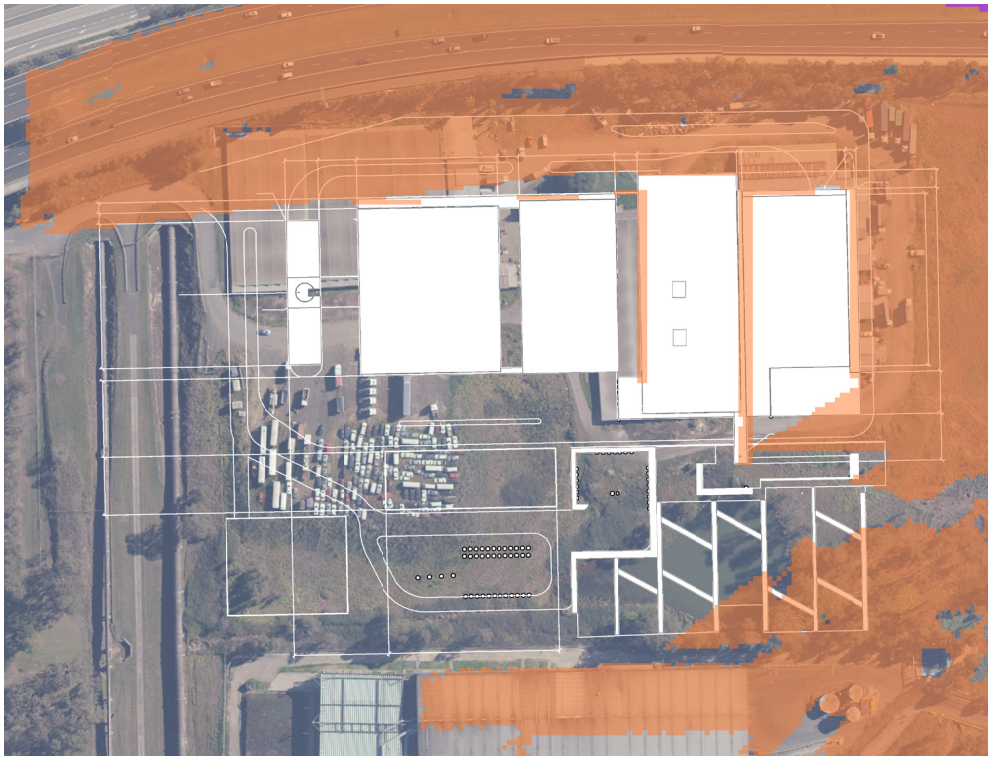

FIGURE 27 VIEWPOINT 3 VIEWSHED EMBEDDED MITIGATION

Embedded design mitigation

Mitigation measures that have been embedded in the design development to mitigate impacts from this location.

Embedded mitigation:

- The incorporation of a green wall to the northern extent, blending the proposal into the vegetation
- Provide perimeter planting to screen views into the site
- Architecture to reduce the bulk and mass of the building by including the 'blades' between the FGT Hall, Boiler Hall and Waste Bunker.

Visual		Impact
Sensitivity	Moderate	
Magnitude of Change: Construction phase	High	High-Moderate
Magnitude of Change: Operational phase	High	High-Moderate

Visual - lighting		Impact
Sensitivity	E3: Medium district brightness	
Magnitude of Change: Operation phase	Moderate	Moderate-Low

Viewpoint 3 Photomontage - With Proposal

Viewpoint 3 Photomontage - With Proposal and outline of stack

Extent of building behind existing vegetation and location of stack to the south of the building.

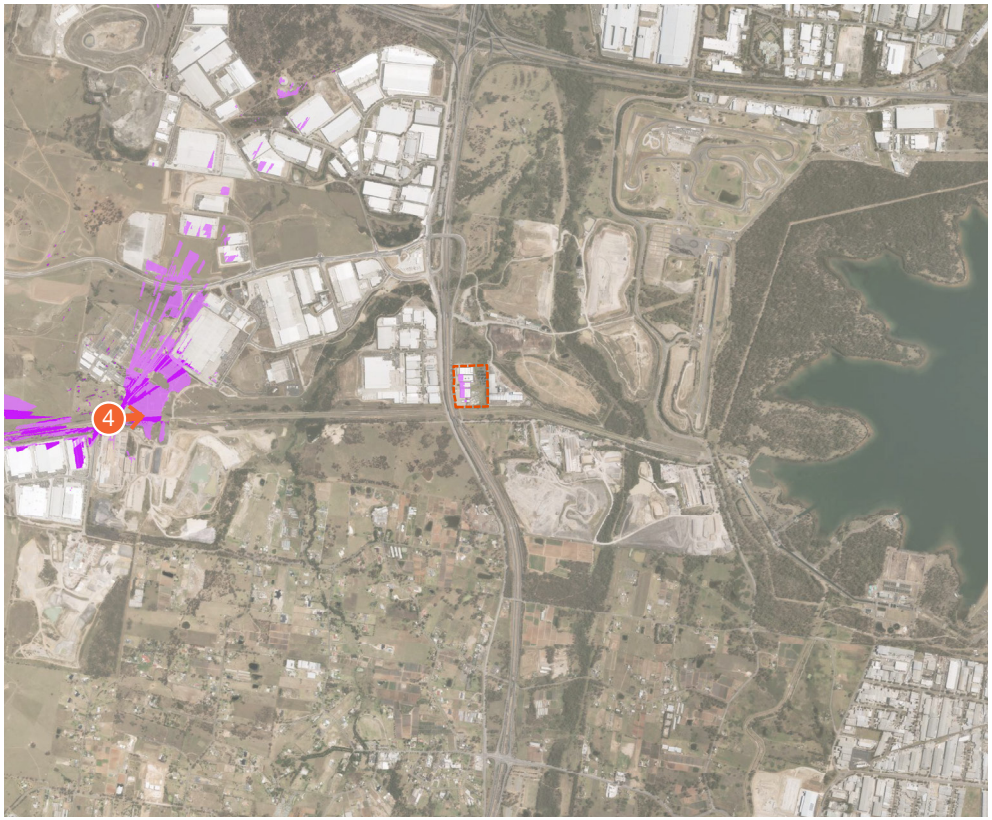

FIGURE 28 VIEWPOINT 4 VIEWSHED

Viewpoint 4 Old Walgrove Road, Eastern Creek

Magnitude of change

The representative viewpoint from Old Wallgrove Rd and the boundary of the designated TransGrid transmission easement is situated approximately 2km from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **Negligible** due to:

- The lack of visibility of the building footprint from the viewpoint.
- The plume, anticipated to be visible from the viewpoint location, would form a perceptible feature however, due to the distance from the proposal and the existing vertically dominate features of a power infrastructure nature, will not alter the overall balance of the view.

Visual Impact

Day time operation

The *Low* sensitivity and *Negligible* magnitude of change is judged to result in a **Negligible** impact during operation.

Night time operation

The proposal will result in a *Negligible* magnitude of change in relation to night time light emittance. The E3: Medium district brightness area (*Low* sensitivity) and *Negligible* magnitude night time change would result in a **Negligible** impact.

Construction

Views towards the construction aspects are not anticipated to be visible resulting in a **Negligible** impact during construction.

FIGURE 29 VIEWPOINT 4 VIEWSHED EMBEDDED MITIGATION

0 10 20m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Embedded design mitigation

No additional embedded design mitigation has been recommended for this representative viewpoint beyond the treatments contained within the Landscape and Architectural design package.

Visual		Impact
Sensitivity	Low	
Magnitude of Change: Construction phase	Negligible	Negligible
Magnitude of Change: Operational phase	Negligible	Negligible

Visual - lighting		Impact
Sensitivity	E3:Medium district brightness	
Magnitude of Change: Operation phase	Negligible	Negligible

FIGURE 30 VIEWPOINT 5 VIEWSHED

0 0.3 0.6km

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Viewpoint 5 Horsley Park Reserve

Magnitude of change

The representative viewpoint from Horsley Park Reserve is situated approximately 2.3km south-west from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **Negligible** due to:

- The lack of visibility of the building footprint from the viewpoint.
- The plume, anticipated to be visible from the viewpoint location, would form a perceptible feature however, due to the distance from the proposal and the existing vertically dominate features of a power infrastructure nature, will not alter the overall balance of the view.

Visual Impact

Day time operation

The *Moderate* sensitivity and *Negligible* magnitude of change is judged to result in a **Negligible** impact during operation.

Night time operation

The proposal will result in a *Negligible* magnitude of change in relation to night time light emittance. The E2: Low district brightness area (*Moderate* sensitivity) and *Negligible* magnitude night time change would result in a **Negligible** impact.

Construction

Views towards the construction aspects are not anticipated to be visible resulting in a **Negligible** impact during construction.

FIGURE 31 VIEWPOINT 5 VIEWSHED EMBEDDED MITIGATION

0 10 20m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Embedded design mitigation

No additional embedded design mitigation has been recommended for this representative viewpoint beyond the treatments contained within the Landscape and Architectural design package.

Visual		Impact
Sensitivity	Moderate	
Magnitude of Change: Construction phase	Negligible	Negligible
Magnitude of Change: Operational phase	Negligible	Negligible

Visual - lighting		Impact
Sensitivity	E2: Low district brightness	
Magnitude of Change: Operation phase	Negligible	Negligible

FIGURE 32 VIEWPOINT 6 VIEWSHED

Viewpoint 6 Burley Road, Horsley Park

Magnitude of change

The representative viewpoint from Burley Road and is situated approximately 1km south-west from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **High** due to:

- The large scale and high contrast of the proposal in comparison to the existing composition of the view
- The proposal would become the dominant feature of the view
- The anticipated visibility of the plume from this view which would introduce a degree of contrast within the rural setting.

Visual Impact

Day time operation

The *Moderate* sensitivity and *High* magnitude of change is judged to result in a **High-Moderate** impact during operation.

Night time operation

The proposal will result in a *Moderate* magnitude of change in relation to night time light emittance. The E2: Low district brightness area (*Moderate* sensitivity) and *Moderate* magnitude night time change would result in a **Moderate** impact.

Construction

The construction phase impacts are assessed to be of a temporary nature with the gradual construction and introduction of the stack and views towards cranes. The construction phase result in a *High* magnitude of change and a **High-Moderate** impact during construction.

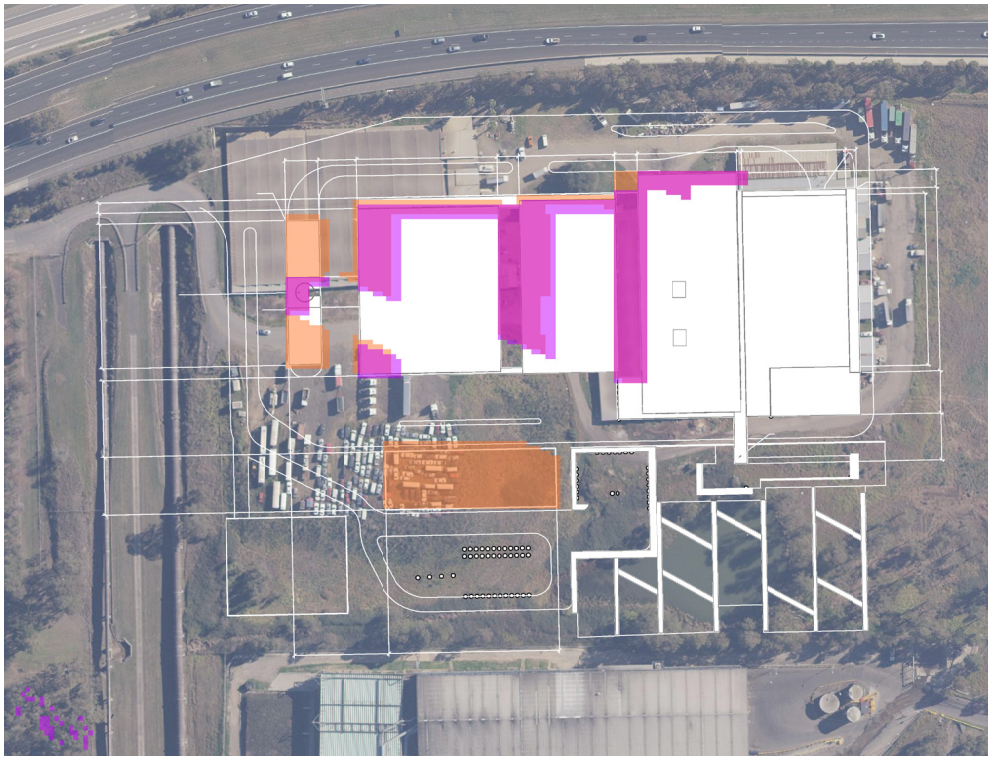

FIGURE 33 VIEWPOINT 6 VIEWSHED EMBEDDED MITIGATION

0 10 20m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Embedded design mitigation

Mitigation measures that has been embedded in the design development to mitigate impacts from this location.

Embedded mitigation:

- The incorporation of a green wall to the southern extent, blending the proposal into the vegetation
- Provide perimeter planting to screen views into the site
- Ensure limited light spill to stack through careful location of lighting columns
- Architecture to reduce the bulk and mass of the building by including the 'blades' between the FGT Hall, Boiler Hall and Waste Bunker.

Visual		Impact
Sensitivity	Moderate	
Magnitude of Change: Construction phase	High	High-Moderate
Magnitude of Change: Operational phase	High	High-Moderate

Visual - lighting		Impact
Sensitivity	E2: Low district brightness	
Magnitude of Change: Operation phase	Moderate	Moderate

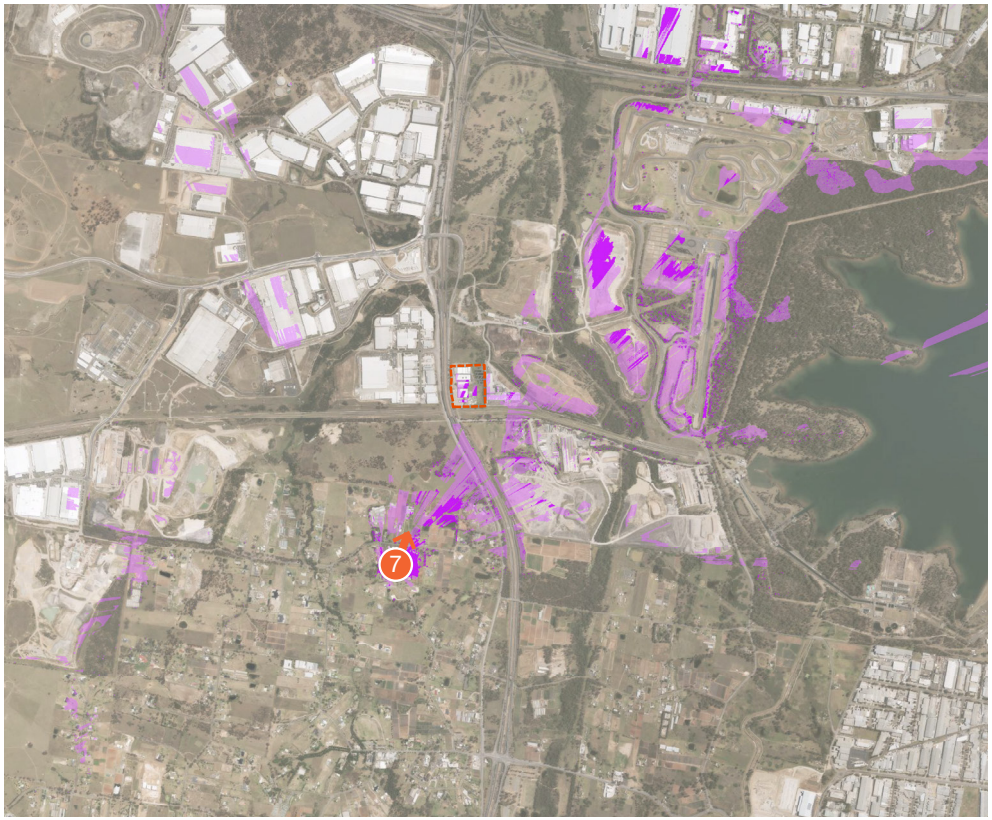

FIGURE 34 VIEWPOINT 7 VIEWSHED

Viewpoint 7 Walworth Road, Horsley Park

Magnitude of change

The representative viewpoint from Walworth Road is situated approximately 1.2km south-west from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **High** due to:

- The large scale and high contrast of the proposal in comparison to the existing composition of the view
- The proposal would become the dominant feature of the view
- The anticipated visibility of the plume from this view which would introduce a degree of contrast within the rural setting.

Visual Impact

Day time operation

The *Moderate* sensitivity and *High* magnitude of change is judged to result in a **High-Moderate** impact during operation.

Night time operation

The proposal will result in a *Moderate* magnitude of change in relation to night time light emittance. The E2: Low district brightness area (*Moderate* sensitivity) and *Moderate* magnitude night time change would result in a **Moderate** impact.

Construction

The construction phase impacts are assessed to be of a temporary nature with the gradual construction and introduction of the stack and views towards cranes. The construction phase result in a *High* magnitude of change and a **High-Moderate** impact during construction.

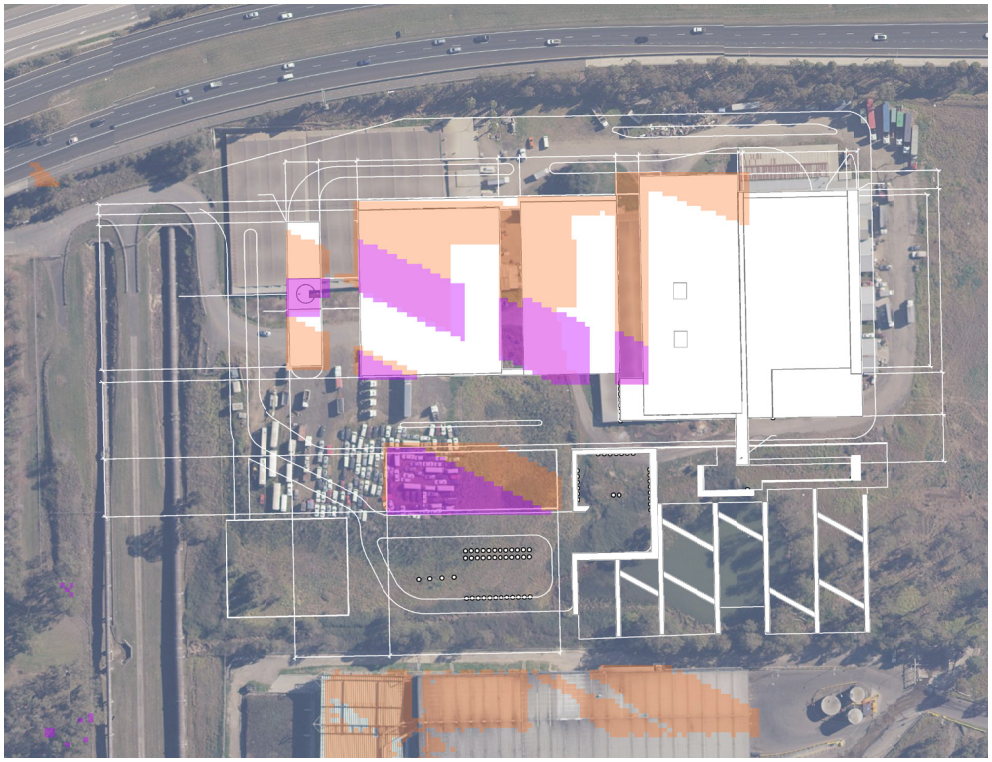

FIGURE 35 VIEWPOINT 7 VIEWSHED EMBEDDED MITIGATION

Embedded design mitigation

Mitigation measures that have been embedded in the design development to mitigate impacts from this location.

Embedded mitigation:

- The incorporation of a green wall to the southern extent, blending the proposal into the vegetation
- Provide perimeter planting to screen views into the site
- Ensure limited light spill to stack through careful location of lighting columns
- Architecture to reduce the bulk and mass of the building by including the 'blades' between the FGT Hall, Boiler Hall and Waste Bunker.

Visual		Impact
Sensitivity	Moderate	
Magnitude of Change: Construction phase	High	High-Moderate
Magnitude of Change: Operational phase	High	High-Moderate

Visual - lighting		Impact
Sensitivity	E2: Low district brightness	
Magnitude of Change: Operation phase	Moderate	Moderate

Viewpoint 7 - Existing view

Viewpoint 7 Photomontage - With Proposal

FIGURE 36 VIEWPOINT 8 VIEWSHED

0 200 400m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Viewpoint 8 Ferrers Rd, Lams Farm Fresh

Magnitude of change

The representative viewpoint from Ferrers Road, Horsley Park is situated approximately 2.6km south-east from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **Moderate** due to:

- The distance from the proposal to the viewpoint location.
- The moderate level of contrast of the proposal (predominately form and colour) to the dense vegetation experienced in the background of the view.
- The industrial LCA experienced in the middle ground of the view - in alignment with the characteristics of the proposal.
- The plume, anticipated to be highly visible from the viewpoint location, would form a noticeable feature in the expansive vista and be readily apparent to the receptor.

Visual Impact

Day time operation

The *Moderate* sensitivity and *Moderate* magnitude of change is judged to result in a **Moderate** impact during operation.

Night time operation

The proposal will result in a *Moderate* magnitude of change in relation to night time light emittance. The E2: Low district brightness area (*Moderate* sensitivity) and *Moderate* night time change would result in a **Moderate** impact.

Construction

During construction, the source and nature of the effect will change, with views towards cranes and the gradual construction and introduction of the stack. The construction phase impacts are assessed to be of a temporary nature and would be readily apparent in the view, resulting in a *Moderate* magnitude of change and **Moderate** impact.

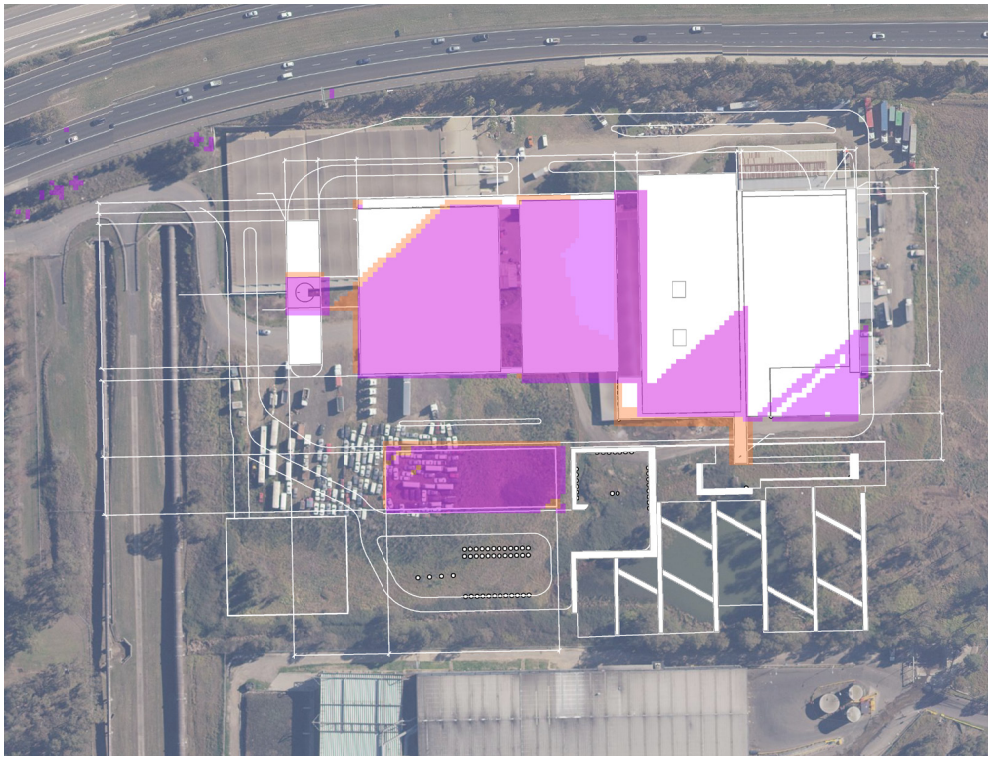

FIGURE 37 VIEWPOINT 8 VIEWSHED EMBEDDED MITIGATION

Embedded design mitigation

Mitigation measures that have been embedded in the design development to mitigate impacts from this location.

Embedded mitigation:

- Integrated design of the stack and blade wall to mitigate visual impact where possible
- Careful selection of colour and material to allow the stack to appear recessive above the skyline
- The incorporation of a green wall to the southern extent, blending the proposal into the vegetation
- Ensure limited light spill to stack through careful location of lighting columns
- Architecture to reduce the bulk and mass of the building by including the 'blades' between the FGT Hall, Boiler Hall and Waste Bunker.

Visual		Impact
Sensitivity	Moderate	
Magnitude of Change: Construction phase	Moderate	Moderate
Magnitude of Change: Operational phase	Moderate	Moderate

Visual - lighting		Impact
Sensitivity	E2: Low district brightness	
Magnitude of Change: Operation phase	Moderate	Moderate

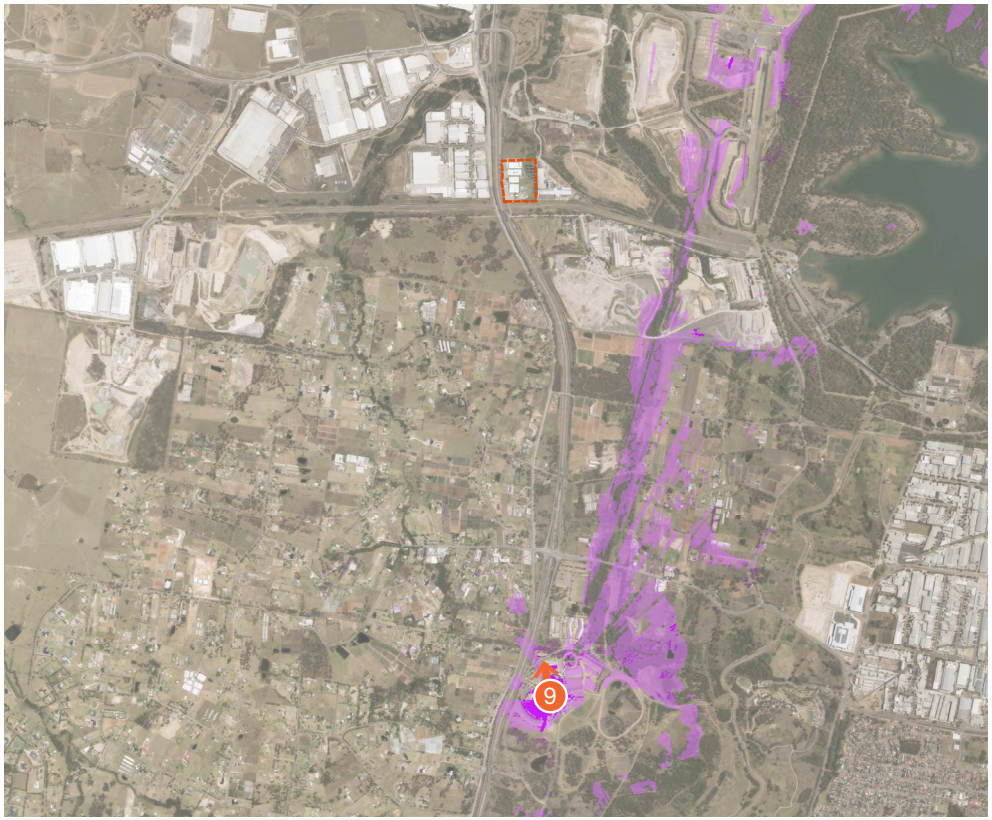

FIGURE 38 VIEWPOINT 9 VIEWSHED

0 200 400m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Viewpoint 9 Sydney International Equestrian Centre

Magnitude of change

The representative viewpoint from the Sydney International Equestrian Centre is situated approximately 3.3km south from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **Negligible** due to:

- The distance from the proposal to the viewpoint location.
- The lack of visibility of the building footprint from the viewpoint.
- The plume, anticipated to be visible from the viewpoint location, would form a perceptible feature depending on micro-climatic conditions however this is not anticipated to detract or alter the existing view.

Visual Impact

Day time operation

The *Moderate* sensitivity and *Negligible* magnitude of change is judged to result in a **Negligible** impact during operation.

Night time operation

The proposal will result in a *Neglgible* magnitude of change in relation to night time light emittance. The E2: Low district brightness area (*Moderate* sensitivity) and *Negligible* night time change would result in a **Negligible** impact.

Construction

Views towards the construction aspects are anticipated to not be visible. The construction phase results in a *Negligible* magnitude of change and a **Negligible** impact during construction.

FIGURE 39 VIEWPOINT 9 VIEWSHED EMBEDDED MITIGATION

0 10 20m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Embedded design mitigation

No additional embedded design mitigation has been recommended for this representative viewpoint beyond the treatments contained within the Landscape and Architectural design package.

Visual	Impact
Sensitivity	Moderate
Magnitude of Change: Construction phase	Negligible / Negligible
Magnitude of Change: Operational phase	Negligible / Negligible

Visual - lighting	Impact
Sensitivity	E2: Low brightness area
Magnitude of Change: Operation phase	Negligible / Negligible

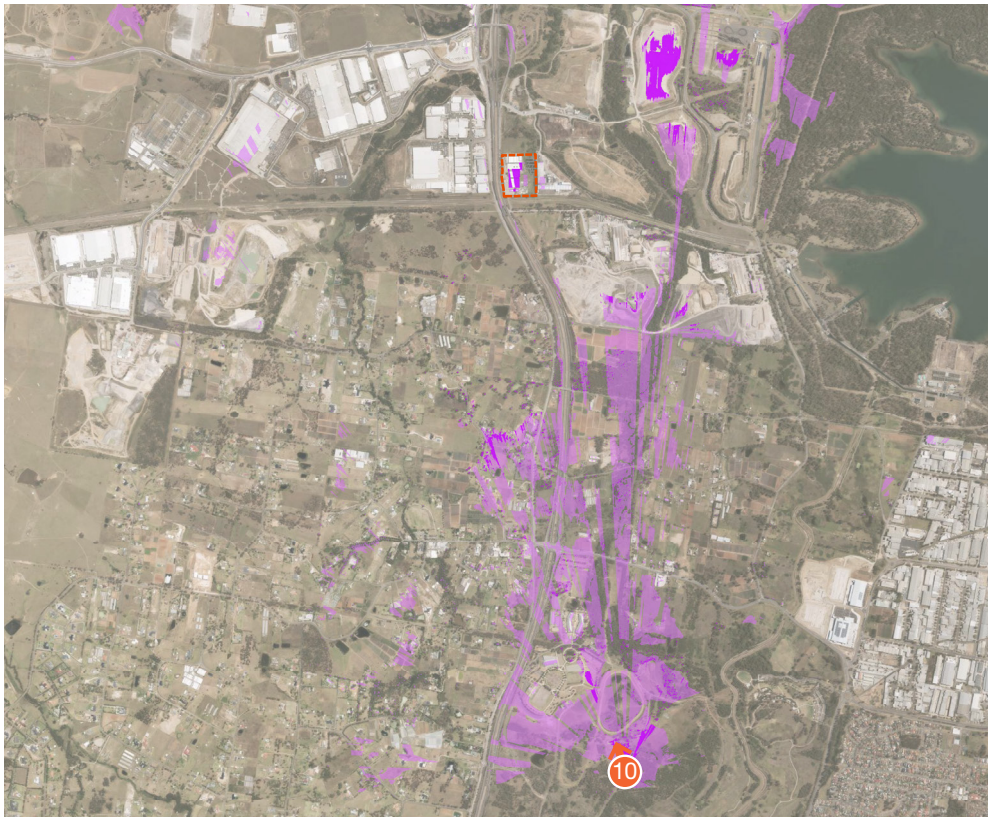

FIGURE 40 VIEWPOINT 10 VIEWSHED

0 200 400m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Viewpoint 10 Moonrise Lookout

Magnitude of change

The representative viewpoint from Border Road at Moonrise lookout, is situated approximately 4km south-east from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **Moderate** due to:

- The distance from the proposal to the viewpoint location.
- The moderate level of contrast of the proposal (predominately form and colour) to the dense vegetation experienced in the background of the view
- The plume, anticipated to be visible from the viewpoint location, would form a noticeable feature in the expansive vista and be readily apparent in the view to the receptor.

Visual Impact

Day time operation

The *High* sensitivity and *Moderate* magnitude of change is judged to result in a **High-Moderate** impact during operation.

Night time operation

The proposal will result in a *Low* magnitude of change in relation to night time light emittance. The E1: Intrinsically dark landscape (*High* sensitivity) and *Low* night time change would result in a **Moderate** lighting impact.

Construction

Views towards the construction aspects are anticipated to be noticeable. The construction phase impacts are assessed to be of a temporary nature with the gradual construction and introduction of the stack and views towards cranes would be readily apparent in the view resulting in a *Moderate* magnitude of change and a **High-Moderate** impact during construction.

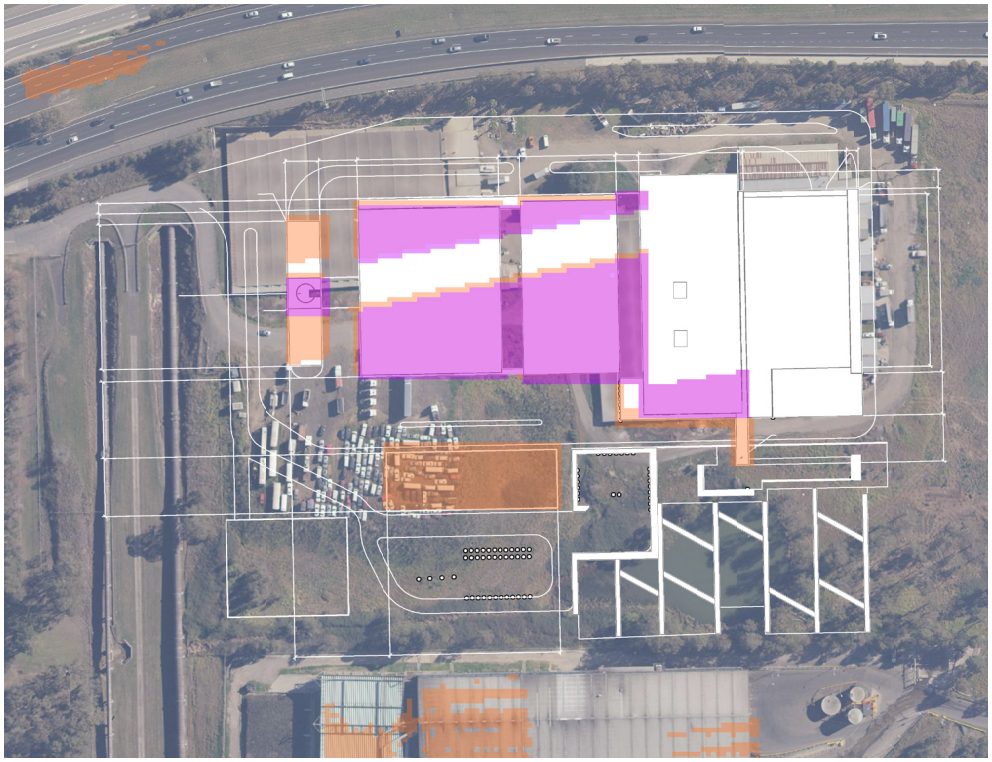

FIGURE 41 VIEWPOINT 10 VIEWSHED EMBEDDED MITIGATION

Embedded design mitigation

Mitigation measures that have been embedded in the design development to mitigate impacts from this location.

Embedded mitigation:

- Integrated design of the stack and blade wall to mitigate visual impact where possible
- Careful selection of colour and material to allow the stack to appear recessive above the skyline
- The incorporation of a green wall to the southern extent, blending the proposal into the vegetation
- Ensure limited light spill to stack through careful location of lighting columns
- Architecture to reduce the bulk and mass of the building by including the 'blades' between the FGT Hall, Boiler Hall and Waste Bunker.

Visual	Impact	
Sensitivity	High	
Magnitude of Change: Construction phase	Moderate	High-Moderate
Magnitude of Change: Operational phase	Moderate	High-Moderate

Visual - lighting		Impact
Sensitivity	E1: Intrinsically dark brightness area	
Magnitude of Change: Operation phase	Low	Moderate

Viewpoint 10 - Existing view

Viewpoint 10 - Photomontage

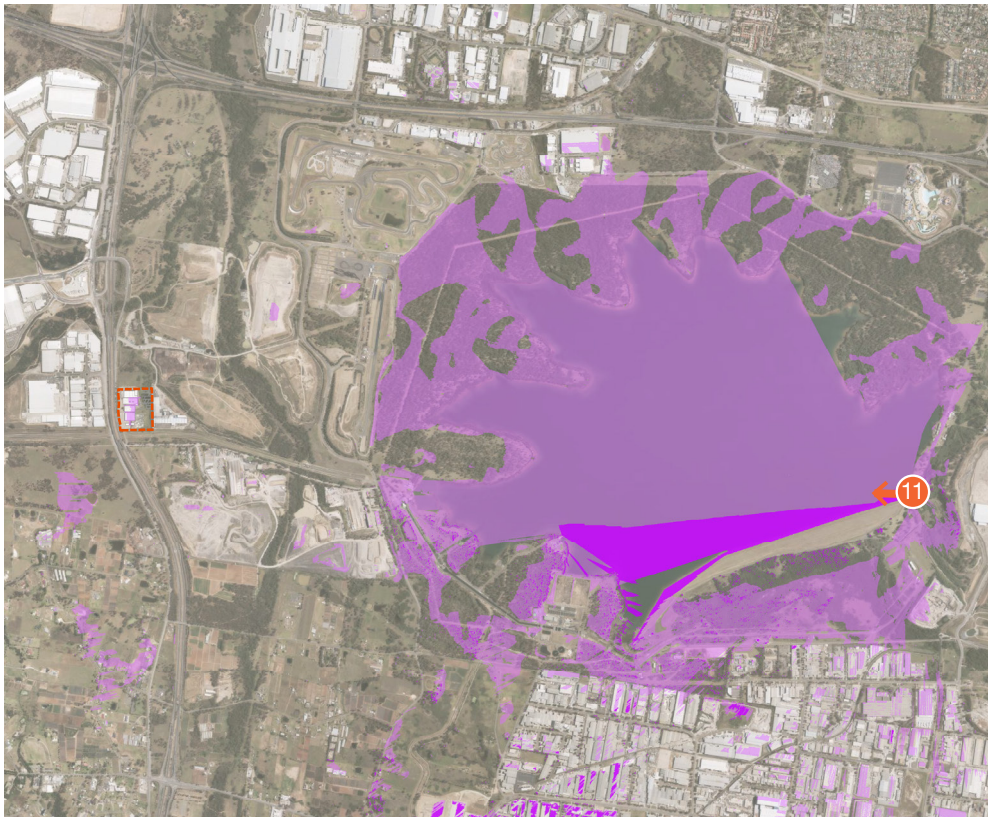

FIGURE 42 VIEWPOINT 11 VIEWSHED

0 200 400m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Viewpoint 11 Prospect Reservoir

Magnitude of change

The representative viewpoint from William Lawson Drive, adjacent to Prospect Reservoir and is situated approximately 5km east from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **Low** due to:

- The distance from the proposal to the viewpoint location
- The limited of visibility of the building footprint from the viewpoint
- The plume, anticipated to be visible from the viewpoint location, would form a perceptible feature, but not alter the overall balance the view.

Visual Impact

Day time operation

The *Moderate* sensitivity and *Low* magnitude of change is judged to result in a **Moderate-Low** impact during operation.

Night time operation

The proposal will result in a *Negligible* magnitude of change in relation to night time light emittance. The E1: Intrinsically dark landscape (*High* sensitivity) and *Negligible* night time change would result in a **Negligible** lighting impact.

Construction

During construction, the source and nature of the effect will change, with views towards cranes and the gradual construction and introduction of the stack. The construction phase impacts are assessed to be of a temporary nature and resulting in a *Low* magnitude of change and a **Moderate-Low** impact during construction.

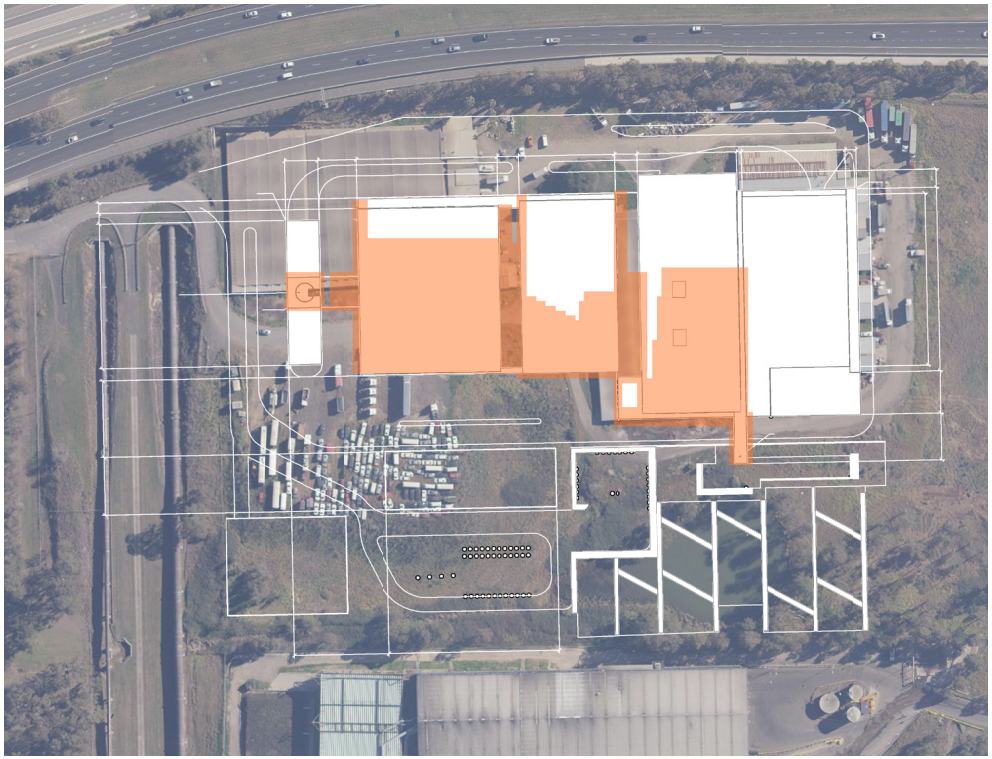

FIGURE 43 VIEWPOINT 11 VIEWSHED EMBEDDED MITIGATION

0 10 20m

LEGEND

- 1 Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Embedded design mitigation

Mitigation measures that have been embedded in the design development to mitigate impacts from this location.

Embedded mitigation:

- Ensure limited light spill to stack through careful location of lighting columns.

Visual		Impact
Sensitivity	Moderate	
Magnitude of Change: Construction phase	Low	Moderate-Low
Magnitude of Change: Operational phase	Low	Moderate-Low

Visual - lighting		Impact
Sensitivity	E1: Intrinsically dark brightness area	
Magnitude of Change: Operation phase	Negligible	Negligible

FIGURE 44 VIEWPOINT 12 VIEWSHED

0 200 400m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Viewpoint 12 Sydney Motorsport Park

Magnitude of change

The representative viewpoint is from an unnamed road off Ferrers Road, Horsley Park and is situated approximately 1.6km north-east from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **Low** due to:

- The visibility of the building footprint from the viewpoint
- The industrial LCA experienced in the view which is in comparable to the characteristics of the proposal
- The plume is anticipated to be visible in the viewshed and would be perceptible, but not alter the overall balance to the view.

Visual Impact

Day time operation

The *Moderate* sensitivity and *Low* magnitude of change is judged to result in a **Moderate-Low** impact during operation.

Night time operation

The proposal will result in a *Low* magnitude of change in relation to night time light emittance. The E3: Medium district brightness area (*Low* sensitivity) and *Low* night time change would result in a **Low** lighting impact.

Construction

During construction, the source and nature of the effect will change, with views towards cranes and the gradual construction and introduction of the stack. The construction phase impacts are assessed to be of a temporary nature resulting in a *Low* magnitude of change and a **Moderate-Low** impact during construction.

FIGURE 45 VIEWPOINT 12 VIEWSHED EMBEDDED MITIGATION

Embedded design mitigation

Mitigation measures that have been embedded in the design development to mitigate impacts from this location.

Embedded mitigation:

- Ensure limited light spill to stack through careful location of lighting columns.

Visual	Impact
Sensitivity	Moderate
Magnitude of Change: Construction phase	Low / Moderate-Low
Magnitude of Change: Operational phase	Low / Moderate-Low

Visual - lighting	Impact
Sensitivity	E3: Medium district brightness
Magnitude of Change: Operation phase	Low / Low

FIGURE 46 VIEWPOINT 13 VIEWSHED

Viewpoint 13 Sydney Zoo

Magnitude of change

The representative viewpoint is from the Sydney Zoo entrance, off the Great Western Highway, situated approximately 3.3km north from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **Low** due to:

- The distance from the proposal to the viewpoint location.
- The industrial LCA experienced in the view which is in alignment with the characteristics of the proposal.
- The plume (anticipated to be highly visible in the worst case scenario viewshed) would form a a perceptible feature however, due to the existing presence of industrial buildings associated industrial and commercial infrastructure, the plume is not anticipated to alter the overall balance of the view.

Visual Impact

Day time operation

The *Moderate* sensitivity and *Low* magnitude of change is judged to result in a **Moderate-Low** impact during operation.

Night time operation

The proposal will result in a *Low* magnitude of change in relation to night time light emittance. The E3: Medium district brightness area (*Low* sensitivity) and *Low* night time change would result in a **Low** lighting impact.

Construction

Views towards the construction aspects are anticipated to be visible. The construction phase impacts are assessed to be of a temporary nature with the gradual construction and introduction of the stack and potential views towards cranes. However, in the context of the commercial setting, this is anticipated to be a small component of the view, resulting in a *Negligible* magnitude of change and a **Negligible** impact during construction.

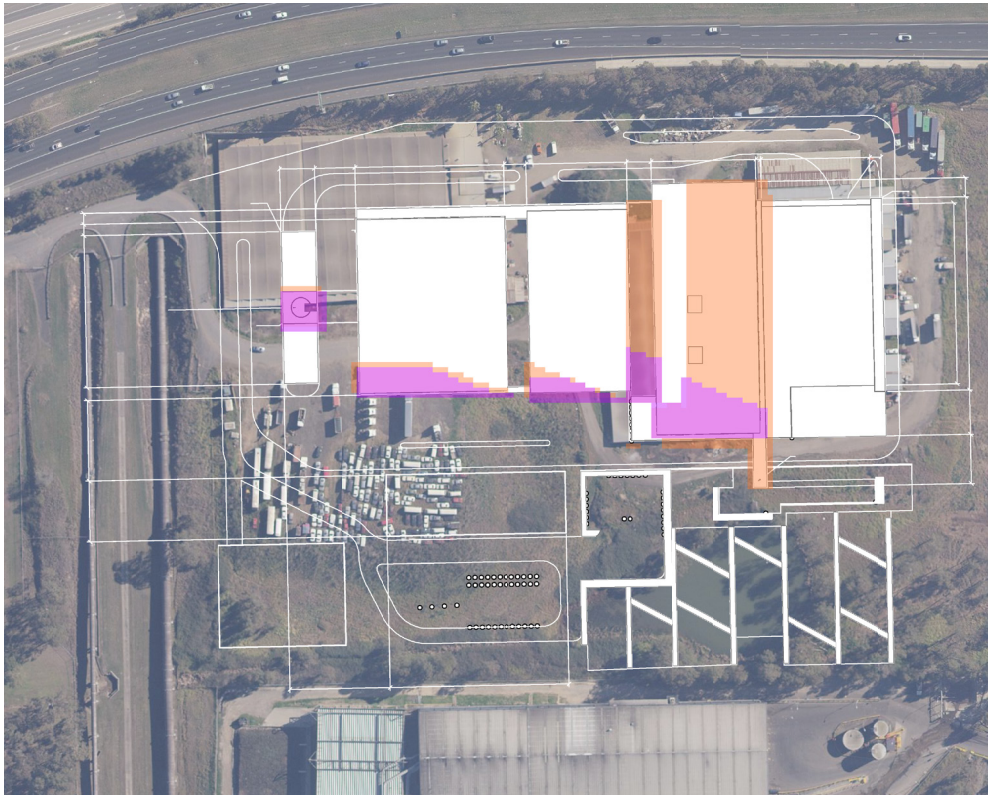

FIGURE 47 VIEWPOINT 13 VIEWSHED EMBEDDED MITIGATION

Embedded design mitigation

Mitigation measures that have been embedded in the design development to mitigate impacts from this location.

Embedded mitigation:

- Ensuring limited lighting spill to stack through careful location of lighting columns.

Visual	Impact
Sensitivity	Moderate
Magnitude of Change: Construction phase	Negligible	Negligible
Magnitude of Change: Operational phase	Low	Moderate-Low

Visual - lighting	Impact
Sensitivity	E3: Medium district brightness
Magnitude of Change: Operation phase	Low	Low

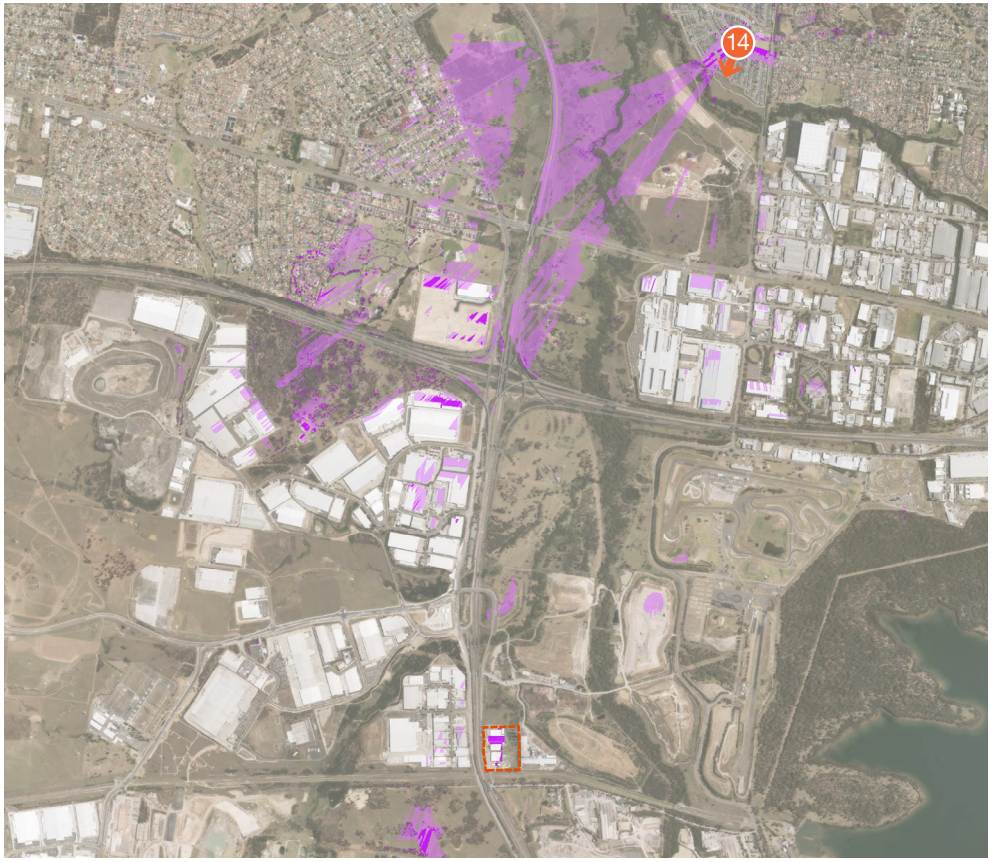

FIGURE 48 VIEWPOINT 14 VIEWSHED

0 200 400m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Viewpoint 14 Bungarribee Homestead Park

Magnitude of change

The representative viewpoint is from Bungarribee Homestead Park, Bungarribee and is situated approximately 4.6km south-east from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **Low** due to:

- The distance from the proposal to the viewpoint location.
- The level of contrast of the proposal (predominately form and colour) to the dense vegetation experienced in the background and middle ground of the view.
- The plume (anticipated to be highly visible in the worst case scenario viewshed) would form a noticeable feature in the expansive vista and be readily apparent to the receptor.

Visual Impact

Day time operation

The *Moderate* sensitivity and *Low* magnitude of change is judged to result in a **Moderate-Low** impact during operation.

Night time operation

The proposal will result in a *Low* magnitude of change in relation to night time light emittance. The E2: Low district brightness area (*Moderate* sensitivity) and *Low* night time change would result in a **Moderate-Low** lighting impact.

Construction

Views towards the construction aspects are anticipated to be visible. The construction phase impacts are assessed to be of a temporary nature with the gradual construction and introduction of the stack and views towards cranes resulting in a *Low* magnitude of change and a **Moderate-Low** impact during construction.

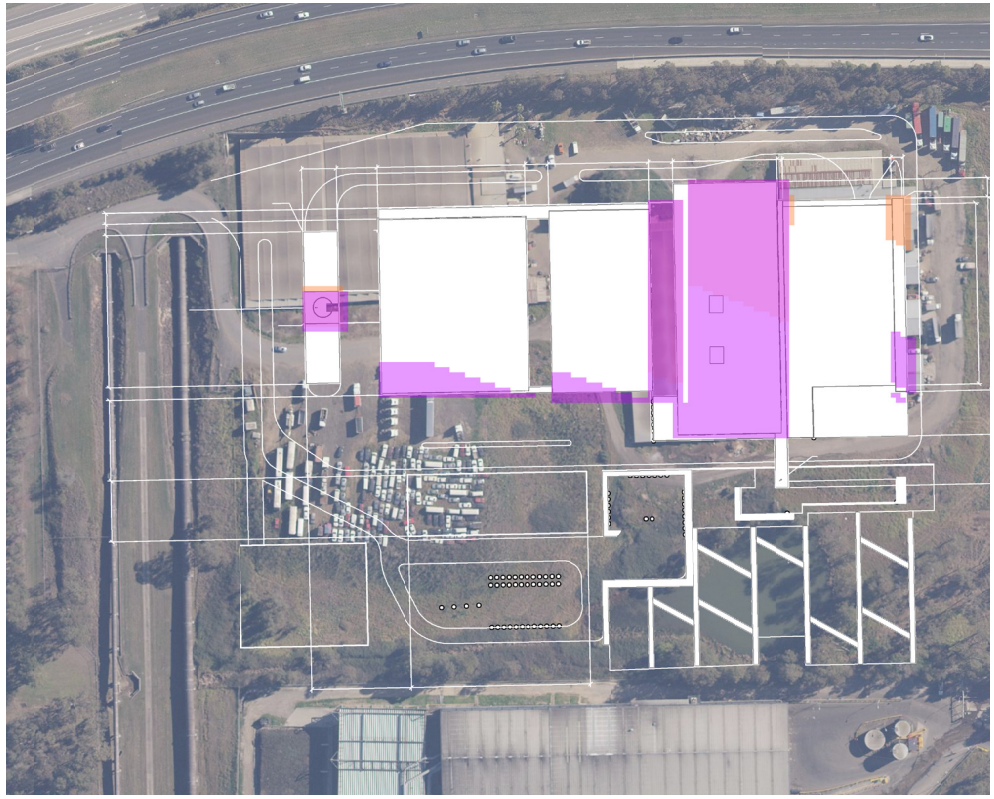

FIGURE 49 VIEWPOINT 14 VIEWSHED EMBEDDED MITIGATION

0 10 20m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Embedded design mitigation

Mitigation measures that have been embedded in the design development to mitigate impacts from this location.

Embedded mitigation:

- Provide perimeter planting to screen views into the site
- Ensure limited light spill to stack through careful location of lighting columns.
- Architecture to reduce the bulk and mass of the building by including the 'blades' between the FGT Hall, Boiler Hall and Waste Bunker.

Visual	Impact
Sensitivity	Moderate
Magnitude of Change: Construction phase	Low / Moderate-Low
Magnitude of Change: Operational phase	Low / Moderate-Low

Visual - lighting	Impact
Sensitivity	E2: Low district brightness
Magnitude of Change: Operation phase	Low / Moderate-Low

Viewpoint 14 - Existing view

Viewpoint 14 - Photomontage

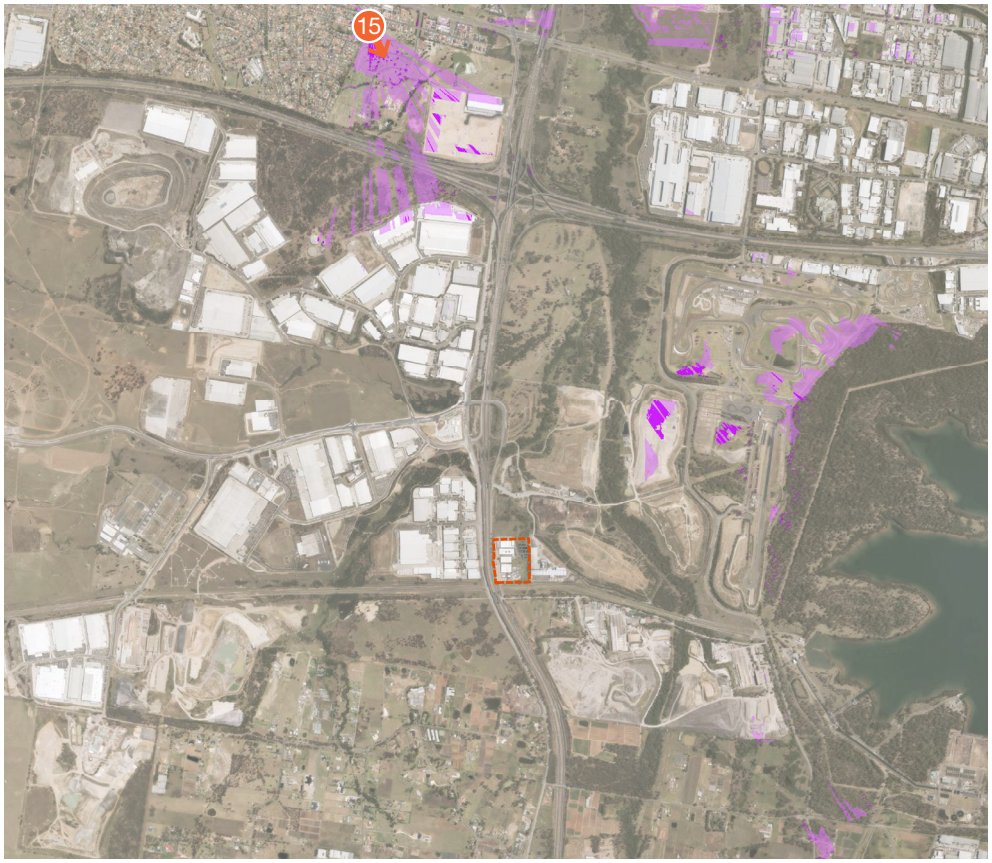

FIGURE 50 VIEWPOINT 15 VIEWSHED

0 200 400m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Viewpoint 15 Pinegrove Memorial Park

Magnitude of change

The representative viewpoint is off Kington Street, within Pinegrove Memorial Park, Minchinbury, and is situated approximately 3.3km north-west from the proposal boundary.

The magnitude of change arising from this proposal is considered to be **Negligible** due to:

- The distance from the proposal to the viewpoint location
- The industrial LCA experienced in the middle ground of the view which is of a similar nature as the characteristics of the proposal
- The plume (anticipated to be visible from the viewpoint location) being perceptible in the view depending on micro-climatic conditions.

Visual Impact

Day time operation

The *Moderate* sensitivity and *Negligible* magnitude of change is judged to result in a **Negligible** impact during operation.

Night time operation

The proposal will result in a *Negligible* magnitude of change in relation to night time light emittance. The E2: Low district brightness area (*Moderate* sensitivity) and *Negligible* night time change would result in a **Negligible** lighting impact.

Construction

Views towards the construction aspects are anticipated to not be visible. The construction phase impacts are assessed to be of a temporary nature with the gradual construction and introduction of the stack and views towards cranes. The construction phase result in a *Negligible* magnitude of change and a **Negligible** impact during construction.

FIGURE 51 VIEWPOINT 15 VIEWSHED EMBEDDED MITIGATION

0 10 20m

LEGEND

- Viewpoint location
- Viewshed - With vegetation in DTM
- Viewshed - No vegetation in DTM
- Proposal

Embedded design mitigation

No additional embedded design mitigation has been recommended for this representative viewpoint beyond the treatments contained within the Landscape and Architectural design package.

Visual		Impact
Sensitivity	Moderate	
Magnitude of Change: Construction phase	Negligible	Negligible
Magnitude of Change: Operational phase	Negligible	Negligible

Visual - lighting		Impact
Sensitivity	E2: Low district brightness	
Magnitude of Change: Operation phase	Negligible	Negligible

08
Overshadowing

Overshadowing analysis

The following diagrams illustrate the expected overshadowing impacts of the proposal.

The overshadowing analysis is based on the winter solstice (21st June), which marks the shortest period of daylight during the year. The sun's elevation in the sky on this day is considered to be at its lowest, representing the worst cast scenario with regards to potential overshadowing impacts.

The overshadowing analysis has informed the design and the development of the building footprint.

Methodology

The following methodology has been employed for the assessment:

- A 3D terrain model was created using 1m contour data derived from LiDAR.
- A 3D model of the proposal, including building footprint, form, scale and roof heights was created and combined with the terrain data.
- 3D studio max software was utilised to undertake overshadowing analysis on June 21 from 6am to 8pm to capture all the daylight hours on the shortest day of the year to enable reporting of the worst case scenario.

Analysis

Currently, there is minimal overshadowing associated with the existing buildings and infrastructure located on the site. Refer to Chapter 04 *Context* (page 28) for further information regarding the existing buildings. There are no surrounding residential receptors in close proximity to the site, and therefore not at risk of overshadowing.

The potential overshadowing impacts that may arise as a result of the proposal (refer to Chapter 06 *Proposal*, page 63 for design information regarding specific components as part of the proposal) have been analysed for the areas surrounding the immediate site boundary.

The reduction of direct day light hours on existing vegetation is not anticipated to adversely impact the survival and growth of existing vegetation. Where possible, this vegetation would be retained.

Limitations

Whilst every effort has been used to create an accurate model, the limited resolution of the contour data and the approximation of the architectural design height and form means that the overshadowing output should only be used as a guide.

The output is conservative as it does not take into account existing vegetation, minor built form, or opportunities for the building design to incorporate transparent structural facades, due to the potential for these items to be designed further over time.

Landscape planting proposed as part of the concept design also has not been modeled at this stage due to the current level of design resolution. It is anticipated that vegetation removed will be reinstated and would reach comparable heights over time.

Overshadowing analysis

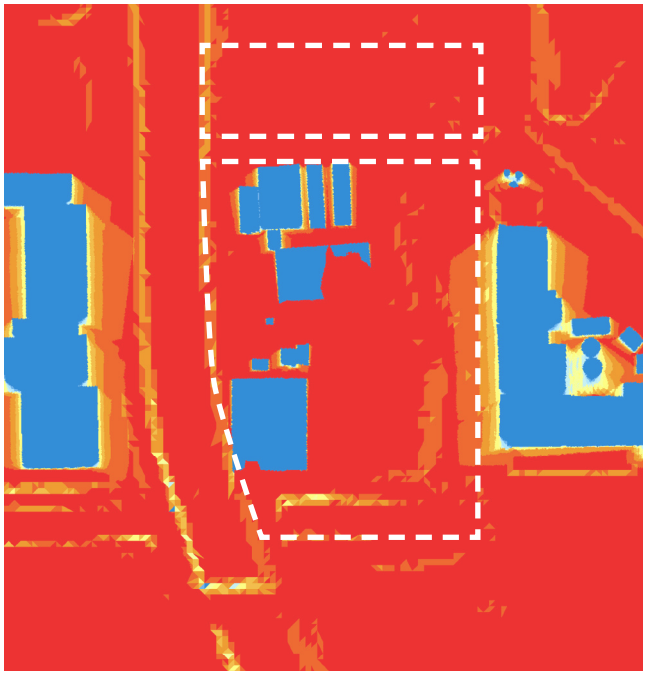

FIGURE 53 OVERSHADOWING IMPACT - EXISTING CONDITIONS

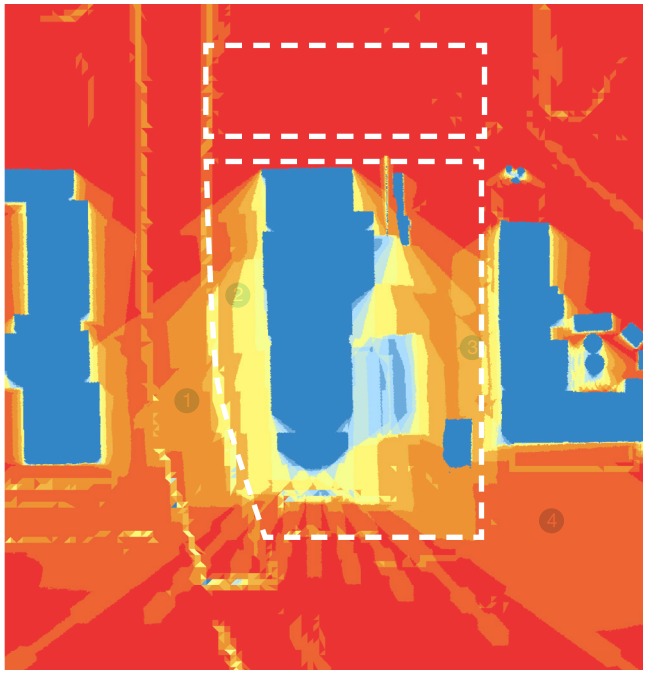

FIGURE 52 OVERSHADOWING IMPACT - PROPOSED BUILDING IMPACT

LEGEND

0-1 hours of sun

9+ hours of sun

Site boundary

LEGEND

0-1 hours of sun

9+ hours of sun

Site boundary

1. Overshadowing experienced to users of the footpath and motorist is not considered to adversely impact the experience of these users. The overshadowing is considered to be of a localised nature to receptors considered to be of transient nature.
2. Existing vegetation on M7 embankment is anticipated to experience a reduction in daily sun exposure from 9+ hours to 5-7 hours.
3. Global Renewables is located along the eastern boundary of the site. Existing sun exposure experienced along the eastern perimeter is currently 7-8 hours daily and is expected to reduce to 5-6 hours daily.
4. Immediate landscape surrounding the site includes dense patches of vegetation that currently experience full sun exposure all day. This is expected to reduce to 7-8 hours daily.

09
Conclusion

Conclusion

Landscape Character Impacts

The physical impact to landscape character during construction would be concentrated to the immediate proposed site extents and, as discussed in the report, is not considered to be incongruous with the character of the LCA 1a (Western Sydney Parkland Wallgrove productive landscape), however the gradual introduction of the proposal and removal of vegetation during construction would result in a noticeable change and an overall *Moderate-Low* impact.

LCA 3 (Horsley Park rural residential) is assessed to have a *Moderate* level of sensitivity, influenced by the semi-rural residential homogeneous character with common place elements considered to offer a sense of place. The project would not result in a direct physical impact on this LCA, however, the gradual introduction of the elevated structure and incremental expansion of the industrial characteristics would influence the setting of this LCA and result in a *Moderate-Low* impact during construction.

Similarly, LCA 6 Westlink M7 would not experience a direct physical change, however the removal of vegetation and introduction of elevated components would be experienced and result in a *Low* impact during construction.

During operation it is anticipated that the vegetation removed would be reinstated, with an overall improvement to the Cumberland Plain ecological community. The green wall would establish and begin to soften the appearance of the building at the lower levels.

Due to the scale of the project, including the building, stack and the plume, it is anticipated that the proposal would appear as a prominent feature within LCA 1a, resulting in an incremental increase in industrial facilities within the parkland and a *Moderate-Low* impact during operation.

The impact arising to LCA3 would remain as a *Moderate-Low* impact during operation due to the introduction of the plume and the further industrialisation to the northern extent of this LCA. This would be a similar case for LCA6 with the prominence of the building, stack and plume remaining as a *Low* impact during operation.

Landscape Character Type / Proposal phase	Sensitivity	Impact
LCA 1a: Wallgrove Productive Landscape	Low	
Magnitude of Change: Construction phase	Low	Moderate-Low
Magnitude of Change: Operational phase	Moderate	Moderate-Low

Landscape Character Type / Proposal phase	Sensitivity	Impact
LCA 6: WestLink M7	Low	
Magnitude of Change: Construction phase	Low	Low
Magnitude of Change: Operational phase	Low	Low

Landscape Character Type / Proposal phase	Sensitivity	Impact
LCA 2: Power and Industrial Estates	Low	
Magnitude of Change: Construction phase	Negligible	Negligible
Magnitude of Change: Operational phase	Negligible	Negligible

Landscape Character Type / Proposal phase	Sensitivity	Impact
LCA 7: Bush Creek Corridor	Moderate	
Magnitude of Change: Construction phase	Negligible	Negligible
Magnitude of Change: Operational phase	Negligible	Negligible

Landscape Character Type / Proposal phase	Sensitivity	Impact
LCA 3: Horsley Park Rural Residential	Moderate	
Magnitude of Change: Construction phase	Low	Moderate-Low
Magnitude of Change: Operational phase	Low	Moderate-Low

Visual Impacts

Visual impacts during the construction phase would arise from the gradual introduction of the project, including the building and the stack. Machinery, including cranes, would form elevated visual elements that would be visible intermittently throughout the construction phase.

Although the source and nature of the impacts would differ during construction and operation, the visual impacts arising at the representative viewpoints are assessed to be consistent.

Viewpoints resulting in the highest visual impact during operation (*High-Moderate*) include; viewpoint 3 (shared user path adjacent to the M7 and the proposal), viewpoint 6 (Burley Road), viewpoint 7 (Walworth Road) and viewpoint 10 (Moonrise lookout).

Viewpoint 3 is considered to be of *Moderate* sensitivity due to the pedestrian and cyclist receptors experiencing the view. The combination of the close proximity of the viewpoint (directly adjacent) to the proposal site and the scale of the proposed built form results in a *High* magnitude of change and a *High-Moderate* overall impact. Whilst it is indicated that this viewpoint will result in a High magnitude of change, it should be noted the proposal includes the implementation of an integrated Architectural and Landscape strategy.

This includes the reinstatement and introduction of planting palettes, revegetation of endemic species of the Cumberland Plains and the use of high quality materiality choices for the built form that will assist with the integration of the proposal over time, particularly in lower level views from this location.

Viewpoints 6 and 7 are both representative viewpoints from rural residential receptors located within Horsley Park with *Moderate* sensitivity. The large scale and high contrast of the proposal in comparison to the existing composition of the views experienced have determined the magnitude of change as *High* with an overall *High-Moderate* impact.

Viewpoint 10 is assessed as having a *High* sensitivity being located within Western Sydney Regional Park and having a direct interest in the vista experienced at this location. The anticipated visibility of the plume will introduce a degree of contrast against the vegetated areas surrounding the site resulting in a noticeable feature and a *High-Moderate* impact.

Vegetation screening around the perimeter of the site, proposed trees and two green walls (north and south faces of the building) embedded as part of the landscape strategy, will assist in the mitigation of visual impact, however the volume and height of the stack and plume will be prominent features above the existing and proposed vegetation.

	Baseline		Operation impact				Construction impact	
	Sensitivity		Nightime impact		Viewpoint		Viewpoint	
	Visual	Lighting	Magnitude	Impact	Magnitude	Impact	Magnitude	Impact
VP 1	Low	Moderate	Low	Moderate-Low	Low	Low	Low	Low
VP 2	Low	Low	Negligible	Negligible	Low	Low	Low	Low
VP 3	Moderate	Low	Moderate	Moderate-Low	High	High-Moderate	High	High-Moderate
VP 4	Low	Low	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
VP 5	Moderate	Moderate	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
VP 6	Moderate	Moderate	Moderate	Moderate	High	High-Moderate	High	High-Moderate
VP 7	Moderate	Moderate	Moderate	Moderate	High	High-Moderate	High	High-Moderate
VP 8	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
VP 9	Moderate	Moderate	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
VP 10	High	High	Low	Moderate	Moderate	High-Moderate	Moderate	High-Moderate
VP 11	Moderate	High	Negligible	Negligible	Low	Moderate-Low	Low	Moderate-Low
VP 12	Moderate	Low	Low	Low	Low	Moderate-Low	Low	Moderate-Low
VP 13	Moderate	Low	Low	Low	Low	Moderate-Low	Negligible	Negligible
VP 14	Moderate	Moderate	Low	Moderate-Low	Low	Moderate-Low	Low	Moderate-Low
VP 15	Moderate	Moderate	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

References

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