Energy from Waste Facility
Eastern Creek (SSD 6236)

Visual Impact Assessment

Prepared for The Next Generation NSW Pty Ltd

Revised Final Report

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urbis

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1 Introduction

1.1 SUMMARY DESCRIPTION OF THE PROJECT

The proposed Energy from Waste Project (the Project) is located at Eastern Creek, approximately 36 kilometres (km) west of the Sydney central business district (CBD) (***Figure 1***). The Applicant for the Project is The Next Generation NSW Pty Ltd (TNG). The Energy from Waste (EFW) Facility is proposed to be located on Lots 2 and 3, DP 1145808 (***Figure 3***).

The Project is identified as a State Significant Development (SSD) under Schedule 1, Clause 20 of the State Environmental Planning Policy (State and Regional Development) 2011.

A Visual Impact Assessment is required as part of the Environmental Impact Statement (EIS) for the Project. Urbis has been commissioned to undertake specialist visual impact assessment services for the Project.

1.2 OBJECTIVES OF THE STUDY

In accordance with the Director-General's Requirements (DGRs) issued by the NSW Department of Planning and Infrastructure, the preparation of a visual assessment is required as a component of the EIS for the Project. ***Table 1*** identifies each of the relevant DGRs and where they are addressed within this visual assessment.

DIRECTOR-GENERAL'S REQUIREMENTS	REPORT SECTION
Visual *– including:* - *an assessment of the proposed building height, scale, signage and lighting, particularly from nearby public receivers and significant vantage points of the broader public domain;*	Section 4
- *details of design measures to ensure the project has a high design quality and is well presented, particularly in the context of the broader Western Sydney Employment Area;*	Section 5
- *consideration of any impact on flight paths; and*	N/A
- *a detailed photo-montage based analysis of the visual impacts of development and emissions stacks.*	Section 4

TABLE 1 – DIRECTOR-GENERAL'S REQUIREMENTS – REFERENCE TABLE

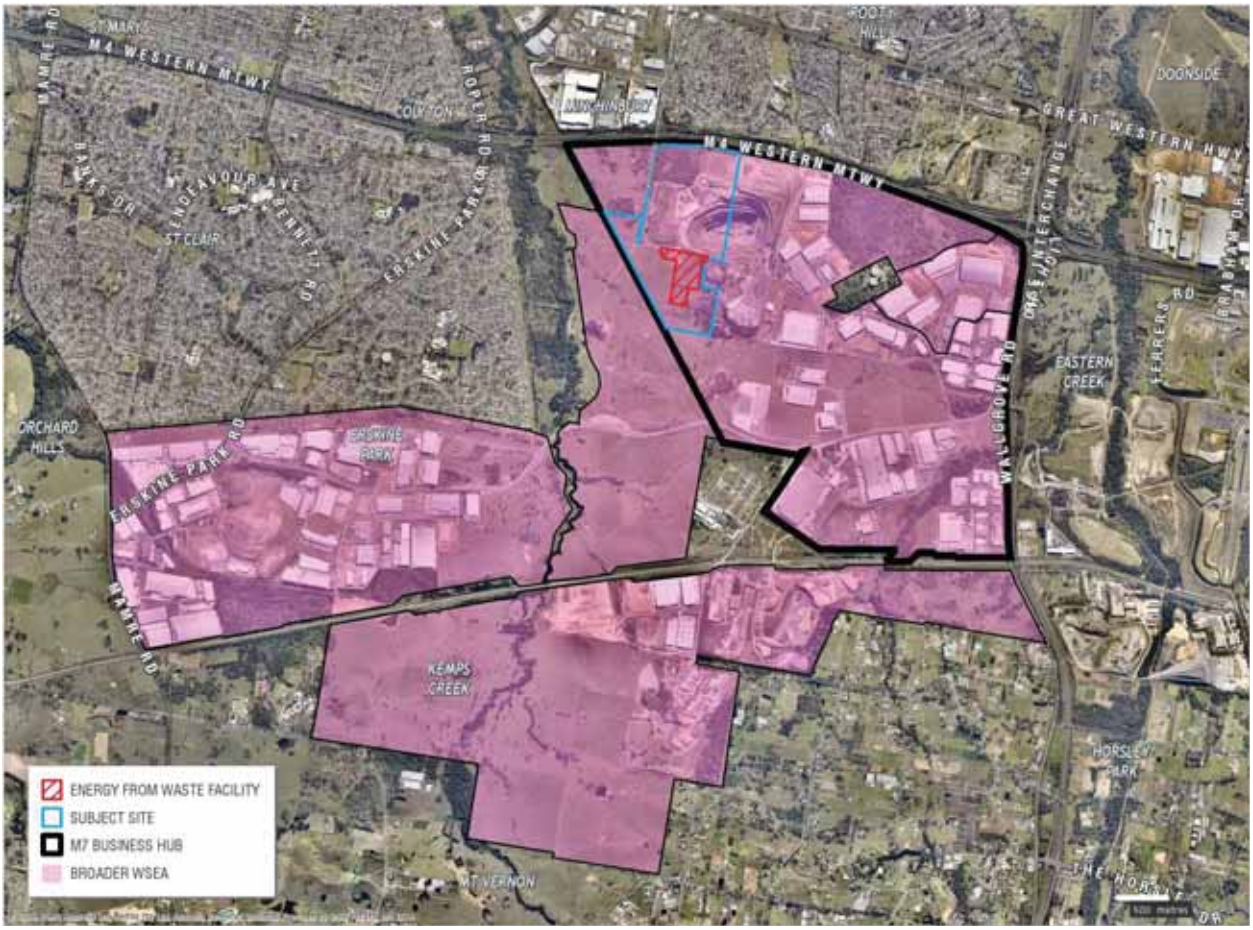

FIGURE 1 – REGIONAL CONTEXT

1.3 STUDY METHOD

The study approach has been based on an analysis of the visual setting and an assessment of the potential impacts of the development of the Project on its viewshed. The urban viewshed assessed is primarily the area where highest impacts are likely to occur, typically within 2.5 km of the Project Area boundary. The methodology is comprised of a number of components. These are:

- **Qualitative Assessment (*Section 1.3.1*)**
  - Visual modification – How does the proposed development contrast with the landscape character of the surrounding setting?
  - What is the quality of the landscape setting?
  - Sensitivity – How sensitive will viewers be to the proposed development?
  - Impacts of Night Lighting **(*Section 1.3.3*)**.
- **Quantitative Assessment (**refer to ***Section 1.3.2*** and ***Appendix A*****)**
  - How much of the proposed development is visible from particular viewpoints?

1.3.1 APPROACH TO QUALITATIVE ASSESSMENT

The methodology employed by Urbis is based on the Landscape Aesthetics Handbook (United States Department of Agriculture [USDA] Forest Service, 1995) methodology. The basis of this Visual Management System methodology is that the visual impact of a proposed development is determined by evaluating the degree of visual modification/fit of the development in the context of the visual sensitivity of surrounding land use areas from which a proposed development may be visible. The visual impact resulting from the combination of visual modification and visual sensitivity, or viewer sensitivity, is illustrated in ***Table 2*** and ***Figure 2***.

Level of Visual Impact VL = Very Low, L = Low, M = Moderate, H = High	**Viewer Sensitivity**		
			L
Level of Visual Modification			

TABLE 2 – VISUAL IMPACT MATRIX

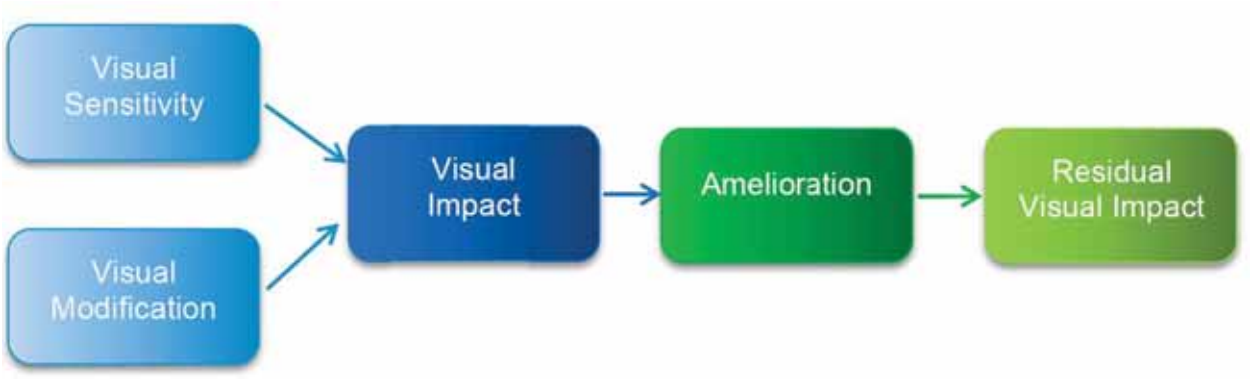

FIGURE 2 – VISUAL ASSESSMENT PROCESS

VISUAL MODIFICATION

The visual modification level of a proposed development can be best measured as an expression of the visual interaction, or the level of visual contrast between the development and the existing visual environment (Zube *et al.,* 1976). Throughout the visual catchment the level of visual modification generally decreases as the distance from the development to various viewpoint locations increases, and is categorised as follows:

- Negligible (or very low) level of visual modification – where the development is distant and/or relates to a small proportion of the overall viewscape.
- Low level of visual modification – where there is minimal visual contrast and a high level of integration of form, line, shape, pattern, colour or texture values between the development and the landscape. In this situation the development may be noticeable, but does not markedly contrast with the existing modified landscape.
- Moderate level of visual modification – where a component of the development is visible and contrasts with the landscape, while at the same time achieving a level of integration. This occurs where surrounding topography, vegetation or existing modified landscape provide some measure of visual integration or screening.
- High level of visual modification – where the major components of the development contrast strongly with the existing landscape.

The quantitative assessment of visual prominence, as outlined in the section following, is considered in the assessment of visual modification in terms of the quantum of viewshed subjected to change. However, the assessment of visual modification also considers the level of visual compatibility of the Project with the existing visual landscape.

VISUAL SENSITIVITY

Visual sensitivity is a measure of how critically a change to the existing landscape will be viewed from various use areas (Brush and Shafer, 1975). Different activities undertaken within the landscape setting have different sensitivity levels. For example, tourists who are using the surrounding landscape as a part of the holiday experience will generally view changes to the landscape more critically than agricultural or industrial workers in the same setting. Similarly, individuals will view changes to the visual setting of their residence more critically than changes to the visual setting of the broader setting in which they travel or work.

The visual sensitivity of the development depends on a range of viewer characteristics. The primary characteristics used in this study are:

- Land use and the expectation of the viewer of a particular visual experience.
- Distance of the development from viewers.

The visual sensitivity of land uses were assessed to assist in determining the visual impact of the development. As distance from the viewer to the proposed development increases, the level of sensitivity reduces.

Typical levels of viewer sensitivity for the assessed visual setting of the Project are based on levels of visual significance as described in the Visual Management System, and are outlined in ***Table 3***.

VISUAL USE AREA	FOREGROUND		MIDDLEGROUND		BACKGROUND
	Local Setting		Sub- Regional Setting		Regional Setting
	0 - 0.5 km	0.5 – 1 km	1 - 2 .5 km	2.5 - 5 km	> 5 km
Residential Areas / Local Streets	H	H	H	M	L
Parks - Recreation	H	H	H	M	
Motorways / Highways	H	M	M	L	L
Parks - Sporting	M	M	L	L	VL
Industrial Areas	L	L	L	VL	VL
Landfill Areas	VL	VL	VL	VL	VL
Legend - H = High, M = Moderate, L = Low, VL = Very Low					

Source: United States Department of Agriculture Forest Service (1974)

TABLE 3 – TYPICAL VISUAL (VIEWER) SENSITIVITY

1.3.2 QUANTITATIVE ASSESSMENT - VISUAL PROMINENCE & RELATIONSHIP WITH VIEWSHEDS

This report defines a number of viewsheds, or visual settings, based on distance from the Project for the purposes of assessment. The methodology is based on the reduction of impact with an increase in distance between a given viewpoint and the Project. The potential visual impact of the Project will also, to a large extent, depend on how much of the central field of vision it occupies (Refer to ***Table 4***, ***Table 5*** and ***Appendix A***).

Throughout the visual catchment, the degree of visual prominence will generally decrease as the distance from the development site to various viewing locations increases.

The quantitative assessment of visual prominence, i.e., how much is potentially visible, is intertwined with the distribution, height and density of vegetation as well as topography throughout the visual catchment , elements which can screen views of a development from a particular viewpoint. Visual prominence helps inform the process of determining the visual modification level as previously outlined in the above section.

Degrees of Field of View Occupied	Potential Visual Prominence – Horizontal Field of View
Less than 5^{o}	▪ ***Insignificant – Low Visual Prominence*** The development may not be highly visible in the view unless it contrasts strongly with the background.
▪ ***5^{o} – 30^{o}***	▪ ***Potentially Noticeable – Moderate Visual Prominence*** The development may be noticeable. The degree that it intrudes on the view will be dependent on how well it integrates with the landscape setting.
▪ ***Greater than 30^{o}***	▪ ***Potentially Dominant – High Visual Prominence*** The development will be highly noticeable.

TABLE 4 – HORIZONTAL LINE OF SIGHT – VISUAL IMPACT / VISUAL PROMINENCE

Degrees of Field of View Occupied	Potential Visual Prominence – Vertical Field of View
Less than 0.5^{o}	▪ ***Insignificant - Low Visual Prominence*** A small thin line in the landscape.
▪ ***0.5^{o} – 2.5^{o}***	▪ ***Potentially Noticeable – Moderate Visual Prominence*** The development may be noticeable. The degree that it intrudes on the view will be dependent on how well it integrates with the landscape setting.
▪ ***Greater than 2.5^{o}***	▪ ***Potentially Dominant – High Visual Prominence*** The development will be highly noticeable, although the degree of visual intrusion will depend on the landscape setting and the width/spread of the object.

TABLE 5 – VERTICAL LINE OF SIGHT – VISUAL IMPACT / VISUAL PROMINENCE

Distance from Object	Potential Visual Prominence
5000 metres (Regional viewshed)	▪ ***Visibility Diminishing*** The visual prominence of the element progressively diminishes over distance.
▪ ***2000 – 5000 metres (Sub-regional viewshed)***	▪ ***Potentially Noticeable*** The development will be noticeable. The degree that it intrudes on the view will increase as distance reduces.
▪ ***Less than 2000 metres – (Local viewshed)***	▪ ***Potentially Dominant*** The development may be highly noticeable.

TABLE 6 – VISUAL PROMINENCE IN RELATION TO DISTANCE AND VIEWSHED SETTINGS – BASED ON STACK HEIGHT OF 100M

1.3.3 IMPACTS OF NIGHT-LIGHTING

Given the lack of Australian standards for the assessment of lighting impacts, the assessment of the impacts of lighting at night-time has been based on the UK's *Guidance Notes for the Reduction of Obtrusive Light* (Refer to ***Appendix B***).

2 The Existing Landscape

This assessment has been undertaken for the following viewsheds or visual settings:

- ***Sub–regional*** – between 1 km and 5 km from the Project:
- ***Local*** – within 1 km of the Project.

2.1 SITE CONTEXT

The Project is located at Eastern Creek, approximately 36 km west of the Sydney CBD within the Western Sydney Employment Area (WSEA).

2.2 SITE LAND USE

The site, which is accessed off Honeycomb Drive at Eastern Creek, is surrounded by land owned by the Corporate Group Alexandria Landfill Pty Ltd, ThaQuarry Pty Ltd, Australand, Hanson, Jacfin, the Department of Planning and Infrastructure and Sargents. The site and surrounding land is identified as part of the 'State Environmental Planning Policy (Western Sydney Employment Area) 2009 (WSEA SEPP)' to be redeveloped for higher end industrial and employment uses over the next decade.

The site is comprised of an existing land fill operation of previously quarried voids.

2.2.1 SUB–REGIONAL SETTING (1 TO 5 KM)

The sub-regional setting to the east and south is primarily comprised of large form industrial buildings (***Figure 3***).

The residential suburbs of Minchinbury, Colyton and Erskine Park are located to the north, north-west and west respectively. The suburban residential character is primarily comprised of single storey residences with construction typically of brick veneer with tiled roofs with scattered canopy tree planting throughout.

The infrastructure associated with the setting includes the M4 Motorway and high voltage powerlines which traverse the setting.

2.2.2 LOCAL (< 1 KM)

The eastern part of the local setting is comprised of industrial uses with large form industrial buildings constructed typically of tilt concrete slabs with metal deck roofs. The undeveloped areas are comprised of open paddocks.

High voltage powerlines diagonally traverse the setting to the east of the Project in a north-west to south-east direction.

The western part of the setting comprises an area of undeveloped open space along Ropes Creek, comprised of remnant and regrowth riparian vegetation up to 15 m in height.

2.3 LANDSCAPE ABSORPTIVE CAPABILITY

The definition of landscape absorptive capability is closely related to that of visual modification levels, as described in ***Section 1.3.1***. It is generally applied at a broader scale than visual modification and is an assessment of how well a landscape setting is able to accommodate change or a development.

The key factors considered in determining absorptive capability are topography and vegetation. In areas of flatter topography, overlooking is not possible and a low and thin band of vegetation is able to screen views to a development from a given viewpoint. In areas of undulating or elevated topography, overlooking can occur and vegetation needs to be higher and denser to achieve effective screening. Intervening undulating topography also has the potential to block views in certain landscapes.

The study area generally has a high level of absorptive capability in areas of high visual sensitivity due to the relatively flat topography, which reduces changes of overlooking, and the presence of built form and vegetation which effectively screens views.

FIGURE 3 – LOCAL CONTEXT AND LANDUSE PATTERNS

3 Description of Project Form

3.1 BROAD DESCRIPTION OF THE PROJECT

The proposed development involves the construction and operation of an electricity generation plant, which will allow for unsalvageable and uneconomic residue waste from the Genesis Xero Material Processing Centre (MPC) and Waste Transfer Station (WTS) to be used for generation of electrical power.

The plant, powered by burning non-recyclable combustible waste material, will have a capacity for up to 1.35 million tonnes of waste material per annum.

The proposed EFW Facility will employment of a total of up to 55 staff upon operation, working over three shifts (i.e. not on site at any one time).

The site has a total area of approximately 56 hectares (ha) including the Riparian Corridor, with a specific development area of 9 ha.

The main components of the EFW facility which are of a form and scale most relevant to visual assessment are:

- Buildings of varying footprints and heights ranging from approximately 20 m above ground level (AGL) to 54 m AGL including:
  - A tipping hall (108 m long [l]x 51 wide[w] x 19 high [h]);
  - A waste bunker (127 m long [l]x 40 wide[w] x 44 high [h]);
  - A boiler house – per phase (50 m long [l]x 50 wide[w] x 52 high [h]);
  - Flue gas treatment – per phase (45 m long [l]x 47 wide[w] x 35 high [h]);
  - Turbine hall – per phase (34 m long [l]x 46 wide[w]) x 26 high [h];
  - Air cooled condensers – per phase (52 m long [l]x 52 wide[w]) x 22 high [h]; and
- Twin vent stacks to 100 m AGL.

The proposed works will, in addition to the EFW Facility, include the adoption of a plan of subdivision and the following ancillary works:

- Earthworks associated with the balance of the site;
- Internal roadways;
- Provision of a direct underpass connection (Precast Arch and Conveyor Culvert) between TNG Facility and the Genesis Xero Waste Facility;
- Staff amenities and ablutions;
- Staff car parking facilities;
- Water detention and treatment basins; and
- Services (Sewerage, Water Supply, Communications, Power Supply).

Further to the above physical works associated with the proposed Energy from Waste Facility, this application seeks approval for the subdivision of Lot 1, 2 and 3 in DP 1145805 in order to create a separate lot of approximately 10,000m² for the Transgrid Switching or Substation and additional lots to allow for future development of land not associated with the Energy from Waste Facility and the Genesis Xero Material Processing Plant.

It should be noted that from a viewer perception perspective, the vent stacks will not emit a visible plume.

Figure 4 shows the general arrangement of the Project and ***Figures 5*** to ***7*** indicates the locations and sizes of key components.

3.1.1 LIGHTING

Operations would occur 24 hours a day. Lighting emissions would be of three types:

- *Fixed*
  - Main facility, administration and ancillary support buildings.
  - Aviation navigation warning lights.
- *Mobile* – fleet headlights.

3.1.2 DURATION OF OPERATION

The Project is expected to operate 24 hours per day, seven days a week.

FIGURE 4 – PROJECT GENERAL ARRANGEMENT (SOURCE: KTA)

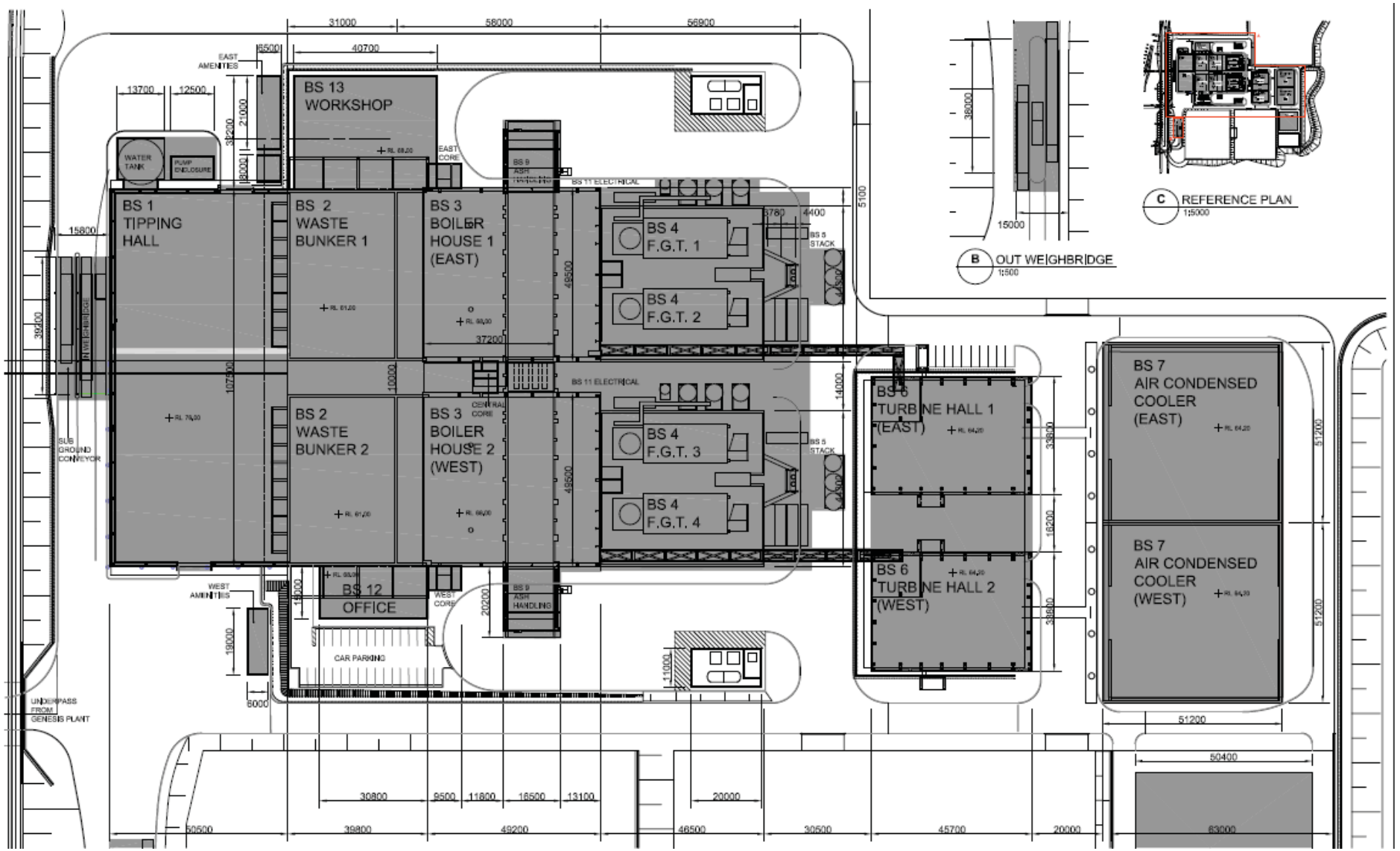

FIGURE 5 – DIMENSIONS OF PROJECT COMPONENTS (SOURCE: KTA)

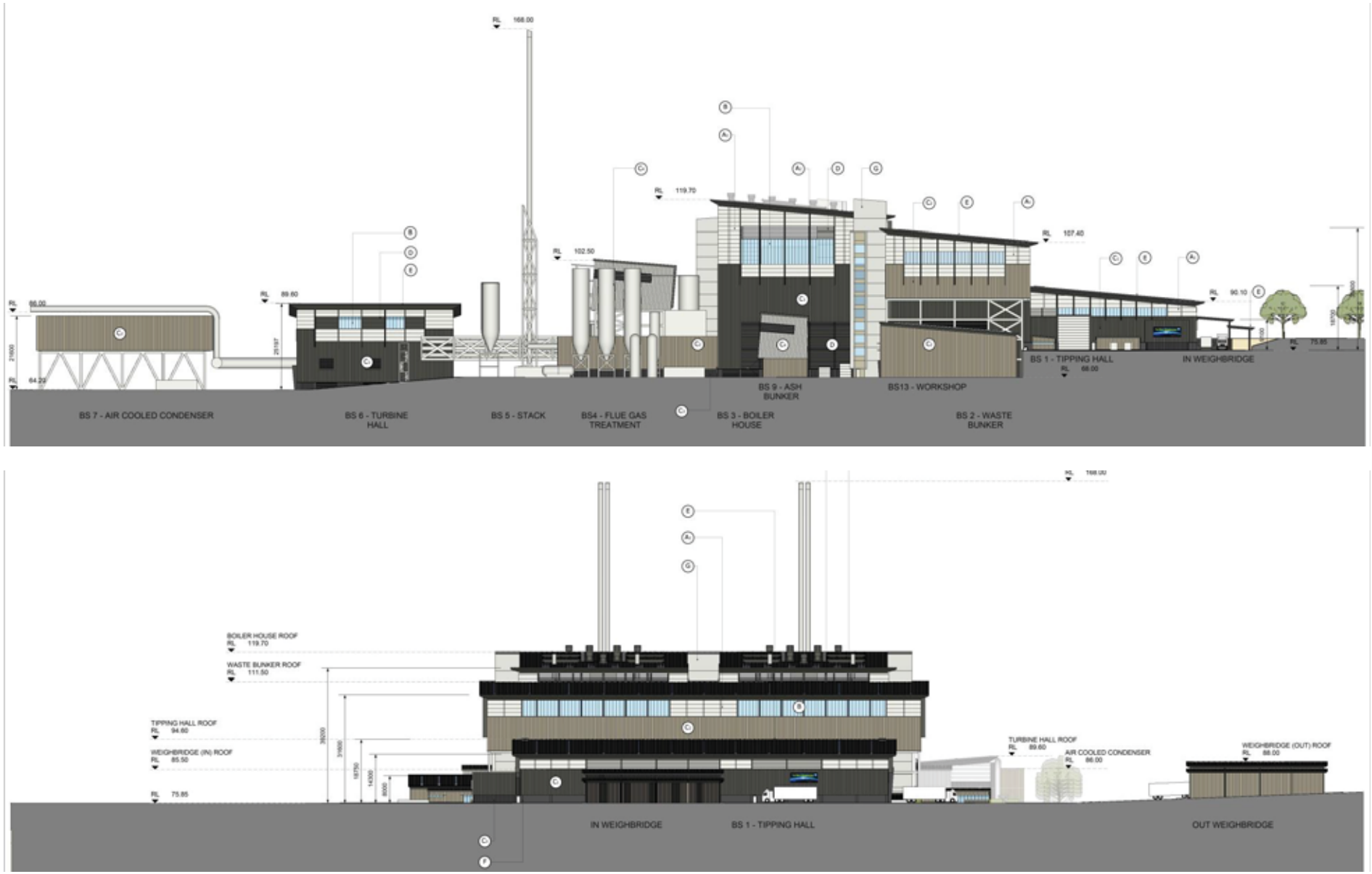

FIGURE 6 – PROJECT ELEVATIONS – EAST (UPPER) AND NORTH (LOWER) (SOURCE: KTA)

FIGURE 7 – PROJECT ELEVATION – WEST (UPPER) AND SOUTH (LOWER) (SOURCE: KTA)

4 Assessment of Potential Impact

This assessment has been prepared to define areas of highest visual impact and to assist in the mitigation of impacts of the proposed works from sensitive viewpoints.

4.1 QUANTITATIVE VISUAL IMPACT – PRIMARY VIEWPOINTS

The critical issues to consider in the assessment of visual impact are:

- Degree to which the proposed works are visible from representative sensitive viewing locations; and
- The degree to which the Project integrates within the character of the existing setting.

The method assumes that if the Project is not seen, then there is no resulting impact.

Analysis was undertaken to identify sensitive viewpoints in the vicinity of the Project. Viewpoints located within the local and near sub-regional settings of the Project were chosen for detailed assessment based on their higher levels of viewer sensitivity:

- Residences and the local road network;
- Transport and Tourist Routes, e.g., motorway; and
- Open Space and recreation areas.

The quantitative assessment process has focussed on the visual modification that may result on views for the most sensitive visual settings/land uses, applying the visibility method as described in ***Section 1.3.1*** and ***Appendix A***. Low sensitivity visual settings, such as existing landfill areas or industrial land uses have not been considered. The quantification of vertical angle is based on the height of the tallest elements of the Project (e.g., the tallest building at 54 m and the vent stacks at 103.7 m). The quantification of vertical and horizontal prominence assists with the determination of visual modification. However, it does not take into account aspects such as visual contrast or visual integration which are assessed as part of the qualitative assessment process.

Distances expressed in the quantitative assessment are based on those from the viewpoint to the most visible components of the Project, either the vent stacks or main building structure.

A quantitative assessment of these viewpoints is given in ***Table 7*** and the locations of viewpoints are shown in ***Figure 8***.

TABLE 7 – QUANTITATIVE ASSESSMENT

VIEWPOINT *(REFER FIGURE 8)*	VIEWSHED	HORIZONTAL DISTANCE FROM VIEWER (TO CLOSEST COMPONENT)	HORIZONTAL ANGLE	*HORIZONTAL POTENTIAL VISUAL PROMINENCE*	VERTICAL ANGLE	*VERTICAL POTENTIAL VISUAL PROMINENCE*	*VISUAL MODIFICATION LEVEL*
EASTERN ASPECT							
Viewpoint 1 Roper Road Overpass	Sub-Regional	1.7 km (Tipping Hall)	5^{o} Minimal Views – Mostly screened by vegetation	Insignificant	2^{o} Minimal Views – Mostly screened by vegetation	Potentially Noticeable	Low to Moderate
Viewpoint 2 Peppertree Drive (Near Phoenix Crescent)	Sub-Regional	1.9 km (Vent Stack)	No View – Screened by built form and vegetation	No Impact	No View – Screened by built form and vegetation	No Impact	No Impact
Viewpoint 3 Peppertree Park	Sub-Regional	1.8 km (Vent Stack)	7^{o}	Potentially Noticeable	3^{o}	Potentially Dominant	Moderate to High
Viewpoint 4 Minchin Drive	Sub-Regional	1.6 km (Tipping Hall)	No View – Screened by topography	No Impact	No View – Screened by topography	No Impact	No Impact
Viewpoint 5 McFarlane Drive	Sub-Regional	1.3 km (Tipping Hall)	No View – Screened by topography	No Impact	No View – Screened by topography	No Impact	No Impact
Viewpoint 6 Indus Street	Sub-Regional	1.5 km (Vent Stack)	4^{o} Minimal Views – Mostly screened by vegetation	Insignificant	2^{o}	Potentially Noticeable	Low to Moderate
Viewpoint 7 Old Wallgrove Road	Sub-Regional	1.6 km (Vent Stack)	8^{o}	Potentially Noticeable	4^{o}	Potentially Dominant	Moderate to High

VIEWPOINT *(REFER FIGURE 8)*	VIEWSHED	HORIZONTAL DISTANCE FROM VIEWER (TO CLOSEST COMPONENT)	HORIZONTAL ANGLE	*HORIZONTAL POTENTIAL VISUAL PROMINENCE*	VERTICAL ANGLE	*VERTICAL POTENTIAL VISUAL PROMINENCE*	*VISUAL MODIFICATION LEVEL*
Viewpoint 8 Blackbird Lane Path	Sub-Regional	1.2 km (Vent Stack)	4^{o} Minimal Views – Mostly screened by vegetation	Insignificant	3^{o}	Potentially Dominant	Moderate
Viewpoint 9 Sennar Lane Path	Sub-Regional	1.3 km (Vent Stack)	4^{o} Minimal Views – Mostly screened by vegetation	Insignificant	3^{o}	Potentially Dominant	Moderate

4.1.1 VISUAL SIMULATIONS

Visual simulations (based on a computer generated three dimensional [3D] model) have been created for the selected locations shown on ***Figure 8*** by Orbital Solutions.

The architectural form of the Project conveyed in the visual simulations in this report in ***Section 4*** relate to an earlier design. The current design of the Project as shown in ***Section 3*** has been revised to provide greater articulation of the massed form as well as a significant reduction in the diameter of the vent stacks. The visual simulations could therefore be considered to be a worst case scenario

Initial verification 3D model views of the Project were prepared by Race Cottam, Orbit and Urbis. These models all portrayed the Project at the same scale or proportion within the field of view for each of the selected viewpoints.

The vertical location of the 3D model within the photo was calibrated by Urbis using a number of elements of known height within the visual setting. These were:

- The HV pylons, where the height was determined using software that calculated height based on length of shadow for a given time of day.

- Mobile phone towers – where Urbis has a data base of specification (and height) of all Telco towers in Australia.

The photo simulations based on photography from typical sensitive viewpoints are included within the following analysis section. The images that the photo simulations have been based on have been captured with a Canon 6D single lens reflex (SLR) full format digital camera, fitted with a Canon GP-E2 GPS unit, with a lens of 50 millimetres (mm) focal length which would result in an image very close to the recognised standard that closely represents the central field of vision of the human eye. Photomontages have been prepared for a range of indicative sensitive viewpoints that represent a variety of distances from the Project as well as locations with differing viewing aspects.

4.1.2 THEORETICAL VIEWSHED

The theoretical viewshed or theoretical zone of visual influence (TZVI) is the area from which views of a particular proposed development may be possible. The viewsheds of the main components of the Project are shown on ***Figures 8*** to ***11***. The contour interval of the digital terrain model was 2 m.

The TZVI has been generated for the top of the vent stacks, and the main buildings and assumes a viewing height for surrounding areas of 1.5 m above ground level.

The TZVI could be considered to be a worst case (i.e. conservative) scenario, with a greater extent of viewshed identified than would actually exist, as it does not take into account the effects of screening of views by existing vegetation. Its primary purpose is to identify locations from which a proposed development may be visible in a worst case scenario.

SUMMARY OF RESULTS

The TZVI analysis demonstrates that where there is no vegetation or built form, the flat topography allows for distant views.

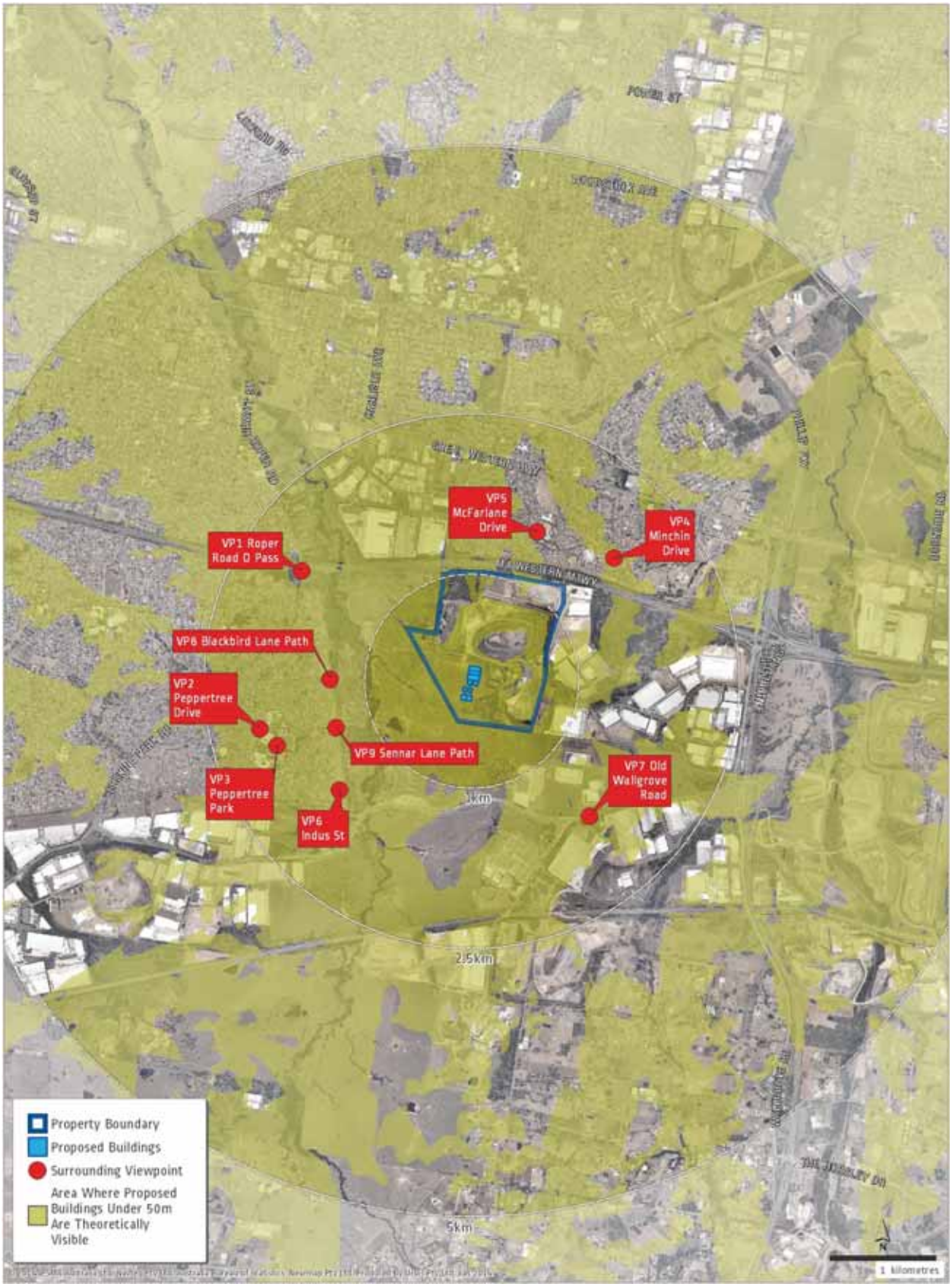

FIGURE 8 – VIEWPOINTS AND TZVI OF AREAS FROM WHICH BUILDINGS 30 - 50M HEIGHT ARE THEORETICALLY VISIBLE

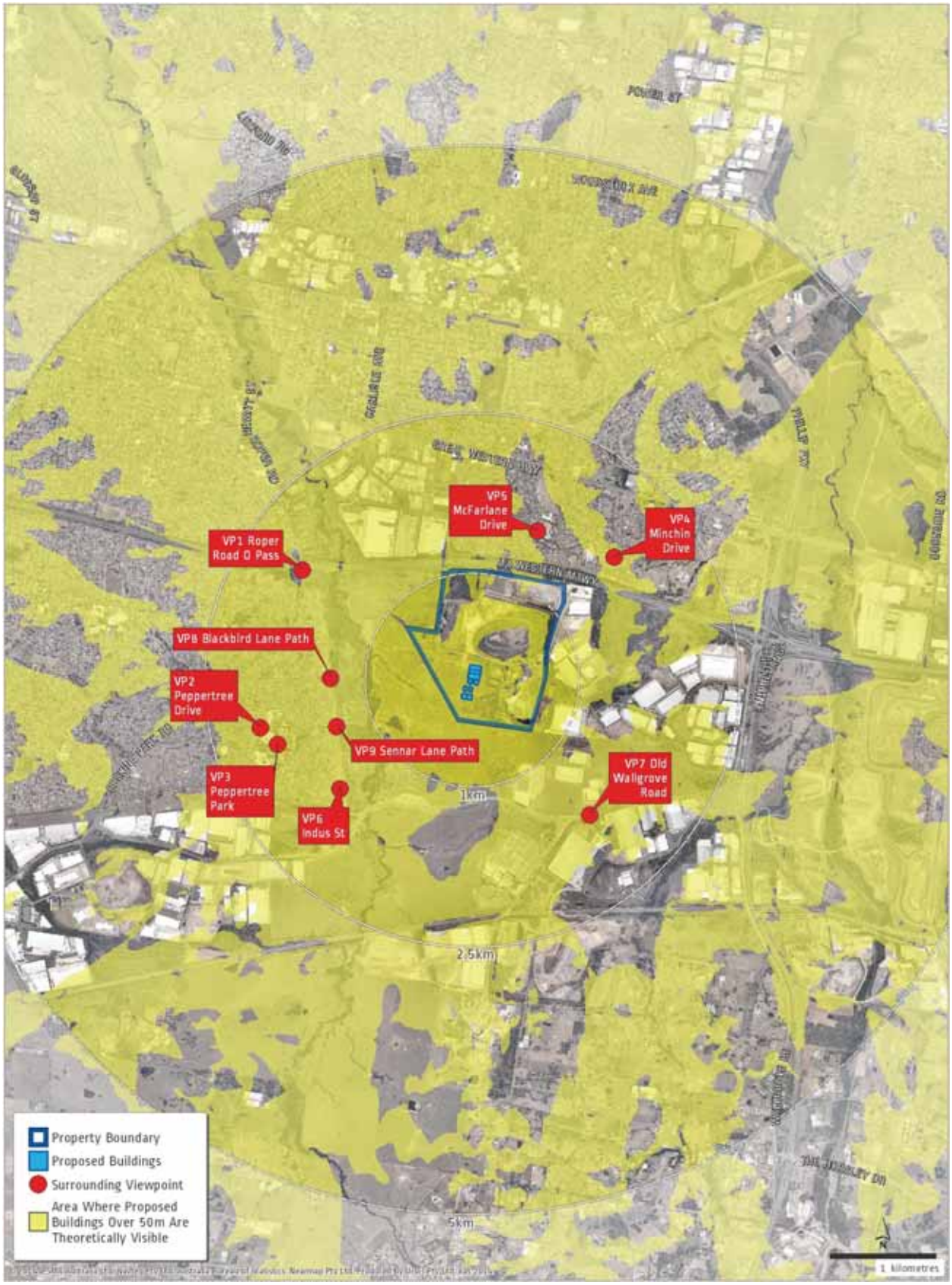

FIGURE 9 – TZVI OF AREAS FROM WHICH BUILDINGS OVER 50M IN HEIGHT ARE THEORETICALLY VISIBLE

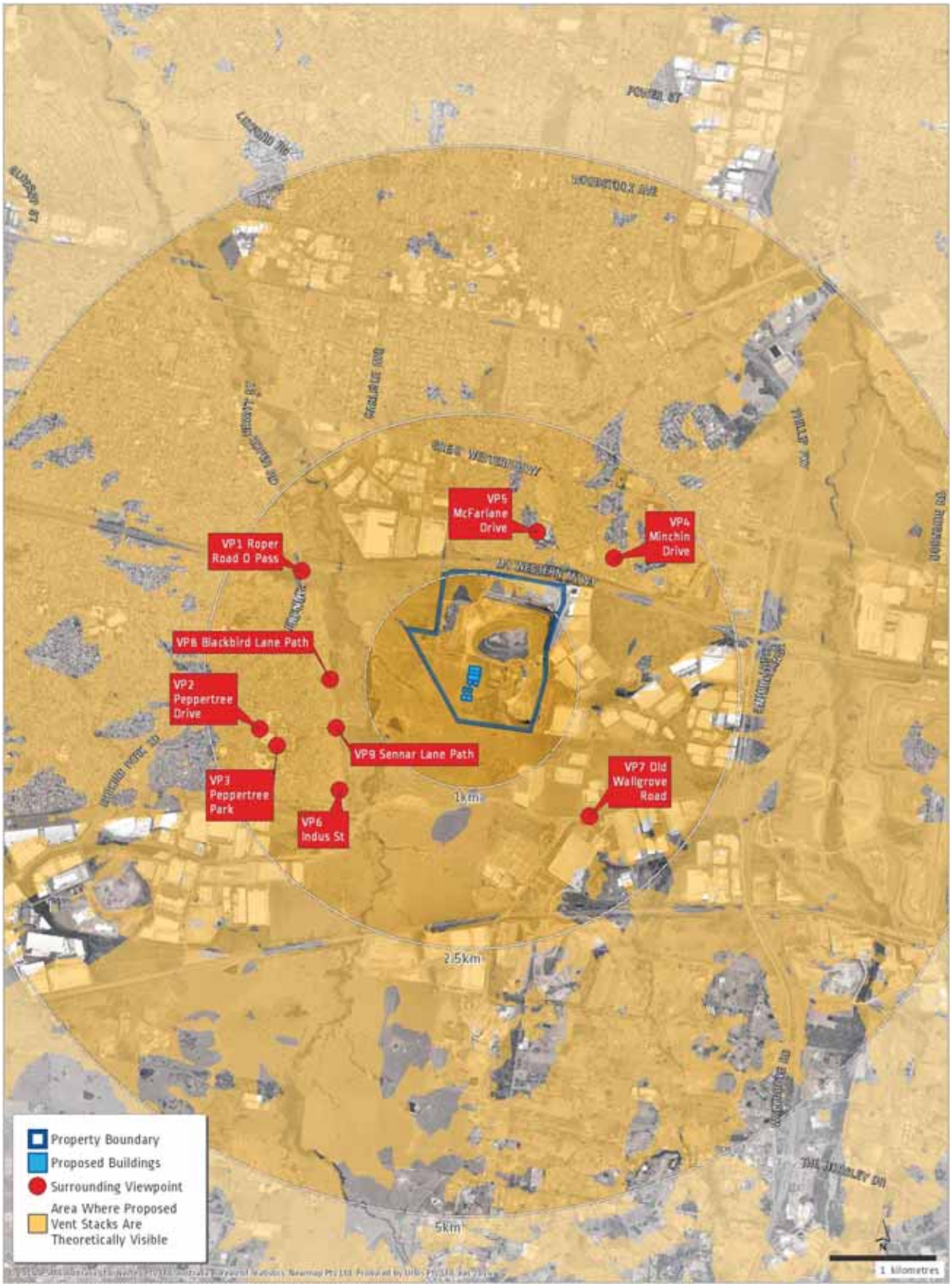

FIGURE 10 – TZVI OF AREAS FROM WHICH VENT STACKS (102M HEIGHT) ARE THEORETICALLY VISIBLE

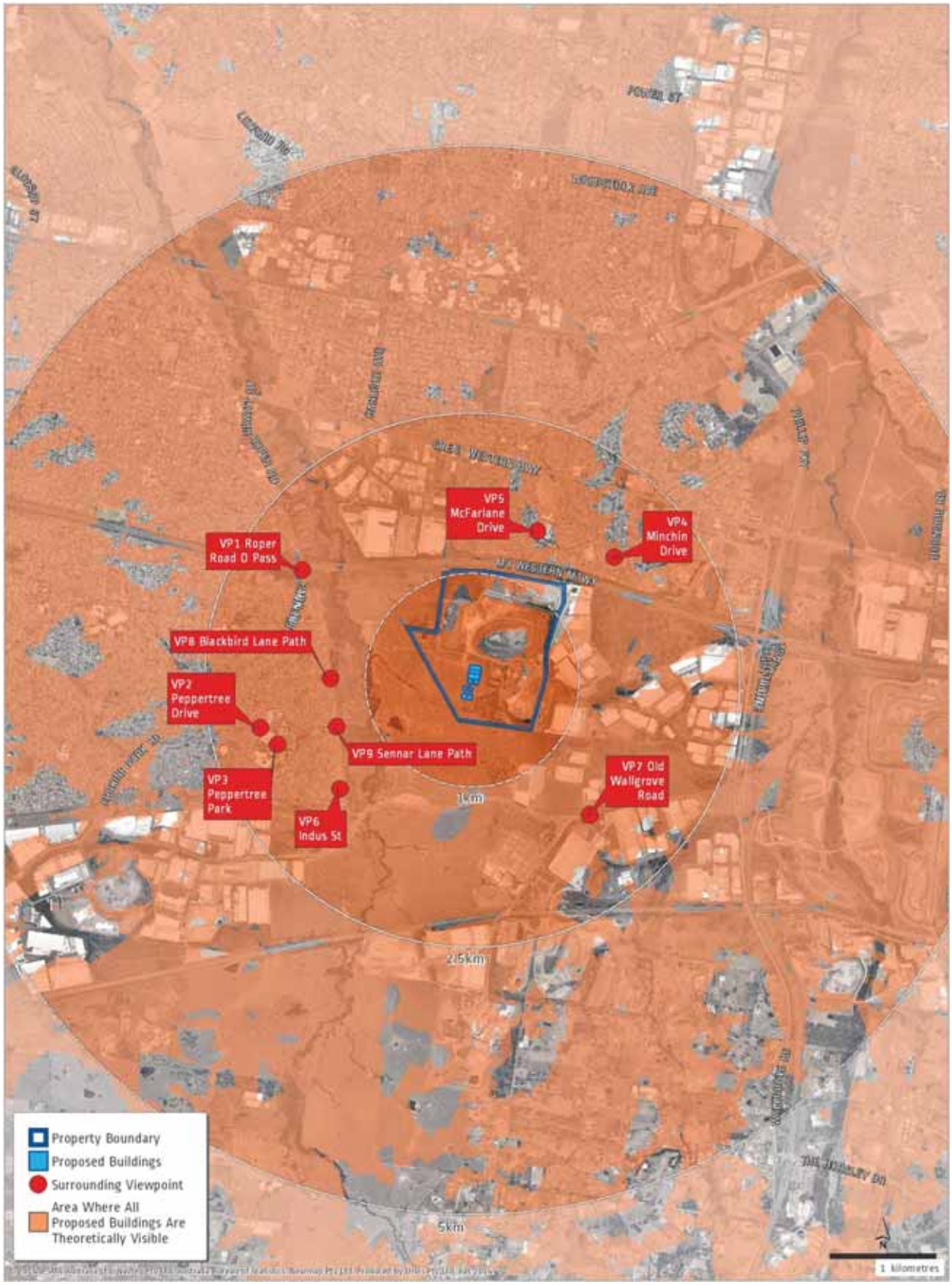

FIGURE 11 – TZVI OF ALL COMPONENTS OF THE PROJECT.

4.2 QUALITATIVE ASSESSMENT

The following section assesses the potential visual impact of the Project on the sensitive viewpoints described in ***Section 4.1***. Distances expressed in the qualitative assessment are based on those from the viewpoints to the most visible components of the Project, the vent stacks and main buildings.

The assessment has been undertaken for a range of individual viewpoints which are representative of other similar viewpoints within the setting with a similar aspect to the Project.

Viewpoints were selected on the basis of their sensitivity (land use and user experience dependant) and radius from the Project. Within 2.5km, residential uses are deemed to be of a high sensitivity. Beyond this distance the level of sensitivity falls and, commensurate with this, the visual modification level or visual prominence level also falls. Additional assessed viewpoints within this area beyond 2.5km would be determined as having a lower level of impact due to residential visual sensitivity reducing to moderate.

All selected viewpoints are located within the near sub-regional setting (i.e., between 1km and 2.5km of the components of the Project). No viewpoints exist in the local setting and viewpoints within the regional setting are considered to be too distant for the impacts to be significant.

VIEWPOINT 1 – ROPER ROAD OVERPASS	
Viewing Location	Footpath on south side of bridge (***Figure 8***).
Viewing Distance	1.7 km to the Project – tipping hall.
Visual Setting	Sub-regional.
Landscape Setting	The viewpoint is located on a road bridge over the M4 Western Motorway connecting the residential areas of Colyton and Erskine Park, which abut the Motorway to the north west and south west of the bridge. The landscape character of the Motorway is dominated by six traffic lanes, centrally divided by a wide, grassed and lightly planted median. Four high voltage transmission lines traverse the Motorway 500 m south of the viewpoint (***Figures 12*** and ***13***).
Visual Modification	The tops of the higher buildings, the tipping hall and the turbine buildings, as well as the vent stacks will be visible protruding above the existing foreground vegetation which will screen views to the lower parts of the Project (***Figure 15***). The landscape character of views from the bridge is defined by the Motorway and its associated infrastructure as well as the high voltage powerlines. Given the distance of the viewpoint from the Project and the visual fit of the project with existing, large scale infrastructure, there is anticipated to be a low visual modification resulting to the views from this viewpoint.
Land Use	Local Connector Road.
Visual Sensitivity	High.
Duration of View	Moving.
Potential Visual Impact	The high visual sensitivity combined with a low visual modification level will result in a moderate visual impact.

FIGURE 12 - CHARACTER OF SETTING – ROPER ROAD OVERPASS – RESIDENTIAL INTERFACE

FIGURE 13 – CHARACTER OF SETTING – ROPER ROAD OVERPASS – MOTORWAY INTERFACE

FIGURE 14 – EXISTING VIEW SOUTH EAST TOWARDS PROJECT - ROPER ROAD OVERPASS

FIGURE 15 – PHOTOSIMULATION VIEW SOUTH EAST TOWARDS PROJECT – ROPER ROAD OVERPASS

VIEWPOINT 2 – PEPPERTREE DRIVE (NEAR PHOENIX CRESCENT)	
Viewing Location	Edge of roadway (***Figure 8***).
Viewing Distance	1.9 km to the Project (vent stack).
Visual Setting	Sub-regional.
Landscape Setting	Suburban street primarily comprised of single storey residences with construction typically of brick veneer with tiled roofs. Vegetation throughout the residential area is mixed native and exotic, deciduous and evergreen species with a sparse canopy cover throughout (***Figure 16***).
Visual Modification	Built form and canopy trees throughout the residential area between the viewpoint and the Project generally screen views. Views to the tops of the vent stacks may be possible where gaps in buildings and vegetation allow for distant unobstructed views (***Figure 17*** and ***18***). As a result, the overall visual modification level is considered to be low to non-apparent.
Land Use	Residential area / local street.
Visual Sensitivity	High.
Duration of View	Stationary - Residences / Moving – Vehicles, pedestrians and cyclists.
Potential Visual Impact	The high visual sensitivity combined with a low or non- apparent visual modification level will result in a generally non-apparent visual impact.

FIGURE 16 – CHARACTER OF SETTING - PEPPERTREE DRIVE

FIGURE 17 – VIEW EAST TOWARDS PROJECT – PEPPERTREE DRIVE

FIGURE 18 – BUILDING OUTLINE VIEW WEST TOWARDS PROJECT – PEPPERTREE DRIVE

VIEWPOINT 3 – PEPPERTREE PARK	
Viewing Location	North eastern corner of park (***Figure 8***).
Viewing Distance	1.8 km to the Project (vent stack).
Visual Setting	Sub-regional.
Landscape Setting	The park is an open playing field with trees bordering its southern boundary and residences abutting the parks eastern boundary. The Erskine Park community centre abuts the park's north western boundary. With the opportunity for viewpoints setback from intervening foreground objects, views out from the space are expansive (***Figure 19***).
Visual Modification	The upper parts of the main buildings and the vent stacks will be visible from this viewpoint above intervening vegetation and built form (***Figure 20*** and ***21***). As a result, there is anticipated to be a moderate to high visual modification resulting to the viewshed from this viewpoint.
Land Use	Recreational.
Visual Sensitivity	High.
Duration of View	Stationary.
Potential Visual Impact	The high visual sensitivity combined with a moderate to high visual modification level will result in a high visual impact.

FIGURE 19 – CHARACTER OF SETTING – PEPPERTREE PARK

FIGURE 20 – VIEW EAST TOWARDS THE PROJECT FROM PEPPERTREE PARK

FIGURE 21 – PHOTOSIMULATION VIEW EAST TOWARDS THE PROJECT – PEPPERTREE PARK

VIEWPOINT 4 – MINCHIN DRIVE	
Viewing Location	Minchin Drive edge of roadway (***Figure 8***).
Viewing Distance	1.6 km to the Project (tipping hall).
Visual Setting	Sub-regional.
Landscape Setting	Suburban street primarily comprised of single storey residences with construction typically of brick veneer with tiled roofs. Vegetation throughout the residential area is mixed native and exotic, deciduous and evergreen species with a sparse canopy cover throughout (***Figure 22***).
Visual Modification	Built form and canopy trees throughout the residential area between the viewpoint and the Project generally screen views. Views to the tops of the vent stacks may be possible where gaps in buildings and vegetation allow for distant unobstructed views (***Figure 23*** and ***24***). As a result, the overall visual modification level is considered to be low to non-apparent.
Land Use	Residential area / local street.
Visual Sensitivity	High.
Duration of View	Stationary - Residences / Moving – Vehicles, pedestrians and cyclists.
Potential Visual Impact	The high visual sensitivity combined with a low or non- apparent visual modification level will result in a generally non-apparent visual impact.

FIGURE 22 – CHARACTER OF SETTING – MINCHIN DRIVE

FIGURE 23 – VIEW SOUTH WEST TOWARDS THE PROJECT FROM MINCHIN DRIVE

FIGURE 24 – PHOTOSIMULATION WITH BUILDING OUTLINE VIEW SOUTH EAST TOWARDS THE PROJECT – MINCHIN DRIVE

VIEWPOINT 5 – MCFARLANE DRIVE	
Viewing Location	McFarlane Drive edge of roadway (***Figure 8***).
Viewing Distance	1.3 km to the Project (tipping hall).
Visual Setting	Sub-regional.
Landscape Setting	Suburban street primarily comprised of single storey residences with construction typically of brick veneer with tiled roofs. Vegetation throughout the residential area is mixed native and exotic, deciduous and evergreen species with a sparse canopy cover throughout (***Figure 25***).
Visual Modification	Built form and canopy trees throughout the residential area between the viewpoint and the Project generally screen views. Views to the tops of the vent stacks may be possible where gaps in buildings and vegetation allow for distant unobstructed views (***Figure 26*** and ***27***). As a result, the overall visual modification level is considered to be low to non-apparent.
Land Use	Residential area / local street.
Visual Sensitivity	High.
Duration of View	Stationary - Residences / Moving – Vehicles, pedestrians and cyclists.
Potential Visual Impact	The high visual sensitivity combined with a low or non- apparent visual modification level will result in a generally non-apparent visual impact.

FIGURE 25 – CHARACTER OF SETTING – MCFARLANE DRIVE

FIGURE 26 – VIEW SOUTH-SOUTHWEST TOWARDS THE PROJECT FROM MCFARLANE DRIVE

FIGURE 27 – BUILDING OUTLINE VIEW SOUTH-SOUTH WEST TOWARDS THE PROJECT – MCFARLANE DRIVE

VIEWPOINT 6 – INDUS STREET - PATHWAY	
Viewing Location	From the eastern end of the street at the intersection of the pathway (***Figure 8***).
Viewing Distance	1.5 km to the Project (vent stack).
Visual Setting	Sub-regional.
Landscape Setting	The eastern edge of Erskine Park interfaces with an area of open space along Ropes Creek. The suburban residential character is primarily comprised of single storey residences with construction typically of brick veneer with tiled roofs. The open space along the creek is undeveloped and is comprised of remnant and regrowth riparian vegetation up to 15 m in height. The tallest vegetation is offset between 150 m and 300 m from the viewpoint, with rough grassland and small trees to 5 m in height located in between the tallest vegetation and the informal pathway, which is located along the rear of the residential fences, running north to south along the length of the interface of the residential area and open space area (***Figure 28***).
Visual Modification	The existing vegetation between the viewpoint and the Project generally screens views to the main buildings. However, views of the tops of the taller buildings will be possible. Views to the tops of the slender vent stacks above the main buildings will be possible above vegetation (***Figure 29*** and ***30***). The built form of the Project will contrast with the natural landscape of the open space area in the foreground. However, the extent visible is likely to be relatively minimal. As a result, the overall visual modification level is considered to be low.
Land Use	Residential area / recreational path.
Visual Sensitivity	High.
Duration of View	Stationary to slow moving – Pedestrians and cyclists.
Potential Visual Impact	The high visual sensitivity combined with a low visual modification level will result in a moderate visual impact.

FIGURE 28 – CHARACTER OF SETTING – INDUS STREET PATHWAY

FIGURE 29 – VIEW NORTH EAST TOWARDS THE PROJECT FROM INDUS STREET PATHWAY

FIGURE 30 – PHOTOSIMULATION AND BUILDING OUTLINE VIEW NORTH EAST TOWARDS THE PROJECT – INDUS STREET PATHWAY

VIEWPOINT 7 – OLD WALLGROVE ROAD	
Viewing Location	Old Wallgrove Road, edge of roadway (***Figure 8***).
Viewing Distance	1.6 km to the Project (vent stack).
Visual Setting	Sub-regional.
Landscape Setting	Industrial area comprised primarily of large form industrial buildings constructed typically of tilt concrete slabs with metal deck roofs. The landscape is generally open with minimal vegetation. Significant areas of undeveloped land, primarily open paddocks, exist between buildings (*Figure 31*).
Visual Modification	The open landscape and flat topography allows for views to the Project as well as other buildings in the viewshed, the presence of such elements creating an already modified landscape character which is consistent with the form of proposed development (***Figure 32*** and ***33***). As a result, the overall visual modification level is considered to be low to moderate due to visual fit.
Land Use	Industrial area.
Visual Sensitivity	Low.
Duration of View	Stationary – Industrial sites / Moving – Vehicles.
Potential Visual Impact	The low visual sensitivity combined with a low to moderate visual modification level will result in a low visual impact.

FIGURE 31 – CHARACTER OF SETTING – OLD WALLGROVE ROAD

FIGURE 32 – VIEW WEST TOWARDS THE PROJECT FROM OLD WALLGROVE ROAD

FIGURE 33 – PHOTOSIMULATION VIEW WEST TOWARDS THE PROJECT – OLD WALLGROVE ROAD

VIEWPOINT 8 – BLACKBIRD LANE - PATHWAY	
Viewing Location	From the eastern end of the lane at the intersection of the pathway (***Figure 8***).
Viewing Distance	1.2 km to the Project (vent stack).
Visual Setting	Sub-regional.
Landscape Setting	The eastern edge of Erskine Park interfaces with an area of open space along Ropes Creek. The suburban residential character is primarily comprised of single storey residences with construction typically of brick veneer with tiled roofs. The open space along the creek is undeveloped and is comprised of remnant and regrowth riparian vegetation up to 15 m in height. The tallest vegetation is offset 50 m from the viewpoint, with rough grassland located between it and the informal pathway, which is located along the rear of the residential fences, running north to south along the length of the interface of the residential area and open space area (***Figure 34***).
Visual Modification	The existing vegetation between the viewpoint and the Project generally screens views to the main buildings. However, views of the tops of the taller buildings will be possible. Views to the tops of the slender vent stacks above the main buildings will be possible above vegetation (***Figure 35*** and ***36***). The built form of the Project will contrast with the natural landscape of the open space area in the foreground. However, the extent visible is likely to be relatively minimal. As a result, the overall visual modification level is considered to be low.
Land Use	Residential area / recreational path.
Visual Sensitivity	High.
Duration of View	Stationary to slow moving – Pedestrians and cyclists.
Potential Visual Impact	The high visual sensitivity combined with a low visual modification level will result in a moderate visual impact.

FIGURE 34 – CHARACTER OF SETTING – BLACKBIRD LANE

FIGURE 35 – VIEW EAST TOWARDS THE PROJECT FROM BLACKBIRD LANE

FIGURE 36 – PHOTOSIMULATION AND BUILDING OUTLINE VIEW EAST TOWARDS THE PROJECT – BLACKBIRD LANE

VIEWPOINT 9 – SENNA LANE - PATHWAY	
Viewing Location	From the eastern end of the lane at the intersection of the pathway (***Figure 8***).
Viewing Distance	1.3 km to the Project (vent stack).
Visual Setting	Sub-regional.
Landscape Setting	The eastern edge of Erskine Park interfaces with an area of open space along Ropes Creek. The suburban residential character is primarily comprised of single storey residences with construction typically of brick veneer with tiled roofs. The open space along the creek is undeveloped and is comprised of remnant and regrowth riparian vegetation up to 15 m in height. The tallest vegetation is offset 50 m from the viewpoint, with rough grassland located between it and the informal pathway, which is located along the rear of the residential fences, running north to south along the length of the interface of the residential area and open space area (***Figure 37***).
Visual Modification	The existing vegetation between the viewpoint and the Project generally screens views to the main buildings. However, views of the tops of the taller buildings may be possible. Views to the tops of the slender vent stacks above the main buildings will be possible above vegetation (***Figure 38*** and ***39***). The built form of the Project will contrast with the natural landscape of the open space area in the foreground. However, the extent visible is likely to be relatively minimal. As a result, the overall visual modification level is considered to be low.
Land Use	Residential area / recreational path.
Visual Sensitivity	High.
Duration of View	Stationary to slow moving – Pedestrians and cyclists.
Potential Visual Impact	The high visual sensitivity combined with a low visual modification level will result in a moderate visual impact.

FIGURE 37 – CHARACTER OF SETTING – SENNA LANE

FIGURE 38 – VIEW EAST TOWARDS THE PROJECT FROM SENNA LANE

FIGURE 39 – PHOTOSIMULATION AND BUILDING OUTLINE VIEW EAST TOWARDS THE PROJECT – SENNA LANE

4.3 IMPACTS OF NIGHT LIGHTING

Operations for the Project would be undertaken 24 hours a day, seven days a week. The methodology applied in this study is drawn from the Institute of Lighting Engineers' (ILE) *Guidance Notes for the Reduction of Obtrusive Light,* and includes a range of categories with which to describe the lit situation of the landscape. These environmental zones are supported by design guidance for the reduction of light pollution which can then inform proposed mitigation techniques (***Appendix B***).

4.3.1 THE EXISTING SETTING

The surrounding lighting environmental zones of the Project include the following settings as identified in the *Guidance Notes for the Reduction of Obtrusive Light* (ILE, 2005):

- Residential Areas:
  - Sub – regional setting:
    - Environmental Zone E3: Medium district brightness area.
  - Regional setting:
    - Environmental Zone E3: Medium district brightness area.
- Existing Industrial land uses :
  - Local setting – Undeveloped land and Industrial uses - Environmental Zone E2: Low district brightness area.
  - Sub – regional setting – Industrial uses - Environmental Zone E3: Medium district brightness area.

4.3.2 LIGHTING SOURCES

The lighting proposed to be employed by the Project would be emitted from three sources:

FIXED/PERMANENT LIGHTS

This is lighting that is installed as part of the permanent infrastructure of the development to allow for safe operations to occur at night as well as for security reasons.

AVIATION HAZARD LIGHTS

Given the height of the vent stacks, flashing red lights will be required to identify the tops of the stacks as an aviation hazard.

VEHICLE MOUNTED LIGHTS

Headlights mounted on trucks and management vehicles. Vehicles operating within the Project area would have headlights and hazard lights operating at all times due to occupational health and safety requirements.

4.3.3 EFFECTS OF LIGHTING

The exact impact or acceptability of night-lighting is difficult to define as it is dependent on individual perceptions and sensitivities as well as the presence of existing light.

From most locations in the sub–regional and regional setting, direct views to the lighting sources would be obscured from view by built form and vegetation within the landscape and around residences.

The management of night time operations, such as baffling and the use of motion sensors, will reduce impacts on adjacent sensitive viewpoints, particularly those within the near subregional setting. However, the local, sub regional and regional settings all contain lighting sources of a similar intensity emitted from both residences and other industrial uses and the nature of the night-lighting for the Project would be similar to that of the existing night-time setting. Therefore any change in potential night lighting impacts would be relatively minor for most viewpoints.

Mitigation measures to reduce the potential impacts of night-lighting from the Project are described in ***Section 5.3***.

5 Amelioration of Visual Impacts

A Site Landscape Concept Plan has been prepared for the Project by Site Image (***Figure 40***). The primary ameliorative actions include canopy tree planting along the northern interface with the future Estate Road.

5.1 CONSTRUCTION MATERIAL SELECTION

The visual impact has been reduced through the cladding of the buildings with non-reflective materials with subdued colours that mimic those found in the landscape of the setting, for example greys, browns and olive greens. The design uses this range of complementary muted colours of slightly lighter and darker shades to provide a dappled effect to improve visual integration.

Given that the vent stacks will be tall elements within the landscape and will be primarily viewed with the sky as a backdrop, the visual impact has been further reduced through selection of a light grey finish which aids visual integration in range of atmospheric conditions. Bright, un-natural colours have been avoided.

5.2 VISUAL SCREENING

While not able to fully screen the proposed 50 m high buildings and 100 m vent stacks, the canopy tree planting proposed for the north eastern boundary of the Project area should be extended to provide visual softening of the bulk of the buildings and assist them to "settle" within the landscape.

A landscape plan was prepared for the Project by Site Image. Their description to the approach to the design of the landscape is:

"The ground plane and landscape treatments shown on the masterplan are in proportion to the buildings and site, reducing the apparent scale of the built forms. The 8m wide bands of ballast rock create a rhythm that is relevant to elevated truck views, and for aerial views of the site. The entry, arrival road, office and weigh-station areas are the principal areas to receive finishes in excess of concrete and bitumen pavements."

5.3 MANAGEMENT OF POTENTIAL LIGHTING IMPACTS

The proponent would seek to minimise light emissions from the Project by carefully selecting the sites where lights would be placed, and by use of physical barriers and/or operational measures to reduce light 'spill' without compromising operational safety. Measures that would be employed to mitigate potential impacts from night-lighting would include the following, where practicable:

- All external lighting associated with the Project would comply with Australian Standard AS 4282: 1997 – *Control of the Obtrusive Effects of Outdoor Lighting*.
- Restriction of night-lighting to the minimum required for operations and safety requirements.
- Use of directional lighting techniques.
- Use of light shrouds and reflectors to limit the spill of lighting.

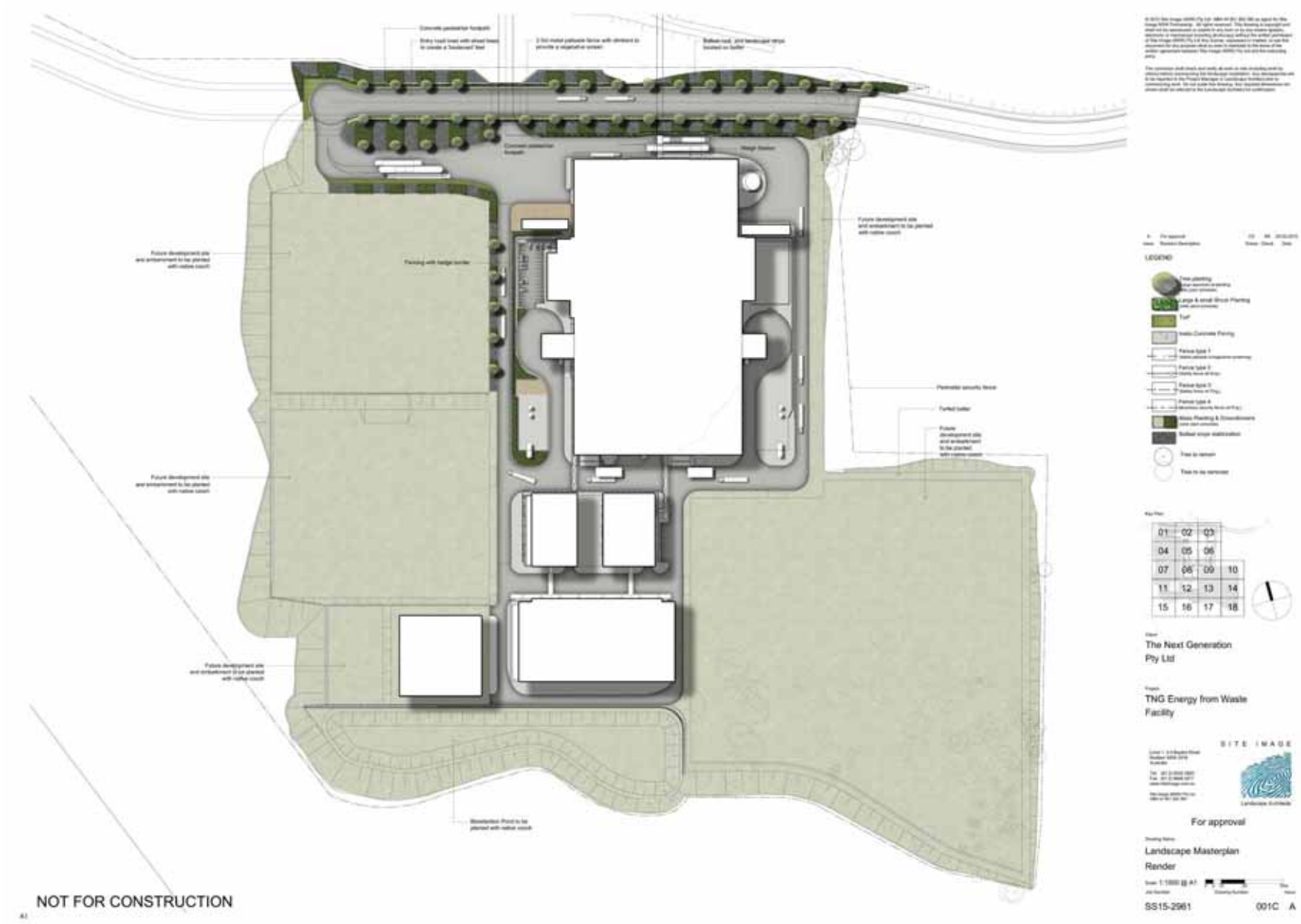

FIGURE 40 – SITE LANDSCAPE MASTER PLAN (SOURCE: SITE IMAGE)

6 Conclusion

The topography in the sub-regional setting, where most sensitive viewpoints are located, and the regional setting of the Project is generally flat to slightly undulating and provides a high degree of absorptive capability once combined with the approximately 10 to 15 m high vegetation scattered throughout the landscape as well as the presence of built form.

The landscape character of the setting east of Ropes Creek is heavily modified and is defined by a cleared landscape and large form industrial buildings. Additionally, four high voltage transmission lines and the six lane M4 Western Motorway traverse the setting. The presence of such elements creates an already modified landscape character which is consistent with the form of proposed development.

West of the Project, the urban character is normal density residential and most views to the industrial landscape from Colyton, Minchinbury and Erskine Park are screened by vegetation and residential built form.

The relatively flat topography of the broader setting reduces opportunities for overlooking from surrounding viewpoints. Due to the presence of vegetation throughout residential areas and along Ropes Creek, as well as high density residential development, the Project, which is typically beyond 1 km of any sensitive viewpoint, will not be highly visible.

From most locations, the lower parts of the Project will be totally obscured from view. Where views are possible, these will generally be of the upper parts of the buildings and the slender twin vent stacks protruding above the tree canopy or building line. The resulting visual impact will be negligible for most locations and generally low to moderate where views are possible from sensitive viewpoints.

The two closest viewpoints (4 and 5) have a low to non-apparent visual impact due to the screening effect of foreground built form and vegetation. Any viewpoints further away from the Project are likely to have a similar level of impact due to the same screening elements being present within the landscape and the topographic form which, as demonstrated in the TZVI, indicates that there are a number of areas where the topography alone blocks views to the Project.

Views from the carriageways of the M4 Western Motorway north west of the Project are visually screened from views of the Project by a combination of vegetation and rising topography. A berm approximately 15 m in height, which incorporates the existing landfill operations, is located along the edge of the Project boundary. The simulation in VP1, Roper Road Overpass, indicates that even from an elevated location, views are significantly screened. Therefore, from less elevated locations there will be no, if any, views.

The TZVI analysis indicates that views of the Project from along the Rooty Hill Visual Corridor north east of the Project will generally not be possible as topography screens views. Taking into account the screening effects of vegetation and built form, as indicated in the simulations for VP4 and 5, views to the Project will generally not be possible.

With regards to views from the Rooty Hill within the sub-regional setting, the Project will be viewed as a distant element in the context of adjacent large scale, industrial built form and it will be visually compatible within this context. The visual impact of the Project will therefore be low.

From the slightly elevated location of the M4 Western Motorway / M7 Westlink Tollway Interchange, within the sub-regional setting, foreground views will be primarily of large scale industrial built form. The simulation for VP7 – Old Wallgrove Road, is indicative of the context of the development with adjacent existing large scale built form. The resulting visual impact of the Project will be low.

The highest sensitivity viewpoints with higher visual impacts are generally located within the near sub regional setting. The highest impact locations are:

- M4 Western Motorway – for a short section within close proximity to the Project (local setting). However, given the modification to the landscape setting created by the M4 itself, and the heavily modified landscapes that it traverses, impacts to views from the M4 are not considered to be significant;

- Shared Path / Recreation Areas- Peppertree Park and Ropes Creek path; and
- Residences – Erskine Park, Colyton and Minchinbury (sub regional setting);

Where open views are afforded to the project, they are from low sensitivity industrial areas in the vicinity of Wallgrove Road to the south east.

7 References

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8 Glossary of Terms

Amelioration – The ability to reduce the visual impact of a development through siting, design, colour or screening.

Sensitivity – The degree to which various user groups will respond to change based on their expectation of a particular experience in a given setting, i.e., the expectation of a high level of visual amenity in a national park.

Modification Level – The degree to which a development contrasts or blends with its setting.

Visual Impact – The result of assessing the sensitivity level of a viewer and the modification level of a development.

Viewshed – The area visible from a particular viewing location.

Theoretical Zone of Visual Influence (TZVI) – The area over which an object can be seen within the landscape. Typically modelled using line of sight within a GIS application.

Visual Amenity – The qualities of a landscape setting that are appreciated and valued by a viewer.

Viewer Perception – The way in which people respond to what they are seeing as influenced by things other than purely visual, – i.e., noise and economic benefits.

Photosimulation - A digital photo illustration produced in 3D modelling software and Photoshop rendering software showing a proposed development in its contextual setting.

Appendix A Visibility Rationale

VISIBILITY – RELATIONSHIP WITH VIEWSHEDS

The report defines a number of viewsheds based on distance from the development for the purposes of assessment. The methodology is based on the reduction of impact with an increase in distance between a given viewpoint and the development. These viewsheds or settings are:

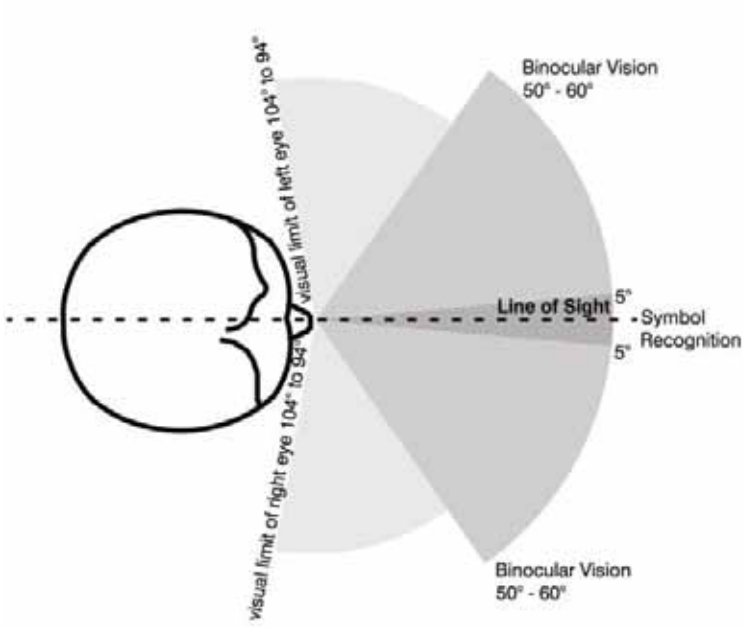
- **Local Setting** – up to 1 km from the development.
- **Sub-regional Setting** – between 1 km and 5 km from the development.
- **Regional Setting** – beyond 5 km of the development.

These distances have been established based on previous studies undertaken by URBIS. They are based on the reduction of visibility of objects in the distance as the field of view reduces.

HORIZONTAL LINE OF SIGHT

It is generally accepted that the central field of vision for the human eye covers a horizontal angle of approximately 50 degrees to 60 degrees. Given both eyes see simultaneously and that there is a degree of overlap, a central field of view results in a person looking straight ahead ***(Figure A.1).***

HORIZONTAL LINE OF SIGHT FIGURE A.1



In the production of visual simulations, a 50 mm lens on a 35 mm film format is most widely used as it captures a field of view of approximately 46 degrees, similar to that of the view from one eye. Two photos taken with a 50 mm lens produced as a panorama, with a degree of central overlap, capture the central field of view in a similar way to that of the human binocular view (binocular field).

Within the central field of vision, the viewed image is sharp, colours are separately defined and depth perception occurs.

VISUAL IMPACT/VISUAL PROMINENCE

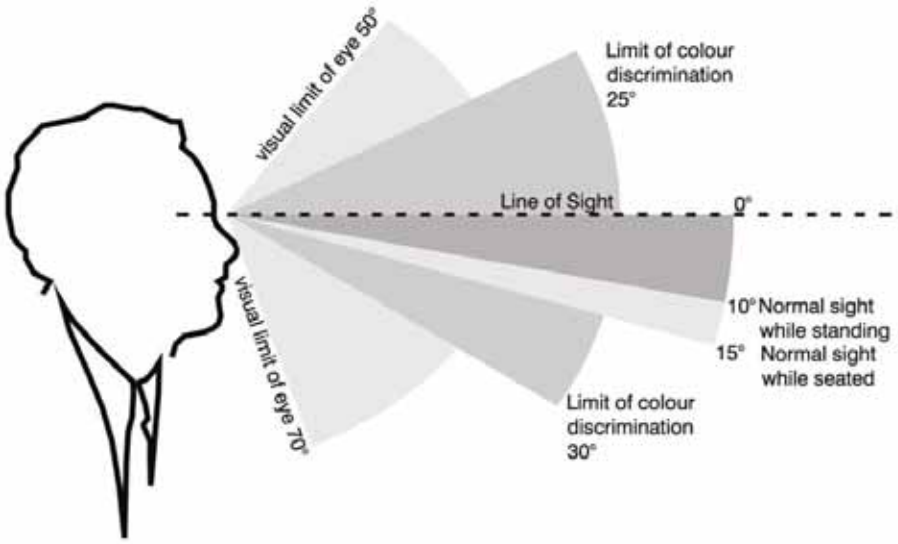
The potential visual impact of a development will, to a large extent, depend on how much of the central field of vision that it occupies. In relation to the assessment of mining sites that often extend across the landscape, the calculation of horizontal view angle is not the only factor to be considered.

DEGREES OF FIELD OF VIEW OCCUPIED	POTENTIAL VISUAL PROMINENCE – HORIZONTAL FIELD OF VIEW
Less than 5^{o}	**Insignificant** The development will not be highly visible in the view, unless it contrasts strongly with the background.
5^{o} – 30^{o}	**Potentially Noticeable** The development may be noticeable. The degree that it intrudes on the view will be dependent on how well it integrates with the landscape setting.
Greater than 30^{o}	**Potentially Dominant** The development will be highly noticeable.

VERTICAL LINE OF SIGHT

As for the horizontal line of sight, there is also a vertical central field of view. If we assume that the horizon is 0^{o} then the eye clearly defines colour, field of view and has image sharpness for an angle of approximately 25^{o} upwards and 30^{o} downwards. However, in reality, the typical line of sight for a standing person at ground level is approximately 10^{o} below the horizon line ***(Figure A.2).***

VERTICAL LINE OF SIGHT FIGURE A.2



VISUAL IMPACT / VISUAL PROMINENCE

Objects that occupy a small proportion of the vertical field of view are visible but not dominant, particularly when they occur within landscapes that have been modified by human activity.

DEGREES OF FIELD OF VIEW OCCUPIED	POTENTIAL VISUAL PROMINENCE – HORIZONTAL FIELD OF VIEW
Less than 0.5^{o}	**Insignificant** A small thin line in the landscape.
0.5^{o} – 2.5^{o}	**Potentially Noticeable** The development may be noticeable. The degree that it intrudes on the view will be dependent on how well it integrates with the landscape setting.
Greater than 2.5^{o}	**Potentially Dominant** The development will be highly noticeable, although the degree of visual intrusion will depend on the landscape setting and the width / thickness of the object.

VISUAL PROMINENCE IN RELATION TO DISTANCE AND VIEWSHED SETTINGS

The following distances relating to visual prominence are based on the previous field of view exercises. The distances also relate to the distances for the setting types in the visual assessment methodology.

DEGREES OF FIELD OF VIEW OCCUPIED	POTENTIAL VISUAL PROMINENCE – HORIZONTAL FIELD OF VIEW
5000 metres	**Insignificant** Visually insignificant.
1000 – 5000 metres	**Potentially Noticeable** The development may be noticeable. The degree that it intrudes on the view will increase as distance reduces.
Less than 1000 metres	**Potentially Dominant** The development will be highly noticeable.

Appendix B

Guidance Notes for the Reduction of Obtrusive Light

GUIDELINES PREPARED BY THE INSTITUTION OF LIGHTING ENGINEERS, UK.

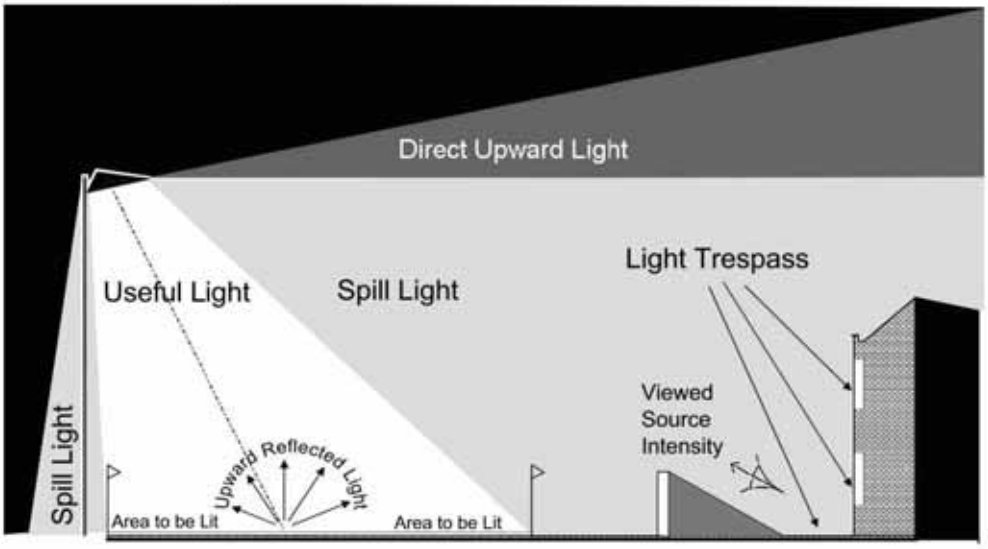
The Institution of Lighting Engineers
E-mail ile@ile.org.uk Website www.ile.org.uk

GUIDANCE NOTES FOR THE REDUCTION OF OBTRUSIVE LIGHT

ALL LIVING THINGS adjust their behaviour according to natural light. Man's invention of artificial light has done much to enhance our night-time environment but, if not properly controlled, obtrusive light (commonly referred to as light pollution) can present serious physiological and ecological problems.

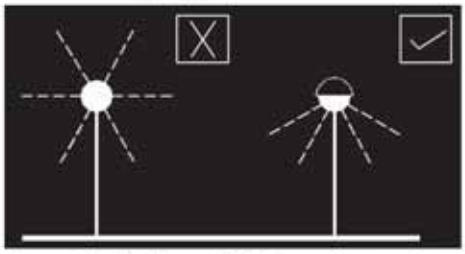
Obtrusive Light, whether it keeps you awake through a bedroom window or impedes your view of the night sky, is a form of pollution and can be substantially reduced without detriment to the lighting task.

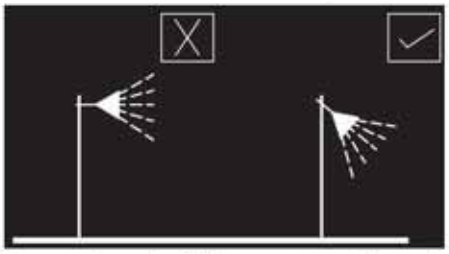
Sky glow, the brightening of the night sky above our towns, cities and countryside, Glare the uncomfortable brightness of a light source when viewed against a dark background, and Light Trespass, the spilling of light beyond the boundary of the property or area being lit, are all forms of obtrusive light which may cause nuisance to others, waste money and electricity and result in the unnecessary emissions of greenhouse gases. Think before you light. Is it necessary? What effect will it have on others? Will it cause a nuisance? How can I minimise the problem?



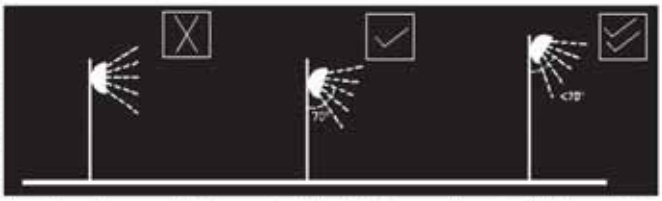
Do not "over" light. This is a major cause of obtrusive light and is a waste of energy. There are published standards for most lighting tasks, adherence to which will help minimise upward reflected light. Organisations from which full details of these standards can be obtained are given on the last page of this leaflet.

Dim or switch off lights when the task is finished. Generally a lower level of lighting will suffice to enhance the night time scene than that required for safety and security.





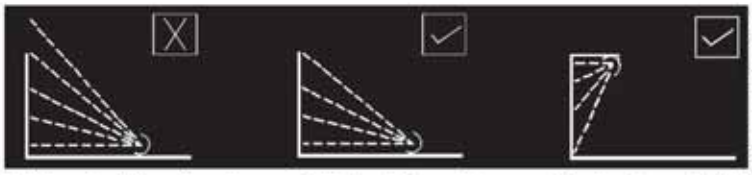
Use specifically designed lighting equipment that minimises the upward spread of light near to and above the horizontal. Care should be taken when selecting luminaires to ensure that appropriate units are chosen and that their location will reduce spill light and glare to a minimum. Remember that lamp light output in LUMENS is not the same as lamp wattage and that it is the former that is important in combating the problems of obtrusive light



Keep glare to a minimum by ensuring that the main beam angle of all lights directed towards any potential observer is not more than 70°. Higher mounting heights allow lower main beam angles, which can assist in reducing glare. In areas with low ambient lighting levels, glare can be very obtrusive and extra care should be taken when positioning and aiming lighting equipment. With regard to domestic security lighting the ILE produces an information leaflet GN02 that is freely available from its web site.

The UK Government will be providing an annex to PPS23 Planning and Pollution Control, specifically on obtrusive light. However many Local Planning Authorities (LPA's) have already produced, or are producing, policies that within the new planning system will become part of the local development framework. For new developments there is an opportunity for LPA's to impose planning conditions related to external lighting, including curfew hours.

For sports lighting installations (see also design standards listed on Page 4) the use of luminaires with double-asymmetric beams designed so that the front glazing is kept at or near parallel to the surface being lit should, if correctly aimed, ensure minimum obtrusive light. In most cases it will also be beneficial to use as high a mounting height as possible, giving due regard to the daytime appearance of the installation. The requirements to control glare for the safety of road users are given in Table 2.



When lighting vertical structures such as advertising signs direct light downwards, wherever possible. If there is no alternative to up-lighting, as with much decorative lighting of buildings, then the use of shields, baffles and louvres will help reduce spill light around and over the structure to a minimum.

For road and amenity lighting installations, (see also design standards listed on Page 4) light near to and above the horizontal should normally be minimised to reduce glare and sky glow (Note ULRs in Table 1). In sensitive rural areas the use of full horizontal cut off luminaires installed at 0° uplift will, in addition to reducing sky glow, also help to minimise visual intrusion within the open landscape. However in many urban locations, luminaires fitted with a more decorative bowl and good optical control of light should be acceptable and may be more appropriate.

ENVIRONMENTAL ZONES:

It is recommended that Local Planning Authorities specify the following environmental zones for exterior lighting control within their Development Plans.

Category	Examples	
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 night-time activity

Where an area to be lit lies on the boundary of two zones the obtrusive light limitation values used should be those applicable to the most rigorous zone.

DESIGN GUIDANCE

The following limitations may be supplemented or replaced by a LPA's own planning guidance for exterior lighting installations. As lighting design is not as simple as it may seem, you are advised to consult and/or work with a professional lighting designer before installing any exterior lighting.

Table 1 – Obtrusive Light Limitations for Exterior Lighting Installations

Environmental Zone	Sky Glow ULR [Max %] (1)	Light Trespass (into Windows) Ev [Lux] (2)		Source Intensity I [kcd] (3)		Building Luminance Pre-curfew (4)
		Pre- curfew	Post- curfew	Pre- curfew	Post- curfew	Average, L [cd/m2]
E1	0	2	1*	2.5	0	0
E2	2.5	5	1	7.5	0.5	5
E3	5.0	10	2	10	1.0	10
E4	15.0	25	5	25	2.5	25

ULR = **Upward Light Ratio of the Installation** is the maximum permitted percentage of luminaire flux for the total installation that goes directly into the sky.

Ev = **Vertical Illuminance in Lux** and is measured flat on the glazing at the centre of the window

I = **Light Intensity in Cd**

L = **Luminance in Cd/m2**

Curfew = **The time after which stricter requirements (for the control of obtrusive light) will apply**; often a condition of use of lighting applied by the local planning authority. If not otherwise stated - 23.00hrs is suggested.

* = From Public road lighting installations only

(1) **Upward Light Ratio** – Some lighting schemes will require the deliberate and careful use of upward light – e.g. ground recessed luminaires, ground mounted floodlights, festive lighting – to which these limits cannot apply. However, care should always be taken to minimise any upward waste light by the proper application of suitably directional luminaires and light controlling attachments.

(2) **Light Trespass (into Windows)** – These values are suggested maxima and need to take account of existing light trespass at the point of measurement. In the case of road lighting on public highways where building facades are adjacent to the lit highway, these levels may not be obtainable. In such cases where a specific complaint has been received, the Highway Authority should endeavour to reduce the light trespass into the window down to the after curfew value by fitting a shield, replacing the luminaire, or by varying the lighting level.

(3) **Source Intensity** – This applies to each source in the potentially obtrusive direction, outside of the area being lit. The figures given are for general guidance only and for some sports lighting applications with limited mounting heights, may be difficult to achieve.

(4) **Building Luminance** – This should be limited to avoid over lighting, and related to the general district brightness. In this reference building luminance is applicable to buildings directly illuminated as a night-time feature as against the illumination of a building caused by spill light from adjacent luminaires or luminaires fixed to the building but used to light an adjacent area.

Table 2 – Maximum Values of Threshold Increment from Non-Road Lighting Installations				
Light Technical Parameter TI	Road Classification [5]			
	No road lighting	ME5	ME4/ ME3	ME2 / ME1
	15% based on adaptation luminance of 0.1cd/m^2	15% based on adaptation luminance of 1cd/m^2	15% based on adaptation luminance of 2 cd/m^2	15% based on adaptation luminance of 5 cd/m^2

TI = Threshold Increment is a measure of the loss of visibility caused by the disability glare from the obtrusive light installation

(5) Road Classifications as given in BS EN 13201 - 2: 2003 Road lighting Performance requirements
Limits apply where users of transport systems are subject to a reduction in the ability to see essential information. Values given are for relevant positions and for viewing directions in path of travel. See CIE Publication 150:2003, Section 5.4 for methods of determination. For a more detailed description and methods for calculating and measuring the above parameters see CIE Publication 150:2003.

RELEVANT PUBLICATIONS AND STANDARDS:

British Standards: www.bsi.org.uk		BS 5489-1: 2003 Code of practice for the design of road lighting – Part 1: Lighting of roads and public amenity areas BS EN 13201-2:2003 Road lighting – Part 2: Performance requirements BS EN 13201-3:2003 Road lighting – Part 3: Calculation of performance BS EN 13201-4:2003 Road lighting – Part 4: Methods of measuring lighting performance. BS EN 12193: 2003 Light and lighting – Sports lighting
Countryside Commission/DOE www.odpm.gov.uk		Lighting in the Countryside: Towards good practice (1997) *(Out of Print)*
CIBSE/SLL Publications: www.cibse.org	CoL	Code for Lighting (2002)
	LG1	The Industrial Environment (1989)
	LG4	Sports (1990+Addendum 2000)
	LG6	The Exterior Environment (1992)
	FF7	Environmental Considerations for Exterior Lighting (2003)
CIE Publications: www.cie.co.at	01	Guide lines for minimizing Urban Sky Glow near Astronomical Observatories (1980)
	83	Guide for the lighting of sports events for colour television and film systems (1989)
	92	Guide for floodlighting (1992)
	115	Recommendations for the lighting of roads for motor and pedestrian traffic (1995)
	126	Guidelines for minimizing Sky glow (1997)
	129	Guide for lighting exterior work areas (1998)
	136	Guide to the lighting of urban areas (2000)
	150	Guide on the limitations of the effect of obtrusive light from outdoor lighting installations (2003)
	154	The Maintenance of outdoor lighting systems (2003)
Department of Transport www.defra.gov.uk		Road Lighting and the Environment (1993) (Out of Print)
ILE Publications: www.ile.org	TR 5	Brightness of Illuminated Advertisements (2001)
	TR24	A Practical Guide to the Development of a Public Lighting Policy for Local Authorities (1999)
	GN02	Domestic Security Lighting, Friend or Foe
ILE/CIBSE Joint Publications		Lighting the Environment - A guide to good urban lighting (1995)
ILE/CSS Joint Publications		Seasonal Decorations – Code of Practice (2005)
Campaign for Dark Skies (CfDS) www.dark-skies.org		

NB: These notes are intended as guidance only and the application of the values given in Tables 1 & 2 should be given due consideration along with all other factors in the lighting design. Lighting is a complex subject with both objective and subjective criteria to be considered. The notes are therefore no substitute for professionally assessed and designed lighting, where the various and maybe conflicting visual requirements need to be balanced.

Appendix C Photosimulations

VISUAL AMENITY STATEMENT OF METHODOLOGY

REFERENCE NO. SSD 6236

V14030 Energy from Waste Facility, Malvern East
30 June, 2014
(Dated 30 June, 2014)

FOR: Dial A Dump Industries
INSTRUCTIONS RECEIVED FROM: URBIS JHD

TABLE OF CONTENTS

1.0 PHOTOMONTAGES

This Statement of Evidence accompanies the images provided to demonstrate potential visual amenity outcomes of the proposal when measured against images of its existing context.

1.1 EVIDENCE REGISTER

Figure No.	Drawing Title	Equivalent SLR LENS	Date	Rev.
i	**COVER PAGE**	n/a	27/06/14	
ii	Camera and Surveyed Landmark Location	n/a	27/06/14	
1.0	View 1 Original Photograph @ 20mm	50 mm	24/04/14	
1.1	View 1 Proposed built form with Building Outline	50 mm	24/04/14	
2.0	View 2 Original Photograph @ 20mm	50 mm	24/04/14	
2.1	View 2 Proposed built form with Building Outline	50 mm	24/04/14	
3.0	View 3 Original Photograph @ 20mm	50 mm	24/04/14	
3.1	View 3 Proposed built form	50 mm	24/04/14	
3.2	View 3 Proposed built form with Building Outline	50 mm	24/04/14	
4.0	View 4 Original Photograph @ 20mm	50 mm	24/04/14	
4.1	View 4 Proposed built form	50 mm	24/04/14	
4.2	View 4 Proposed built form with Building Outline	50 mm	24/04/14	
5.0	View 5 Original Photograph @ 20mm	50 mm	24/04/14	
5.1	View 5 Proposed built form with Building Outline	50 mm	24/04/14	
6.0	View 6 Original Photograph @ 20mm	50 mm	24/04/14	
6.1	View 6 Proposed built form with Building Outline	50 mm	24/04/14	
7.0	View 6 Original Photograph @ 20mm	50 mm	24/04/14	
7.1	View 7 Proposed built form	50 mm	24/04/14	
7.2	View 7 Proposed built form with Building Outline	50 mm	24/04/14	
8.0	View 8 Original Photograph @ 20mm	50 mm	24/04/14	
8.1	View 8 Proposed built form	50 mm	24/04/14	
8.2	View 8 Proposed built form with Building Outline	50 mm	24/04/14	
9.0	View 9 Original Photograph @ 20mm	50 mm	24/04/14	
9.1	View 9 Proposed built form with Building Outline	50 mm	24/04/14	

2.0 INITIAL INFORMATION

Initial instructions to prepare the photomontages were received from Urbis for the proposed development.

2.1 Client

Dial A Dump Industries

2.2 Landscape Architect

Urbis JHD

3.0 INFORMATION UTLISED FOR PHOTOMONTAGE

It is important to understand that the accuracy of the representation in a Photomontage is based on the quality of the information that is collected at the time that the initial photograph is taken and that this information is correctly correlated with the spatial data relied on in the documentation of the proposed development. A decision maker's ability to rely on the information that is being presented relies on an unbiased and fair and reasonable representation of the proposal.

3.1 Architectural Information

Dwg No.	Rev	Drawing Title/File Name	Type	Date
3d Model	-	3356-01 Building Model	Revit Model	18/06/2014
3d Model	-	3356-01 Site	Revit Model	18/06/2014

3.2 Landscape Information

Landscape information was provided by the Landscape Architect.

Dwg No.	Rev	Drawing Title/File Name	Type	Date
3d Model	-	2mContours_Boundary_3km_001_MGAZ56	CAD	25/06/2014
3d Model	-	MD3346_TNGEnergyFromWaste_005_MatchesForOrbit	3DSMax	27/06/2014

3.3 Photography

Photographs were provided by the client.

The intention of the compositions is to provide sufficient contextual information to represent the impact of the proposal in its wider context. The photographs were taken with 50mm equivalent SLR lens. This selection of lens does not create discernible barrel distortion and as such is suitable for representing the view of the proposal and the context in which it sits. Each photograph is taken at standard eye height of 1.5m height.

3.4 Digital Model

The 3D base model was modeled in AUTODESK REVIT and rendered in AUTODESK 3DS MAX. Geometry, Materials and Lighting effects are representative of real world conditions

3.5 Camera Match

The function of creating the camera match utilizes the suite of tools contained in the proprietary software package. Image accuracy is dependent upon available data and in this instance was limited to a digital terrain model provided by the architects and GPS camera position matched to Google Earth co-ordinates.

3.6 Photomontage Process

Adobe Photoshop CS6 was used to composite the 3D rendered image with the original photograph. There is no distortion of the original photographic image or that of the computer rendered image.

4.0 APPENDICES

4.1 Appendix I – Photo Data

Align View: Energy from Waste Facility

Exposure Details:

24-04-2014

Position 1: 1:28pm Eastern Standard Time
Height = 1500mm, 50mm Full Frame Equivalent Lens

Position 2: 2:09pm Eastern Standard Time
Height = 1500mm, 50mm Full Frame Equivalent Lens

Position 3: 2:02pm Eastern Standard Time
Height = 1500mm, 50mm Full Frame Equivalent Lens

Position 4: 12:39pm Eastern Standard Time
Height = 1500mm, 50mm Full Frame Equivalent Lens

Position 5: 12:51pm Eastern Standard Time
Height = 1500mm, 50mm Full Frame Equivalent Lens

Position 6: 2:47pm Eastern Standard Time
Height = 1500mm, 50mm Full Frame Equivalent Lens

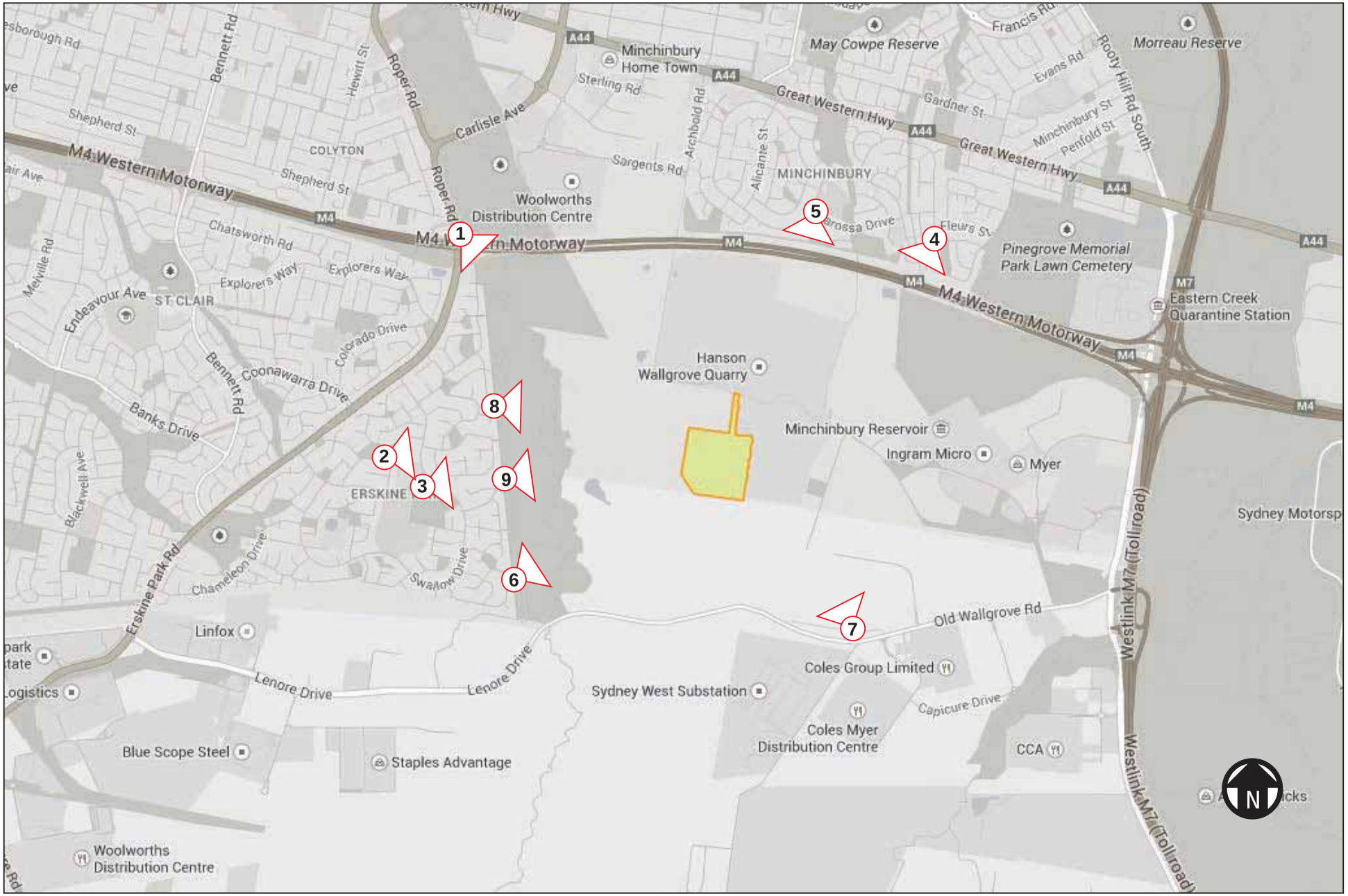
Position 7: 11:56am Eastern Standard Time
Height = 1500mm, 50mm Full Frame Equivalent Lens

Position 8: 2:58pm Eastern Standard Time
Height = 1500mm, 50mm Full Frame Equivalent Lens

Position 9: 2:34pm Eastern Standard Time
Height = 1500mm, 50mm Full Frame Equivalent Lens

STATE SIGNIFICANT DEVELOPMENT APPLICATION. SSD6236
FOR: DIAL A DUMP
INSTRUCTIONS RECEIVED FROM: URBIS JHD

Job: V14030
Date: 30/06/14



Camera Locations

View cones are a representation of camera view only

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

Figure:
Camera Locations

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 1 Original Photograph @ 50mm

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

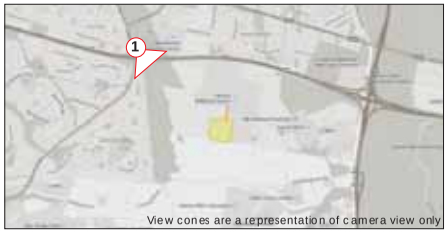


Figure:
1.0

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 1 Proposed Built Form

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

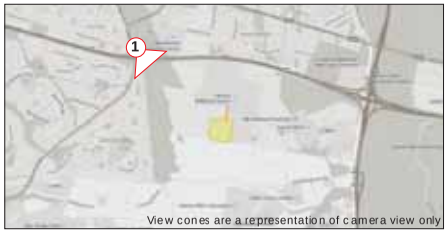


Figure:
1.1

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 1 Proposed Built Form with Building Outline

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

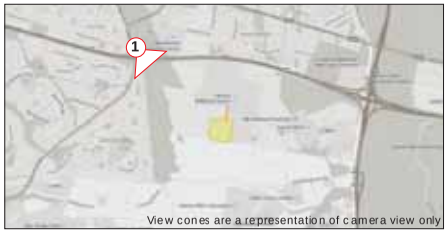


Figure:
1.2

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 2 Original Photograph @ 50mm

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

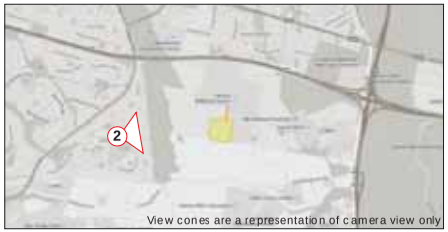


Figure:
2.0

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 2 Proposed Built Form with Building Outline

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

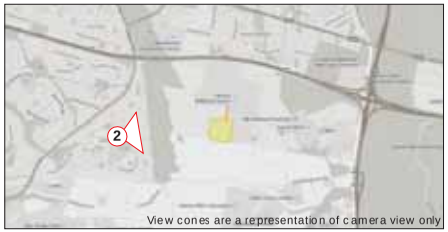


Figure:
2.1

Date: **30/06/2014**
Job Number: **V14030**
Drawn: MH, GH

View 3 Original Photograph @ 50mm

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

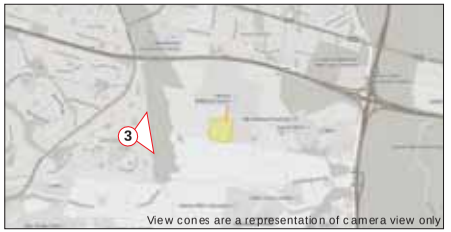


Figure:
3.0

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 3 Proposed Built Form

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

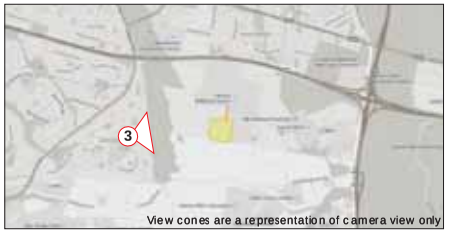


Figure:
3.1

Date: **30/06/2014**
Job Number: **V14030**
Drawn: MH, GH

View 3 Proposed Built Form with Building Outline

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

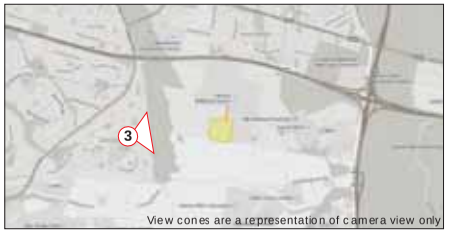


Figure:
3.2

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 4 Original Photograph @ 50mm

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

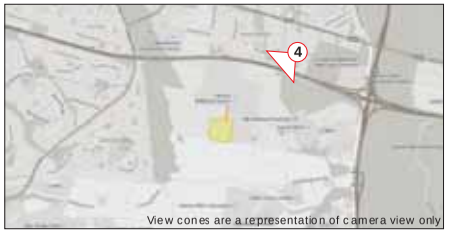


Figure:
4.0

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 4 Proposed Built Form

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

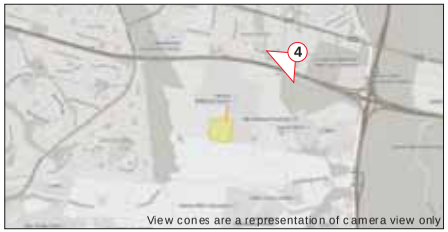


Figure:
4.1

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 4 Proposed Built Form with Building Outline

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

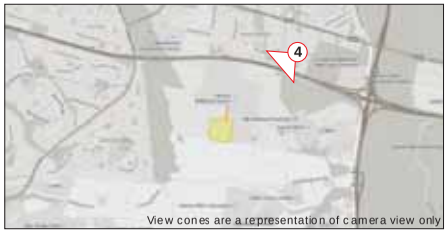


Figure:
4.2

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 5 Original Photograph @ 50mm

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

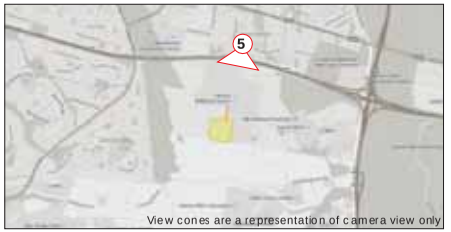


Figure:
5.0

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 5 Proposed Built Form with Building Outline

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

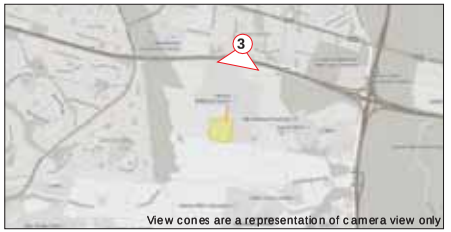


Figure:
5.1

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 6 Original Photograph @ 50mm

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

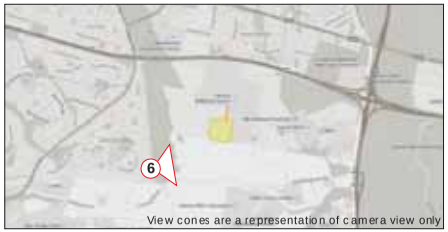


Figure:
6.0

Date: **30/06/2014**
Job Number: **V14030**
Drawn: MH, GH

View 6 Proposed Built Form

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

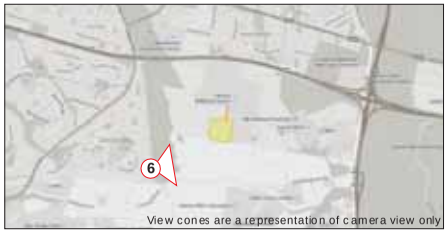


Figure:
6.1

Date: **30/06/2014**
Job Number: **V14030**
Drawn: MH, GH

View 6 Proposed Built Form with Building Outline

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

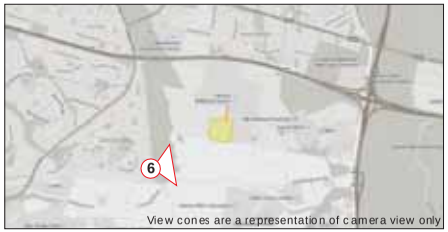


Figure:
6.2

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 7 Original Photograph @ 50mm

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

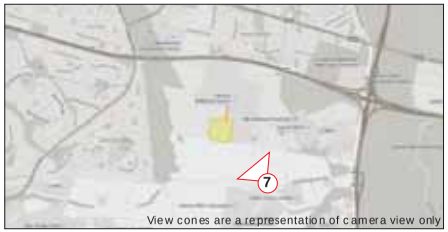


Figure:
7.0

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 7 Proposed Built Form

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

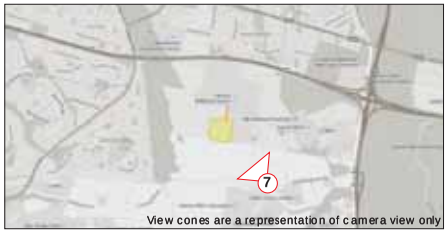


Figure:
7.1

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 7 Proposed Built Form with Building Outline

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

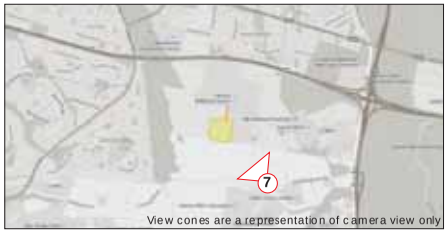


Figure:
7.2

Date: **30/06/2014**

Job Number: **V14030**

Drawn: MH, GH

View 8 Original Photograph @ 50mm

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

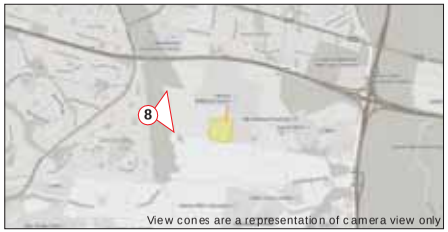


Figure:
8.0

Date: **30/06/2014**
Job Number: **V14030**
Drawn: MH, GH

View 8 Proposed Built Form

Project:
Energy from Waste Facility

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Urbis JHD

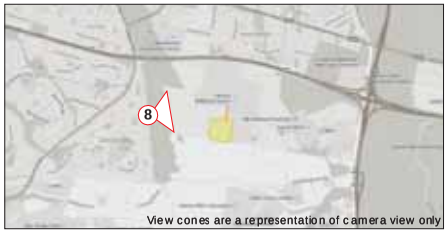

Figure:
8.1

Date: **30/06/2014**
Job Number: **V14030**
Drawn: MH, GH

View 8 Proposed Built Form with Building Outline

Project:
Energy from Waste Facility

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Urbis JHD

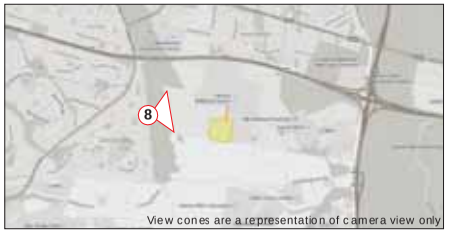

Figure:
8.2

Date: **30/06/2014**
Job Number: **V14030**
Drawn: MH, GH

View 9 Original Photograph @ 50mm

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

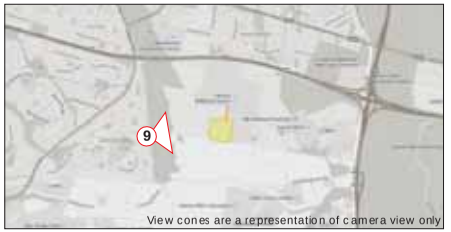

Figure:
9.0

Date: **30/06/2014**
Job Number: **V14030**
Drawn: MH, GH

View 9 Proposed Built Form

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

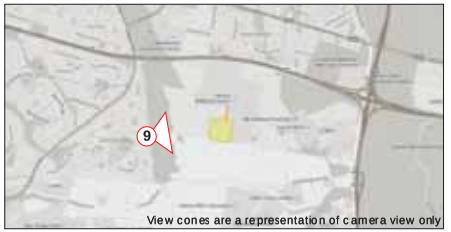

Figure:
9.1

Date: **30/06/2014**
Job Number: **V14030**
Drawn: MH, GH

View 9 Proposed Built Form with Building Outline

Project:
Energy from Waste Facility

At:
Energy from Waste Facility

For:
Urbis JHD

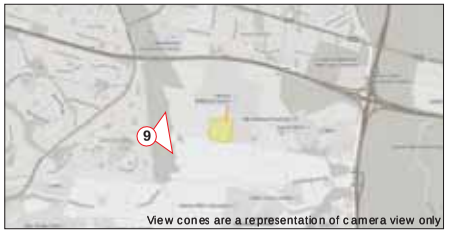

Figure:
9.2

Date: **30/06/2014**
Job Number: **V14030**
Drawn: MH, GH

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