

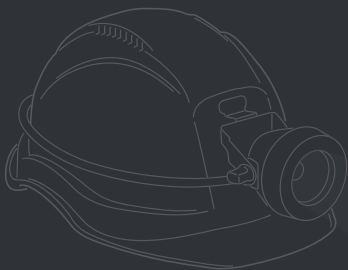
Wallarrah 2 Coal Project

Environmental Impact Statement

April 2013

Appendix U

Visual Impact Assessment





WALLARAH 2 COAL PROJECT VISUAL IMPACT ASSESSMENT

FEBRUARY 2013

Project Number 11.050

THE **DESIGN** PARTNERSHIP

WALLARAH 2 COAL PROJECT VISUAL IMPACT ASSESSMENT

PROJECT NUMBER: 11.050

ISSUE	DATE	DESCRIPTION	AUTHOR
A	22/06/12	Draft	AN
B	27/08/12	Final	AN
C	10/10/12	Revised Final	AN
D	22/11/12	Revised Final	AN
E	27/02/2013	Final	AN

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Executive Summary

This Visual Impact Assessment (VIA) addresses the proposed Wallarah 2 Coal Project (the Project) and the potential impacts of its infrastructure areas proposed for each of the Tooheys Road Site, Western Shaft Site and the Buttonderry Site. These sites are located within the Project Boundary at Tooheys Road and at Hue Hue Road, Buttonderry, on the New South Wales Central Coast. It follows standard VIA preparation procedure which includes:

- A detailed identification and analysis of view sheds and key viewing locations;
- Analysis of landscape character; assessment of Visibility and Visual Absorption Capacity (VAC), visual impact; and
- Appropriate mitigation measures;
- Commentary on the degree of likely compliance with relevant planning controls; and
- Indication of the mitigated and non-mitigated proposal scenarios.

The VIA has revealed that the quality of the existing subject landscapes ranges from “Ordinary Quality Landscape” to “Good Quality Landscape”. Consequently, any Project impacts at both sites requires careful landscape management because of:

- The comparative ground levels;
- The comparative elevations of surrounding viewpoints; and
- Degrees of intervening screening landscape elements.

Varying degrees of landscape management are required for the different landscape units of the infrastructure sites.

As a result of these findings, the recommendations of the VIA are summarised below.

Tooheys Road Site

This site potentially has a high degree of exposure because of its location in relation to surrounding major roads.

However, its actual level of “visibility” is low. It is considered to be part of a larger “Good Quality Landscape”, but is itself partially cleared with varying degrees of VAC. The future uses of the lands surrounding the Tooheys Road Site are expected to remain the same as current (or currently approved), with additional industrial zoned areas likely to be developed in the future. The site requires a very minor degree of landscape management in order to minimise potential impacts. However, given the low visual impact of the proposal, this is minimal. Nevertheless, the elements of the Project have been sited so that they are substantially concealed from view from private receiver locations.

Buttonderry Site

This site has a less apparent visual exposure than the Tooheys Road Site. Because of the existing and proposed surrounding uses, the extent of tree cover and proposed future land uses, this site has a greater level of VAC than the Tooheys Road Site. Disturbance Boundary is an area which has largely been cleared of vegetation.

In addition, the majority of the storage areas are all located amongst dense, established trees and the Disturbance Area is located well below the adjacent ridgeline.

As a result of the above, less landscape management than at the Tooheys Road Site is required to avoid loss of landscape character and to maintain the overall existing level of local landscape amenity into the future.

1.0 Project Overview

The Wyong Areas Coal Joint Venture (WACJV) seeks a Development Consent under Division 4.1 in Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Wallarah 2 Coal Project (the Project). This Visual Impact Assessment supports 'The Wallarah 2 Coal Project Environmental Impact Statement' (Walarah 2 EIS) prepared by Hansen Bailey Environmental Consultants to support the application.

This Visual Impact Assessment has been prepared in accordance with the Director-General's Environmental Assessment Requirements (DGRs) for the Project issued 12 January 2012 in accordance with the requirements in Part 2 in Schedule 2 to the *Environmental Planning and Assessment Regulation 2000* (EP&A Regs).

Development Consent is sought to mine coal within the Extraction Area for a period of 28 years. The majority of this resource lies beneath the Wyong State Forest and surrounding ranges (including the Jilliby State Conservation Area (SCA)) while a proportion, to be extracted first, lies beneath a section of the Dooralong Valley and the Hue Hue area. The location of the Project is shown on Figure 1.

Key features of the Project include:

- The construction and operation of an underground mining operation extracting up to 5.0 Mtpa of export quality thermal coal by longwall methods at a depth of between 350 m and 690 m below the surface within the underground Extraction Area;
- The construction and operation of an underground mining operation extracting up to 5.0 Mtpa of export quality thermal coal by longwall methods at a depth of between 350 m and 690 m below the surface within the underground Extraction Area;
- Mining and related activities will occur 24 hours a day 7 days a week for a Project period of 28 years;
- Tooheys Road Site surface facilities on company owned and third party land (subject to a mining lease) between the Motorway Link Road and the F3 Freeway which will include (at least) a rail loop and spur, stockpiles, water and gas management facilities, workshop and offices;
- Buttonderry Site Surface Facilities on company owned land at Hue Hue Road between Sparks Road and the Wyong Shire Council's (WSC) Buttonderry Waste Management Facility. This facility will include (at least) the main personnel access to the mine, main ventilation facilities, offices and employee amenities;
- An inclined tunnel (or "drift") constructed from the coal seam beneath the Buttonderry Site to the surface at the Tooheys Road Site;
- Construction and use of various mining related infrastructure including water management structures, water treatment plant (reverse osmosis or similar), generator, second air intake ventilation shaft, boreholes, communications, water discharge point, powerlines, and easements to facilitate connection to the WSC (after July 2013, the Central Coast Water Corporation) water supply and sewerage system;
- Capture of methane for treatment initially involving flaring as practicable for greenhouse emission management and ultimately for beneficial use of methane such as electricity generation at the Tooheys Road Site;
- Transport of coal by rail to either the Newcastle port for export or to domestic power stations;
- A workforce of approximately 300 full-time company employees (plus an additional 30 contractors); and
- Rehabilitation and closure of the site at cessation of mining operations.

2.0 Location

The following Infrastructure Areas with a potential for visual impact are proposed to be developed as part of the Project:

- Buttonderry Site;
- Tooheys Road Site; and
- Western Ventilation Shaft.

The Buttonderry Site will be used as the administrative centre for the Project. It is located on Hue Hue Road, Buttonderry, just west of the Sparks Road / F3 freeway interchange.

The Buttonderry Site is located opposite the proposed Warner Business Park site, which forms part of the Wyong Employment Zone (WEZ). To the north lies the Buttonderry Waste Disposal site. Rural-residential and rural development is located to the south and west of the site.

The Tooheys Road Site will be located between the F3 Freeway, the Motorway Link Road and Tooheys Road. The Tooheys Road Site is separated from Blue Haven by the Motorway Link Road, the main Northern Railway Line, Council's Sewage Treatment Plant and an operational quarry. It is located within an existing industrial zone.

The Western Ventilator Shaft site is located in the Wyong State Forest and required from about Year 10.

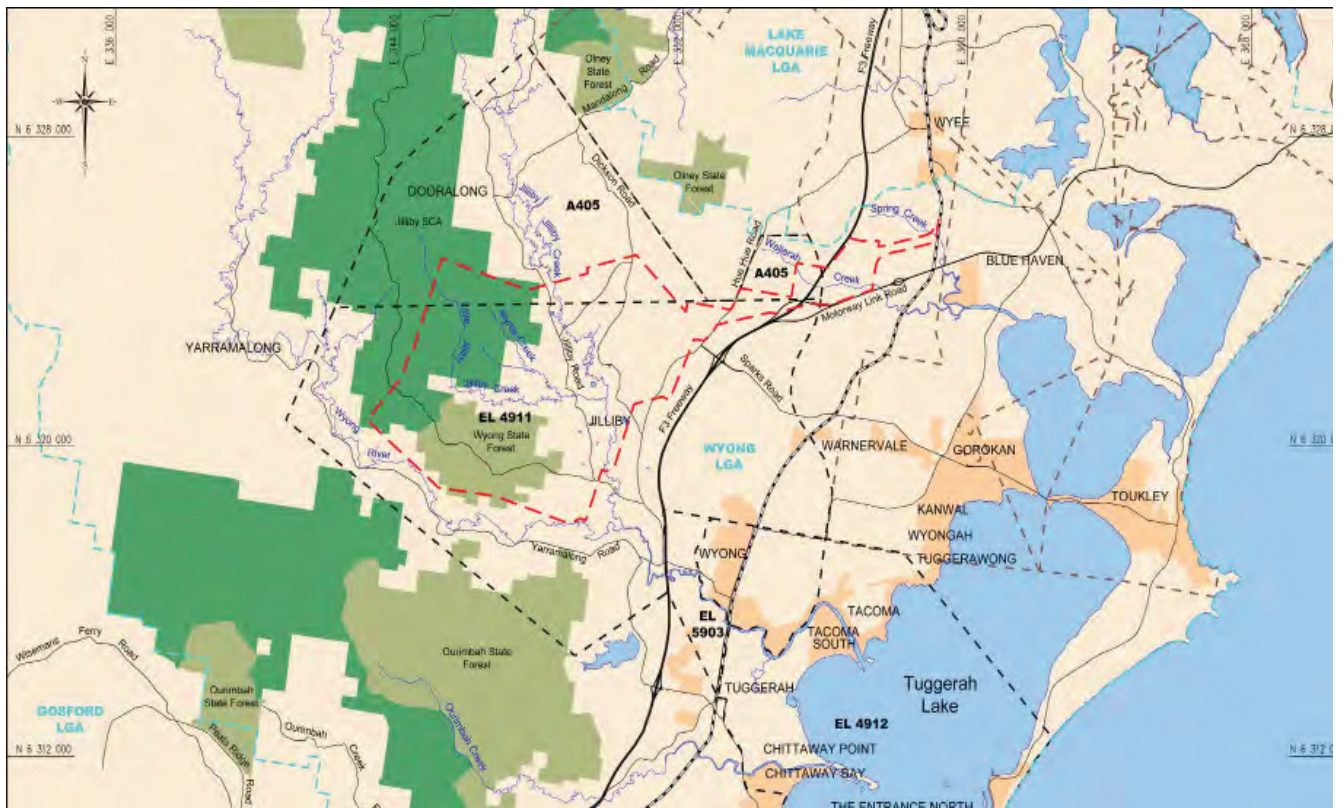


Figure 1 – Regional Locality

3.0 Objectives

The objectives of the VIA are to:

- Identify and assess the potential viewpoints at which the proposed impact may have a visual impact, both external and internal to the Project;
- Identify, document and analyse the different character zones and units within the infrastructure boundary in relation to the surrounding environment and anticipated future development;
- Define the Project;
- Assess the Visual Absorption Capacity (VAC) of the Project;
- Assess the visual suitability of the Project for its landscape siting;
- Provide photo montages illustrating the potential impacts of the Project;
- Identify potential adverse and positive visual impacts; and
- Recommend mitigation measures where appropriate, which may include:
 - Siting, scale, footprint, form and materials options;
 - and
 - Vegetation alteration.

The purpose of all of the above is to ensure that the Project is of a physical form which will have the lowest practical visual impact on its landscape setting, when viewed from viewpoints available to the public.

Visual management objectives provide the basis for determining the degree of intervention required to modify any identified adverse visual and landscape impacts.

4.0 Landscape Context

The landscape contexts of the Infrastructure Areas which comprise the Project are somewhat different. They differ in:

- Degree of visibility and exposure;
- Current on site and surrounding uses; density of vegetation; and
- Visual scale of landscape context.

These differences are described below.

4.1 Tooheys Road Site

The landscape surrounding the Tooheys Road Site is characterised by undulating farmland, vegetated land to the north and vegetated land to the south which is a mix of freehold and Crown Reserve. The F3 (Sydney – Newcastle) Freeway is located along the western boundary of the site and runs north to south. A powerline easement runs through the site, resulting in a largely cleared corridor along the northern boundary of the site. The northern boundary of the site is largely vegetated, with thick stands of trees, with the exception of an area close to the freeway underpass.

The Motorway Link Road forms the southern boundary of the site. A vegetated landscape mound constructed as part of the Motorway Link Road and cutting prevent views over the site.

Beyond the ridgeline to the south, the landscape is heavily treed to an unformed east-west aligned road reserve that extends to Mountain Road in the west. To the southwest, Mountain Road forms the north-eastern limit of the Wyong Employment Zone (WEZ). Further to the southeast of the site at the intersection of Sparks Road and the Main Northern Railway is the location of the proposed Warnervale Town Centre. The land to the east of the site is generally lower-lying, while that to the west and north-west of the F3 Freeway consists of a series of consistently more elevated ridgelines. See Figure 2 for site context.

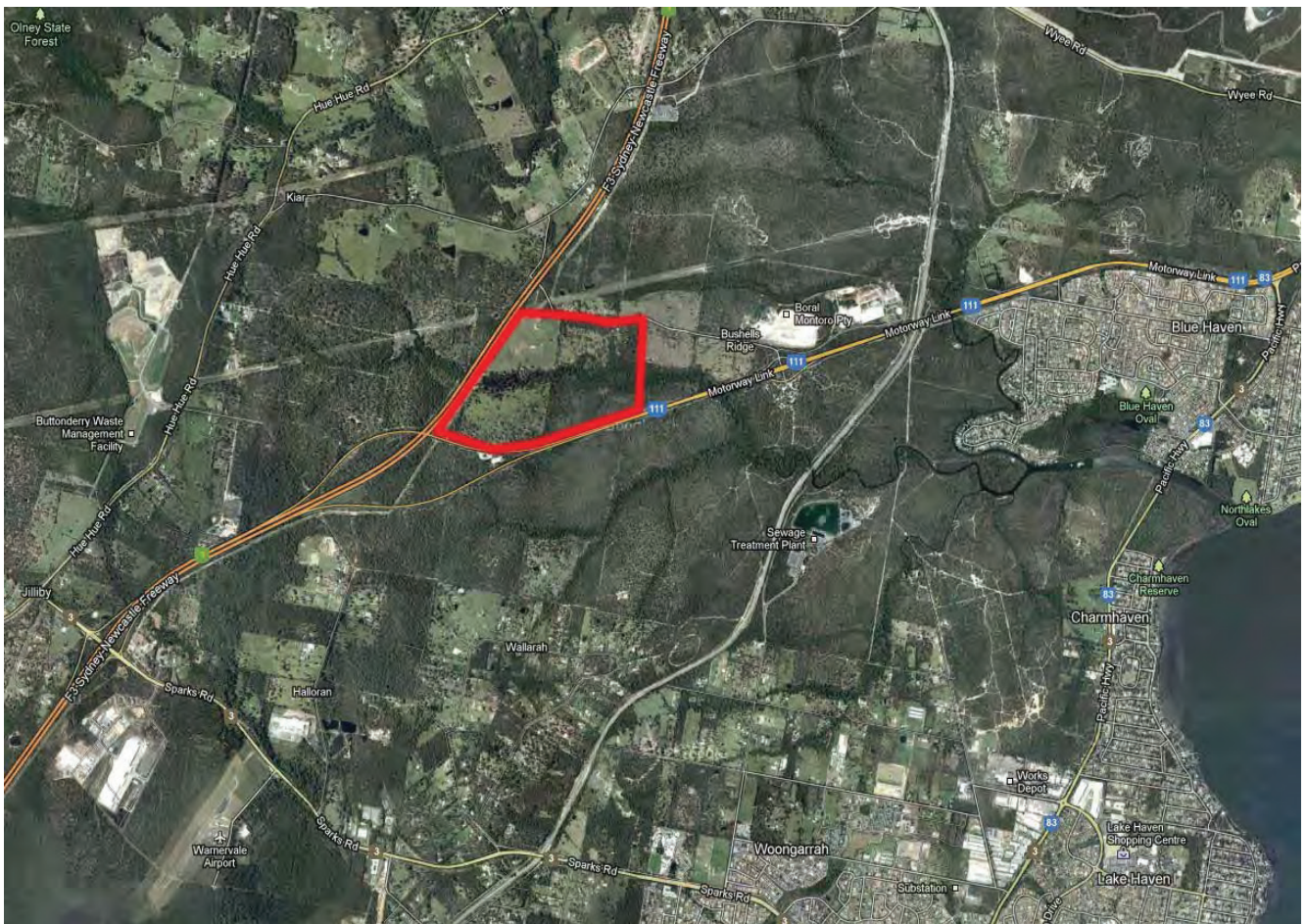


Figure 2 - Tooheys Road Site Context – Indicative Site Boundary

Further to the south-west, the land lying alongside the F3 Freeway is generally lower-lying and comparatively cleared. To the north-west only the southerly slope below Bushells Ridge Road has been cleared. The ridgeline which passes through the site from its north-west corner to the mid-point of the eastern boundary, extends to the east as far as the Motorway Link Road.

The characteristic tree type within this visual catchment has an approximate average height of 15-20m.

4.2 Buttonderry Site

The site is consistently more elevated than the Tooheys Road Site, with the land gently sloping downwards to the east and north-east towards Hue Hue Road. There is a continuous ridge arcing around from the south towards the north effectively separating the Buttonderry site from rural and rural-residential properties to the south and west. The density of tree cover falls off with the landfall, to the west of this ridge.

The dense tree cover to the south of the site extends only as far as the intersection of Hue Hue Road and Sparks Road, whereas to the north it extends north for a number of kilometres and surrounds the swathe of cleared land of the rubbish tip.

The west-side arcing ridge-line mentioned above forms the north-eastern boundary of the rubbish tip, separating that boundary from visual exposure to Hue Hue Road.

The vegetation in the visual catchment of this site is similar to that identified in relation to the Tooheys Road Site. See Figure 3 for site context.

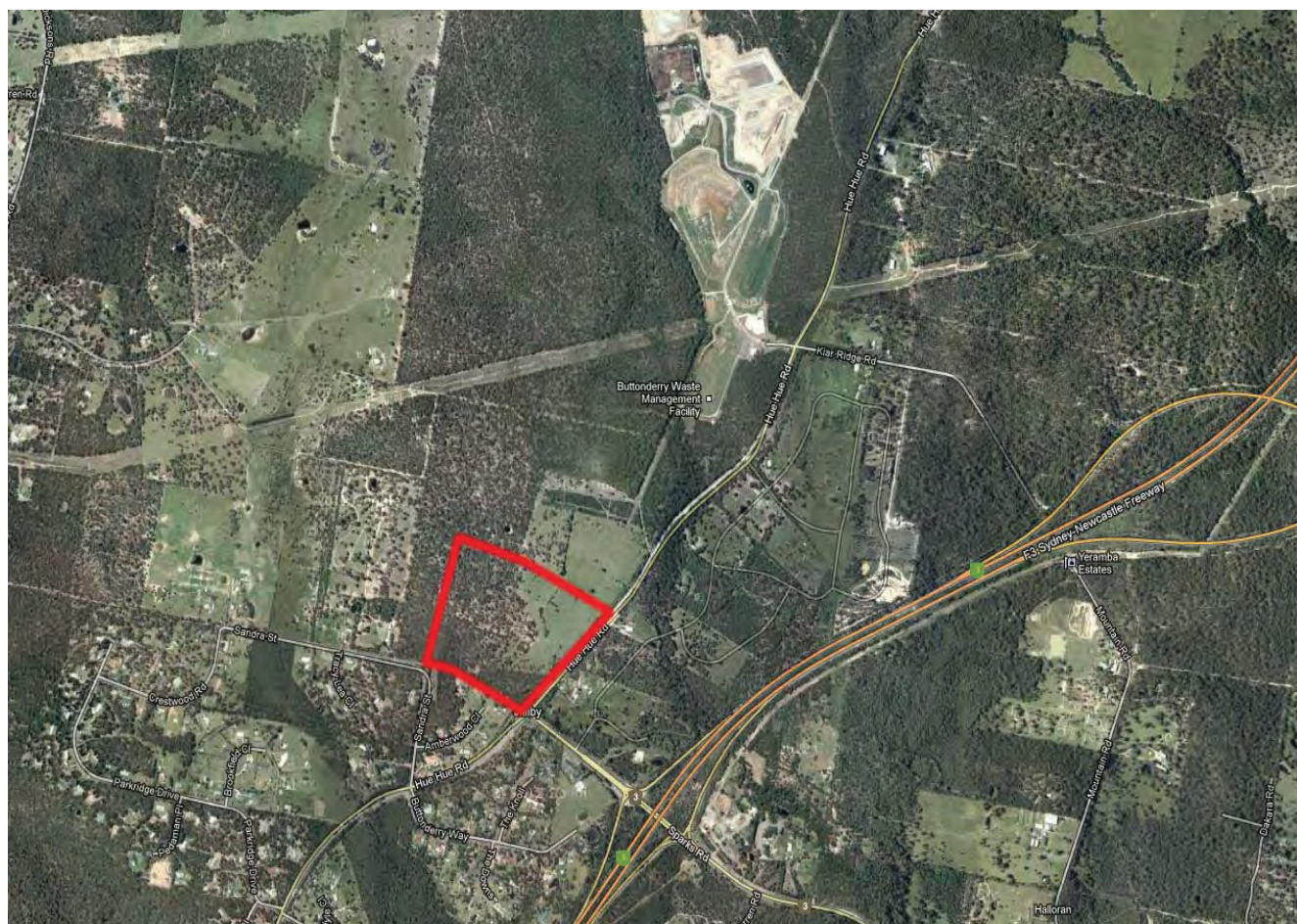


Figure 3 - Buttonderry Site Context – Indicative Site Boundary

4.3 Western Ventilation Shaft

A second ventilation shaft to augment the original shaft at the Buttonderry Site will be required around Year 10 and will be located in the Wyong State Forest as shown approximately on Figure 4. This future western ventilation shaft facility will be a downcast shaft (for air intake to the underground).

Only limited facilities will be required at this site however the site will also serve as a secondary emergency access/egress point. The downcast ventilation shaft will be approximately 5 m in diameter and to about 485 m depth. Electricity supply to the site will be provided. Given this location, no significant visual impacts are predicted to occur from the Western Ventilation Shaft. The western shaft site will be located adjacent to an existing unsealed forestry road that is used periodically by horse trail riders, walkers and 4WD enthusiasts but is not expected to be visible from residences. Accordingly the resultant impacts are considered to be very low and no further discussion is considered necessary. See Figure 4 for Site Context.

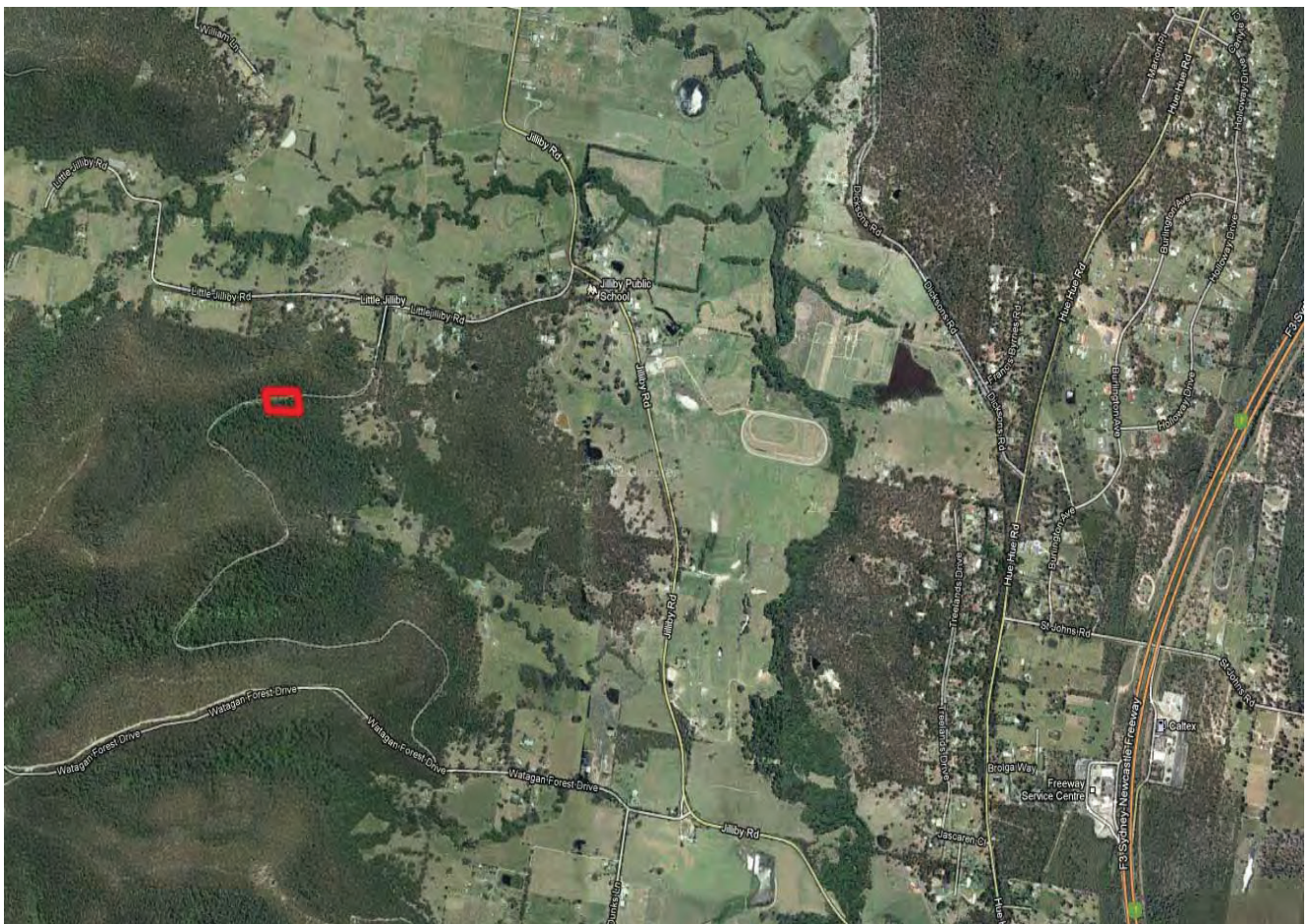


Figure 4 - Western Ventilation Shaft Site Context – Indicative Site Boundary

5.0 Project

5.1 Tooheys Road Site

The proposal for the Tooheys Road Site is shown in Figure 5 below.

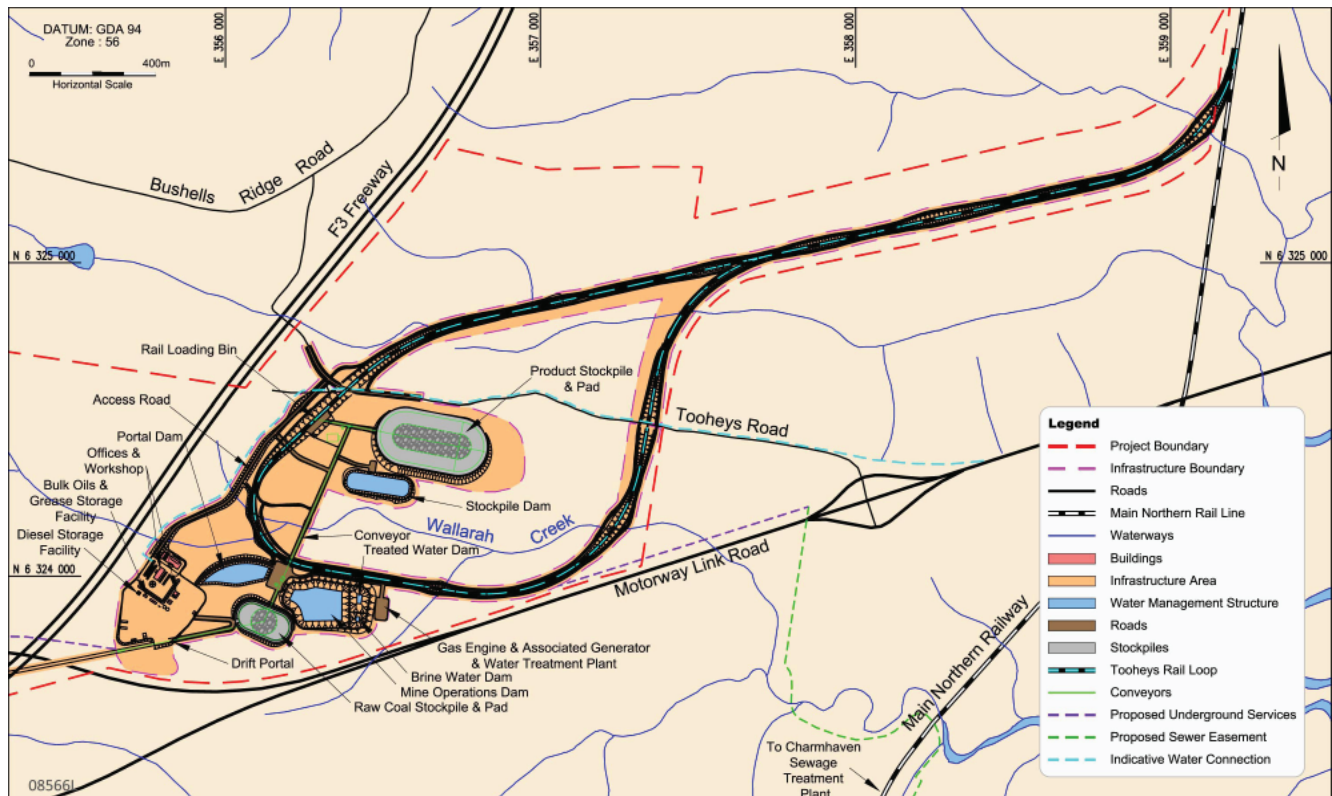


Figure 5 - Tooheys Road Site

Key elements of the site are:

- Rail spur, loop with coal loader and two rail overbridges along Tooheys Road;
- Office facility (inclusive of administration offices, bathrooms, training facilities);
- Site access roads including at least partial closure and relocation of Tooheys Road;
- Mine access drift and portal;
- Gas extraction and treatment plant;
- Coal stockpiles and material handling facilities;
- Car parking;
- Surface workshop and secure store;
- Bulk dry goods store;
- Open yard storage;
- Air compressor installation;
- Vehicle wash down bay, incorporating water treatment plant;
- Fuel, oil and flammable goods storage area;
- Fire fighting water storage tanks and surface fire station;
- Electricity powerlines, switchyard and transformers;
- Environmental monitoring;
- Mine operations waste water dam and surface runoff settling ponds;
- Gas engine and associated generator; and
- Water treatment plant (reverse osmosis plant or similar) for treatment of mine water.

The Project has been modified from earlier conceptual designs to accommodate both social and environmental issues raised through community consultation.

The area to the immediate east of the Tooheys Road Site comprises industrial zoned land where a proposed industrial development has been approved but not yet developed. An existing quarry and tile factory are located to the east of the subject site. Rural properties are located to the north of the subject site. However, those properties fronting Tooheys Rd have been acquired by the proponent. Approximately 1km away to the north, on the opposite side of the F3 Freeway, are a number of rural properties on land currently zoned 10A Investigation.. To the west of the Tooheys Road Site is the F3 Freeway while the Motorway Link Road is located on the southern boundary of the site.

5.2 Buttonderry Site

The Infrastructure and Infrastructure Boundary for the Buttonderry Site is shown in Figure 6 below.

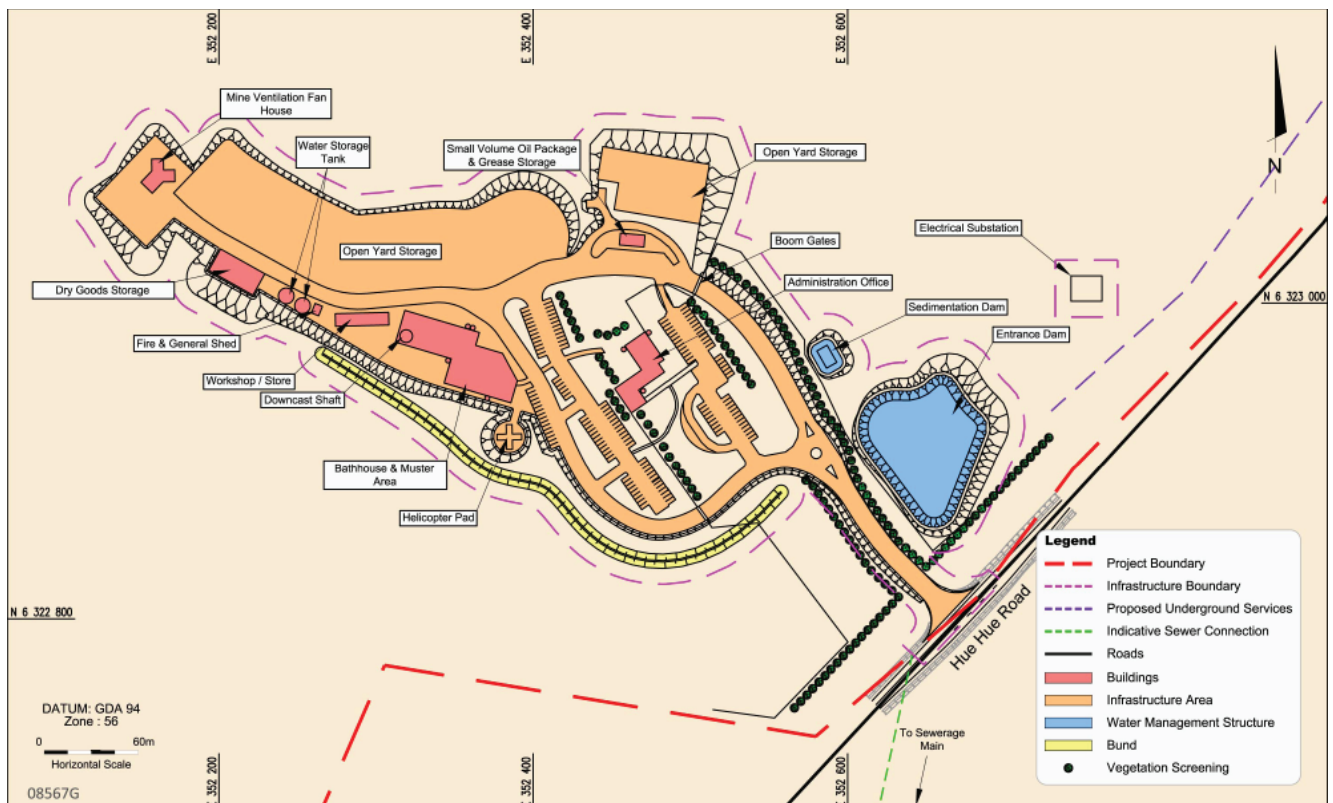


Figure 6 -Buttonderry Site

Key elements of this site include:

- Upcast ventilation shaft and fan for mine ventilation;
- Downcast ventilation shaft for mine ventilation and man-riding;
- Main office (inclusive of administration offices and training rooms);
- Bathroom and showers facilities;
- Car parking;
- Small fuel, oil and hazardous materials storage area;
- Explosives magazine;
- Fire fighting water storage tanks for surface fire;
- Emergency services helicopter landing area;
- Air compressor installation;
- Environmental monitoring;
- Ballast borehole(s); and
- Electrical switchyard, hardstand and pollution control facilities.

It will be the point where the underground workforce will commence and complete their shifts. Inside the buildings there will be showers and change rooms, offices and training rooms, two fully enclosed shafts which will transport the workers underground and provide ventilation facilities and a landscaped car park.

It is important to note that land to the east of Hue Hue Road comprises part of the WEZ, and as such will be developed in the future, in a similar form to the administration block.

6.0 Methodology

The level of assessment applied to a VIA should be pertinent to the potential impact of the proposed development. In order to assess the Project, the following levels of visual impact have been used, and are based on the Guidelines for Landscape and Visual Impact Assessment' (GLVIA) prepared by the Landscape Institute (UK), which are commonly used for Visual Impact Assessments within NSW. The levels of VIA are described in Table 1.

Table 1 - Level of Assessment Required

Regional	Proposals that may require a VIA include: <ul style="list-style-type: none"> • Major land use projects such as plantations, wind farms, or large scale clearing; • Developments that have large-scale impacts such as a new port facility or highly visible development located on a regionally significant site (e.g. quarry on an escarpment adjacent to an urban area); • Projects with incremental or indirect impacts in which large-scale changes result from a number of small individual changes over time (e.g. clearing for agriculture); and • Large scale tourist resorts.
Local	Proposals that may require a VIA include more locally specific developments such as residential subdivisions or residential flat buildings.
Site	Nearly all proposals require a VIA at a site level in response to proposals for development on individual sites, such as subdivisions, buildings and public recreation facilities.

Once the level of assessment required has been determined, the assessment follows the sequence:

1. Determine visual landscape character and the objectives for managing conservation of character and visual amenity;
2. Describe the proposed development;
3. Undertake site inspections, photos and prepare photo montages illustrating potential impacts on views;
4. Describe the potential visual impacts;
5. Develop appropriate visual management and mitigation measures/modify the proposal; and
6. Prepare recommendations.

In this instance, the Buttonderry and the Tooheys Road Sites differ considerably in character and type. The use proposed for the Tooheys Road Site is a mining surface facility, while the Buttonderry development is in general terms, a commercial office and administration facility.

The Tooheys Road Site includes both underground and above ground structures of significant scale. Figure 5 above shows the following significant components relevant to the VIA of this site:

- Rail spur, loop with coal loader and two rail overbridges along Tooheys Road;
- Office facility (inclusive of administration offices, bathrooms, training facilities);
- Site access roads including at least partial closure and relocation of Tooheys Road;
- Mine access drift and portal;
- Gas extraction and treatment plant;
- Coal stockpiles and material handling facilities;
- Car parking;
- Surface workshop and secure store;
- Bulk dry goods store;
- Open yard storage;
- Air compressor installation;
- Vehicle wash down bay, incorporating water treatment plant;
- Fuel, oil and flammable goods storage area;
- Fire fighting water storage tanks and surface fire station;
- Electricity powerlines, switchyard and transformers;
- Environmental monitoring;
- Mine operations waste water dam and surface runoff settling ponds;
- Gas engine and associated generator; and
- Water treatment plant (reverse osmosis plant or similar) for treatment of mine water.

These components clearly initially suggest that this site is a 'Major Land Use Project' and 'a Highly Visible Development', requiring 'Regional' level assessment when compared to Table 1.

As described in Section 4.2 the components of the proposal for the Buttonderry Site which are of significance for this VIA are:

- Upcast ventilation shaft and fan for mine ventilation;
- Downcast ventilation shaft for mine ventilation and man-riding;
- Main office (inclusive of administration offices and training rooms);
- Bathroom and showers facilities;
- Car parking;
- Small fuel, oil and hazardous materials storage area;
- Explosives magazine;
- Fire fighting water storage tanks for surface fire;
- Emergency services helicopter landing area;
- Air compressor installation;
- Environmental monitoring;
- Ballast borehole(s); and
- Electrical switchyard, hardstand and pollution control facilities.

Compared with the large scale coal handling facilities on the surface at the Tooheys Road Site, the visible components of the Buttonderry Site do not represent development requiring large scale clearing or comprising a 'Major Land Use Project' when assessed against Table 1.

This site comprises the administration and passive facilities section of the Project as there is no coal handling conducted at the surface of this site. Accordingly, this site is assessed using the methodology appropriate to a 'local development' classification as shown in Table 1.

7.0 Visual Landscape Character Assessment

7.1 Method

This component of the VIA involves:

- Identifying the viewshed (or visual limits) of the Infrastructure Areas - including identifying the locations where viewers are likely to be affected by visual changes brought about by development of the site;
- Identifying key viewpoints which would most clearly convey or reveal the visual effects of the Project and the viewer groups potentially affected; and
- Identifying visual character as determined from key sites and from local viewer responses. Character is then rated:
 - Highest Quality Landscape;
 - Very attractive Landscape;
 - Good Quality Landscape;
 - Ordinary Quality Landscape; or
 - Poor Quality Landscape.

7.2 Determination of View Shed and Private Receptor Viewing Locations

In order to ascertain the potential impacts of the Project, the following approach was undertaken:

- A desktop review was undertaken to identify potential viewing sites, surrounding land uses and key road linkages, as well as a review of contours and topography of the site;
- An initial site visit was undertaken to confirm the findings of the desktop review;
- The GPS locations of the key viewing sites were recorded, and a vertical map developed, based on lot boundaries, vegetation and contours;
- Helium balloons were raised to the height of the development on site. The location of these balloons was recorded;

- Photographs were taken in order to identify whether the proposed works could be seen from the identified viewing sites;
- Where the Project could be viewed, photo montages were prepared in order to assess the potential impacts; and
- Where the Project could not be viewed, generally as a result of topography and vegetation, an indicative location for the works was marked on the photos to illustrate that there would be no impacts.

7.3 Identifying Visual Access

The visual character of an area is determined by a number of factors

7.3.1 Tooheys Road Site

The visual access to the Tooheys Road Site is defined by the following characteristics:

- a. The approach to the site from the south-west along the F3 Freeway is totally restricted by lack of elevation of the Freeway; carriageway bends and the Wallarah Creek overpass of the Motorway. This overpass prevents at-grade view of the site from any distance south-west until the viewer arrives at the south-west corner of the site;
- b. On approach from the north-east, the F3 Freeway falls well below the elevation of the NW corner of the site, before rising to a relative level of 44 m, some 1.75 km north of the Raw Coal Stockpile location. It is not possible to readily distinguish the location of the site from this point because of the intervening mature vegetation;
- c. The Motorway link forming the southern limit of the site is located on a ridge, with land to the south and south-east of it falling away to the creekline some 300m distant and approximately parallel with the Motorway, which lies in a cutting at this point. There is a group of private rural residences from approximately 500 m south-east of the F3 on Mountain Road and extending further to the east on an unnamed and unformed road (dirt track) running east-west. However, they are on the leeside of a knoll which separates them visually from the site. For these reasons, the southern limit of the viewshed does not extend further south than the line of the Motorway Link Road. The vegetated buffer area and mound along the northern boundary of the Motorway Link Road substantially decrease viewing opportunities over this section of the site;

- d. The north-east limit of the viewshed can reasonably be said to extend only to the RL 40 hilltop area which includes a portion of the transmission line easement;
- e. Compared with the above foreshortened viewsheds from the south and south-west, the site is potentially visible from the north north-west, from parts of the well elevated (RL 40 to 50 plus) Bushells Ridge Road and the low-lying (RL 12-20) portion of the Motorway Link road, 350m to the east of the site. Again, mature vegetation, especially immediately adjacent road carriageways, restricts views and comprehension of the location of the site. Again, mature vegetation, especially immediately adjacent to road carriageways restricts views and comprehension of the location of the site. For the above to the north-west, views over the site from Bushells Ridge Road are generally possible. This is a lightly trafficked road, with a speed limit of 80 km/h. As a result, visual impacts along this section of road are fleeting and only glimpsed between vegetation. The affected observers are passing motorists, none of whom would be afforded lengthy views of the site at normal travel speeds.
- f. The topography and vegetation between the site and the proposed location of Warnervale Town Centre means that there will be no visual impacts from the proposed works at the Tooheys Road Site. The RL of the Warnervale Town Centre site is approximately 20m, the ridgeline of the hill between the Tooheys Road site and the Warnervale Town Centre is approximately 42m. The maximum height of the proposed Raw Coal Stockpile is RL 65.5m and the maximum height of the product stockpile is RL 54.5m. As such, there is little possibility of the proposed development having any visual impact on the Warnervale Town Centre, nor from any areas of public domain associated with the Warnervale Town Centre. Given the distance of the Warnervale Town Centre from the site, the intervening topography and the vegetation of the subject site, including landscaping treatments, nil impact is anticipated to occur. An analysis of the potential viewshed from Bruce Crescent, closer to the subject site than the Warnervale Town Centre site was undertaken to illustrate this.

As a result, those who will be potentially exposed to part of the proposed structures and stockpiles on the site are those using:

- The F3 Freeway (very short length only);
- The Motorway Link (very short intermittent lengths only);
- Tooheys Road (very low usage); and
- Bushells Ridge Road (very low usage).

7.3.2 Buttonderry Site

The visual access to the Buttonderry Site is defined by the following characteristics:

- a. The approach to the site from the east along Sparks Road is screened by trees. Land to the north of Sparks Road is part of the WEZ, and will be developed as an industrial/commercial usage in the future;
- b. The approach to the site from the north along Hue Hue Road provides some viewing opportunities. However, these views will be of commercial type buildings which will be consistent with the proposed development on the eastern side of Hue Hue Road;
- c. A ridgeline with extensive vegetation wraps around the site to the south and the west. This completely blocks any views from rural-residential properties located in these areas; and
- d. The only potential area for any views is for motorists travelling south along Hue Hue Road for a period of approximately 22 seconds. Given the speed limit along this stretch (80km/h) this creates very minimal visual impacts, especially as intervening roadside vegetation in some sections filters some of the site visibility.
- e. Although some visibility of the Buttonderry site may be possible from adjoining sites that are developed as part of the WEZ, the visual impact is likely to be extremely minimal. This is because the Buttonderry Site will present as a similar form of building to the light industrial/warehouse style development that characterises the WEZ proposal. This, coupled with the landscaping treatments proposed minimise the potential visual impacts upon the WEZ.

8.0 Impact on Views

For the purposes of this Visual Impact Assessment:

- Viewing Zones means the distances (or locations) from the site from which it is possible to view the site, whereas;
- Viewshed refers to the extent of views of a particular type. The extent of the Viewshed is dependent on how far distant the site remains visible and whether particular points, bends in roads or physical structures prevent views of the site.

8.1 Tooheys Road Site

In relation to the Tooheys Road site, two Viewing Zones only are considered necessary. These are:

- Immediate vicinity (< 1 km); and
- Local area (1-3km).

Within those Zones, the following viewsheds apply.

Immediate Vicinity:

- From the Motorway Link Road (Figure 7); and
- From Bushells Ridge Road (Figure 8);

A third viewshed map has been prepared to illustrate that development within the Warnervale Town Centre will not be visually impacted upon by the proposed development. This is shown in Figure 9.

Only one other immediate viewshed is possible along the immediate northern boundary along the unformed Tooheys Road.

The tallest element on this site will be a Product Stockpile 28.5 m at maximum height (top level at RL 54.5 m) with accompanying gantry with travelling conveyor less than 10 m above this level. This will be upon a cut and filled base and located amongst existing trees of a slightly lower height (approximately 25m) on the northern boundary of the site, and as such will not be visually prominent. This product stockpile will not be visible from beyond the south or west of the site.

A conical Raw Coal Stockpile approximately 31 m high at maximum height (top RL 65.5) on a cut and filled stockpile base is to be located on the southern section of the site, closer to the Motorway Link Road. Extensive vegetation exists along the southern boundary of the site, and, combined with the existing mound along this road, effectively shields this section of the site from passing views.

All other development on the site will be of a low scale and will not create any significant visual impacts.

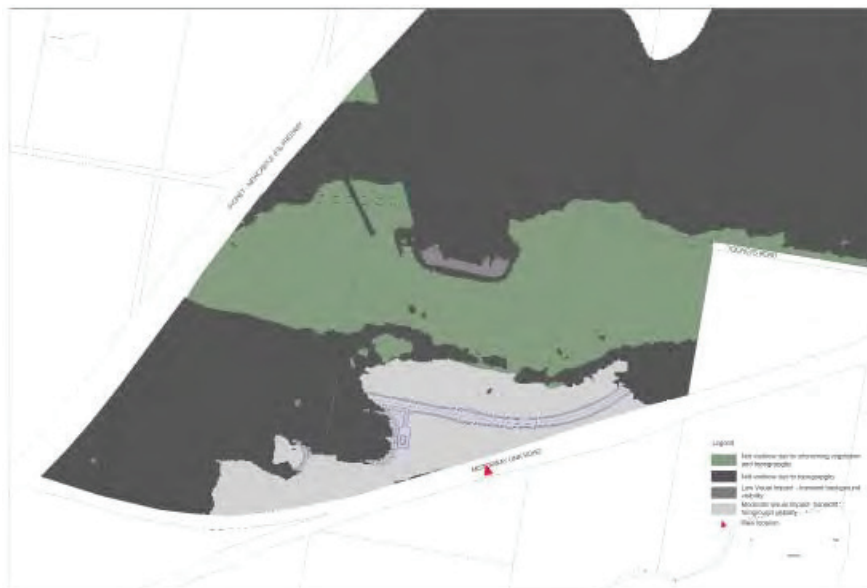


Figure 7 - Viewshed from Motorway Link Road



Figure 8 - Viewshed from Bushells Ridge Road



Figure 9 - Viewshed from Bruce Crescent

8.2 Buttonderry Site

In relation to the Buttonderry Site, the rezoning of all previous rural residential lands to the east for the WEZ industrial development negates the need to consider viewing zones and viewsheds in that direction. In addition, the land immediately to the north of the site is owned by WACJV and is not occupied by any dwellings and the Waste Depot is located north of the eastern end of the northern boundary of the site. Accordingly, there is no need to consider Viewing Zones or viewsheds in that direction.

There is a steep rise from east to west along the southern boundary of the site. This ridge obscures all views into the site from the south, other than any potential views into the south eastern corner. As there is dense tree cover immediately south of the site at this point, it is not possible to view the eastern third of the site (as this is the cleared area). To test the reality of that possibility, an Immediate Vicinity Viewing Zone (shown as not visible due to intervening vegetation and topography (has been applied to that corner and the associated viewshed is indicated in Figure 9).

If “Visibility” is a measure of the extent to which particular activities / components of a proposal may be visible from surrounding areas, the relative number of viewers, the period of view, viewing distance and context of view. The rationale for the assessment is that if a proposal is not visible the impact is nil; if the number of people who would potentially see the proposal is low, then the visual impact would be lower than if a large number of people has the same view.

For the purpose of this Visual Impact Assessment, the general categories of visibility have been defined broadly and are presented in Table 2 below. In order to assess the Project, the following visibility categories have been used, and are based on the Guidelines for Landscape and Visual Impact Assessment’ (GLVIA) prepared by the Landscape Institute (UK), which are commonly used for Visual Impact Assessments within NSW. The levels of VIA are described in Table 1.

No viewing area for this site further than 1km is considered applicable, because there is another similar ridge to the south and all lands beyond that are much lower lying – thus not providing view points to the site. This has been identified through the approach detailed in the methodology outlined in Section 5 above. Due to the topography of the site, and the low scale of the development, no visual impacts are predicted to occur from this site.

The tallest element on this site will be a man winding shaft superstructure of approximately 24m in height. This will be located amongst existing trees of a similar height, and as such will not be visually prominent. This shaft will not be visible from the south or west of the site due to both existing topography, vegetation and the painting of the shaft in a colour that will blend into the surrounding area.

8.3 Western Ventilation Shaft Site

The Western Ventilation Shaft Site is located adjacent to an existing unsealed forestry road. The proposed shaft will not be visible from residences in the area. The shaft will be visible to horse riders, walkers and 4WD enthusiasts who use the forestry track. However, given the minimal usage no significant visual impacts are expected to occur.



Figure 9 - Viewshed from Sparks Road/Hue Hue Road Intersection

9.0 Visibility

“Visibility” is a measure of the extent to which particular activities / components of a proposal may be visible from surrounding areas, the relative number of viewers, the period of view, viewing distance and context of view. The rationale for the assessment is that if a proposal is not visible the impact is nil; if the number of people who would potentially see the proposal is low, then the visual impact would be lower than if a large number of people has the same view.

For the purpose of this Visual Impact Assessment, the general categories of visibility have been defined broadly and are presented in Table 2 below. In order to assess the Project, the following visibility categories have been used, and are based on the Guidelines for Landscape and Visual Impact Assessment’ (GLVIA) prepared by the Landscape Institute (UK), which are commonly used for Visual Impact Assessments within NSW. The levels of VIA are described in Table 1.

Table 2 – Visibility Categories

High (H)	Where a large number of people would see the proposed development at short distance over a short, moderate or long period of time
Moderate (M)	Where a small number of people would see the proposed development at a short or medium distance over a moderate or long period of time, or a moderate number of people would see the proposed new development at a medium distance over a short, moderate or long period of time, or a large number of people would see it at a medium or long distance over a short period of time
Low (L)	Where a small number of people would see the proposed development at long distance over a short, moderate or long period of time.

For the purpose of this Visual Impact Assessment, the criteria listed in Table 3 have been determined and used in the visibility assessment for each of the two sites.

Table 3 – Visual Assessment Criteria

Criterion	Definition
Number of Viewers <ul style="list-style-type: none"> High Moderate Low 	<ul style="list-style-type: none"> > 1,000 people per day 100 – 1,000 people per day 100 people per day
View Distance <ul style="list-style-type: none"> Long distance Medium distance Short distance 	<ul style="list-style-type: none"> > 3 km 1.5 km – 3 km < 1.5 km
Period of View <ul style="list-style-type: none"> Long term Moderate term Short term 	<ul style="list-style-type: none"> > 120 minutes 1 – 120 minutes < 1 minute

9.1 Tooheys Road Site

The Tooheys Road Site has a relatively high level of exposure to two major arterial roads, the F3 Freeway and the Motorway Link Road.

The Motorway Link Road is a connection between the F3 Freeway north-west of Warnervale and the Pacific Highway at Doyalson. It was used in the past as the main connection between the F3 and the Pacific Highway before the freeway extended north of Warnervale.

There is no connection to the northbound lanes of the F3 from the Link Road/F3 Freeway junction.

At the time of writing, there are no available traffic count data for the Motorway Link Road. However, if the F3 Freeway count is 60,000 AADT, it may be safe to assume a figure in the order of one third to one half of that for the Motorway Link Road. For the purposes of this assessment, a figure of 20,000 vehicles AADT has been assumed. What the RTA has predicted is that existing volumes on the Motorway Link and Pacific Highway north of the Motorway Link are considered to have a zero growth as the historical data shows a negative growth rate on the Motorway Link.

The site is visible from Tooheys Road, but this road has a very low traffic usage level. Bushells Ridge Road also has a low traffic usage, but that road is relatively remote from the Project Boundary (being 1km away).

Thus, based on the above table of Visibility Assessment Criteria:

- a) Site Viewed from West (F3 Freeway):
 - HIGH number of potential viewers;
 - SHORT distance of view; and
 - SHORT period of view.
- b) Site Viewed from East (Motorway Link Road):
 - HIGH number of potential viewers;
 - SHORT & MEDIUM view of distance; and
 - SHORT period of view.
- c) Site Viewed from North (F3 Freeway):
 - HIGH number of potential viewers;
 - SHORT view distance; and
 - SHORT period of view.
- d) Site Viewed from South (Motorway Link Road):
 - HIGH number of potential viewers; and
 - View generally not available.
- e) Site Viewed from the North-West (Bushells Ridge, Road):
 - LOW numbers of potential viewers (rural, local road);
 - LONG viewing distance; and
 - MODERATE period of view (although view restricted by intervening vegetation).
- f) Views from Tooheys Road:
 - LOW numbers of potential viewers (rural, unmade road);
 - SHORT viewing distance; and
 - EXTENDED period of view (although extensive, immediately intervening vegetation).

From the above, it is clear that while a great many motorists pass the site:

- The visibility of the various parts of the site is generally quite restricted from every viewpoint with the possible exception of the east;
- There are few other motorists who can see the site, irrespective of proximity to it; and
- For all passing motorists – again from every view point (possibly) other than the east – views of the site are at best, very fleeting and otherwise restricted by intervening trees.

In summary, the overall the site has LOW visibility to the public in general.

A small number of private residences are located near the site. Of these, those located along Tooheys Road are now in the ownership of the proponent. As such, although they will be impacted upon, they will either be used by the proponent or removed. House nos. 209 and 235 Bushells Ridge Road will have some minor impacts upon view as shown in Figures 11 and 12. However, these impacts are significantly reduced due to their views being limited to the uppermost section of the Product

Coal Stockpile facility (if any) and because the views would be filtered through existing vegetation which is to be retained. Also, the views in the direction of the stockpile already include existing infrastructure (the F3 Freeway and power transmission lines). As such, the impacts of the Project are minimal.

9.2 Buttonderry Site

Given the approval of the Warner Business Park (part of the WEZ) on the opposite side of Hue Hue Road from the site, and the appearance of this site as being of a commercial nature, the Buttonderry Site is in keeping with the desired future land use of the site.

As illustrated in Figures 14 and 15 the development cannot be viewed by adjoining rural and rural residential properties due to both vegetation and topography.

As such, the visibility of this site is not a major consideration, and the project will have little to no adverse visual effects and will largely not be visible from any public or private areas.

9.3 Western Ventilation Shaft Site

The Western Ventilation Shaft is located within the Wyong State Forest and is not visible from any surrounding residences. As it is located adjacent to an existing forestry track it will be visible to any bushwalkers, horse riders or 4WD Enthusiasts that may use the track. However, this number is anticipated to very low to negligible.

10.0 Visual Absorption Capacity

Visual Absorption Capacity (VAC) is the estimated capacity of the landscape to absorb development without creating significant visual change which results in a reduction in scenic quality. The capacity to absorb development is primarily dependant on vegetation cover, landform and the presence of other development. VAC increases where the development being assessed has visual forms which complement the existing environment.

Large footprint, large volume, highly coloured, sharp-edged structures will have less chance of achieving a high level of visual absorption into an unmodified natural environment, than small, understated smooth-form structures coloured to blend into the existing environment. Table 4 details the criteria for the Visual Absorption Capacity of an area.

Table 4 – Visual Absorption Criteria

High	Landscape able to absorb development. Low degree of visual contrast would result
Moderate	Landscape able to absorb some development. Some visual contrast would result
Low	Landscape unable to absorb development. High degree of visual contrast would result

It is important to note that the assessment of VAC is intended to relate to a landscape setting larger than simply the subject sites.

10.1 Tooheys Road Site

The scenic quality of this site is defined in part by its relationship to the wider locality, sharing a similar characteristic to the surrounding area. However, it is important to note that this is a transitional area, with large areas of surrounding land being zoned industrial, with subsequent developments anticipated to occur. Land to the north and west is largely rural in nature but zoned either rural or 10A Investigation.

Approximately half of the site is vegetated, with the northern, southern and eastern boundary areas thickly vegetated. The majority of the cleared land is located in the centre and west of the site. The eastern portion of the site is more sparsely treed than the remainder, comprising sporadic regrowth in previously disturbed grazing lands.

The area where the Product Coal Stockpile is proposed is located in the middle portion of the site. Clearing of mature vegetation is required, but the Stockpile can remain surrounded by mature native vegetation.

10.1.1 Raw Coal Stockpile

The area where the Raw Coal Stockpile is proposed, is currently quite open but only partially visible at grade from the F3 Freeway immediately to the west (on approach from the south). However, this view requires drivers or passengers in vehicles to turn their heads to such a degree as to focus away from the road – the site of the Raw Coal Stockpile is not within the immediate line of sight and as such does not present as much of an impact. For drivers travelling south on the F3 Freeway, there is a visible section of the site. However, this once again requires the diverting of attention away from the road, and at the legal speed limit, there is approximately a 15 second window in which the Raw Coal Stockpile potentially could be viewed.

On approach on the Motorway Link Rd from the east, this stockpile is substantially concealed by tall, mature trees and because the approach is generally from a lower elevation. Where this stockpile is at its most (potentially) exposed, is to motorists passing along the most westerly portion of the Motorway Link Road (on an elevated ridge) and at this point, views are very fleeting.

However, at this point the roadway level is set within a cutting, making view of the lower position of the Raw Coal Stockpile impossible. From this point, the larger footprint Product Coal Stockpile is also lower, but in this case, is substantially concealed by a dense distribution of tall trees. Figure 10 illustrates this.



Figure 10 - View from Motorway Link Road

N.B. The Product Coal Stockpile is located away from the road boundary. The indicative height of the Raw Coal Stockpile is shown above. Not the physical location.

The Product Coal Stockpile is set below the ridge immediately to its north-west and is absorbed from the view of southbound approaching F3 motorists by dense intervening tree cover. It will be on a level platform that will be excavated into the sloping land.

10.1.2 Other Infrastructure

The degree of visual absorption of the conveyor gantry and rail loop (with associated cuttings) is more problematic as they represent more “alien” forms and occupy more exposed areas of the site than the stockpiles. The capacity of the open, upper eastern and upper western portions of the site to absorb these forms of intervention is not as good as the capacity of the densely treed areas. However, substantial cuttings are to be introduced, which will largely shield these areas of infrastructure from being viewed from outside the site.

From external viewpoints, the visibility of the rail line will be significantly moderated where the line is located into the gullies north of Tooheys Road and is concealed by surrounding trees. A background of highly angular 330 KV transmission towers is highly visible in this area both as foreground and distant views. The alignment of the raw coal stockpile in the photo from Bushells Ridge Rd (see Figure 11) is along approximately the same alignment as the Tower 23 and this raw stockpile top will

be at or just below the horizon in this photo. The top of the raw coal stockpile will be RL 65 m.

As the marked-up photo at Figure 11 shows, there may be some minor and filtered and/or intermittent views between trees of the overhead gantry structure above the product coal stockpile but little, if any, visibility of the product coal itself. This is because of intervening trees in the foreground and nearby the stockpile itself, and partly because of topography. Depending on the intervening trees when viewed from the elevated house further east, this house might have increased visibility of part of the product stockpile handling infrastructure, but this would need to be individually assessed.

Impacts along Tooheys Road are more visible. However, given the very low levels of passing traffic, and the extensive vegetation to be retained, the overall impact of these stockpiles are limited. This is shown in Figures 12 and 13.



Figure 11 - View to the South from Bushells Ridge Road



Figure 12 - View to the South from hilltop near Bushells Ridge Road Intersection

As detailed in Section 5 above, helium balloons were raised to the height of the proposed stockpiles. These were then measured off against known landmarks, including electricity towers, existing buildings and topographic features with the F3 Freeway used as a central marker.

The known top heights of the 330 kV transmission towers 720 m away from Bushells Ridge Rd were used as the measurement benchmark for the superimposed heights of the product stockpile and gantry.

Overall, the VAC of the Tooheys Road Site is assessed as MODERATE. With appropriate landscape management, (i.e. with very little physical intervention) that overall capacity can be increased to MODERATE – HIGH. In order to further minimise the effects it is recommended that landscaping around key building structures and the painting of these buildings in a neutral colour in order to minimise potential impacts.

An example of current screening vegetation can also be seen in Figure 13, which shows the majority of the Product Stockpile from Tooheys Road, near the Bushells Ridge Road intersection being screened by vegetation. Due to the height and thickness of this vegetation, the product stockpile is largely shielded from view. This minimises the impacts to passing traffic along Tooheys Road.

On the basis of the above assessment, it is clear that the Tooheys Road Site infrastructure as a whole can be easily absorbed visually by the hills and denser bushland trees as well as by the other developments surrounding the site, such as a quarry, electricity pylons and the F3 Freeway. The VAC of the Tooheys Road landscape can be illustrated in the table below:

Table 5 - Visual Absorption Capacity – Tooheys Road Site Stockpiles when viewed from the:

Criteria	North	South	East	West
High		Y		
Moderate	Y	Y	Y	Y
Low				

It should be recognised that the visual impact of the Tooheys Road Site can be expected to decrease even more with distance from the site and the degree of intervening hills and tall vegetation. Therefore, the impact upon views is assessed from both close and distant points and is provided in Table 6 below.



Figure 13 - View from Tooheys Road

Table 6 - Extended Visibility – Tooheys Road Site

	High	Medium	Low	Nil
Distant North (Bushells Ridge Road)			Y	
Distant North-west (Bushells Ridge Road)			Y	
Distant South-west (F3 Freeway)				Y
Distant South (unnamed/unformed E-W road leading west to Mountain Road)				Y
Distant South-east (Motorway Link Road)		Y		
Distant South-east (Proposed Warnervale Town Centre, 3km away)			Y	Y
Distant East (Motorway Link Road)			Y	Y
Close North (Tooheys Road)		Y	Y	
Close North-west (Cnr Tooheys Road and Bushells Ridge Rd)		Y		
Close South-west (Motorway Link Road)				Y
Close South-east (Motorway Link Road)		Y		
Close East (Tooheys Road)		Y		

The southern portion of the Buttonderry Site adjoins a rural residential development. No views over the site are available from this area to the site due to the topography and vegetation of the site. A similar situation is found when looking at the rural residential properties to the west – a prominent forested ridgeline separates visually the development from these properties. As per the Tooheys Road Site, helium balloons were raised to show the height of the development. These helium balloons were not visible from potential viewing locations. See Figure 14.

On this basis, the overall Visual Absorption Capacity of the Bushells Ridge Road site tends towards Low.

10.2 Buttonderry Site

The approach to the Visual Absorption Capacity of the Buttonderry Site is approached using the same methodology as above (i.e., for the Tooheys Road Site), but the equivalent of table 6 above has been dispensed with because it is clear that the majority of the Buttonderry Site facilities will be shielded from view from all directions.

The densely treed western portion of the site, set well below the ridge in the south-west corner, has a HIGH level of VAC in relation to the Project and as such, a “low degree of visual contrast would result”.



Figure 14 - View North from Amberwood Close

The existing landscape in the eastern portion of the site, although not as thick as along the southern boundary, still largely shields the Project from view. The view from near the Sparks Road / Hue Hue Road intersection is shown in Figure 15.



Figure 15 - View west from Sparks Road/Hue Hue Road

The development proposed in this part of the site, is located within a portion of site that is largely sheltered from view by both topography and vegetation.. The VAC of the eastern portion of the site is currently MODERATE-HIGH. The minor mitigation work proposed will result in this classification being maintained. Overall, the VAC applicable to the Buttonderry Road site is MODERATE – HIGH, tending towards HIGH.

11.0 Visual Impact Rating

The following matrices provide the means of setting the visibility rating for the two sites, against the VAC for each, to arrive at a determination of the Visual Impact Rating (VIR) for each.

In turn, it is this rating which determines whether or not any mitigation is required to reduce the visual impact to acceptable levels.

11.1 Tooheys Road Site

The matrix prepared below details how the visibility and the visual absorption rating of the Tooheys Road Site combine to give the Visual Impact Rating. The Visibility of the site is based on the number of locations and distance it can be seen from, whilst the Visual Absorption Rating is the ability of the landscape and vegetation to shelter the project from view.

Table 7 - Visual Impact Matrix - Tooheys Road

2. VISUAL ABSORPTION RATING	1. VISIBILITY		
	LOW	MODERATE	HIGH
	3. VISUAL IMPACT RATING		
	LOW	LOW	MODERATE
HIGH	LOW	MODERATE	HIGH
MODERATE	LOW	MODERATE	HIGH
LOW	LOW	MODERATE	HIGH

The Tooheys Road Site has a LOW level of visibility and a MODERATE VAC.

Using the matrix to align these two values, the result is a therefore, a LOW Visual Impact Rating – as indicated by the shadings in the matrix above.

11.2 Buttonderry Site

The matrix prepared below details how the visibility and the visual absorption rating of the Buttonderry Site combine to give the Visual Impact Rating. The Visibility of the site is based on the number of locations and distance it can be seen from, whilst the Visual Absorption Rating is the ability of the landscape and vegetation to shelter the project from view.

Table 8 - Visual Impact Matrix - Buttonderry

2. VISUAL ABSORPTION RATING	1. VISIBILITY		
	LOW	MODERATE	HIGH
	3. VISUAL IMPACT RATING		
	LOW	LOW	MODERATE
HIGH	LOW	MODERATE	HIGH
MODERATE	LOW	MODERATE	HIGH
LOW	LOW	MODERATE	HIGH

The Buttonderry Site has a LOW level of visibility and a MODERATE-HIGH VAC. Using the matrix to align these two values, the Buttonderry Site has a LOW Visual Impact Rating.

12.0 Recommended Mitigation Measures

The following Landscape Mitigation Measures respond to the areas of the Tooheys Road Site which have lower VIRs when viewed from both close and distant range.

The principal areas of the site at which VAC should be increased are:

- The north-western boundary area from north of half way along the western boundary; and
- Along part of the eastern boundary.

A concept landscape design to mitigate these impacts has been prepared and is included in Appendix A.

Undertaking these landscaping works as shown in Appendix A will have the effect of reducing distant Visual Impacts to LOW and close range Visual Impacts also to LOW. These impacts are considered acceptable and appropriate, given that they include reinstatement of the local vegetated character.

Appendix A demonstrates the proposed mitigation measures compared to the visual impact.

For the Buttonderry Site, effective enhancement of the VAC could be achieved by screen planting along the Hue Hue Road boundary and particularly adjacent to the entrance and access roadway.

13.0 Conclusion

13.1 Tooheys Road Site

The proposed infrastructure at this site requires landscape and visual impact management assessment because of:

- The scale and form of the proposed structures;
- Its location at the convergence of two major arterials;
- The previous clearing of certain areas of the site, and
- The number of both distant and close viewpoints.

However, because of the uniformity of vegetation height in the local viewing catchment, the potential for visual impacts are generally minimal, particularly if a landscaped buffer area is maintained or enhanced along the key arterial routes.

The key areas, as illustrated by Figures 10 to 13, where potential visual impacts are likely to be registered include the low traffic volume Bushells Ridge Road and Tooheys Road. A small number (2) of rural-residential properties along Bushells Ridge Rd are likely to be able to partly view the Project. However, existing vegetation and topography as well as infrastructure associated with the F3 Freeway between the site and the properties in question minimise the visual impacts. The main views from these locations will include the uppermost part of the coal stockpiles, although these will be partially filtered by vegetation. The other Project infrastructure will largely be hidden from view by intervening topography and vegetation.

No visual impacts on the proposed Warnervale Town Centre are anticipated to occur. The viewshed prepared in Figure 9 illustrates that the site is not visible from the northernmost, and highest, point of the proposed Warnervale Town Centre.

The level of visual impact cannot be reduced to a NIL level but, given the types of site exposure identified, the LOW Visual Impact Result is considered satisfactory.

13.2 Buttonderry Site

This infrastructure development site has a narrow frontage, compared with its depth and the bulk of the proposed development will occur at the rear of the site, where the site's VAC is high. The proposed revegetation will increase the VAC of the eastern portion of the site. As has previously been detailed, no additional visual mitigation measures are required along the southern and western boundary as the existing topography and vegetation provide effective visual screening.

In the context of the anticipated future character of the surrounding land, it is considered that no significant visual impact mitigation measures are required. This is primarily due to the surrounding vegetation and topography of the site shielding surrounding residences from any adverse visual impacts. However, effective enhancement of the VAC could be achieved by screen planting along the Hue Hue Road boundary and particularly adjacent to the entrance and access roadway.

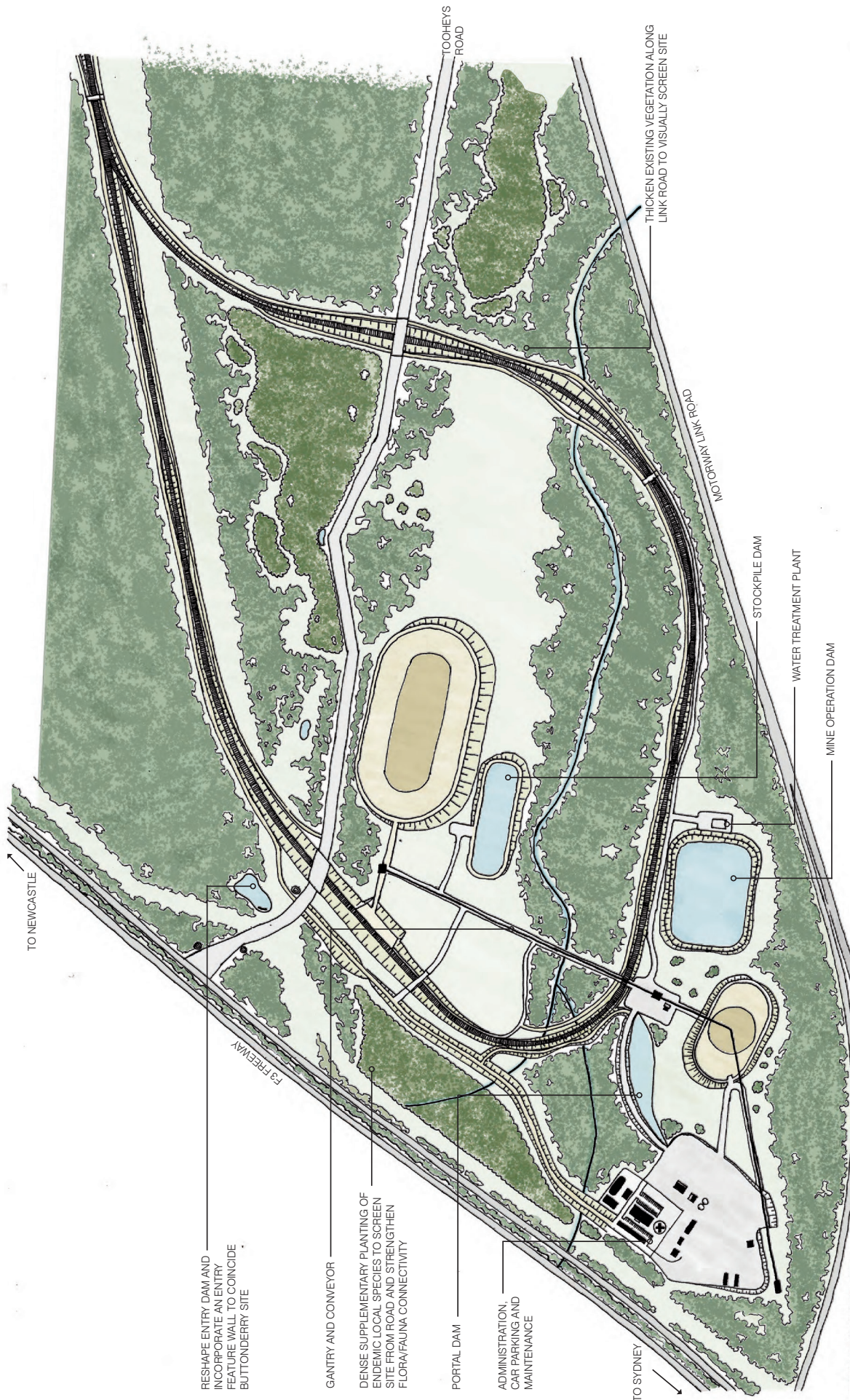
The project infrastructure, where it will be visible, will read as a logical continuation of the Wyong Employment Zone, which is to extend to the eastern side of Hue Hue Road. The minimal structures that will be visible from the road will respond to the context of the WEZ, which further minimises their impact.

The proposed development at the Buttonderry Site will have a MINIMAL – LOW Visual Impact Result on the existing and proposed landscape character of the area.

13.3 Western Shaft Site

Due to the location, the nature of the development and the surrounding environment, there is to be no negative visual impact as a result of the Western Shaft.

APPENDIX A - Concept Landscape Design

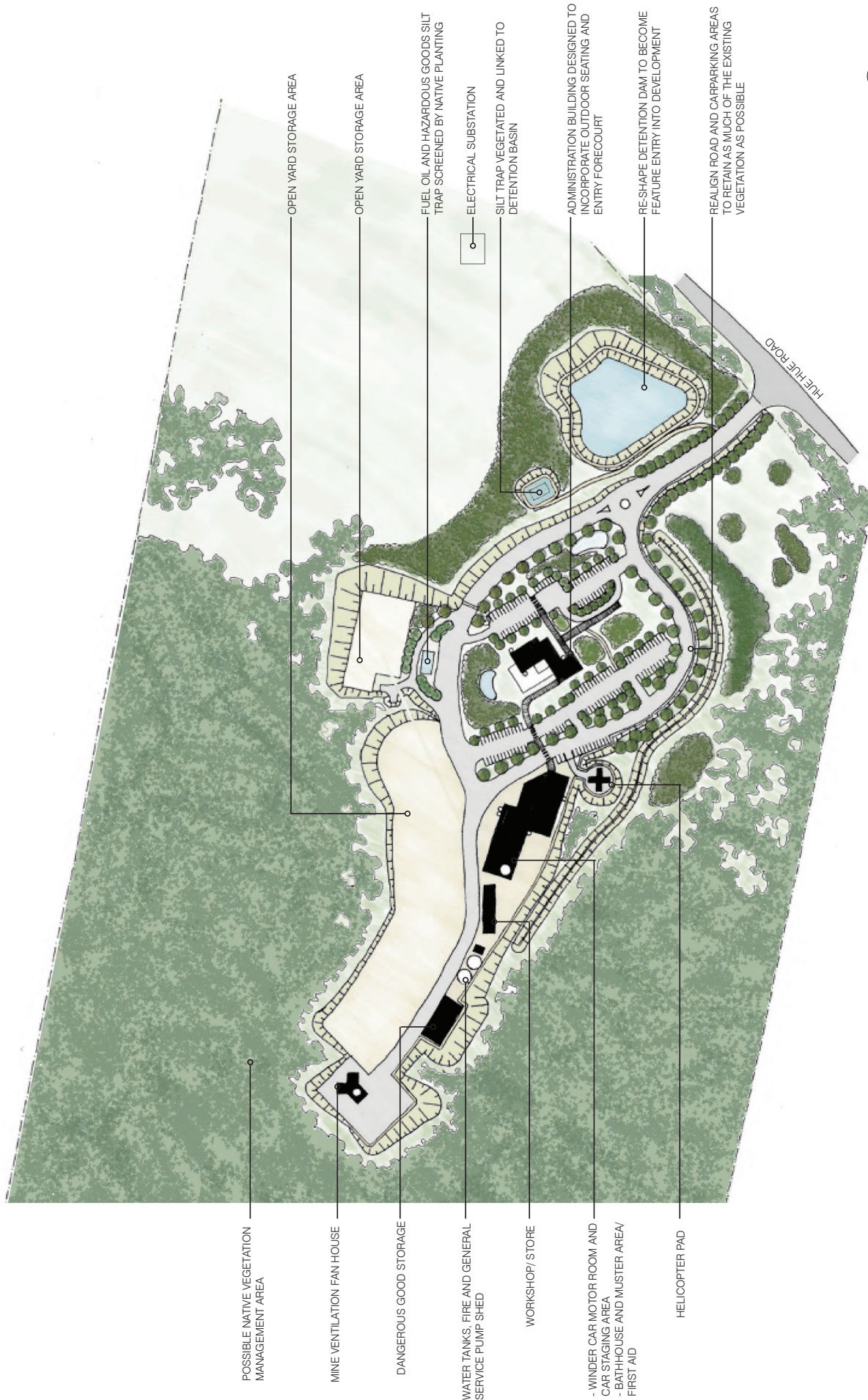


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Landscape Concept Plan - Tooheys Road Site

Walarah 2 Coal Project

Date: 3 October, 2012 Scale 1 : 2500 @ A1 Project No: 11.050 Sheet: 1/2



Landscape Concept Plan - Buttonderry Site

Wallarrah 2 Coal Project

Date: 3 October, 2012 Scale 1 : 2500 @ A1 Project No: 11,050 Sheet: 2/2



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