

Appendix M

Visual Impact

Assessment





Newcastle Power Station

Visual Impact Assessment

AGL Energy Ltd

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1 Introduction

1.1 Overview of the Proposal

AGL Energy Limited (AGL) proposes to develop a new power station in Tomago, NSW ('the Proposal'). AGL ('the proponent') is seeking approval for the Proposal from the NSW Minister for Planning and Environment under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

AGL proposes to construct and operate a dual fuel power station, the Newcastle Power Station (NPS), gas pipelines supplying gas to the facility, electricity transmission from the NPS, site access and associated ancillary facilities at Tomago in New South Wales (NSW). Together, the NPS, gas supply, electrical connections and associated infrastructure form the Proposal.

The NPS would be a fast start dual fuel peaking plant with a nominal operating capacity of 250MW, designed to provide firming capacity to the National Electricity Market (NEM). The NPS is intended to be operated as a peaking plant; however, it will be designed for continuous base load operation to maximise operational flexibility and will be operated as such should requisite circumstances arise in the NEM. This impact assessment considers both the peaking operation and the base load operation.

The Proposal would consist of three key components along with associated ancillary infrastructure, which are discussed in detail in Chapter 2 of the Environmental Impact Statement (EIS). The key components include:

Specifically, the Proposal, as shown in Figure 2, would include:

- A new dual fuel power station with a nominal capacity of 250 MW comprising of either large reciprocating engine generators or aero-derivate turbine generators. The power station would be capable of operating using gas or diesel fuel, as required.
- Facilities ancillary to the power station include gas compression facilities, fuel storage tanks and infrastructure including diesel storage and truck unloading facilities, water management facilities and office, administration / amenities areas, workshop / storage facilities.
- Connection of the power station to the gas supply at the Newcastle Gas Storage Facility (NGSF) with a new gas pipeline(s) and connection of the power station directly to the existing Tomago to Hexham high pressure gas pipeline (HPP).

The Proposal area indicates the area which was considered for environmental assessment to inform this Environmental Impact Statement (EIS), whilst the development footprint is the refined maximum area of impact required to develop the Proposal. All vegetation within the development footprint is likely to be cleared to facilitate the siting of the NPS and the required area for construction.

The Proposal is subject to ongoing design development. The power sector is exposed to rapidly changing technologies and AGL is seeking to use these processes to determine the most cost-effective technology best suited to the Proposal requirements, the local environment and the relevant statutory requirements of NSW. Given the Proposal is subject to further design and contractor involvement, for the purposes of this EIS an assessment of potential construction and operational impacts of the Proposal has been developed using a 'worst case' or 'maximum parameters' approach in accordance with Section 3.7.2 of the *NSW Draft Environmental Impact Assessment Guidance Series Preparing an Environmental Impact Statement* (DPE, 2017) to bring greater certainty to the assessment of the Proposal

2 Study Methods and Criteria

2.1 Approach

The Proposal is located within the Port Stephens Local Government Area (LGA). Port Stephens Council does not have a specific policy relating to the assessment of visual impacts, so the *Guidance Note for Landscape and Visual Assessment* (ALIA, 2018) has been used as a basis for this assessment along with recent and relevant studies including Terras (2011), Integral (2009), and EDAW (2000). The Department of Planning and Environment's *Rural Land Evaluation* study has also been referenced (DoP, 1988).

The ALIA, 2018 methodology follows the five steps illustrated below and includes a feedback loop to assist in refining the design during or after the assessment. The visual impact assessment:



Figure 1 The ALIA methodology

The aim of the ALIA methodology is to describe the existing visual character around the Proposal, assess the likelihood and nature of impacts on the nearby landscape and visual character resulting from the Proposal, and to determine measures for the mitigation and management of those impacts.

The assessment included:

- Analysis of aerial imagery, transport routes, infrastructure and services, and adjacent and nearby land uses
- Review of the above information to determine locations where the visual character may be impacted by the Proposal
- Determination of representative accessible viewpoints. Typical viewpoints are areas of high ground, parks and other public venues, road corridors, rail corridors, and residential areas
- Site inspection at each of the pre-determined viewpoints and where necessary, modification of the viewpoints in field for locational and/or safety reasons
- Photography and written descriptions at each viewpoint to illustrate the local context
- Impact assessment to describe visual properties of the Proposal and location and to understand the overall visual effect.

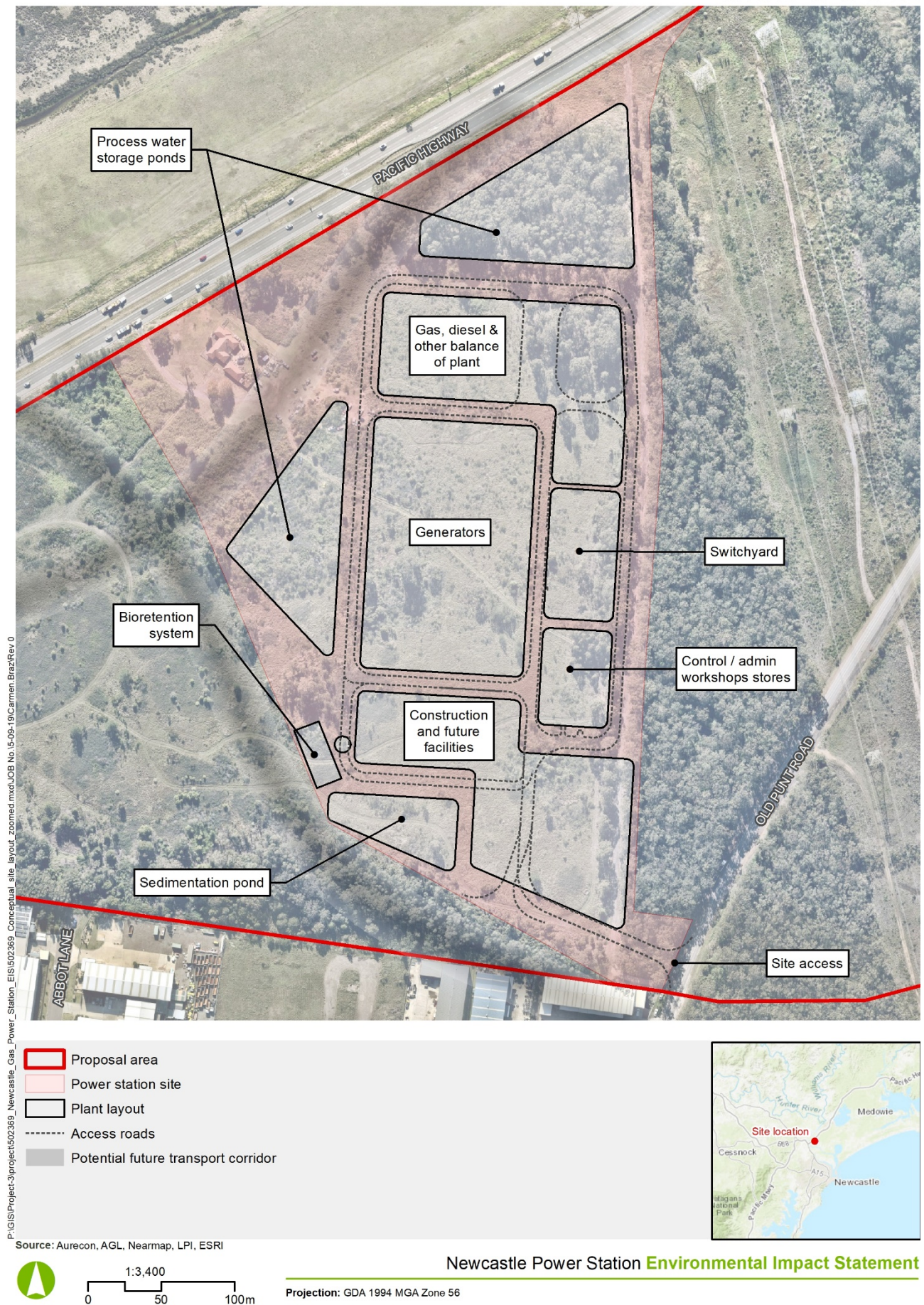


Figure 2 Conceptual Site Layout

2.2 Visual effect

The visual effect is a measure of the level of contrast and integration of the Proposal with the existing landscape. Project elements are expressed through visual expression elements. That is, form, shape, pattern, line, and colour. These contrast and/or integrate to varying degrees with the surrounding landscape. In addition, the lower the proportion of the view that is occupied by the Proposal, the less the overall visual effect. The proportion of view is defined as the Primary View Zone (PVZ). The relationship between contrast, integration, and effect is shown in Table 1.

Table 1 Contrast, integration, and visual effect

Visual properties		Visual effect levels		
Contrast	Integration	High	Moderate	Low
High. Development elements do not borrow, form, shape, line, colour or texture or scale from existing features of the visual setting and contrast levels are high with existing landscape.	Low. The development lacks integration with visual setting because of scale totally dominating the ability of site or surrounding features, vegetation and or topographic features to integrate the development.	The development occupies more than 2.5% of the primary view shed.	The development occupies between 1 - 2.5% of the primary view shed	The development occupies less than 1% of the primary view shed.
Moderate. Development elements borrow from some features of the visual setting in terms of form, shape, line pattern and or colour and scale, reducing visual contrast with existing setting.	Moderate. The development has some degree of visual integration with setting from other features, vegetation and or topography achieve some level of integration.	The development occupies more than 20% of the primary view shed, generally when in a foreground location.	The development occupies between 20-10% of the primary view shed.	The development occupies less than 10% of the primary view shed.
Low. Development elements borrow extensively from features in visual setting in terms of form, shape, line, pattern colour and scale minimizing contrast with the existing setting/	High. Visual integration is high due to other features, vegetation and or topography achieving dominance and screening or filtering.	The development occupies more than 40% of the primary view shed.	The development occupies 40-30% of the primary view shed.	The development occupies less than 30% of the primary view shed.

2.3 Visual sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape is viewed by people from different land use areas in the vicinity of a development (Internal, 2009). Residential areas typically have a higher visual sensitivity because residents use the scenic amenity values of the surrounding landscape. Likewise, tourist and recreational areas have a high visual sensitivity. This is in contrast to industrial and agricultural areas, or major transport corridors. Users in these areas do not expect or demand scenic amenity. Table 2 shows the relationship between land use and visual sensitivity.

Table 2 Land use and visual sensitivity

Land use	Visual sensitivity levels*			
	Nearest visible elements less than 2.5 km away	Nearest visible elements 2.5 - 7.5 km away	Nearest visible elements 7.5 - 12.5 km away	Nearest visible elements more than 12.5 km away
Residential areas	High	High	Moderate	Low
Tourist areas	High	Moderate	Low	Low
Highway traffic	Moderate	Low	Low	Low
Local traffic	Moderate	Low	Low	Low
Rural lands	Low	Low	Low	Low

* Visual sensitivity levels are from the perspective of viewers from each of the various land uses.

For any view to be scored it must have visibility to the Proposal. Visibility was determined based on the determination of representative accessible viewpoints and field inspection.

2.4 Visual impact

Visual impact assessment considers sensitivity and effect, as shown in Table 3. This approach seeks to apply a semi-quantitative method to what is overwhelmingly a subjective matter. It is limited in that different viewers will, by their nature, apply different values to a particular scene. However, by applying a “reasonable” approach to assessment of visual amenity this method provides a basis on which to determine likely impacts and discuss mitigation.

Table 3 Visual impact assessment

Visual effect	Visual sensitivity		
	High	Moderate	Low
High	High visual impact	High to moderate visual impact	Moderate to Low visual impact
Moderate	High to moderate visual impact	Moderate visual impact	Moderate to Low visual impact
Low	Moderate to Low visual impact	Moderate to Low visual impact	Low visual impact

3 Existing Environment

The proposed power station is located at 1940 Pacific Highway, in Tomago in NSW. The north western boundary of the power station site is adjacent to the Pacific Highway, while the south eastern corner meets Old Punt Road. The southern boundary backs on to the industrial area along Kennington Drive, Kilcoy Drive, and Abbot Lane. Figure 2 shows the local layout, including the nearest industrial areas and other nearby viewpoints.

The NGSF, Jemena gas pipeline, electrical infrastructure, and Tomago Aluminium Company (TAC) are all within land zoned IN1 General Industrial under the Port Stephens Local Environmental Plan 2013. A range of other industries within the IN1 General Industrial zone include:

- Transportation and haulage
- Metal fabrication and galvanising
- Manufacturing
- Commercial construction
- Petrochemical
- Self-storage.

The Proposal is located in an area defined by industrial development, large scale buildings, and electrical infrastructure as shown in Figure 2. The existing TAC and NGSF buildings dominate the surrounding area. There are no residential zones in the area; however, there is a residence in Oakfield Road in the Maitland LGA, and a single residence on the site. The latter will be demolished as part of the Proposal. The current view of the site from surrounding locations is wholly or partially obstructed by vegetation.

The primary visual catchment is from the Pacific and New England Highways. From the north, Pacific Highway motorists view the Proposal site to their left as they approach, as shown in Figure 3. This view is currently defined by the highway cutting, electricity transmission pylons, and vegetation consisting mainly of grasses and trees. From the south, the current view is of the transmission pylons, grasses, and trees. From the New England Highway heading south, the Proposal site is to the left approximately 2.5 kilometres across the Hunter River and wetlands, as shown in Figure 3. This view is dominated by the wide flat wetland area, and includes mangroves, some larger trees, and the ubiquitous transmission pylons.

The Hunter Region Botanical Gardens are located approximately 1.2 kilometres north of the Proposal on the Pacific Highway. This is a popular tourist site that is conveniently located off the highway. It provides meals and refreshments as well as tours and walking trails. There is no view of the Proposal from the gardens, café, or car park. The only view towards the Proposal is from the access road as motorists turn left onto the highway. The view at this location currently consists of the highway, transmission pylons, and vegetation. Visual impact often assumes that views are wide and lengthy; however, this location is an example where the view would be fleeting as motorists exit the car park and merge with traffic on the 80 kilometres per hour (kph) Pacific Highway.

Oakfield Road is approximately 2.2 kilometres northwest of the Proposal. A single residence and several farm buildings occupy the only built area on the road, and the surrounding land is agricultural. The current view at this location for residents and farm workers is of the surrounding agricultural land, with riparian vegetation of the Hunter River in the background, as can be seen in Figure 3. The land is generally low, and is in the Hunter River floodplain, although the residence and associated buildings are raised on fill platforms to combat flooding.

Old Punt Road is a local road that connects the Pacific Highway with Tomago Road via the Tomago industrial area. Motorists heading south will pass the site to their right as shown in Figure 3. The current view at this location for motorists in either direction is dominated by trees and the transmission easement. Motorists heading north will first pass through the industrial area before encountering the trees and the transmission easement.

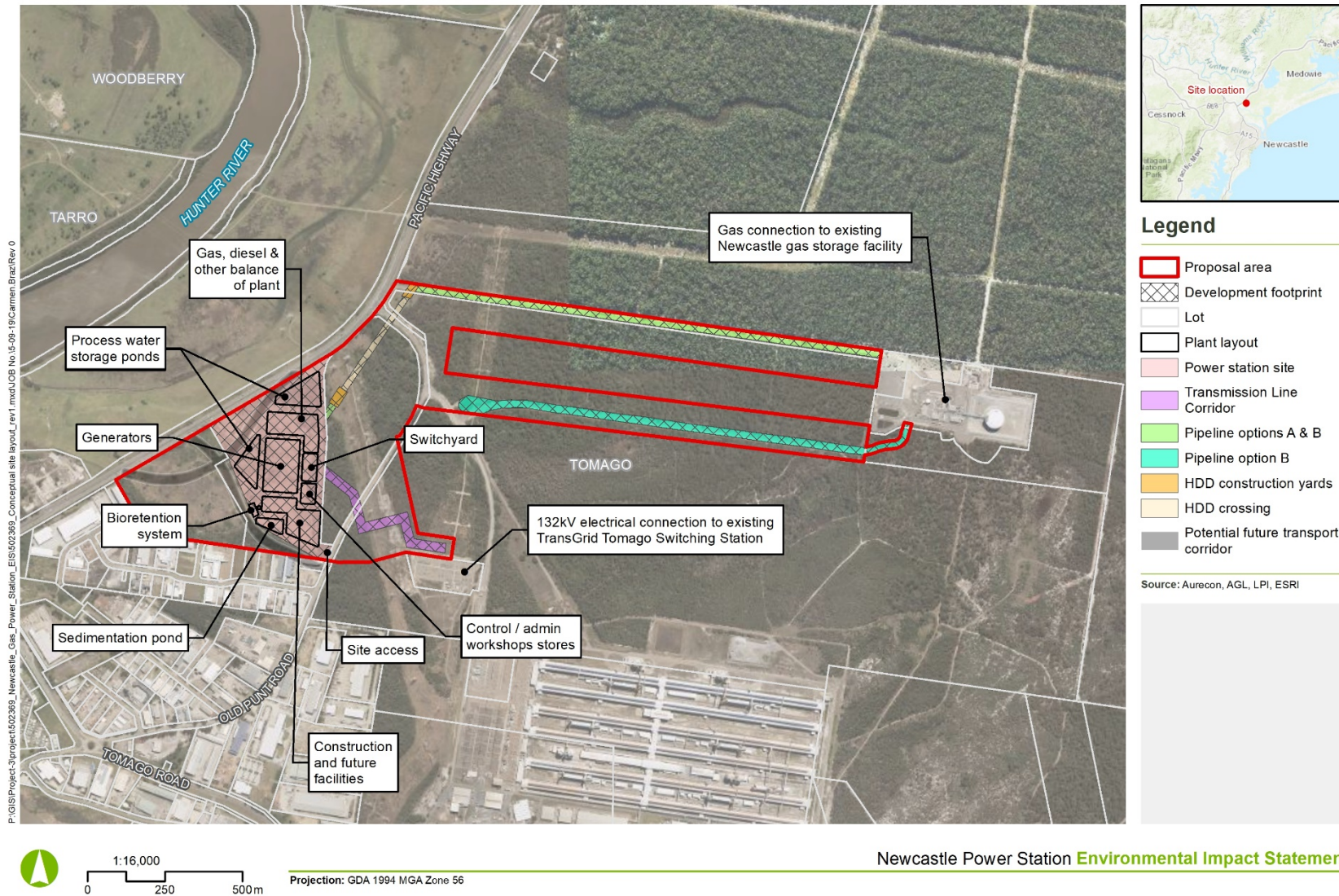
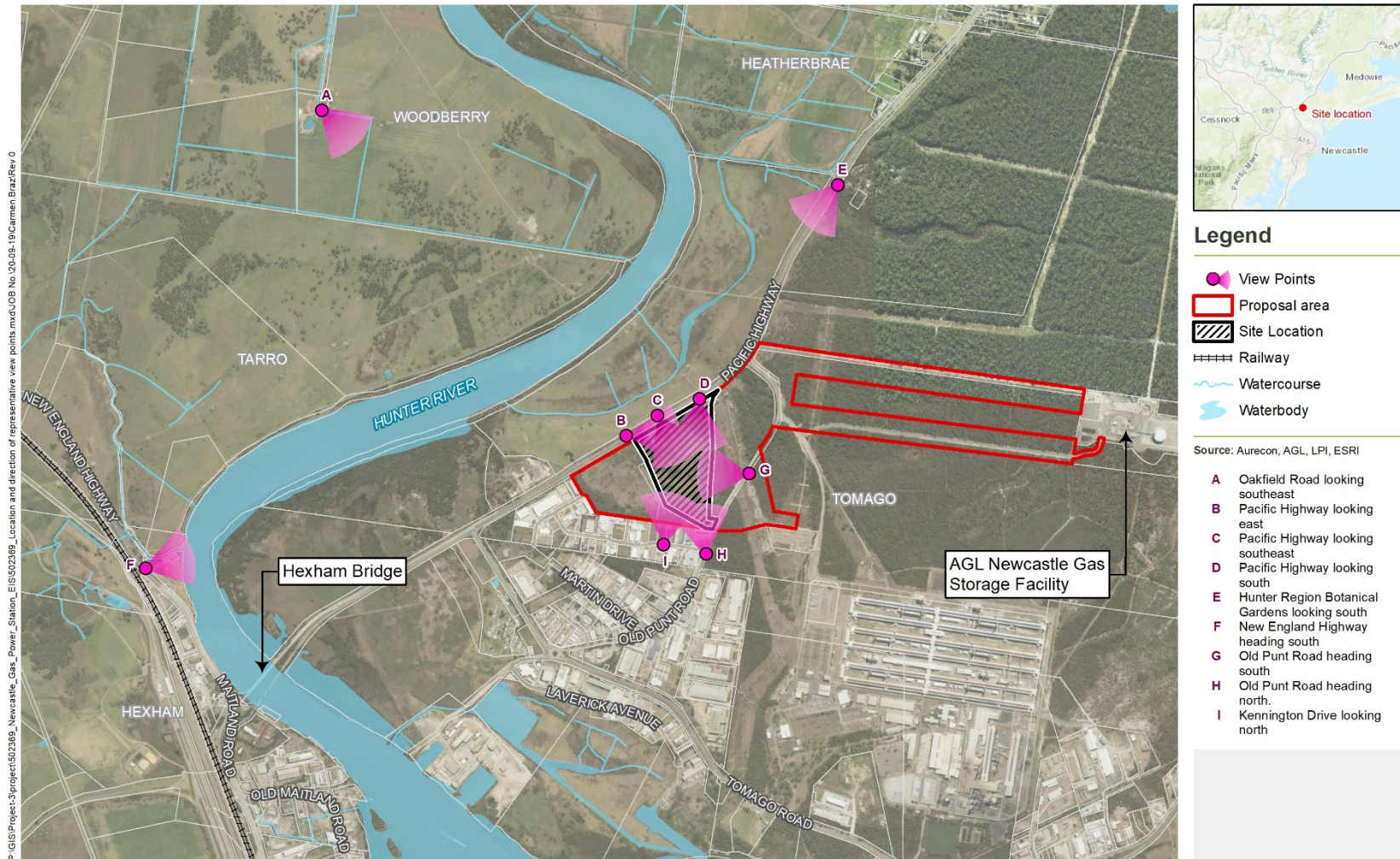


Figure 3-1 Conceptual site layout



Newcastle Power Station Environmental Impact Statement

Figure 3-2: Viewpoints

4 Proposed Development

4.1 General

AGL propose to construct and operate a dual fuel (gas and diesel) fast-start peaking power station with a nominal operating capacity of 250MW. The Proposal would be located at in Tomago, approximately five kilometres south west of Raymond Terrace and about two kilometres north east of Hexham, and would include the power station and associated infrastructure for access, gas supply, electrical connections, and utilities. The basis of design is to provide dual fuel capability as a contingency in the event of a loss or interruption of gas supply, and 24 hours of liquid fuel, likely diesel and/or bio-diesel, will be stored on site. 24 hours of operation will require approximately 1.5 ML of diesel and/or bio-diesel storage in two tanks each with an expected size of approximately 10,473 m³.

The power station would be located on Lot 3 DP1043561 alongside the Pacific Highway. This lot has been substantially cleared and was previously used for agricultural purposes with a single residential dwelling remaining. The site retains some mature trees and stands of native vegetation which are generally confined to the boundary and north eastern portion of the site. The site is gently undulating with a central low peak grading in all directions off the site. A number of earthen and gravel paths cross the site. Lot 2 DP1043561 is situated immediately west of Lot 3 but is not part of the Proposal.

The gas pipeline(s) would supply the proposed NPS with gas from the eastern Australia gas transmission pipelines via the Jemena network and via the Newcastle Gas Storage Facility (NGSF). A new electricity transmission line would transfer the electricity produced by the Proposal to the national electricity network via connection to the existing 132kV TransGrid switching station.

The area for the proposed gas and electrical transmission corridors is situated to the east of the power station site in Lot 4 DP 1043561, Lot 1203 DP1229590, and Lot 202 DP1173564. Lot 1203 is cleared to allow maintenance of AGL's easement between the Jemena HPP and the NSGF. This remainder of the area is predominantly vegetated and contains existing easements for gas pipelines, electrical infrastructure, and roads.

4.2 Visual properties

The power station layout consists of a nominal 250 metres x 250 metres footprint including ancillary facilities but excluding construction facilities and laydown areas. The power station will require up to five clusters of reciprocating engines or up to five individual turbines to meet the 250 MW requirement. Each cluster or individual turbine would require an emission stack or cluster of stacks. Emission stack height varies by technology; however, the highest stacks would be approximately 32 metres above ground level.

The power station is an imposing industrial facility that would be visible from the north and northwest. Once constructed, it will have a high degree of contrast to the surrounding lands and low integration as the elements of the development do not borrow form, shape, line, colour, texture, or scale from existing features of the visual setting. It will be a large, industrial facility located alongside the Pacific Highway in an area currently dominated by treed vegetation, wetlands, and rural land uses. The visual impact of the power station is described in Section 5 of this report.

A high voltage 132kV electricity transmission line would be required to connect the proposed power station to the TransGrid Tomago 132kV switchyard, approximately 500 metres south east (refer to Figure 2). The overhead transmission line will be contiguous with the adjacent TransGrid corridor for much of its route, before crossing over Old Punt Road to the proposed power station site. Once constructed, it will have a high level of integration with the existing TransGrid infrastructure. Due to the high degree of integration with the existing transmission line the visual impact of the proposed additional electricity line is not discussed further.

The gas pipeline from the NSGF would require around 5km of pipeline to provide storage capacity. AGL has carried out an options assessment and two preferred corridors remain for the gas connection (refer to Figure 2). The power station would also be connected to the existing Jemena supply in Old Punt Road. Once constructed, the pipeline will have a high level of integration as it will be installed at a minimum depth of 0.9

m below the ground surface and would be below ground for its entire length. Due to the high integration of the gas pipeline its visual impact is not discussed further.

4.3 Construction phase

During construction, the power station works would be screened with temporary security fencing with standard dust control/visual screening mesh installed. Deliveries to the site would be from Old Punt Road, and laydown areas would be located in the south and southwestern parts of the Proposal site. Clearing of existing vegetation would take place across the site to provide for construction, access, laydown areas, and construction accommodation.

The new gas pipeline connections would be installed through a combination of trenching and horizontal directional drilling (HDD). On completion the pipeline would be entirely underground other than for the gas yard within the power station site and the connection to the Jemena HPP and the NGSF. It will have a high degree of similarity to the surrounding lands.

The power transmission line will be constructed across Old Punt Road between the Proposal site and the existing Tomago switchyard. The transmission line will be installed in an area already dominated by transmission infrastructure. On completion, the transmission line will have a high degree of similarity to the surrounding lands.

5 Potential Impacts

5.1 Introduction

The visual impact assessment considers the relationship between the Proposal and the visual setting in which it is proposed and will be seen. A number of potential viewing locations were identified in Section 3. This assessment has considered each of these locations as follows:

- A. Oakfield Road looking southeast
- B. Pacific Highway looking east
- C. Pacific Highway looking southeast
- D. Pacific Highway looking south
- E. Hunter Region Botanical Gardens looking south
- F. New England Highway heading south
- G. Old Punt Road heading north
- H. Old Punt Road looking west.
- I. Kennington Drive looking north

These locations are shown in Figure 3-2.

In addition, four photographic montages were prepared from four viewpoints listed above illustrating two optional power station technologies in the existing context. These viewpoints were:

- Pacific Highway looking east
- Pacific Highway looking southeast
- Pacific Highway looking south
- Kennington Drive looking north.

The photographic montages are provided in Appendix A.

5.1.1 Oakfield Road

Oakfield Road is located in the agricultural area within the Hunter River floodplain, and provides access to a single rural residential dwelling located at Lot 12 DP1189457.

Figure 5a shows the view from Oakfield Road looking towards the Proposal, with the approximate location of the power station highlighted by a green arrow. From this location the Proposal would be partially obstructed by proposed vegetation and diminished by distance.



Figure 5a The current view from Oakfield Road

5.1.2 Pacific Highway locations

The Pacific Highway is aligned in an approximate northeast/southwest direction and runs adjacent to the Proposal along the northwest boundary of Lots 2 and 3 DP1043561. The road in this area is constructed on a shallow cut and fill platform as the topography falls away toward the Hunter River. Motorists in any direction are generally looking up, albeit very slightly, towards the Proposal site.

Figure 5b illustrates the view from Pacific Highway looking east towards the Proposal site. Figure 5c illustrates the view from Pacific Highway looking south east. Figure 5d shows the view from Pacific Highway near the northern corner of the Proposal site as looking south. Figure 5e shows the view as motorists exit the Hunter Region Botanic Gardens. The approximate location of the power station is highlighted by a green arrow in each case. Photographic montages have been prepared for the viewpoints identified in figures 5b, 5c and 5d, which can be viewed in Appendix A.

The speed limit on the Pacific Highway is 80 kph in both directions and there are no posted pull outs or other safe stopping places. As discussed above, there is no view of the Proposal from inside the Botanic Gardens. Motorists will view the Proposal from the rear and side as they pass heading north, and from the side as they pass heading south. In each case, the view will be partially obstructed by the proposed vegetation that is to provide visual screening for motorists on Pacific Highway. These viewpoints are recognised to be the most effected by the Proposal.



Figure 5b The current view from Pacific Highway looking east



Figure 5c The current view from Pacific Highway heading south east



Figure 5d The current view from Pacific Highway looking south

Hunter Region Botanical Gardens looking south



Figure 5e The current view from Pacific Highway at the Hunter Region Botanic Gardens Source: Google maps

5.1.3 New England Highway location

The New England Highway is aligned in an approximate northwest/southeast direction and intersects the Pacific Highway at the Hunter River overbridge at Hexham. The road from the view location is raised to reduce the impact of localised flooding on through traffic. The view takes in grazing land in front of the river, with the broader Hunter River wetlands in the background towards the Pacific Highway.

Figure 5f illustrates the view looking south from the New England Highway towards the Proposal, with the approximate location of the power station highlighted by a green arrow.

The speed limit on the New England Highway is 80 kph in each direction. There is a u-turn bay that provides respite from traffic; however, it is signposted “no stopping” and there are no other safe places to stop. Motorists may view the power station given sufficient time and clear weather; however, the view is likely to be fleeting given the distance to the site and the velocity of the traffic.



Figure 5f The current view from New England Highway heading south

5.1.4 Old Punt Road locations

Old Punt Road runs in an approximate northeast/southwest direction past the Proposal site and provides access for the local workforce as well as access between the Pacific Highway and Tomago Road. The existing electrical transmission easement crosses over Old Punt Road in the vicinity of the Proposal and the power station will connect to the Tomago switchyard via a new transmission line that will also cross Old Punt Road.

Figure 5g illustrates the view heading north from Old Punt Road towards the Proposal and Figure 5h shows the view from the south looking west. The approximate location of the power station is highlighted by a green arrow in each case. Motorists and local workers will see the power station, ancillary facilities, the access road, and overhead power transmission wires and poles.

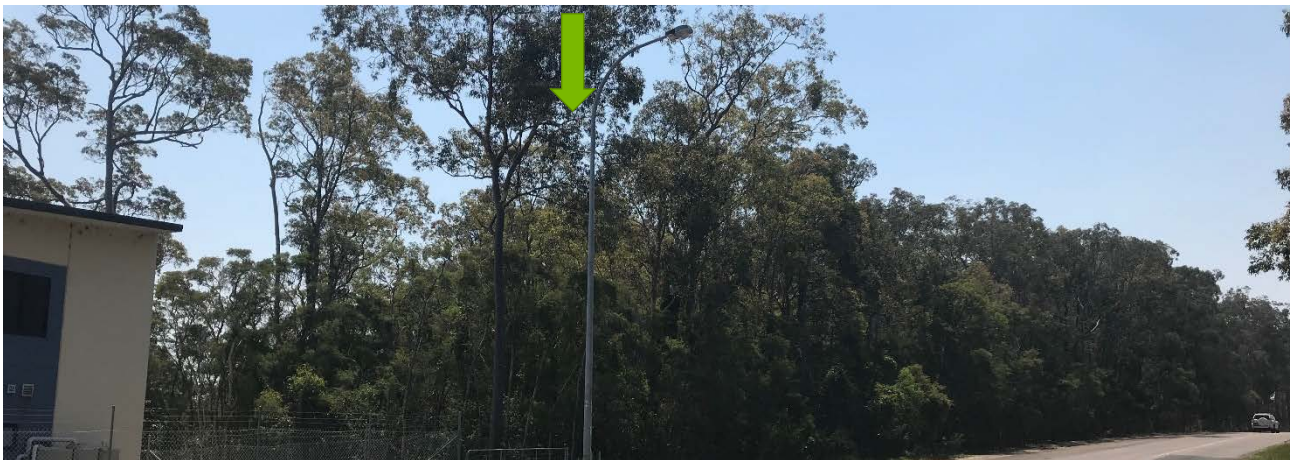


Figure 5g The current view from Old Punt Road heading north



Figure 5h The current view from Old Punt Road looking west

5.1.5 Kennington Drive

Kennington Drive runs perpendicular to Old Punt Road in an approximate east/west direction south of the Proposal site and is access via Old Punt Road. Kennington Drive is located within the Industrial area of Tomago and provides access to businesses. Existing vegetation is visible from the view towards the Proposal site.

Figure 5i illustrates the view from Kennington Drive looking north towards the Proposal. The approximate location of the power station is highlighted by a green arrow in each case. The Proposal would be mostly obstructed from this view.



Figure 5i The current view from Kennington Drive looking north

5.1.6 M1 to Raymond Terrace upgrade

The proposed extension of the Pacific Motorway M1 to Raymond Terrace (M12RT) is in its planning stages and while the route has not been finalised, it will include an interchange with Old Punt Road with vehicles exiting to the west of the Proposal. In this location, the M12RT is likely to be grade separated above the Pacific Highway so motorists will have an unimpeded view of the power station, the existing Tomago industrial estate, and TAC. This view cannot be definitively assessed as the M12RT has not yet been constructed nor design finalised; however, the potential impacts have been discussed below. For further details regarding the M1 to Raymond Terrace upgrade can be found on the Roads and Maritime website.

5.2 Assessment

As discussed above, visual sensitivity varies depending on the viewer, but generally speaking, residents and tourists are likely to be more sensitive to a change to the landscape than workers and motorists. Table 2 shows the relationship between land use and visual sensitivity. Visual sensitivity levels are shown from the perspective of viewers within each of the various land uses. In the following assessment, the Oakfield Road residence is considered residential and the Botanic Gardens tourism related. All other locations are either highways or local roads.

Visual impact assessment considers sensitivity and effect, but does not include assessment of visibility. Factors that influence visibility include aspects such as topography, vegetation, buildings, gardens, and street trees, as well as distance, timeframe, and viewing angle. Visibility of the Proposal is likely to be all highway locations, and from Oakfield Road and Old Punt Road.

Table 4 describes the visual impact at each location.

The Proposal would have a low visual effect at the Oakfield Road property (figure 5a) as the Proposal would occupy less than 1% of the primary view shed. Given the locality is of a rural nature, the site would have a low visual sensitivity to change. The overall visual impact would be low.

Visual sensitivity from Pacific Highway (figures 5b, 5c and 5d) is considered to be high from viewpoints directly adjacent to the Proposal site. As demonstrated in the photographic montages in Appendix A (view 1, view 2 and view 3), the Proposal requires clearing of existing vegetation which will make the Proposal visible to motorist using the Pacific Highway. As such, the overall visual impact is identified to be high to moderate. Proposed vegetation planting would assist in providing some screening from views adjacent to the Proposal site, however it is recognised that the Proposal would be visible from these viewpoints. Mitigation measures have been identified in Section 6.

The Proposal would have a low visual effect from the Hunter Region Botanical Gardens (figure 5e), occupying less than one percent of the view shed. Visual sensitivity would be high, given the Hunter Region Botanic Gardens is less than 2.5kms away and tourist use of the location; however, the Proposal would be somewhat obstructed from views by existing and proposed vegetation resulting in a moderate visual impact.

The Proposal would have a low visual effect at the Old Punt Road location looking north and west (figure g and h), as it would occupy less than 1% of the primary view shed. As the nearest visible elements would be less than 2.5 km away for local traffic, the visual sensitivity would be moderate. The Proposal would remain largely screened with existing vegetation resulting in a moderate to low overall visual impact.

The viewpoint from Kennington Drive (figure 5i) would have a low visual effect as the Proposal would occupy less than 1% of the primary view shed. The nearest visible elements would be less than 2.5km away from local traffic area and so the visual sensitivity is considered moderate. View 4 in Appendix A illustrates the view from Kennington Drive looking to the north. From this direction the power station would be obscured by existing vegetation and so the overall visual impact is considered to be moderate to low.

The Proposal is considered to have a high to moderate visual impact on motorists exiting the proposed M12RT, as it would occupy more than 2.5% of their view. It should be noted that as motorists exit the M12RT they will have an unobstructed view of the existing Tomago industrial estate and TAC as well as of the Proposal.

The overall visual impact of the Proposal would be moderate to low. The Proposal would be visible particularly from views from Pacific Highway as demonstrated in the photographic montages in Appendix A which demonstrate the highest effected viewpoints to the site (view 1, 2 and 3). A number of avoidance, mitigation and management measures have been identified in section 6 which are recommended to be implemented in order to minimise the visual impact associated with the Proposal.

Table 4 Visual impact

Location	Visual effect	Visual sensitivity	Visual impact
Oakfield Road	Low	Low	Low
Pacific Highway looking east (view 1, 2 and 3 are in Appendix A)	High	Moderate	High to Moderate
Hunter Region Botanical Gardens looking south	Low	High	Moderate
New England Highway heading south	Low	Low	Low
Old Punt Road heading north	Low	Moderate	Moderate to Low
Old Punt Road heading west	Low	Moderate	Moderate to Low
Kennington Drive looking north (View 4 in Appendix A)	Low	Moderate	Moderate to Low
M12RT interchange	High	Moderate	High to Moderate

6 Avoidance, Mitigation and Management

6.1 Avoidance through design

The Proposal was selected as providing the most suitable location for a dual fuel power station given its proximity alongside an existing industrial estate and close to existing gas and electrical infrastructure. The TAC smelter and NGSF are also located close to the Proposal. Furthermore, the surrounding existing vegetation would, for some views, limit the visibility of the Proposal and reduce the visual impact of the location. In addition:

- The power station design including all plant facilities such as diesel storage and operational and amenity buildings would be located insofar as is practical to reduce the requirement to clear vegetation and to reduce the angle from passing viewpoints
- A landscape design workshop would be considered to establish the means to minimise the visual impact and visibility of the Proposal. The workshop would assess the retention of trees, the planting of new and endemic vegetation, and viewpoint specific plantings to eliminate visual impacts from specific locations
- A site landscape plan would be prepared that emphasises integration of new plantings with existing vegetation and that includes opportunities to provide screen plantings
- The power station design would seek to include the selection of visually sympathetic cladding and security fencing materials to reduce contrast and improve integration of the balance of plant and of the site as a whole.

6.2 Control measures during construction

Visual impact mitigation and management may be considered for both on-site and off-site situations so as to mitigate or eliminate the visual impact of the Proposal at any highly impacted location. Lighting impacts will be kept to the minimum necessary for construction and operational safety and security needs. All lighting will be used in accordance with provisions and commitments made during the consultation process. AGL will implement a community engagement system that will allow for comments and complaints to be made in regard to construction stage concerns. All complaints will be actioned in accordance with the AGL system.

On site mitigation would include:

- Implementation of the site landscape plan
- Visual and ecological planting patterns of locally endemic species to emulate existing mixes of tree and grass cover in the surrounding landscape
- Installation of temporary screens to minimise exposure of construction areas from local viewpoints
- Where possible, lights will be used at the lowest effective level and would be directed downwards to the work area and away from incoming viewpoints
- Construction lighting would not be directed in a manner so as to shine toward oncoming traffic on the Pacific Highway
- Night works will be limited where possible to avoid areas that are exposed to direct views along Pacific Highway and workers will be trained in the management of night time lighting
- Monitoring will be carried out during construction as per a Construction Environmental Management Plan (CEMP) prepared specifically for the Proposal. The CEMP would include inspection requirements such as:
 - Inspection and maintenance of construction lighting direction to ensure it is directed to the worksite and away from neighbouring land uses
 - Inspection and maintenance of temporary construction fencing and screening

- Inspection and maintenance of delineated no-go areas installed to reduce construction impacts on vegetation to be retained
- Inspection and maintenance of vegetation plantings and rehabilitation
- Implementation of landscape design commitments.

Off site or at viewer location mitigation is not expected to be necessary; however, consultation would be ongoing with the Oakfield Road residence and would include:

- Discussion with the occupants at the Oakfield Road residence regarding appropriate plantings to screen or filter views to the Proposal.

6.3 Control measures during operation

Monitoring will be carried out during operation as per an Operation Environmental Management Plan (OEMP) prepared for the Proposal. The OEMP would include inspection requirements such as:

- Inspection and maintenance of security lighting direction to ensure it is directed to the worksite and away from neighbouring land uses
- Inspection and maintenance of vegetation plantings and rehabilitation.

7 Conclusions

The Proposal would involve the construction and operation of a dual fuel power station and associated gas supply and electricity transmission connections. The Proposal would be constructed in an area currently zoned for industrial uses and adjacent to industrial development, large scale buildings, and electrical infrastructure.

The power station would have a high degree of contrast to the surrounding lands as the elements of the development do not borrow form, shape, line, colour, texture, or scale from existing features of the visual setting.

The visual impacts associated with the Proposal are likely to be varied depending on the viewer and the viewpoint. The Proposal is likely to result in moderate to high impacts at Oakfield Road, along Pacific Highway and at the future M12RT motorway intersection upgrade and low to moderate impacts elsewhere. A number of avoidance and mitigation measures are recommended including on and off site measures. A number of monitoring measures are proposed to ensure the efficacy of the recommended controls. The implementation of these measures is likely to reduce the impact of the Proposal on visual amenity; however, it should be noted that the Proposal will be visible from view points to the north and northwest as discussed in this assessment.

8 References

- ALIA, 2018 *Guidance Note for Landscape and Visual Assessment*, Australian Institute of Landscape Architects, June 2018.
- DoP, 1988 *Rural Land Evaluation*, Department of Planning, August 1988.
- EDAW, 2000 *The Mount Arthur North Coal Project: Environmental Impact Statement, Section 12 – Visual Assessment*, prepared by EDAW (Australia) Pty Ltd for Coal Operations Limited.
- Integral, 2009 *Mt Arthur Coal Consolidation Project visual impact assessment study*, prepared by Integral Landscape Architecture & Visual Planning for BHP Billiton, August 2009.
- Terras, 2011 *Environmental Assessment Newcastle Gas Storage Facility Project, Appendix 11 - Visual impact assessment*, prepared by Terras Landscape Architects, for Coffey Environments, May 2011.

Appendix A Photographic montages

View 1: Pacific Highway looking east

View 2: Pacific Highway looking southeast

View 3: Pacific Highway looking south

View 4: Kennington Drive looking north

AGL Newcastle Power Station - View 1 (Existing)



AGL Newcastle Power Station - View 1 (Power Station)



AGL Newcastle Power Station - View 1 (Gas Turbine)



AGL Newcastle Power Station - View 2 (Existing)



AGL Newcastle Power Station - View 2 (Power Station)



AGL Newcastle Power Station - View 2 (Gas Turbine)



AGL Newcastle Power Station - View 3 (Existing)



AGL Newcastle Power Station - View 3 (Power Station)



AGL Newcastle Power Station - View 3 (Gas Turbine)



AGL Newcastle Power Station - View 4 (Existing)



AGL Newcastle Power Station - View 4 (Power Station)



AGL Newcastle Power Station - View 4 (Gas Turbine)



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