Delta Munmorah Proposed Gas Turbine

Planning Focus Meeting Briefing Paper

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Delta Electricity

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1.1 Introduction

This document presents background information on a proposed gas-fired power generation facility to be located at the existing Munmorah Power Station site on the Central Coast of NSW, approximately 10 kilometres north-east of Wyong within the Wyong Local Government Area.

The recently released NSW Government Energy Decisions Green Paper (December 2004) demonstrates that peak energy demand in NSW is growing much faster than average demand. With continuing urban development across NSW, there is likely to be a shortage of electricity supply capacity arising during peak demand periods in approximately 2006.

The use of peak-load or peaking plants that have the ability to supply electricity to the grid at relatively short notice during these peak periods has been identified in the Green Paper as one of the key short-term measures that would help to avoid or manage the pending peak demand situation until base-load generation is able to meet the demand

The nature of a peaking plant required to meet this peak demand depends on considerations of price, availability of fuel, efficiency and the estimated capacity. The peaking plant will also strengthen the regional supply grid during system disturbances and may also allow for faster grid re-energizing in the event of a complete system or regional system shutdown.

As a consequence of the above factors, the proposed gas-fired power generation facility would be configured as an open cycle gas turbine facility and operate as a peaking plant to supply electricity during periods of peak power demand.

1.2 Description of the Proposal

The proposal entails the construction of an open cycle gas turbine (OCGT) peaking plant and lateral gas pipeline connecting the OCGT peaking plant to the Horsley Park-Hexham natural gas transmission main.

A functional design that specifies how the OCGT peaking plant and gas pipeline would be constructed and operated is currently being finalised by Parsons Brinckerhoff and would be referenced during the preparation of the EIS.

The OCGT peaking plant would be located within the grounds of the existing Munmorah Power Station and would be operated as a peak-load plant, supplying electricity at short notice during periods of peak power demand.

Power from the OCGT peaking plant would enter the grid via the existing TransGrid substation that is located near the proposed site. The existing overhead transmission

powerlines would also be used, as they currently have sufficient capacity to take the proposed generating capacity.

The OCGT peaking plant would comprise four gas turbines with a combined total net power output range of approximately 500 MW to 600 MW. The gas turbines would be capable of running on natural gas (primary fuel) and distillate fuel (back-up fuel) in the case of a major interruption to the natural gas supply or if the peak demand period extends beyond the nominated period of gas supply. The OCGT peaking plant would also include other ancillary plant items, such as distillate fuel and demineralised water storages, a gas compressor and an evaporative inlet air cooling unit.

It is proposed at this stage that Delta Electricity operating and maintenance staff would provide the operational and maintenance services necessary to support the new facility.

An estimate of the baseline average number of hours the peaking plant is likely to operate has been based on a conservative analysis of electricity market pricing data from 2000 to 2005. The current concept design of the OCGT peaking plant has been based on 500 operating hours per year, of which up to 75 hours per year may be operated using distillate fuel. The peaking plant would also respond to system emergency and system security needs, as required.

The proposed operating profile of the OCGT peaking plant may change slightly as the functional design is finalised and would be assessed during the EIS phase.

Natural gas will be supplied via a new underground pipeline connecting the facility to the existing Horsley Park-Hexham pipeline located approximately 7 kilometres west of the facility and adjacent to the F3 Freeway. Two pipeline routes have been assessed as being viable, however, the preferred route has not yet been selected and will be determined through detailed assessments undertaken as part of the EIS.

1.3 Description of the Locality

The location of the proposal is within the existing Munmorah Power Station site off Scenic Drive, Munmorah and is presented in *Figure 1*.

The overall power station site is large, comprising nearly 940 hectares, and is made up of a number of different land parcels. Much of the site is undeveloped and comprises 'buffer' lands separating the surrounding residential areas from the power station. As well as the power station itself, there are two collieries on the site: the Munmorah State Coal Mine to the west of the power station (still operating); and Endeavour Colliery to the south-east (decommissioned).

TransGrid own the existing electricity substation and the site is located approximately 2 km west of Lake Munmorah and 2 km north of Budgewoi Lake. The residential suburbs of Halekulani, Budgewoi, Bluff Point, San Remo, Blue Haven Doyalson and Lake Munmorah surround the site.

2. Statutory Planning and Approvals

2.1 Statutory Planning

Development approval is required for the gas turbine development under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). In accordance with Clause 18 of Schedule 3 of the *Environmental Planning and Assessment Regulations 2000*, electricity generating stations that "supply or are capable of supplying more than 30 megawatts of electrical power from other energy sources (including coal, gas, wind, bio-material or solar powered generators, hydroelectric stations on existing dams or co-generation)" are deemed to be designated development. The development will generate more than 30 megawatts of power from gas and would not operate exclusively for stand-by power for less than 4 hours per week on average. Therefore the development meets the definition of designated development and an Environmental Impact Statement will be prepared and lodged with a development application.

Delta has requested the Minister for Infrastructure and Planning to invoke his powers under section 76A(7)(b) of the EP&A Act to declare the proposal to be of State or Regional environmental planning significance, constituting State Significant development. As such, the Minister for Infrastructure and Planning becomes the consent authority for the development. In accordance with Section 90(2) of the EP&A Act, the proposal would not be considered 'integrated development', as Delta is a representative of the Crown.

Although the gas supply pipeline would meet the definition of a 'public utility' under the *Environment Planning and Assessment Model Provisions 1980*, making the pipeline exempt from the need for development consent, section 76A (8) of the EP&A Act requires that, if the proposal is deemed 'S*tate Significant development*', the pipeline be considered along with the power station upgrade under Part 4 of the EP&A Act. Hence, the pipeline will require development consent and will be included in the Environmental Impact Statement.

2.2 Other Approvals

It is likely that the following additional approvals may be required for the proposal:

- *Protection of the Environment Operations Act 1997*;
- *Dangerous Goods Act 1974*;
- *Mine Subsidence Act 1961*;
- *National Parks and Wildlife Act 1974*;
- *Threatened Species Conservation Act 1995;*
- *Roads Act 1993;* and

3. Key Environmental Issues

Based on a preliminary environmental assessment carried out by Parsons Brinckerhoff in May 2004 and the current development of the functional design for the proposal, the following key issues are considered to be most relevant to the proposal and will be investigated in further detail in the Environmental Impact Statement:

Air Quality and Greenhouse Gases

Gas turbine technologies produce significantly less greenhouse gases and pollutant sources such as O_3, SO_x, NO_x and total suspended particulates per unit of power output than conventional coal-fired technologies due to increased efficiencies (approximately 50% of the emission rate per unit of power generated by existing coal-fired power stations).

The proposed OCGT peaking plant will use state of the art technology, including low NOx burners and an evaporative inlet air cooling unit, to minimise pollutant emissions and improve energy efficiency. Demineralised water would be injected into the gas turbines when the turbines are using distillate fuel to reduce NOx emissions to within acceptable levels.

The proposal has the potential to reduce the NSW pool coefficient and would be eligible under the NSW Greenhouse Benchmark Scheme to create NGACs for trade, as a Category D power generator.

Emissions from the proposal will be modelled to assess the local and regional air shed impacts. Particular emphasis will be made on the potential cumulative impacts of NO_X, VOCs and O_3 on the local air shed.

Water Quality

The proposal would require the use of demineralised water for the following processes:

- gas turbine water injection during distillate fuel firing;
- compressor washing (once per year); and
- evaporative cooling for the gas turbine inlet air cooler.

The source of the potable water supply has not yet been determined. A range of water supply options will be assessed and determined during the functional design and EIS development phases.

The potable water would be treated by the existing on-site demineralised water treatment plant. The estimated demineralised water consumption of the proposal is 24 megalitres per year (maximum), based on the estimated hours of operation per year of the proposal.

The proposal would generate approximately 12 kL of wastewater per year, associated with compressor washing activities. It is proposed that this wastewater would either

be stored on site and collected by a licensed liquid waste contractor for off-site disposal or discharged to the existing onsite oil and grit trap system at the station. This aspect would be finalised and confirmed during the EIS development phase. There are no other liquid waste discharges associated with this type of facility.

Impacts of the gas pipeline on existing drainage lines are expected to be minimal. The pipeline will be buried approximately 0.5m below the ground surface. Soil disturbance will be temporary and may be minimised with the use of directional drilling. Following installation, the ground surface will be reformed to the existing grade and rehabilitated. A detailed erosion and sediment control plan will be designed to prevent any construction impacts on the nearby creeks and wetland areas.

Hazards and Risks

The hazards and risks associated with the underground pipeline and OCGT facility will be assessed in the EIS in accordance with SEPP 33. The key issues to be assessed with the Preliminary Hazard Analysis (PHA) phase of the EIS include:

- any section of pipeline located above ground;
- pressure regulating station and / or gas reception area;
- OCGT peaking plant and associated supply infrastructure; and
- distillate fuel storage depot and associated supply infrastructure.

The proposed site of the OCGT peaking plant is approximately 700 metres to the nearest residential premises. The outcomes from a risk assessment of credible incident scenarios are likely to be within acceptable land-use risk criteria set by DIPNR to assess such developments under SEPP33. The proposal will include all the necessary safety and safeguard measures and will be sufficiently buffered from the nearest receptors to minimise the risk of harm or fatality to these receptors from an incident at the site.

The risks associated with underground pipelines are generally considered low, under normal operating conditions. The fact that it may be located within an existing transmission easement would also further minimise this risk (due to access restrictions).

The siting of the pressure regulating station and /or gas reception area is important in terms of ensuring potential off-site impacts are within acceptable limits and would be determined during the PHA process. The potential risks associated with the proximity of the proposed underground gas pipeline to the overland transmission lines, including stray currents, have been considered in the design of the pipeline and would be considered in the risk assessment process detailed in the PHA.

Noise

Noise associated with the construction of the pipeline may be an issue in the short-term, although activities would generally occur during the day and generally far from residences, depending on the preferred route. The noise associated with the construction of the proposal is unlikely to be an issue due to the relatively small amount

of earthworks that would be necessary and the pre-assembled nature of the majority of the components that would comprise the facility.

The noise that would be produced by the gas turbine facility during operation is expected to be in the order of 85 dB(A) at 1 metre. The proposed facility is located approximately 700 metres from the nearest residential receptor and some shielding may be afforded by existing structures. Hence, it is considered unlikely that significant noise impacts would be experienced beyond the Delta property boundary.

A detailed assessment of the potential construction and operational noise impacts of the proposal, which would include noise modelling of potential cumulative impacts and climatic variations, will be undertaken in the preparation of the EIS. Noise design criteria will be established in accordance with the *Environmental Control Manual* and *Industrial Noise Policy* and in consultation with the Department of Environment and Conservation.

Visual Amenity Impacts

The site currently consists of two exhaust stacks approximately 150m high, with buildings to the west of approximately 40m high. The proposal will include the construction of four additional stacks, one for each gas turbine unit, of approximately 35m in hight.

A preliminary visual assessment reported no potential viewpoints within the most sensitive foreground viewing zone (less than 1km). However, some intermittent views of the top of the new stacks would probably be possible from a small number of residences near the old Pacific Highway at Doyalson and travellers on Norah Point Road, with a viewing distance of about 1km. Other permanent residents with potential views are at least 2.5 - 3km away (areas such as Budgewoi and Lake Munmorah).

There would be little change to the limited outside views available. From these locations the top of the new exhaust stacks would be seen against the backdrop of the existing buildings. As such, overall visual impact would be low. Further assessment including photomontages will be undertaken during the EIS.

Flora and Fauna Impacts

The preferred gas turbine location will not impact on the local natural flora and fauna, as it would be located on an already disturbed and cleared site within Munmorah Power Station.

The pipeline construction will require the temporary clearing of vegetation along the pipeline route. Preliminary environmental surveys of the pipeline route along the existing Transgrid easement (shown as Route 1A in Figure 1) and road easement along Wyee Road (shown as Route 2A in Figure 1) conducted by PB during the first week of March have identified the potential presence of at least two threatened flora species along both routes. Further surveys would be required during early spring to determine the extent of the area covered by these species in order to accurately assess the significance of impact (8-part tests).

The operation of the proposal, including the pipeline, would have a negligible impact on the local flora and fauna environments. Measures to rehabilitate the disturbed pipeline

corridor with local native species, as soon as practical after completion of construction activities would be implemented to ensure the long-term effects associated with the construction of the pipeline are negligible.

A detailed flora and fauna impact assessment of the proposal will be included as part of the EIS process.

Waste Management

During construction, wastes such as concrete, timber, steel and packaging would be created. Most solid waste generated would be inert waste from air and oil filters, scrap metal, wood and cloth. Some hazardous liquid wastes would also be generated, including waste oil and solvents. These will be contained on-site prior to disposal off-site in accordance with the relevant NSW waste regulations.

During normal operation, the site is likely to generate small amounts of solid waste and liquid waste, generally associated with ongoing maintenance activities and wastewater generated from the compressor washing facilities.

A detailed discussion on the likely waste management issues associated with the construction and operation of the proposal will be included as part of the EIS process.

Traffic

Delta proposes to continue to use the existing access to the site from Scenic Drive (Norah Road) for construction and operational traffic. Potential impacts on local traffic and selected transport routes for delivery and disposal of material during construction will be assessed. The traffic impacts of the proposal are expected to be minor and limited to the construction period.

During operation, liquid fuels and other materials would be delivered to the site by truck. Operational traffic is not likely to be a significant issue considering the small number of employees required and the limited extent of supplies which need to be delivered by road.

Heritage

Preliminary archaeological survey indicates the archaeological potential is relatively low; however, this will be confirmed by a more detailed survey.

Detailed heritage investigations including consultation with the Local Aboriginal Land Councils will be undertaken as part of the EIS.

Socio-Economic Impacts

The proposed upgrade would have significant socio-economic benefits in regard to the provision of construction jobs, reduced environmental emissions associated with improved efficiencies and downstream State-wide economic benefits associated with the improved electricity supply.

Reductions in electricity transmission losses, minimisation of the potential for disruptions to the electricity supply and the provision of gas infrastructure to the Doyalson Industrial area would also result in the long-term economic benefits to the area.

Community Consultation

The community consultation program is aimed at informing the community on the need and potential impacts associated with the proposal and gathering feedback on the key concerns to develop the best mitigation measures.

The program acknowledges that there has been new residential development in the area, representing a different socio-economic profile than the existing residents who may be more accepting of the proposal. Many recent residents would know little of the site's existing operations and may be concerned at its expansion or extension.

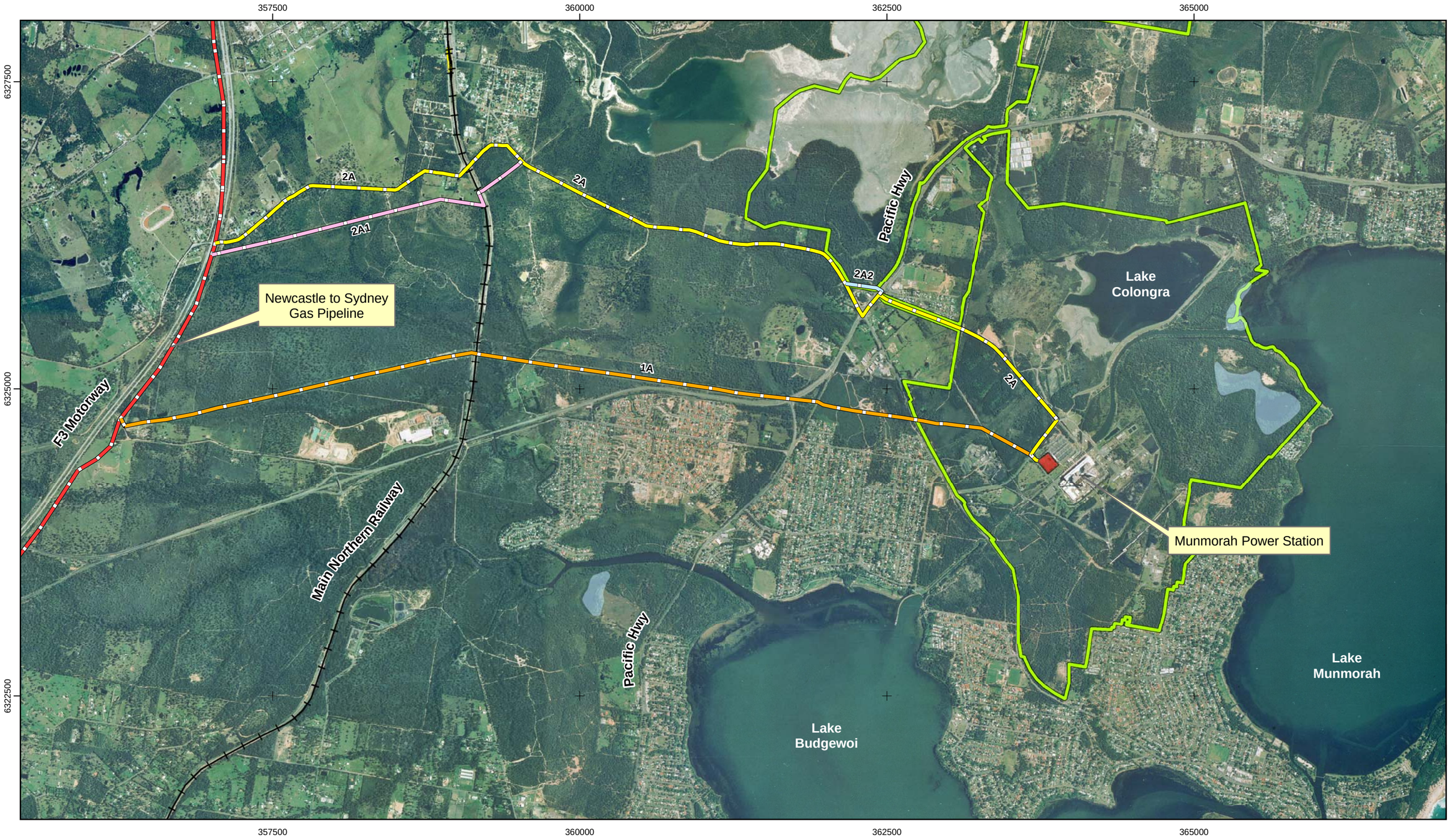
Key community concerns are likely to be related to visual impact, noise, emissions and the possibility of extending the life of the existing facility. A comprehensive Communications and Public Consultation Plan (Parsons Brinckerhoff 2004) has been developed detailing the approaches, responsibilities and timing of activities. Activities proposed include community newsletters, staffed displays, information line, website and presentations.

The outcomes and community feedback received as a result of these activities would be detailed and discussed in the EIS.

Cumulative Impacts

Vales Point Power Station is located within five kilometres of the existing Munmorah power station, and other power stations, coal mining operations and industry are located nearby. There is, therefore, the potential for existing cumulative impacts in regard to air emissions, noise and visual amenity.

The air, noise, and visual assessments that will be conducted as part of the EIS will consider the existing background conditions and future impacts in the context of the local region.



Rail Line

Newcastle to Sydney Gas Trunk Pipeline

SEPP14 - Wetland Area

Land Owned by Delta Electricity

Helipad Site

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Proposed Natural Gas Pipeline Routes

1A

2A

2A1

2A2

N

0 500 1,000 1,500 2,000 2,500 3,000 Meters

Title: Proposed Natural Gas Pipeline Routes

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