10. Environmental impact assessment — additional impacts

This chapter assesses additional potential impacts identified through the environmental risk analysis for the project (see Chapter 8).

10.1 Traffic and transport

Section 3.13 provides an overview of the existing traffic and transport conditions within the project area. This section summarises the project's potential construction and operational impacts of the project on the surrounding transport infrastructure, investigated through a desk-based assessment.

10.1.1 Power station

Construction

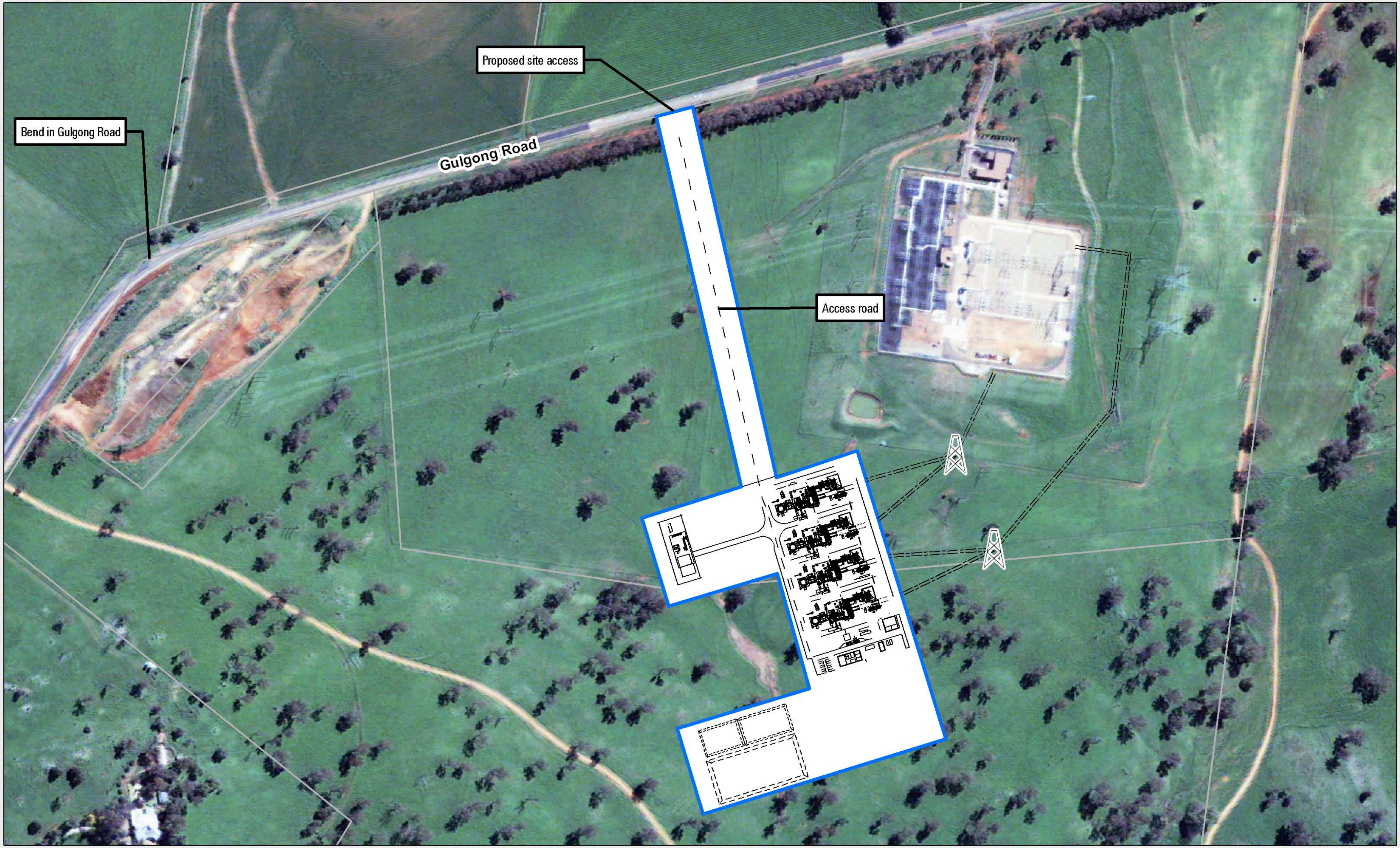
Site access

Access to the proposed power station site would primarily be gained via the Mitchell Highway and Gulgong Road, both of which are NSW Roads and Traffic Authority (RTA)-approved B-Double routes. In the vicinity of the proposed power station site, the speed limit is 100 kilometres per hour, at which speed the minimum safe intersection sight distance required is 225 metres in rural areas (RTA 2000).

During construction and operation, access to the proposed power station site would be gained via a new access road off Gulgong Road. The road would be located approximately 570 metres east of an existing bend in Gulgong Road (see Figure 10-1). This distance between the bend in Gulgong Road and the proposed access road would be ample to provide a safe intersection sight distance. The new access road would be wide enough to provide for two-way construction vehicle traffic and would be designed in accordance with the RTA's *Road Design Guide* (RTA 2000).

Construction staff vehicles are expected to be on the road mainly between 6.30–7.30 am and 4.00–5.00 pm. As such, they would be travelling outside of typical traffic and school peaks, thus minimising impacts during peak periods. Heavy vehicles would not use local routes to access the site where possible and would be directed to avoid travel in peak periods.

During construction, the worst-case maximum daily two-way traffic movements would be approximately 150 cars and 24 trucks. This expected arrangement was tested in accordance with guidelines in the *Road Design Guide* (Section 4, p30, RTA 2000) to determine the intersection type required to facilitate safe turn movements from Gulgong Road into the proposed site access road. During the peak hour it was assumed that a worst-case of approximately 80% of employees would arrive within 1 hour; it was assumed that around 80% of these arrivals would be from the west. Therefore, the peak hour would need to cater for approximately 50 right-turn movements and 10 left-turn movements from Gulgong Road into the site in the AM period, and 50 left-turn movements and 10 right-turn movements out of the site in the PM period. The current traffic flows along Gulgong Road are estimated to be 1,573 vehicles per day (see Table 3-14). Adjusting the rate to a worst-case peak hourly rate (15% of daily flow) gives a peak-hour flow of 235 vehicles per hour (approximately 118 vehicles in each direction).



Access road
Operational boundary
Power lines
Transmission line towers

Figure 10-1 Proposed access to the power station site

0 37.5 75 150
Metres
1:6,000

2116720A_2155_Fig10_1_Proposed_access.mxd, GK, 14 April, 2008

Having considered the additional traffic flows that would access the proposed power station site during construction, it was determined that a type 'AUR right-turn treatment' and type 'BAL left-turn treatment' would be required (see Figure 10-2). The AUR treatment would be required for right turns into the site access road, while the BAL left-turn treatment would be required for left turns in and out of the site access road. This intersection arrangement would likely require some widening of Gulgong Road to provide a right-turn lane and flared site entry for left turns.

During the detailed design, on-site assessment would be undertaken to finalise the access arrangement to the proposed power station site.

Intersection of Gulgong Road and Mitchell Highway

During construction of the proposed power station, approximately 50 additional vehicles would travel through the intersection of Gulgong Road and the Mitchell Highway (see Figure 3-18) during the AM and PM peak periods. An assessment was conducted for this intersection as part of a traffic impact assessment of the (then) proposed Wellington Correctional Centre (Traffix 2003). The Traffix assessment took 2003 vehicle turning volumes and added estimated increases in traffic due to the proposed Correctional Centre, with 2015 used as the assessment year.

Using SIDRA (an intersection simulation program that assesses the performance of intersections based on intersection layout and traffic flows), the following construction traffic volumes (associated with construction of the proposed power station) were added to the 2015 traffic volumes estimated in the Traffix assessment (including the Correctional Centre traffic) to assess the Mitchell Highway/Gulgong Road intersection performance:

- AM peak: 30 vehicles turning right from Mitchell Highway and 20 vehicles turning left from the Mitchell Highway (onto Gulgong Road)
- PM peak: 20 vehicles turning right onto Mitchell Highway and 30 vehicles turning left onto the Mitchell Highway (from Gulgong Road).

Despite use of the predicted 2015 volumes, the SIDRA assessment found that the Mitchell Highway/Gulgong Road intersection would operate at a level of service (LoS) of A at all times during construction of the proposed power station (see Section 3.13 for an explanation of LoS). Average vehicle delay predictions did not exceed 11 seconds for any movement. This is considered to be a low level of delay, which would result in minimal impact to traffic conditions.

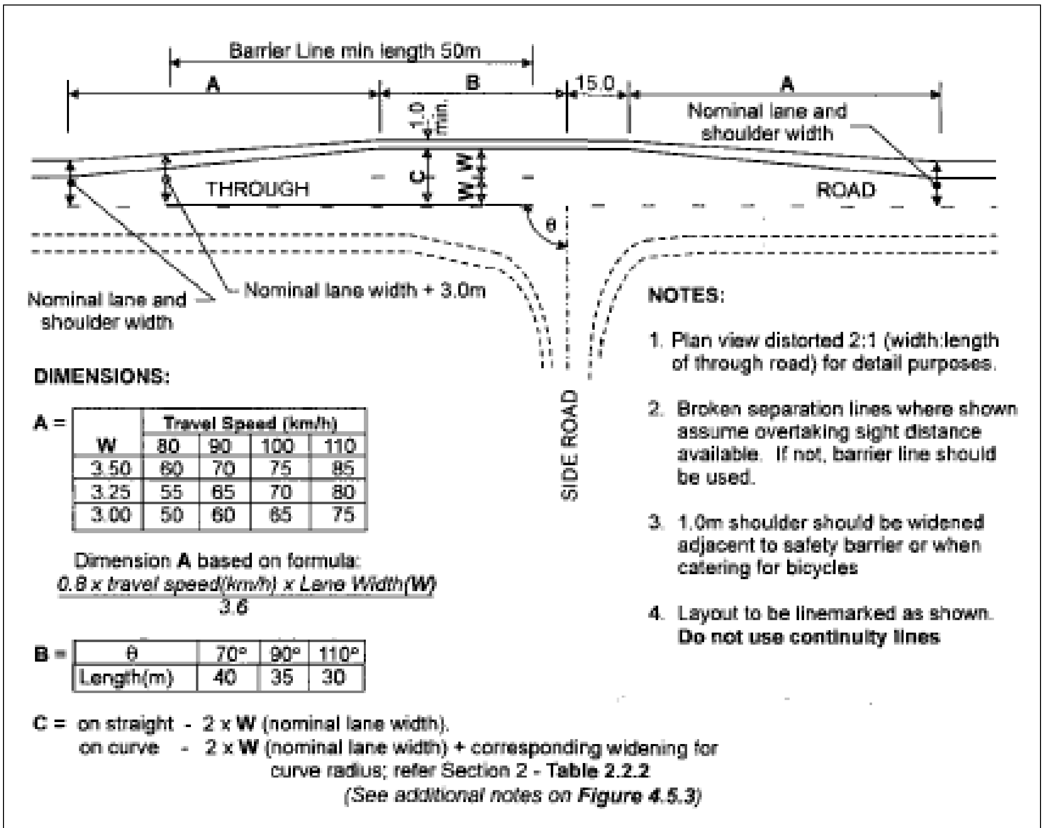


Figure 4.8.24 - Type "AUR" Right Turn Treatment

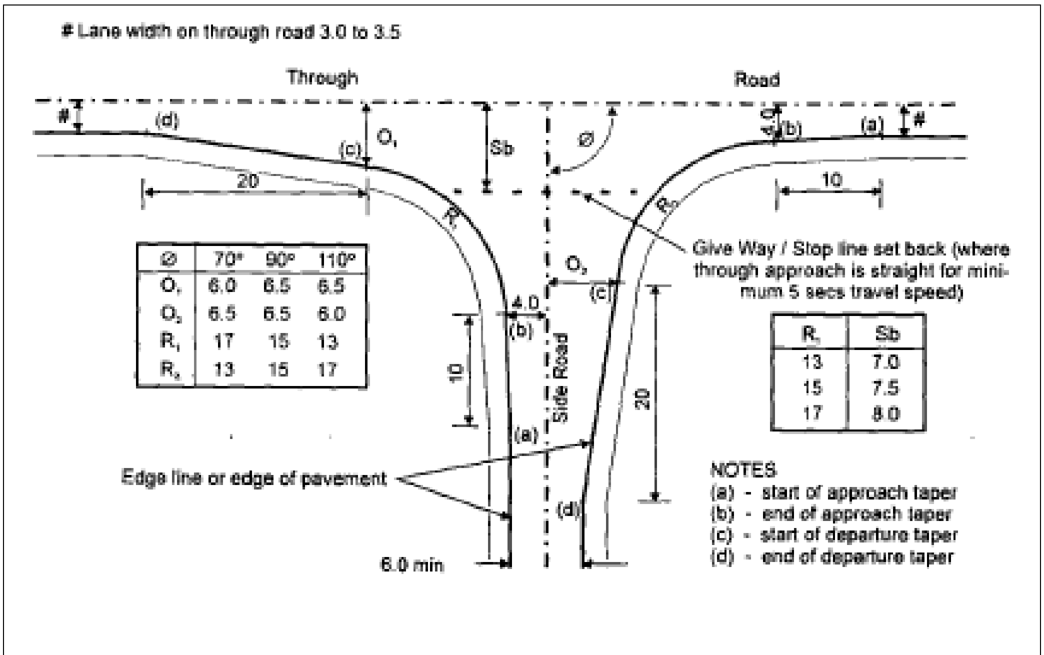


*Figure 4.8.35 - Details of Type "BAL" Layout for Rural Sites.
where Side Road AADT ≥ 50 and / or
specifically for articulated vehicles.*

Source: RTA *Road Design Guide* (2000)

Figure 10-2 Intersection treatments to be implemented at the intersection of Gulgong Road and the proposed power station access road

Transport of plant and equipment

The gas-fired turbine facility would comprise a number of very large and heavy plant items. The transport of these items would require significant planning and coordination to ensure that the route used is safe, and able to withstand the loads and height clearances required by the type of equipment being transported.

The equipment would most likely arrive at the Port of Newcastle, where it would be loaded onto purpose-built trailers designed to carry large and heavy loads. From there it would be transported to the site via an appropriate route.

A specialist heavy equipment transport contractor with specific experience in lifting and transporting this type of equipment would be engaged during the detailed design phase. The contractor would determine and confirm the proposed route, and obtain the necessary approvals from the relevant authorities to carry out the task.

Once all relevant approvals are obtained and route preparations are completed, the task of actually transporting each item of heavy plant to the site would take a few days.

Site accessibility

Public transport, cyclists and pedestrians would not affected during construction of the proposed power station. To minimise impacts on cyclists and pedestrians, all shoulders on existing roads would be maintained to existing standards.

Operation

Traffic volumes during the operational phase would be expected to be low, with a maximum of six to eight vehicles per day accessing the power station site. This would have a negligible impact on the existing road operations in the area.

Vehicles delivering small amounts of hazardous materials (e.g. 1–1.5 tonnes of sulfuric acid and/or caustic soda) to the site would be expected approximately every 6 months during operation of the proposed power station.

The Gulgong Road/site access intersection arrangement to be implemented for construction of the proposed power station would be retained for the operational period.

10.1.2 Gas pipeline

Construction

Access to the proposed gas pipeline route during construction would generally be via farm gates, local roads and main roads such as:

- Newell Highway
- Peak Hill Road
- Renshaw McGirr Way
- Obley Road
- Bushrangers Creek Road.

Section 7.5.3 provides details on the anticipated construction workforce for the proposed gas pipeline. This indicates that up to 40 vehicles (60 staff in mini-buses or 4WDs) could travel to sites within a 5–7 kilometre section of the pipeline in a day. Due to the likely progressive nature of construction along the proposed pipeline route, the traffic impact would be minimal. However, access to private properties would be required, which would need to be negotiated with individual property owners.

Generally, heavy vehicle movements for deliveries and spoil removal would occur at different locations throughout the day. However, the intensity of these movements would be low with the highest level of intensity for the 'pipe haul and string' task (see Section 7.5.3), involving only 10 trucks per day over the whole day. The traffic impact of this would be negligible.

During construction of the proposed gas pipeline, excavated spoil would be laid to the side of the trench for reuse in backfilling. This would result in minimal spoil removal from the site and, therefore, minimal traffic impact from heavy vehicles.

Operation

During operation of the project, weekly inspections would be conducted along the gas pipeline easement by patrol officers. These officers would monitor the status of the underground pipeline to ensure that no activities are taking place within the easement that could jeopardise the safety of the pipeline. Vehicular access along the easement would generally be via existing farm gates, as negotiated with land owners. Impacts to existing traffic arrangements would be negligible.

10.1.3 Compressor station

Construction

Site access

The proposed compressor station site is located on Alectown West Road, a relatively narrow, unsealed road.

No detailed assessment of existing traffic conditions was undertaken for the proposed compressor station site. The presence of a silo on the opposite side of Alectown West Road suggests that some heavy vehicular traffic would utilise the area. However, traffic volumes in the vicinity of the site are anticipated to be low, and given the relatively small construction workforce required (an estimated 20 light vehicles throughout construction and 12 heavy machinery vehicles during the first month), construction of the proposed compressor station would not affect existing traffic arrangements.

Transport of plant and equipment

The proposed compressor station would comprise a few large and heavy plant items, mainly the gas compressors. Transport of these items would require planning and coordination to ensure the route used to transport the equipment is safe, and able to withstand the loads and height clearances imposed by transport of such equipment.

The equipment would most likely arrive at the Port of Newcastle, where it would be loaded onto purpose-built trailers designed to carry large and heavy loads. From there it would be transported to the site via an appropriate route.

A specialist heavy equipment transport contractor with specific experience in lifting and transporting this type of equipment would be engaged to undertake this task. The contractor would design and confirm the proposed route and obtain the necessary approvals from the relevant authorities to carry out the task.

Once all relevant approvals are obtained and route preparations are completed, the task of actually transporting each item of heavy plant to the site would take a few days.

Operation

During operation, the proposed compressor station would be remotely operated by personnel at the power station. As such, other than for infrequent inspections and maintenance, traffic access to the compressor station would not be necessary. Consequently, impacts to existing traffic arrangements would be negligible.

10.1.4 Mitigation measures

General

Construction

- Where works would affect roads or at access points to work sites, traffic control plans (TCPs) would be developed through the construction environmental management plan (CEMP) in accordance with the *Traffic Control at Work Sites Guidelines* (RTA 2003). Also:
  - For main site entry points, the power station and compressor station TCP195 in the above-mentioned document would be used to warn of turning trucks.
  - Access to points along the pipeline corridor would not require signage due to the low and infrequent truck volumes accessing the sites.
- Construction traffic impacts would be minimised by adhering to the construction hours indicated in Section 7.5.1. Deliveries of oversized wide or heavy loads to construction sites would be encouraged to travel outside of peak times to minimise impact on existing traffic.
- Appropriate road management measures on internal and external roads would be maintained, with all employees and contractors required to abide by road and safety procedures and the Australian road rules.
- All road shoulders would be maintained at their existing standard to cater for any cyclist and pedestrian movements.

Power station

Construction

- A new road would be developed to provide access to the proposed power station site from Gulgong Road. It would be located approximately 570 metres east of the bend in Gulgong Road, and would be designed in accordance with the RTA *Road Design Guide* (RTA 2000).

- An AUL right-turn treatment (for turns into the power station site) and a BAL-turn treatment (for turns in and out of the power station site) would be developed at the intersection of the new site access road and Gulgong Road. This arrangement would be designed in accordance with the RTA *Road Design Guide* (RTA 2000) and finalised through on-site assessments during the detailed design phase.
- Through the CEMP, a traffic management plan would be prepared and implemented to outline the route assessment, upgrade requirements and methodology for the transportation of heavy plant and equipment from the Port of Newcastle to the proposed power station site. This would ensure use of a safe route that would be able to withstand the loads and height clearances required for transport of this type of equipment.

Operation

- The intersection arrangement developed during construction would remain in place during operation of the power station to allow (irregular) heavy vehicle deliveries and maintain safe intersection performance.
- Deliveries of hazardous substances (e.g. small amounts of sulfuric acid and caustic soda) to the power station site would be transported in intermediate bulk containers by an accredited carrier in accredited packaging. These hazardous substances would be handled in accordance with the *Australian Code for the Transportation of Dangerous Goods by Road and Rail*. The two substances (sulfuric acid and caustic soda) would be carried in separate vehicles at different times, as they are not compatible with each other. Specific handling procedures would be identified in a risk management and emergency response plan to be developed for the site.

Compressor station

Construction

- Through the CEMP, a traffic management plan would be prepared and implemented to outline the route assessment, upgrade requirements and methodology for the transportation of heavy plant and equipment from the Port of Newcastle to the proposed compressor station site. This would ensure use of a safe route that would be able to withstand the loads and height clearances required for transport of this type of equipment.

10.2 Historic heritage

Australian Museum Business Services (AMBS) undertook an assessment of potential impacts to historic cultural heritage that may arise from the project.

Section 3.9 provides a description of the existing environment as it relates to historic heritage in the area. This section summarises potential impacts of the project on this heritage and other areas/items of significance identified during the assessment, and outlines management measures to address these impacts.

Detailed assessment of this issue is included in Technical Paper No. 2 – *Heritage Assessment*. The outcomes of the assessment are summarised in this section.

10.2.1 Methodology

The historic heritage assessment was consistent with the principles and guidelines of the Burra Charter and was undertaken in accordance with current heritage best practice guidelines.

The key heritage requirements addressed in this assessment were:

- location and assessment of the significance of historic heritage sites and places within the study area and surroundings
- investigation of the historic heritage significance of the study area
- identification of any potential constraints or opportunities arising from considerations of the study area's heritage
- determination of the cultural significance of the study area based on the results of the archaeological survey
- provision of advice regarding potential constraints and opportunities for future development resulting from considerations of historic heritage.

A 200-metre wide buffer around the proposed pipeline route was surveyed and assessed as part of this assessment, to account for any minor deviations of the pipeline route that may occur as a result of geotechnical or other assessments during the detailed design phase.

As well as a targeted field survey of the proposed gas pipeline route, the proposed power station and compressor station sites were surveyed to investigate the likelihood for potential archaeological deposits.

10.2.2 Assessment of significance

The NSW Heritage Office (now Heritage Office, NSW Department of Planning) developed seven criteria by which to assess and identify the heritage significance of items, places and archaeological sites in NSW. An item is considered to be of state or local significance, in the opinion of the Heritage Council, if it meets one or more of the following criteria:

a) An item is important in the course, or pattern of NSW's cultural or natural history.

b) An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural of natural history of the local area).

c) An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area.

d) An item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.

e) An item has potential to yield information that will contribute to an understanding of NSW's (or the local area's) cultural or natural history.

f) An item posses uncommon, rare or endangered aspects of NSW's (or the local area's) cultural or natural history.

g) An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or environments (or in the local area).

In addition to the assessment criteria above, the Commonwealth and NSW Government authorities have developed a series of historic themes to provide a framework for understanding the primary influences in the historical development and significance of a place. The major historic themes that apply to the general Wellington-Alectown area are listed in Table 10-1.

Table 10-1 Major historic themes

Theme	Description	Details	Criteria it complies with
Peopling Australia	Aboriginal cultures and interaction with other cultures	Wiradjuri culture is living culture that has adapted to the incursion and occupation of the region by people from other cultures.	a), b), d), g)
	Convict	Reflected locally at the convict and mission precincts.	
	Ethnic influences	Reflected in the local accomplishment of J.B. Montefiore.	
Developing local, regional and national economies	Agriculture	The Wellington convict and mission precinct represent agricultural beginnings.	a), c), g)
	Pastoralism	Large pastoral properties (i.e. Nanima and Goonoo Goonoo) remain as reflections of the early stages of pastoralism in the district.	
	Mining	Gold-rush was the beginning of an important commercial industry (i.e. Parkes and Peak Hill).	
Building settlements, towns and cities	Land tenure	Historically reflected in the: ▪ arrival of squatters, settlers and pastoralists ▪ Crown retention of land as gold-field reserves ▪ release of reserves leading to settlement.	a), b), e)
	Towns, suburbs and villages	Reflected locally at Montefiores, where a private village was founded in response to public needs that Government administration failed to meet at the time. Montefiores subsequently declined as Wellington emerged as a Government-approved township. Reflected regionally in the rapid development of Parkes and Peak Hill, which were mining towns.	

No significant historical structures, places or archaeological sites of known or potential significance were identified within the proposed project area during the field survey.

10.2.3 Impact assessment

As no significant historical structures, places or historical archaeological sites were identified through the review of records or site visits, impacts on historic heritage are expected to be negligible.

10.2.4 Mitigation measures

There are no constraints to the current proposed development arising from considerations of historic heritage. Therefore, no specific mitigation measures are required.

Vehicle access during construction of the power station, gas pipeline and compressor station would be guided by a CEMP. The CEMP would outline any constraints and issues regarding access and construction activities arising from considerations of historic heritage.

10.3 Land use and property

Section 3.11 provides a description of the existing environment as it relates to land use and property in the area. This section summarises potential impacts of the project on this land use and property, and outlines management measures to address these impacts.

10.3.1 Power station

Construction

The proposed power station site comprises land owned by TransGrid, immediately adjacent to the existing Wellington substation, and private land that would be purchased by ERM Power. The private land is currently used for grazing purposes. Some parcels of the TransGrid and private land are under agistment (i.e. they are leased by the owner to another party to be utilised for grazing).

Development of the proposed power station would result in a reduced grazing area or reduced agricultural productivity. However, given only 45 hectares would be purchased by ERM Power for the project, this would be minor compared to the overall land available in the region for agricultural practices.

The proposed power station is compatible with the ongoing use of TransGrid's substation land. There is no conflict between the construction of the power station and ongoing agricultural use on adjacent land.

Potential impacts on residential amenity, including air quality, noise and visual impacts on surrounding properties could occur as a result of construction. However, mitigation measures would ensure these construction impacts are adequately managed (see Sections 9.2.6, 9.3.7 and 9.4.4 respectively).

Operation

Impacts on land use and property during operation of the proposed power station would be similar to those for construction. Operation of the power station would result in the permanent loss of approximately 45 hectares of agricultural land. As previously discussed, the operational boundary of the power station would comprise approximately 6 hectares, with the remaining land used as a buffer zone (i.e. for safety reasons and to implement mitigation measures).

There would be no conflict between the power station operations and ongoing agricultural uses of surrounding land. There could, however, be potential impacts associated with air quality, noise and visual amenity, which are discussed in Sections 9.2, 9.3 and 9.4 respectively.

10.3.2 Gas pipeline

Construction

As explained in Section 7.5.3, the construction zone for the proposed gas pipeline would typically be 25–30 metres wide in open space areas and approximately 10 metres wide in areas where there may be sensitive ecological communities or existing structures, such as transmission towers. Some impacts to current agricultural practices would be experienced by approximately 55 private land owners, but this impact would be minimised by reducing the width of the construction zone where possible.

Pipeline construction would proceed progressively along the route, with approximately 70% of construction personnel concentrated in a 5–7 kilometre section of the pipeline at any time. As such, impacts on existing land use practices would be short-term, such that minimal impact on agricultural productivity would be experienced.

Construction of the pipeline across the Newell and Mitchell Highways (see Figures 7-6 and 7-9 respectively), the Molong–Dubbo and Main Western Railways (see Figures 7-8 and 7-9 respectively), and the Parkes to Peak Hill water supply would require close coordination between the nominated construction contractor and ERM Power, the RTA, the Australian Rail Track Corporation (ARTC) and Parkes Council, to ensure the appropriate controls and safeguard measures are implemented to minimise disruption to these important infrastructure corridors. Pipeline construction across minor roads would require coordination and consultation with the respective managing bodies: the Wellington, Parkes or Cabonne Councils, or the Department of Lands (Crown).

All relevant standards and guidelines, including those of the relevant authorities, would be followed to ensure compliance.

The pipeline inlet facility (proposed compressor station) would be constructed on private land that would be purchased or leased by ERM Power near the Central West Pipeline at Alectown. The land and its surrounds are currently used for agricultural purposes. Development of the compressor station would result in the loss of an estimated 10 hectares of agricultural land. There would be no conflict between construction of the proposed compressor station and ongoing agricultural use of adjacent land.

Operation

Development of the gas pipeline would require the acquisition of a 20–25-metre wide easement from approximately 55 private land owners. ERM Power would require access to this easement at all times for maintenance and emergency reasons. It is proposed that the easement would be inspected weekly in order to monitor the status of the underground pipeline and to ensure its safety is not jeopardised by any activities.

The proposed pipeline route has been aligned to be a minimum of 300 metres away from any residences or buildings. Dams have also been avoided. Consequently, operation of the gas pipeline would not alter current land uses, as existing agricultural activities could still be undertaken on the land.

10.3.3 Mitigation measures

Power station

There are currently few permanent residences on the lands that would be directly affected by construction and operation of the power station. The key potential impacts on surrounding land uses from construction of the proposed power station would be associated with air quality, noise, visual amenity, and traffic. These are described in detail in Sections 9.2, 9.3, 9.4 and 10.1 respectively, and have been assessed as manageable and within acceptable limits based on the proposed mitigation measures. These measures would be incorporated and implemented in the CEMP for the project.

There would be no conflict between operation of the power station and ongoing agricultural use of the surrounding land. Any potential impacts associated with noise, air quality and visual amenity would be managed by those mitigation measures identified in Sections 9.2 to 9.4.

Gas pipeline

The following mitigation measures would be implemented to minimise impacts on land use and property associated with the gas pipeline and compressor station:

Construction

- During the detailed design phase, careful consideration would be given to minimising potential land use conflicts between construction of the gas pipeline and compressor station, and existing agricultural activities.
- Close consultation with, and coordination between, the nominated construction contractor and ERM Power, the RTA, the ARTC and Parkes Shire Council would be undertaken to ensure the appropriate controls and safeguard measures are implemented to minimise disruption to these important infrastructure corridors.
- Construction methods described in Section 7.5.3 would be implemented at major roads and railways to minimise impact on road users and rail services.
- Through the CEMP, traffic management measures would be implemented to further minimise construction impact on road and rail services.
- The mitigation measures identified in Sections 9.2 and 9.3 would be implemented to ensure minimal noise and dust impacts during construction.
- Appropriate specifications and safety standards would be incorporated into the design of the pipeline to ensure the safe construction and operation of the pipeline.
- Consent to access the pipeline construction corridor would be clearly defined and agreed prior to the commencement of construction. Conditions of access (including vehicular access) would be implemented through the CEMP to ensure the least disruptive access possible.
- Following construction, land would be reinstated to its original condition and any loss of crops would be compensated by agreement with the affected land owner. Fencing and other farm infrastructure modified for construction of the pipeline would be promptly reinstated to its original condition.

Operation

- Operational impacts on surrounding land uses would be minimised through clearly defined access agreements developed in consultation with affected property owners. Vehicular access along easements would be oriented to minimise damage to vegetation and property. Inspection schedules would be arranged to minimise impact on land owner activities.

10.4 Socio-economic impacts

Section 3.12 provides a description of the existing socio-economic environment as it relates to the area. This section summarises potential impacts (negative and positive) of the project on this socio-economic environment, and outlines management measures to address these impacts.

10.4.1 Power station

Construction

Construction of the proposed power station has the potential to increase economic activity in the vicinity of Wellington. The potential socio-economic impacts are addressed below under three broad categories:

- employment and expenditure
- tourism
- other impacts.

Employment and expenditure

During construction of the proposed power station, workforce numbers would peak at around 200 employees. Actual numbers would vary according to design specifications, and the construction staging and techniques utilised.

The construction workforce would comprise local and non-local personnel. Any jobs filled by outsiders would only add to the transient workforce, and no significant increase in the regional population would be expected over the long term.

Economic benefits would be expected to flow throughout the local community during the 18-20-month construction period. A proportion of construction employees' wages and contractor fees during the construction period would ultimately filter through the local economy by effects attributable to expenditure. The additional income received by local households would generate further rounds of spending activity.

Indirect incomes would also be generated from the purchase of materials, transportation of materials, petrol, diesel, fuel supplies, truck parts, tyres, office supplies, accommodation, and other requirements sourced from local suppliers. Therefore, it is anticipated that the overall economic effect of construction of the power station would be beneficial to the local area.

Tourism

During the construction phase, non-local employees would require temporary accommodation, thus increasing the demand for temporary accommodation in the area. This could reduce availability for the tourism industry during peak periods, resulting in a short-term reduction in tourism expenditure. Any decrease in tourism, however, would be compensated by an increase in spending by the construction workforce.

Other impacts

Potential adverse socio-economic impacts associated with construction of the power station would be associated with dust, noise, visual amenity and traffic. These are discussed further in Sections 9.2, 9.3, 9.4 and 10.1 respectively.

Operation

The potential socio-economic impacts associated with operation of the power station can be addressed under four broad categories:

- power supply
- employment and expenditure
- impacts on land prices
- other impacts.

Power supply

In the absence of adequate electricity supply during peak periods, the cost of electricity is likely to rise during these peak periods in the future (see Chapter 5). Operation of the proposed power station during these peak demand periods would facilitate state-wide economic growth through improved system reliability and overall reduced cost of supply, thus contributing to the stabilisation of electricity pricing in NSW.

The proposed power station would also provide security of supply for the NSW electricity network, as it would come on-line in response to system emergency or black-out conditions.

Employment and expenditure

Operation of the proposed power station would require approximately six full-time personnel with specialised experience and training. Therefore, it is unlikely that these positions would be filled by local personnel in the short term, as suitable training would be required. Regardless, the employees and their families would be expected to live locally. Local expenditure from the full-time workforce, plus ongoing local maintenance expenditure, would provide significant economic benefits for Wellington.

A proportion of the operational expenditure allocated to the power station would likely be directed to local manufacturers and service providers. These benefits would be magnified during major maintenance activities, where the need for materials and services would significantly increase.

Impacts on land prices

The future value of land is always uncertain. It is unlikely, however, that cogenerative industries would be attracted to the area as a result of the project, due to the regional location and geographic economics. The proposed power station would also be unlikely to impact on agricultural production on surrounding land. Consequently, it is unlikely that the proposed power station would have a significant negative impact on land prices in the area.

Other impacts

Operation of the proposed power station has the potential to create adverse impacts associated with greenhouse gas emissions, air quality, noise and visual amenity. Consultations (see Chapter 4) have revealed that the community fears this could affect the value of property surrounding the proposed site, which could affect the local tourism industry, including the nearby Keston Rose Garden Café. The mitigation measures discussed below, however, would ensure that any negative impacts are adequately managed such that significant adverse socio-economic impacts would be avoided.

10.4.2 Gas pipeline

Construction

The socio-economic impacts during the construction phase of the gas pipeline would be similar to that of the power station in relation to the construction workforce and expenditure. However, such impacts would be experienced for a shorter term and at a smaller scale, since the construction workforce would progressively move along the pipeline route (see Section 7.5.3). A construction camp would be established approximately halfway along the pipeline, so temporary accommodation would not be required for the majority of the pipeline construction workforce, thus removing any potential impacts on the tourism industry.

It is expected that a proportion of the wages of construction employees and contractor fees during the construction period would ultimately filter through the local economy. In turn, the additional income of the local community would generate further rounds of spending activity.

The local economy would also benefit from the purchase and transportation of materials, petrol, diesel, fuel supplies, truck parts, tyres and office supplies; accommodation; and other requirements sourced from local suppliers. Therefore, it is anticipated that the overall economic effect of the gas pipeline construction would be beneficial to the local area.

Operation

Operation of the gas pipeline could restrict the development of lands that would be adjacent to the proposed pipeline route. There could be a requirement to establish a 25–30-metre wide buffer zone from the pipeline centreline to restrict future sensitive land use developments along the entire length of the pipeline route. Agricultural activities would not, however, be restricted. Since the large majority of land use around the pipeline route is agricultural, any adverse impacts associated with operation of the gas pipeline would be minimal.

10.4.3 Mitigation measures

Power station

The use of local trades and services would be sourced, where possible, to maximise the economic benefits to the local community.

Mitigation measures relating to greenhouse gas emissions, noise, visual, and traffic and transport impacts are discussed in Sections 9.1, 9.3, 9.4 and 10.1 respectively. Implementation of these measures would minimise the potential adverse impacts of the power station on the socio-economic environment of Wellington.

Gas pipeline

Mitigation measures implemented for the pipeline would be the same as those for the power station. Additionally, community consultation would continue with land owners throughout the detailed design and construction of the pipeline, to minimise disruption and maximise socio-economic benefits for the local community.

10.5 Geology and soils

Section 3.3 provides a description of the existing environment as it relates to geology and soils in the area. This section summarises potential impacts of the project on geology and soils, and outlines management measures to address these impacts.

10.5.1 Power station

Construction

No detailed geotechnical testing was undertaken as part of this Environmental Assessment. Desk-based assessment of geotechnical conditions, however, indicated that the proposed power station site’s geology and soils would be suitable for construction of the power station.

Given that the site has been in use for long-term grazing, any site contamination is unlikely. As such, no contaminated land assessment was undertaken as part of the Environmental Assessment.

Construction of the proposed power station has the potential to affect the following existing geological conditions:

- Potential acid sulfate soils could be exposed due to disturbance of soils.
- The long-term stability and structural integrity of heavily loaded and/or buried structures could be affected by subsidence. However, the area is remote from mining activity so this risk is considered to be low.
- Foundation hazards for the aboveground facilities could be caused by inundation of low-lying ground.
- Exposure of highly erosive soils due to excavation during earthworks could lead to sediment run-off and siltation of nearby waterbodies.

Operation

If potential acid sulfate soils are exposed through construction of the proposed power station, this could lead to corrosion of foundation structures.

10.5.2 Gas pipeline

Construction

Excavation difficulties have the potential to occur during construction of the proposed gas pipeline if the following existing geological conditions are encountered:

- hard rock
- soft soils
- acid sulfate soils
- mineral deposits/ mining leases and subsidence.

Operation

The long-term stability and structural integrity of the proposed gas pipeline could be affected by subsidence. However, this area is remote from mining activity so this risk is considered to be low.

10.5.3 Compressor station

Construction

Geology and soil impacts during construction of the proposed compressor station site would be similar to those for the power station (see Section 10.5.1).

Operation

If potential acid sulfate soils are exposed through construction of the proposed power station, this could lead to corrosion of foundation structures.

10.5.4 Mitigation measures

General

Construction

During the detailed design phase, a comprehensive assessment of the potential impacts on geology and soils would be carried out for the proposed power station and compressor station sites, as well as along the proposed gas pipeline route. This would include the following:

- a detailed acid sulfate soil investigation
- a detailed geotechnical site investigation.

As it relates to the gas pipeline, the geotechnical assessment would seek to identify areas of the proposed route that are susceptible to subsidence. The detailed design would consider the findings of these assessments to ensure such areas are avoided, or the design/construction of the pipeline through those areas is compatible with the potential for subsidence.

The CEMP for the project would include an erosion and sediment control plan for the proposed power station, gas pipeline and compressor station. The plan would be based on the following soil erosion and sedimentation control practices:

- Soil and water management practices would be considered concurrently with engineering design and in advance of any earthworks.
- The area and duration of soil exposure would be minimised.
- Stripped topsoil would be stockpiled for re-use and protected from erosion using suitable erosion control measures.
- Stormwater run-off would be controlled by diverting stormwater from denuded areas, and minimising slope gradients, lengths and run-off velocities.
- Erosion and sediment controls measures, such as silt traps, sediment basins, perimeter banks, silt fences and nutrient traps, would be used as appropriate.
- Areas that have been denuded of surface vegetation would be revegetated with native vegetation as soon as practical after works are complete in that area.

Gas pipeline

Where surface rock deposits are encountered, minor realignment of the pipeline would occur to avoid these deposits, provided that such realignment could be retained within the surveyed corridor and avoid environmentally, culturally and socially sensitive areas. Consultation with biodiversity and heritage specialists would occur where any realignment is necessary beyond the corridor surveyed for this Environmental Assessment.

10.6 Hydrology and water quality

Section 3.7 provides an overview of the existing hydrology and water quality conditions within the project area. This section summarises the potential hydrology and water quality impacts of the project, which were investigated through a desk-based assessment. Key requirements and documents relating to best practice stormwater and water quality management are outlined below, as are mitigation measures to reduce potential impacts.

The key issues identified relate to the management of stormwater quality and quantity, and the management of any potential water quality impacts from construction and operation of the project.

10.6.1 Relevant standards and objectives

Stormwater management

Wellington Council requires that stormwater infrastructure be designed in accordance with *Australian Rainfall and Runoff* (Engineers Australia 2001) and *AUS-Spec #1 Development and Design Construction Specifications*, with particular attention given to the provision of safe overland flow paths.

To implement best practice management at the proposed power station site in relation to flooding and site drainage, the design would be based on the following industry standard references:

- *Australian Runoff Quality — A Guide to Water Sensitive Urban Design* (Engineers Australia November 2005)
- *Australian Rainfall and Runoff* (Engineers Australia 2001)

- *NSW Floodplain Development Manual* (NSW Department of Infrastructure, Planning and Natural Resources 2005).

Water quality

Development within the Wellington local government area should be undertaken in accordance with the *NSW Water Quality and River Flow Objectives: Macquarie-Bogan River,* developed by the (then) Department of Environment and Conservation (DEC 2006b). The water quality objectives set out desired environmental values for waters in the area. *The Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (Australian and New Zealand Environmental Conservation Council 2000), which form a benchmark document under the National Water Quality Management Strategy, provide the technical guidance to assess the water quality needed to protect those values.

10.6.2 Power station

Construction

Construction of the proposed power station would involve site preparation works, construction of concrete footings and pads, and installation of associated pipework, controls, power and other ancillary services. Due to the undulating topography of the site, construction would also involve some earthworks to ensure the gas turbines are positioned on even ground. All of these activities have the potential to generate pollutants that could affect surface water quality.

The primary potential impact on water quality during construction of the power station would result from increased sediment loads, as exposed soil is conveyed to the unnamed tributary that flows through the site during storm events. Increased sedimentation of waterways can smother benthic habitats and organisms, and increase levels of nutrients, metals and other potential toxicants that attach to the sediment particles. Water quality impacts to this tributary would also affect water quality of the Macquarie River.

Other potential pollutants that could affect water quality during the construction period include:

- hydrocarbons and chemicals, as a result of spills and leakages from construction vehicles or fuel/chemical stores on construction sites
- general litter and gross pollutants from construction materials.

Provided that the mitigation measures discussed below are implemented, the potential impacts of construction of the power station would be low.

Operation

Development of the site, from its current state as undulating land used for stock grazing to a gas-fired power station, would alter the site drainage characteristics and increase potential for impacts on water quality within the unnamed tributary and the Macquarie River. Potential impacts could result as a consequence of the change to the land surface following construction of the proposed power station, as well as through aspects of the plant’s operation that require the use of water.

Site water use

Site activities would use water and generate wastewater. Subject to council approval, water would be sourced from a council watermain pipeline that passes by the site to the newly established Wellington Correctional Centre. Total annual consumption is estimated to be less than 20 megalitres.

Raw water would be required for the following activities:

- evaporative cooling for the gas-fired turbine inlet air cooler
- fire services
- domestic use.

It is anticipated that a small demineralised water plant would also be installed on-site, and storage tanks would be provided to store the town and demineralised water. Demineralised water would be required for the following activities:

- gas turbine water injection for power augmentation
- compressor washing.

Liquid wastes are classified as per the *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* (DEC 1999c). Liquid wastes that would be generated on the site include:

- liquid non-controlled aqueous waste:
  - water from turbine blade washing
  - any contaminated stormwater
  - small quantities of water from servicing of heat exchanger and the oil traps
- liquid group C waste:
  - human waste storage facilities or waste treatment devices
- liquid hazardous waste:
  - flammable liquids
  - distillates
  - lubricant from duplex filters
  - medium quantities of waste oil.

Small quantities of reject water would most likely be produced from the demineralisation plant (generated through the reverse osmosis process).

Impacts associated with the site water would be manageable, provided that the mitigation measures identified in Section 10.6.4 are implemented.

Potential water quality impacts

The proposed power station has the potential to affect water quality of the unnamed tributary and the Macquarie River as a result of site wastewater generation and stormwater run-off, if these two streams are not appropriately managed.

Water quality characteristics of stormwater run-off from the site would change due to the change in site activities. Pollutants likely to be associated with operation of the power station include oils, litter, sediment, nitrogen, phosphorous, metals, and other specific chemicals that would be used and stored on-site. Stormwater has the potential to mobilise and transport any pollutants it comes into contact with into local waterways.

These potential impacts to the unnamed tributary and the Macquarie River would be mitigated through appropriate site water management procedures, as discussed in Section 10.6.4.

Potential drainage and water quantity impacts

Development of the proposed power station would result in an increase in the proportion of impervious surfaces on the site. This would lead to an increase in the volume of stormwater run-off generated. If uncontrolled, this could affect the hydrology of the unnamed tributary and has the potential to lead to increases in peak flood levels.

It is proposed to level the topography of the site to ensure that the gas turbines can be constructed on level ground, which would alter the drainage paths across the site. During the detailed design, future overland drainage paths would be considered, particularly in relation to the proposed earthworks. The headwaters of the existing unnamed tributary are located at the proposed fill area (see Figure 3-10). Overland flow generated during storm events from the small area of the catchment upstream of the site would need to be diverted around the site, or managed within the site stormwater system. There is potential for erosion and scour to result if gradients adjacent to the area to be levelled are steepened, or if drainage is concentrated and discharged at a point.

These potential impacts would be mitigated through the appropriate site water management procedures detailed in Section 10.6.4.

10.6.3 Gas pipeline

Construction

The primary impacts of the proposed pipeline would be experienced during its construction. The pipeline would be constructed in accordance with Australian Standard *AS 2885.1 Pipelines: Gas and liquid petroleum*. Detailed construction methods along the pipeline route would be based on an assessment of constraints and environmental sensitivities at different locations.

At major river crossings, such as the Macquarie River crossing, directional drilling or micro-tunnelling would be adopted to minimise impacts to the riparian area and watercourse, as discussed in Section 7.5.3. This would require clearance of areas of land for launch and retrieval pads. A bentonite slurry would be used to lubricate the cutting head and drilling equipment.

For minor creek and river crossings, open cut techniques would be used, with over-pumping of water conducted where required. The NSW Department of Water and Energy (DWE) would be consulted prior to construction to ensure that the proposed construction methods are appropriate.

The key impacts during construction of the gas pipeline have the potential to occur as a result of land disturbance and the resulting increases in sediment run-off. Spoil from directional drilling and the bentonite slurry would affect the quality of local waterways if not appropriately controlled.

Provided the mitigation measures discussed below are implemented, construction of the gas pipeline would not have significant impacts on waterways.

Operation

There is potential for the pipeline to affect surface waters at the waterway crossings. Should the pipe not be constructed at an adequate depth from the bottom of the watercourse, there would be potential for scour and resulting changes to channel morphology. A detailed assessment of each waterway crossing would be undertaken during pre-construction activities to ensure that the pipeline profile is suitable to prevent such impacts. The DWE would be consulted during this process.

10.6.4 Mitigation measures

Power station

Construction

Mitigation measures would be required to prevent impacts that could result during the construction of the proposed power station. These include:

- Erosion and sediment control measures would be established in the CEMP framework in accordance with *Soils and Construction: Managing Urban Stormwater* (Landcom 2004) prior to the commencement of any construction activities.
- Erosion and sediment controls would be installed, such as sediment basins, staked straw bales, and sediment fences, in accordance with the erosion and sediment control measures in the CEMP.
- Surface run-off would be diverted away from disturbed areas.
- Construction works would be planned to minimise the length of time soils are disturbed.
- Construction traffic would be restricted to defined internal roads and, where required, wheel cleaning areas would operate at locations where vehicles leave the construction site.
- Chemicals and fuels would be appropriately stored and bunded.
- Construction employees would be trained to implement spill response procedures, and to implement, maintain and be aware of sediment and erosion control measures and requirements.

Operation

Stormwater management

A site stormwater management system would be developed during detailed design for the power station site. This system would be developed in accordance with best practice stormwater management and would be designed using the Engineers Australia document *Australian Rainfall and Runoff* (2001), with designs complying with *AUS-SPEC#1 Development and Design Construction Specifications*.

Particular attention would be given to the provision of safe overland flow paths across the site, especially through areas that currently drain to the upper reaches of the unnamed tributary. Careful design of the drainage system would ensure that water can be safely diverted around the site. The design would also incorporate measures to prevent erosion and scour of any diversion channel or stormwater discharge point.

The stormwater management system for the site would ensure that peak stormwater flows from the site do not increase as a result of the power station development. A preliminary estimate of peak run-off from both the existing site and the proposed site, based on the 'rational method', as outlined in *Australian Rainfall and Runoff* (Engineers Australia 2001), indicated that approximately 1,200 kilolitres of on-site detention would be required for the site. The exact volume of detention required would be determined during detailed design of the site stormwater system. This preliminary estimate indicates, however, that the required storage volume would be accommodated within the proposed water storage area (see Figure 7-3).

Stormwater run-off would be collected from the power station site and roadway areas by a series of stabilised drains, which would direct water to a stormwater collection pond that would be established at a lower elevation to the rest of the plant. The stormwater collection pond would be constructed using local soils to standard engineering specifications. The pond dimensions would be optimised depending on site topography and geology. The stormwater collection pond would be designed without overflow for 1:100 year average recurrence interval (ARI) storm events.

The pond would be constructed to act as a sediment trap during construction and would convert to a stormwater collection pond after construction is complete. It could incorporate a grassed spillway area that would drain to the natural depression of the site.

During operation, reuse of the stormwater captured on-site would be maximised for purposes such as site irrigation, and general wash-down and maintenance requirements (where demineralised water quality is not required). Opportunities to irrigate neighbouring land and/or provide stock water would be provided where possible.

Grease and oil traps would be installed downstream of areas of potential contamination. Any spills of fuel, oil or hazardous chemicals would be contained in the grease traps or, in the case of a very large spill, caught in the sediment pond. Depending on the nature of the spill, cleanup and/or neutralisation would be undertaken according to an appropriate emergency response plan.

The stormwater management system would be based on the principle of separating clean and dirty water. Areas across the site would be designated as 'clean' or 'dirty' depending on their proposed use and the potential for stormwater to entrain pollutants. Stormwater from clean areas could be discharged to the unnamed tributary without any additional treatment (subject to ensuring the existing peak stormwater flows are not exceeded). Stormwater from dirty areas, however, would need to be treated to remove potential pollutants prior to discharge. The level of treatment provided would depend on the areas where the run-off has been generated and associated potential pollutants that may arise. Treatment measures would include the use of gross pollutant traps, water/oil separators, bioretention swales, stormwater ponds, and erosion and sediment controls.

All chemicals used, and wastes generated at the facility would be handled and stored in such a way that pollutant discharges to stormwater are prevented. Areas where chemicals are stored and used, all process liquid transfer points and process areas that have potential for liquid spillage would be bunded to contain any spills and prevent contamination of stormwater run-off.

Design of a stormwater management system for the site in accordance with the best management practices outlined in the documents referenced above would ensure that pollution of waterways is minimised or eliminated.

Regular monitoring of the quality of stormwater discharges would be incorporated into the site stormwater management plan to provide a mechanism for ensuring that the system is operating effectively. This would ensure that any problems are identified to allow changes to be made on-site and ensure that water quality objectives are being achieved.

Wastewater management

The liquid group C and liquid hazardous wastes identified in Section 10.6.2 would be managed in accordance with a zero liquid waste effluent policy. All wastes to be removed from the power station site would be stored on-site in dedicated 200 litre drums or in pits prior to collection and disposal by a licensed liquid waste contractor. There may be opportunities for these liquid waste streams to be recycled by the nominated contractor.

The small quantities of reject water from the demineralisation plant would be contained within site-dedicated storage drums or in pits for collection by a licensed liquid waste contractor.

Small quantities of wastewater (less than 20 kilolitres per year) would be generated during the compressor washing cycle and other maintenance activities. This wastewater stream would primarily be contaminated with oils and grease. This stream would pass through an on-site oil/water separator prior to discharge to an evaporation pond.

There would be no discharges of wastewater from the power station site.

Gas pipeline

Construction

The following mitigation measures would be implemented to prevent impacts that could result during construction of the proposed gas pipeline:

- Erosion and sediment control measures would be established in the CEMP framework in accordance with *Soils and Construction: Managing Urban Stormwater* (Landcom 2004) prior to the commencement of any construction activities.
- Erosion and sediment controls would be installed, such as staked straw bales and sediment fences, in accordance with the erosion and sediment control measures in the CEMP.
- Spoil and bentonite slurry from directional drilling activities would be contained and managed to ensure the safe removal of these materials from site. The bentonite slurry would be processed and reused throughout the drilling process as much as possible to minimise the amount of waste generated.
- Surface run-off would be diverted away from disturbed areas.
- Construction works would be planned to minimise the length of time that soils are disturbed, and revegetation would occur promptly following completion of works.
- Construction activities at waterway crossings would be planned to coincide with dry periods where possible.
- Chemicals and fuels would be appropriately stored and bunded.

- Construction employees would be trained to implement spill response procedures, and to implement, maintain and be aware of sediment and erosion control measures and requirements.

Operation

Measures to mitigate impacts during operation of the pipeline would be incorporated into the design of the proposed gas pipeline. The key design parameter required to manage impacts during the operational stage is the minimum cover to be provided between the pipeline and river bed at each waterway crossing. The DWE would be consulted during pre-construction activities to ensure that the pipeline design at waterway crossings is suitable.

10.7 Waste

10.7.1 Power station

Construction

Construction of the proposed power station would generate various types of construction wastes. These would include construction material packaging and workforce-associated wastes. Standard environmental mitigation measures to manage construction waste would be included in the CEMP prior to construction. Any wastewater collected would be appropriately treated prior to discharge in accordance with current standards (see Section 10.6).

All suitable excavated material would be re-used as backfill material on-site and at other construction sites associated with the project. Material that is unsuitable for this purpose would be reused, where safe and practicable to do so, as landscaping and batters for noise and visual mitigation. Any spoil unsuitable for on-site use would be disposed of appropriately at a licensed landfill.

Construction of the power station would require minimal vegetation clearance (see Section 9.5). As far as practicable, vegetation cleared during construction would be stockpiled for later replacement on the ground as part of site restoration.

Portable toilets would be provided for workers at the construction sites. The associated wastes would be disposed of appropriately by a licensed contractor.

Operation

A range of liquid and solid wastes would be generated during the operation of the proposed power station.

Liquid waste

Liquid wastes are classified as per the *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* (DEC 1999c). Liquid wastes that would be generated on the site are listed in Section 10.6.2.

A contained, composting toilet system, such as a Civius Multrum or Rota-Loo system, would cater for sewerable wastes for operational staff. When required, the facility would be emptied, and the waste transported and disposed of in accordance with legislative requirements.

All liquid wastes would be controlled in accordance with a zero liquid waste effluent policy, which would be implemented through evaporation and stormwater ponds and appropriate waste removal practices. All liquid wastes to be removed from the site would be stored on-site inside dedicated 200 litre drums or in pits prior to collection and disposed of by a licensed liquid waste contractor. There may be opportunities for these liquid waste streams to be recycled by the nominated contractor.

Solid waste

The normal day-to-day operation of the proposed gas-fired power station would not be expected to generate significant quantities of solid waste. Most of the solid waste would be 'inert waste' as classified under the *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* (DEC 1999c), and would typically be generated during routine maintenance activities, comprising:

- packaging waste, such as used wooden pallets, cardboard and plastic
- chemical and oil containers
- general office type waste.

Solid waste would be segregated into recyclable and non-recyclable waste products, where possible, and disposed of off-site by licensed waste contractors.

10.7.2 Gas pipeline

Construction

Only minor quantities of waste would be generated during construction of the proposed gas pipeline. These would include general construction wastes, such as packaging, off-cuts, excess materials and workers wastes (i.e. food packaging and scraps), as well as spoil from excavation.

All soil excavated during the pipeline construction would be suitably stored within the construction corridor to minimise loss due to wind, etc. This virgin excavated natural material would be re-used as fill, where possible, or removed from the project area for disposal to landfill.

Where directional drilling is required, bentonite slurry would be used to lubricate the cutting head and drilling equipment. Micro-tunnelling would also use this slurry, and excavated spoil would be removed by an auger flight or by mixing it with water and pumping it to the surface. The slurry associated with both methods would be disposed of with care.

Operation

Waste generation associated with operation of the proposed gas pipeline would be negligible.

10.7.3 Mitigation measures

To ensure that no environmental harm occurs as a result of uncontrolled or inappropriate collection, transport and disposal, the relevant provisions of the following Acts would be implemented:

- *Protection of the Environment Operations Act 1997*
- *Waste Avoidance and Resource Recovery Act 2001*.

Management measures for construction waste would be developed and implemented through the CEMP, and management measures for operational waste would be developed and implemented through the operational environmental management plan (OEMP).

All waste associated with the operation and construction phases of the power station and gas pipeline would be classified and disposed of in accordance with the *Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-Liquid Waste*s (DEC 1999c). Through the CEMP and OEMP, waste storage areas and procedures would be developed to ensure that wastes are appropriately segregated, recycled or reused, and disposed of. Off-site waste disposal, and waste transport on-site and off-site, would be managed in accordance with the plan and relevant regulations.

10.8 Cumulative impacts

Cumulative impacts are those resulting from the interaction of a project with existing and future proposed land uses in the vicinity of an area affected by a project. The key potential cumulative impacts associated with the project relate to biodiversity impacts from construction of the proposed gas pipeline, and air and noise emissions from operation of the proposed power station, owing to the presence of the TransGrid Wellington substation. The majority of the surrounding land is used for agricultural and residential purposes.

A brief description of the potential cumulative impacts during the construction and operation phases of the proposal is provided in the following sections.

10.8.1 Power station

The proposed power station is adjacent to the existing TransGrid Wellington substation. It could, therefore, contribute to the existing noise impacts caused by the substation. However, the substation has a rural noise classification (i.e. it generates very low noise). The noise impact assessment undertaken for this project identified that operation of the power station would result in some increases in received noise levels at some sensitive receptors (see Section 9.3 and Technical Paper No. 3). However, implementation of the mitigation measures identified in Section 9.3.7 would effectively minimise this impact, such that any cumulative impact associated with noise from operation of the project would be diminished.

The air quality assessment undertaken for the proposed power station concluded that minimal impact to air quality would be experienced through construction and operation of the project (see Section 9.2 and Technical Paper No. 4). Furthermore, since the area is not part of an airshed that is under stress, the cumulative impacts of air quality associated with the project would be negligible.

10.8.2 Gas pipeline

The proposed gas pipeline route is located in a highly developed landscape dominated by agricultural activity, in which the remaining areas of remnant vegetation and associated habitat are fragmented and isolated. The proposed pipeline route falls within the footprint of an existing electricity easement, access tracks and areas cleared for agriculture. Due to its location in a highly developed landscape, the gas pipeline is one of many developments and pressures on biodiversity in the local area. Consequently, the significance of the biodiversity impacts of construction of the project is likely to be increased by biodiversity impacts associated with the surrounding projects and agricultural activities.

10.8.3 Mitigation measures

Power station

Implementation of the mitigation measures identified in Section 9.3.7 would minimise the cumulative noise impact of operation of the proposed power station.

Gas pipeline

Implementation of the mitigation measures identified in Section 9.5.3 would minimise the cumulative impact of construction of the proposed gas pipeline on biodiversity.