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Delta electricity

Proposed Gas Power Facility at Bamarang near Nowra

Environmental Assessment

Volume 1
Main Report

May 2006

Submission of Environmental Assessment

Prepared under the Environmental Planning and Assessment Act 1979, Section 75H

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In respect of:

Project to which Part 3A applies	
Applicant name	Delta Electricity
Applicant address	PO Box Q863 QVB NSW 1230
Land to be developed	Lot 1, DP 27482; 681 Yalwal Road, Bamarang NSW
Proposed development	Construction and operation of a gas turbine power facility and associated infrastructure in two stages

Environmental assessment	An environmental assessment is attached

Certificate	I certify that I have prepared the contents of this document and to the best of my knowledge: » It is in accordance with the requirements of Part 3A; » It contains all available information that is relevant to the environmental assessment of the development to which it relates; and » The information contained in the document is neither false or misleading.
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Date	1 May 2006

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Glossary of terms

Aboriginal site	In the environmental assessment an Aboriginal 'site' is any location where physical (archaeological) evidence survives of traditional Aboriginal settlement within a defined context.
Acoustic	Pertaining to the sense or organs of hearing, or to the science of sound.
Ambient	Surrounding or existing.
Asset protection zone	A bushfire asset protection zone (APZ) is an area of land, adjacent to a building, in which the bushfire fuel load is managed to significantly minimise the impact of fire on that asset. The APZ acts as a buffer zone between an asset and the bushfire hazard. Usually the focus is on reducing ground and shrub fuel layers, however in some situations tree canopies may need to be pruned or thinned.
Base load facility	Power generating facility that produces electricity at an essentially constant rate.
Bund	A barrier designed to contain liquids within a defined area.
Cogeneration	A generating facility that produces electricity and another form of useful thermal energy (such as heat or steam), that can be used as an additional source of electricity, or exported off site for use for industrial, commercial, heating, or cooling purposes.
Combined cycle	Combined cycles use both gas and steam turbine cycles in a single plant to produce electricity with high conversion efficiencies.
Consent	See development consent.
dB(A)	The most common measurement of environmental noise (A level weighting) – measured using a simple sound level meter, to simulate the subjective response of the human ear.
Development consent	Approval to undertake a development received from the consent authority. Also referred to as a development approval.
Dispersion model	Mathematical model used to estimate concentration profiles of gases or particles suspended in air at various distances from the initial point of release.
Distribution network	The apparatus, equipment, plant and buildings used to convey and control the flow of electricity from the network to customers.
Effluent	Liquid industrial waste or wastewater, which may or may not have been passed through some purification processes.
Emission	The release of material into the atmosphere (eg gas, noise).
Environmental management plan	A document setting out the management, control and monitoring measures to be implemented during construction (a construction environmental management plan) and/or operation (operational environmental management plan) of a development, to avoid or minimise the potential environmental impacts identified during an environmental assessment process.
Environmental Protection Licence	A licence authorising the carrying out of scheduled development work or scheduled activities or controlling the pollution of water arising from non-scheduled activities, being a licence issued under the *Protection of the Environmental Operations Act 1997*.
Flora and fauna	Plants and animals.
Gas turbine	Rotating machinery where liquid or gaseous fuel is burned to produce electric power and heat.
Greenhouse gases	Gases that accumulate within the earth's atmosphere (eg primarily carbon dioxide and methane) and contribute to global climatic change/global warming (ie the 'greenhouse effect').
Heat recovery steam generator	The heat recovery steam generator recovers the hot gases exhausted from the gas turbines to produce steam through a steam generator, resulting in an improved overall efficiency of the plant.
Hot tap	A procedure used to repair or connect equipment (such as a pipeline) under pressure,

	without the interruption of service for the substance (such as gas) within the distribution system.
Particulate	Small particles, usually occurring in suspension.
Peaking facility	Power generating facility used to supply electricity during peak demand times (usually gas-fired).
Potable water	Water suitable for drinking.
Preliminary hazard analysis	A hazard analysis is used to develop an understanding of the hazards and risks associated with an operation or facility and of the adequacy of safeguards. A preliminary hazard analysis occurs at an early stage of a project.
Preliminary risk screening	An assessment of the likelihood of risk, required under State Environmental Planning Policy No 33, to determine the need for a preliminary hazard analysis.
Process water	Water consumed or used during an industrial or manufacturing process for rinsing or other purposes.
Putrescible	Capable of biological decomposition.
Steam turbine	A device for converting energy of high-pressure steam into mechanical power which can then be used to generate electricity.

List of abbreviations

AGO	Australian Greenhouse Office
AHD	Australian height datum
AHIMS	Aboriginal Heritage Information Management
APZ	Asset protection zone
AS	Australian Standard
CAPER	Clear Air (Plant Equipment) Regulation 1997
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
DEC	Department of Environment and Conservation
DEUS	Department of Energy, Utilities and Services
DIPNR	Department of Infrastructure, Planning and Natural Resources
DP	Deposited Plan
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
esaa	Energy Supply Association of Australia
GWP	Global Warming Potential
HAZOP	Hazard and Operability Studies
HIPAP	Hazardous Industry Planning Advisory Paper
INP	NSW Industrial Noise Policy
IPCC	Intergovernmental Panel on Climate Change
km	Kilometre
kV	Kilovolt
LALC	Local Aboriginal Land Council
L_{eq}	Equivalent continuous noise level
L_{10}	Average maximum noise level – the noise level exceeded for 10% of a sampling period.
L_{90}	Background noise level – the noise level exceeded for 90% of a sampling period.
LEP	Local environmental plan
LGA	Local government area
mg	Milligram
m^3	Cubic metre
m/s	Metres per second
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NEPM	National Environment Protection Measures
NES	National environmental significance
NHMRC	National Health and Medical Research Council
NMVOC	Non-measurable volatile organic compounds
NO_x	Nitrous oxide
NO_2	Nitrogen dioxide

NPWS	National Parks and Wildlife Service
O_3	Ozone
OCS	Obstruction Clearance Surface
PAD	Potential archaeological deposit
PCB	Polychlorinated biphenyls
PHA	Preliminary hazard analysis
PM_{10}	Particulate Matter
POEO Act	*Protection of the Environment Operations Act 1997*
ppb	Parts per billion
ppm	Parts per million
REMS	Reclaimed Water Management Scheme
RFS	Rural Fire Service
RoTAP	Rare or Threatened Australian Plants
RTA	Roads and Traffic Authority
SEPP	State Environmental Planning Policy
SO_2	Sulphur dioxide
STP	Sewage Treatment Plant
TAMP	The air pollution model
TSC Act	*Threatened Species Conservation Act 1995*
TSP	Total suspended particulate
UHC	Unburnt hydrocarbons
$\mu g/m^3$	Micrograms per cubic metre
Vpd	Vehicles per day
vtph	Vehicle trips per hour

Executive summary

1 Overview of the proposal

1.1 Introduction

This environmental assessment has considered the potential impacts of the proposal to develop a gas turbine power facility at Bamarang, near Nowra in NSW. It has been prepared by GHD Pty Ltd (GHD) on behalf of Delta Electricity (Delta) to assist the Minister for Planning in assessing Delta's application for concept approval for the proposal. The environmental assessment has been prepared in accordance with the provisions of Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act) and the requirements of the Director-General of the Department of Planning.

The proposed gas power facility would be developed in two stages. Stage one would involve development of a gas turbine peaking facility, a gas pipeline and an electricity transmission line. The second stage would involve converting the proposed facility to a base load facility, by adding two heat recovery steam generators and a steam turbine.

1.2 Why is the proposal needed?

A shortfall in electricity supply is predicted to occur in NSW within the next few years. Analysis of electricity supply and demand shows that the level of demand in NSW is increasing by approximately 3% per year, with summer peak load demand growing by approximately 500 megawatts per year. Based on current rates of supply, it is predicted that NSW will need to rely on imports from interstate to meet minimum requirements from 2005/2006, and that by 2008/09, NSW will not be able to source additional supply from other states.

The key objective of the proposal is to provide additional electricity supply in NSW to address the predicted shortfalls. The development of a peaking facility (stage one) would supplement electricity supply during times of peak demand, such as on hot summer days. Gas power facilities provide an efficient means of meeting peak demands.

When the overall level of demand increases further, the facility would be converted to a combined cycle facility (stage two), allowing it to operate efficiently full time, producing a constant supply of electricity.

The two stage development would provide a cost effective way of meeting short-term demand requirements, whilst providing the option to fast track development of a base load facility when required.

1.3 What would the proposal involve?

Stage one

Gas turbine peaking facility

Stage one would involve the development of a peaking facility designed to operate during periods when the demand for electricity peaks (such as hot summer days). The peaking facility would operate in an open cycle configuration, whereby electricity is generated by combustion of natural gas

in gas turbines. In the open cycle configuration, hot exhaust gas is vented directly to atmosphere through the exhaust stack, without heat recovery.

The stage one facility would have the capacity to generate approximately 300 megawatts of electricity during periods of peak demand.

Gas pipeline

Stage one also involves construction of a new 150 millimetre diameter high pressure gas pipeline, approximately 900 metres long, connected to the Eastern Gas Pipeline. The preferred option for connection to the Eastern Gas Pipeline would be a new hot tap connection at the closest point to the site (approximately 600 metres east). The pipeline would supply the proposed facility with gas.

The pipeline is proposed to be located underground in a 10 metre wide easement to be acquired over the land in which it would be located (owned by Shoalhaven City Council).

Electricity transmission line

Stage one also involves construction of a 132 kilovolts electricity transmission line, approximately 7.2 kilometres in length. The proposed transmission line would deliver electricity generated at the site to the national electricity grid via the regional distribution network supplying Nowra.

The proposed route would extend north from the site across Yalwal Road and through Crown land (and a small section of private land) to meet the existing cleared transmission route located in the Bamarang Nature Reserve. The transmission line would then continue along this existing corridor (located to the north of, and parallel to, Yalwal Road) through the reserve. The corridor finishes near the intersection of Flat Rock and Yalwal Roads. The line would then travel along the south side of Yalwal Road, within the existing road easement, until east of Flat Rock Creek.

From east of Flat Rock Creek, the line would run underground to the Shoalhaven terminal station, where it would connect to Integral Energy's existing high voltage power lines.

Stage two – base load facility

The second stage would involve the conversion of the facility to a combined cycle facility, by adding two heat recovery steam generators and a steam turbine, to increase the amount of energy recovered from the gas and therefore the amount of electricity produced.

In combined cycle facilities, the hot exhaust gases are used in the heat recovery steam generator to produce steam. This steam is then used to drive a steam turbine to generate additional electricity. Combined cycle plants have higher thermal efficiency due to the recovery of heat energy.

Waste steam from the steam turbines would be directed to a cooling system where it would be condensed by transfer of heat to a cooling medium. Wet cooling is proposed.

The stage two facility would provide a constant supply of electricity and is referred to as a base load facility. The stage two facility would be able to generate approximately 400 megawatts of electricity.

Employment

The estimated maximum employment generation would be:

» Stage one – 150 employees during construction and eight during operation; and

» Stage two – 300 employees during construction and 18 during operation.

1.4 What are the benefits of the proposal?

» Provides additional electricity supply in NSW to address the predicted shortfalls.

» Gas power facilities provide an efficient means of meeting peak demands.

» Adding power to the electricity network at Nowra would help to improve the security of power supplies in the local area.

» Opportunities for local employment, particularly during construction and stage two.

» Use of a redundant industrial site and, where possible, existing corridors for electricity supply, minimises the potential for development impacts.

» Combined cycle facilities have lower greenhouse gas emissions than conventional coal fired power stations.

» Removal of the existing 33 kilovolts transmission line between Bamarang and the Shoalhaven Terminal Station.

2 Scope of the environmental assessment

The proposed facility is a project to which Part 3A of the EP&A Act applies. In accordance with Part 3A, the other parts of the proposal (the proposed pipeline and transmission line) are also subject to this part of the Act. As a result, the environmental assessment and approval requirements specified by Part 3A of the EP&A Act apply to proposal as a whole.

The Minister for Planning is the approval authority for the proposal, and an environmental assessment (this document) is required to support the application for development approval. Delta intends to seek a concept approval for the proposal, defined as:

» Construction and operation of the proposed gas power facility in two stages;

» Development of a gas pipeline to connect the facility to the Eastern Gas Pipeline; and

» Development of a 132 kilovolts electricity transmission line to connect the facility to the Shoalhaven Terminal Station.

The environmental assessment provides:

» Information on the proposal, including its strategic context and justification and the alternatives considered;

» An assessment of the potential environmental impacts of the proposal; and

» Measures proposed to minimise and manage potential environmental impacts where necessary.

The environmental assessment focuses on the key assessment requirements specified by the Director General's Requirements. It is supported by a number of specialist technical studies, provided as appendices to the main document.

3 Key assessment requirements

3.1 Air quality

The potential air quality impacts of the proposal were assessed. Dispersion modelling was used to assess the impacts on local air quality during operation. Equipment specifications provided to prospective equipment suppliers would dictate the technical and environmental performance the units would be expected to meet.

The results of the assessment indicate that ground level concentrations of all pollutants would not exceed their respective criteria at sensitive receptors. The existing air environment in the Bamarang area is consistent with a rural environment, and the proposal is not expected to impact significantly on the existing air quality environment.

Dust mitigation measures would be implemented during construction to ensure impacts on surrounding receptors are minimised.

3.2 Greenhouse

The air quality study also included assessment of the greenhouse gas impacts of the proposal. It concluded that there was limited potential for photochemical smog impacts on the regional air shed.

It is noted that a major attraction of gas is its relative greenhouse efficiency compared to coal fired generation. Combined cycle gas generation emits approximately 0.4 tonnes of CO_2 per megawatt hour of electricity produced. This is less than half the level set for the NSW pool coefficient (0.913 tonnes of CO_2 per megawatt hour of electricity in 2005). Open cycle gas generation emits approximately 0.6 tonnes of CO_2 per megawatt hour.

3.3 Flora and fauna

The potential impacts of the proposal on threatened species were assessed in accordance with the DEC 'Draft Guidelines for Threatened Species Assessment' (July 2005). Recommendations for avoidance and mitigation of impacts were developed based on the results of the literature review, field surveys and impact assessment.

Much of the vegetation on the western side of the site was cleared during the construction phase for the original abattoir development. The transmission line easements are regularly slashed and vegetation is maintained as a grassy cover. Road reserves along Yalwal Road are also regularly slashed.

Ten ecological communities were recorded within the study area. One of these communities, River-flat Eucalypt Forest, is listed as an endangered ecological community under the Threatened Species Conservation Act. A modified remnant characteristic of this community was recorded north of Yalwal Road along Cabbage Tree Creek. This would not be directly impacted by the proposal.

Stage one would result in the clearance of approximately 5.5 hectares of vegetation, including approximately:

» 1 hectare for the facility footprint;

» 0.9 hectares cleared for fire truck turning bay;

» 0.9 hectares for the gas pipeline; and

» 2.7 hectares for the electricity transmission corridor.

In addition, 3.5 hectares of hazard reduction would need to be undertaken for the proposed bushfire asset protection zones.

Stage two would result in additional clearance of approximately 0.5 of a hectare of vegetation for the facility footprint on the site, and an additional 1.2 hectares of partial clearing for asset protection zones.

The footprint of the proposed facility and the location of the proposed transmission line and pipeline have been chosen to minimise impacts on biodiversity of the locality, especially in relation to threatened species and endangered ecological communities. Consequently, it is considered that significant impacts are unlikely. Nonetheless, a number of mitigation and management measures are proposed to prevent direct and indirect impacts of the proposal on flora and fauna and their habitat.

3.4 Bushfire risk assessment

A bushfire risk assessment was undertaken in accordance with the *Rural Fires Regulation 2002,* and the guideline 'Planning for Bushfire Protection' (PlanningNSW, 2001). Proposed fire management measures include the provision of bushfire asset protection zones, site access and water sources.

A bushfire asset protection zone is an area of land, adjacent to a building, in which the bushfire fuel load is managed to significantly minimise the impact of fire on that asset. The bushfire asset protection zone acts as a buffer zone between an asset and the bushfire hazard.

The Rural Fire Service advised that the vegetation clearance required for the transmission line easements, together with the standard vegetation management measures implemented below transmission lines, would be suitable for managing fire risks in these areas. As a result, no additional management measures need to be implemented.

As the proposed gas pipeline would be located underground, no bushfire asset protection zones are required in this area.

Bushfire asset protection zones would be required at the site, to surround the proposed facility. The bushfire asset protection zones, which range from 20 to 40 metres in width, were determined in consultation with the Rural Fire Service and are shown in figures included within the environmental assessment. It is considered that the implementation of bushfire asset protection zones, together with other site management practices proposed, would adequately protect the proposed facility from risk associated with bushfire hazards.

3.5 Water

A water cycle management assessment was undertaken. The assessment considered the integration of water supply and sources, and management of stormwater, sewerage and process wastewater, using background information on the existing environment and hydrological simulations for the site stormwater analysis and for the overall water balance for the site.

Water usage requirements for the proposal would include:

Process water

During stage one, the plant and equipment would require minimal water. The total process water demand is estimated to be approximately 2 megalitres per annum. Water would be sourced from the Nowra potable water supply.

The combined cycle facility proposed for stage two requires water for steam generation and cooling. The preferred option (subject to availability of water) is to use a water based cooling system. This technology has a high net water demand (approximately 8.4 megalitres per day or 3,100 megalitres per annum). The preferred water supply option for stage two process water is industrial effluent. Possible sources of sufficient industrial effluent have been identified.

The proposed facility is a staged project and there is uncertainty regarding timing of the second stage, which requires larger volumes of water to be supplied. As a result, it is not possible at this time to confirm and secure the water resource (from either current wastewater streams or the existing fresh water supply network) and determine a water pipeline route. If water were not available, Delta would have to revert to dry cooling for the stage two operations, which is more costly and less efficient. Prior to commencing stage two, Delta would need to further investigate and confirm the availability of water.

Domestic water

Potable water supply would be sourced from the Nowra Water treatment plant for domestic type uses. During stage one, the total potable water demand is expected to be approximately 200 kilolitres per annum, with the stage two domestic water demands expected to be approximately double that.

Infrastructure required to supply water to the proposed facility is outside the scope of this assessment.

Impact assessment

Potential water cycle impacts were considered. The main potential for water quality impacts relates to site surface water drainage. The facility footprint and surrounds would be designed to drain in a northeast direction. This would ensure that there is better control of site surface water quality and no risk to the water quality in Bamarang Reservoir.

To ensure that runoff discharged from the site is of an appropriate quality, surface water management would be undertaken in accordance with the measures recommended, including implementation of soil and water management plans during construction and operation, and a site stormwater management plan.

4 Consideration of other environmental issues

4.1 Noise

The gas turbines, heat recovery steam generators and ancillary equipment such as the air cooled condensers have the potential to generate noise. To minimise the potential for noise impacts to be experienced by residential receivers, acoustic mitigation features would be incorporated into the design of the proposed facility. Acoustic mitigation features would ensure that off site noise levels remain at or below specified criteria.

Modelling was undertaken under differing meteorological and operational conditions (that is, with and without noise attenuation measures in place) for both stages of the proposal. Acoustic modelling was undertaken using the Computer Aided Noise Abatement (CadnaA) model.

The results of modelling indicate that if all equipment was attenuated to a minimum sound power level of 91 dB(A) then the project specific noise goals for stages one and two can be met at the monitoring locations. These noise level specifications would be imposed on all equipment manufacturers.

4.2 Soils and groundwater

Overall, the potential for the site to be subject to contamination that would inhibit its suitability for the proposal is considered to be low.

Given the relative low risk of any spills on the site and minimal disturbance of the sub-soil structure, the proposal would not pose any significant threat to groundwater.

Construction would be guided by a comprehensive construction phase soil and water management plan, accompanied by appropriate OH&S and contingency plans, to form part of the construction environmental management plan for the proposal.

4.3 Hazards and risk

A preliminary hazard analysis was prepared for the proposal. The analysis concluded that the cumulative risk values for off-site fatality, injury and damage at the site boundary were below the criteria for all adjacent land uses. Similarly the on-site fatality risk values for industrial sites were well below the suggested criteria.

4.4 Visual amenity

Heavily wooded areas would surround the majority of the proposal, significantly reducing its overall visibility. The concept design for the proposed facility has also attempted to maximise the use of existing cleared areas on the site to reduce the potential visual impacts associated with clearing.

Although the clearing required to construct the proposed pipeline and maintain the corridor would result in change to the landscape, the pipeline would be located underground and would be surrounded by bushland. The limited visibility of the site reduces the potential for visual impacts.

The route for the proposed transmission line has been chosen to maximise use of existing cleared corridors, and therefore reduce the potential impacts associated with clearing. The visibility of the majority of the transmission line would be reduced by its location along the existing corridor through Bamarang Nature Reserve, and by locating a section underground.

4.5 Cultural heritage

An Aboriginal and a historical cultural heritage assessment were undertaken. Two Aboriginal sites and one possible historic Aboriginal site were identified during the field survey of the study area, in the vicinity of Yalwal Road. These comprise an artefact scatter with potential archaeological deposit, an isolated artefact and a tree with a series of foot-hole scars of indeterminate origin.

Depending on the final location of transmission poles, there is potential for the first two sites to be impacted by the construction of the proposed transmission line. This would be confirmed during the detailed design process. It may be possible to avoid the location of the latter two sites by careful placement of the transmission poles. The tree would not be impacted by the proposal.

One historic cultural heritage site was identified during the field survey. The site, which consists of the remains of a house and its grounds, is located towards the north of Yalwal Road, and would not be impacted by the proposal.

4.6 Traffic and access

Construction of the proposal would generate traffic, including construction worker traffic and employee vehicles. A number of measures are recommended for implementation during the construction period, including provision of new intersection between the site and Yalwal Road, reduced speed limits and signposting.

Operation of the proposal is not expected to lead to any traffic impacts on the surrounding road network.

5 Draft statement of commitments

The environmental assessment provides Delta's commitments for environmental mitigation, management and monitoring. The draft statement of commitments includes recommended mitigation measures to reduce and avoid identified impacts, management measures (such as the preparation of construction and operation environmental management plans) to ensure a high level of environmental performance against identified criteria, and measures to monitor performance. The statement of commitments would be finalised following exhibition.

6 Conclusion

This environmental assessment has considered the potential impacts of the proposal to develop a gas power facility at Bamarang near Nowra in the local government area of Shoalhaven. It recognised that the design of the proposed facility would incorporate a range of features and controls to minimise the potential for negative impacts on the environment. Features include:

» Integrated noise and air emission controls to ensure that required standards of environmental performance are achieved;

» Bushfire asset protection zones; and

» Maximising use of existing cleared areas on site and existing transmission corridors to minimise potential flora/fauna impacts.

In addition, the environmental assessment recommends measures to further reduce the potential for impacts.

It is considered that the proposal would:

» Improve the surety of power supply to NSW during peak demand periods (stage one of the proposal);

» Provide NSW with a long-term generation facility to satisfy base demand for electricity in NSW (stage two of the proposal);

» Allow for the future expansion of the NSW economy by providing enough electricity for growth in the future; and

» Utilise existing infrastructure for transmission purposes and existing fuel supplies to generate electricity in a cleaner manner than traditional coal-fired generation.

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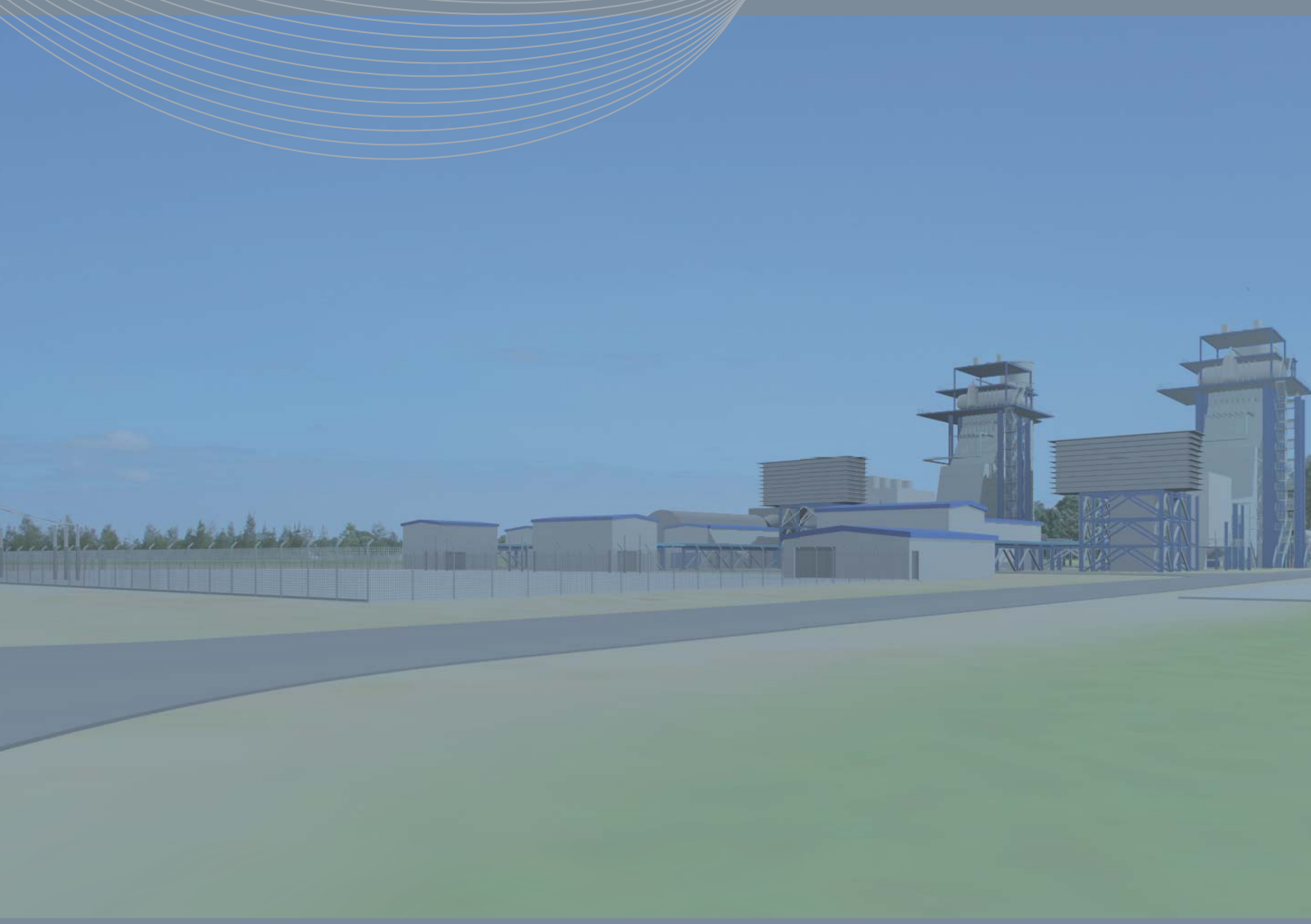
Delta electricity



Part A

Introduction and context

Chapter 1. Introduction

1.1 Overview

Delta Electricity (Delta) proposes to develop a gas turbine power facility at Bamarang, near Nowra in NSW (referred to as the 'proposed facility' for the purposes of the environmental assessment). The proposed facility would be developed in two stages. Stage one would involve development of a peaking facility designed to operate during periods when the demand for electricity peaks. The stage one facility would incorporate two gas turbines in an open cycle configuration.

Stage one also involves development of a gas pipeline and an electricity transmission line (referred to as the 'proposed pipeline' and 'proposed transmission line' for the purposes of the environmental assessment). The pipeline would supply the proposed facility with gas from the Eastern Gas Pipeline. The transmission line would transfer the electricity produced to the national electricity network.

The second stage would involve converting the proposed facility to a combined cycle configuration by adding two heat recovery steam generators and a steam turbine. This would increase the amount of energy recovered from the gas and therefore the amount of electricity produced. The stage two facility would provide a constant supply of electricity and is referred to as a base load facility.

The above works are collectively referred to as 'the proposal' for the purposes of the environmental assessment.

GHD Pty Ltd (GHD) was commissioned by Delta in June 2005 to prepare an environmental assessment for the proposal. The environmental assessment has been prepared in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979* (the EP&A Act) to address the requirements of the Director-General of the Department of Planning (the Director-General's Requirements) received on 18 August 2005.

1.2 Location of the proposal

The site for the proposed facility (referred to as 'the site' for the purposes of the environmental assessment) is located at Lot 1, DP 27482, 681 Yalwal Road, Bamarang, approximately 7 kilometres southwest of Nowra on the NSW south coast. The site is approximately 20 hectares in size and is owned by Delta. The site was purchased by Delta because it is located in close proximity to the Eastern Gas Pipeline and the high voltage electricity transmission network. As a result, the site was identified as one of only a few sites in NSW suitable for the location of a gas power facility.

The proposed pipeline would be located in a 10 metre wide easement to be acquired over Council owned land located to the south of the boundary with the Bamarang Nature Reserve. It would connect to the Eastern Gas Pipeline (owned by Alinta) located approximately 600 metres to the east of the site.

The proposed transmission line (to be designed and constructed by Integral Energy) would connect to Integral Energy's high voltage (132 kilovolts) electricity distribution network, via the existing substation located at the corner of Yalwal and Albatross Roads. It would run north from the site

(above ground) to the existing transmission corridor located within Bamarang Nature Reserve, then east long the corridor to Yalwal Road. It would then continue along the south side of Yalwal Road to the eastern side of Flat Rock Creek. At this location it would run underground through the urban areas of West Nowra to the substation.

The location of the proposal is shown on Figure 1.1.

1.3 Key features of the proposal

A summary of key features of the proposal is provided in Table 1.1. Further detail is provided in Chapter 6.

Table 1.1 Key features of the proposal

	Stage 1	**Stage 2**
Gas power facility	Two gas turbines with an electrical output in the range of 130-150 megawatts each Step-up transformers to convert the generator output to 132 kilovolts for transmission 132 kilovolts switchyard containing electrical equipment for connection to the transmission lines Gas metering and regulating station for fuel gas supply Gas piping to deliver fuel gas to the turbines	Two heat recovery steam generators connected to the gas turbine generators Steam turbine with an electrical output of approximately 100 megawatts Steam generator step-up transformer
Ancillary on-site infrastructure	Electrical and control building used to monitor the power station Administration building Access roads, car parking area and site drainage	Cooling tower (water) Water storage and treatment plant
Gas supply	A 150 millimetre gas pipeline, approximately 900 metres in length, would be provided to allow natural gas to be supplied to the proposed facility from the Eastern Gas Pipeline	-
Electricity transmission connections	A 132 kilovolts electricity transmission line, approximately 7.2 kilometres in length, would be provided to connect the proposed facility to the electricity distribution network.	-
Electricity generated	Approximately 300 megawatts	Approximately 400 megawatts
Employment (estimate maximum)	Construction – 100-150 employees Operation – 8 employees	Construction – 200-300 employees Operation – 18 employees
Water Supply	Domestic – Nowra potable supply (0.2 megalitres per year) Process water – Nowra potable supply (2 megalitres per year)	Water supply for stage 2 is subject to further investigations. Proposed sources/estimates are as follows: Domestic water – Nowra potable supply (0.4 megalitres per year) Process water – industrial effluent (8.4 megalitres per day)

1.4 Who is the proponent?

Delta is an electricity generation company owned by the NSW Government (a State owned corporation). Delta produces around 12% of the electricity consumed in the national electricity market, which covers consumers in NSW, South Australia, Queensland, Victoria and the ACT. Electricity is currently produced by Delta using a range of fuels including coal, water and biomass materials.

Since it was formed in 1996, Delta has mainly operated in the wholesale electricity market, selling to energy retailers and a small number of large industrial customers. Delta's business practices focus on providing cost-effective, safe and reliable electricity.

Delta currently operates four major power stations in NSW: Vales Point, Munmorah, Mt Piper and Wallerawang, which have a combined generating capacity of 4,240 megawatts. In order to secure NSW's future electricity supply, Delta is currently proposing the development of a number of other power facilities (of which the current proposal is one).

1.5 Purpose and benefits of the proposal

Analysis of electricity supply and demand shows that the level of demand in NSW is increasing by approximately 4% per year, with summer peak load demand growing by approximately 500 megawatts per year. Based on current rates of supply, it is predicted that NSW will need to rely on imports from interstate to meet minimum requirements from 2005/2006, and that by 2008/09, NSW will not be able to source additional supply from other states (NEMMCO 2004; NSW Government 2004).

The key objective of the proposal is to provide additional electricity supply in NSW to address the predicted shortfalls likely to occur within the next few years. The development of a peaking facility (stage one) would supplement electricity supply during times of peak demand, such as on hot summer days. When the overall level of demand increases further, the facility would be converted to a combined cycle facility (stage two), allowing it to operate efficiently full time, producing a constant supply of electricity.

Delta has determined that developing the proposal in two stages would provide a cost effective way of meeting short-term demand requirements, whilst providing the option to fast track development of a base load facility when required.

Further information on the strategic justification for the proposal is provided in Chapter 5.

1.6 Guide to the approval requirements and environmental assessment

1.6.1 Summary of approval requirements

The proposed facility is a project to which Part 3A of the EP&A Act applies. Under clause 75B(3) of the EP&A Act, the other parts of the proposal (the proposed pipeline and transmission line) are also

subject to Part 3A of the Act. As a result, the environmental assessment and approval requirements specified by Part 3A of the EP&A Act apply to proposal as a whole.

The Minister for Planning is the approval authority for the proposal, and an environmental assessment (this document) is required to support the application for development approval in accordance with the requirements of the EP&A Act. Delta intends to seek a concept approval for the proposal, in accordance with clauses 75M-P of the Act, for the reasons described in Section 3.2.1.

Approval for the water supply infrastructure required would be sought separately and is outside the scope of this proposal.

Further information on the assessment requirements for the proposal is provided in Chapter 3.

1.6.2 Purpose and scope of the environmental assessment

The environmental assessment supports an application for concept approval for the proposal from the Minister for Planning under Part 3A of the EP&A Act. It has been prepared in accordance with the EP&A Act. The environmental assessment provides:

» Information on the proposal, including its strategic context and justification and the alternatives considered;

» An assessment of the potential environmental impacts of the proposal, with a focus on the key assessment requirements (see below); and

» Measures proposed to minimise and manage potential environmental impacts where necessary.

The environmental assessment focuses on the key assessment requirements specified by the Director-General's Requirements. These are summarised below, together with where they are addressed within this document:

» Strategic justification – Chapter 5;

» Infrastructure provision – Section 6.3;

» Air quality and greenhouse gases – Section 8.1 and 8.2;

» Flora and fauna – Section 8.3;

» Bushfire safety – Section 8.4; and

» Water consumption and water cycle management – Section 8.5.

Other potential environmental issues are considered in Chapter 9.

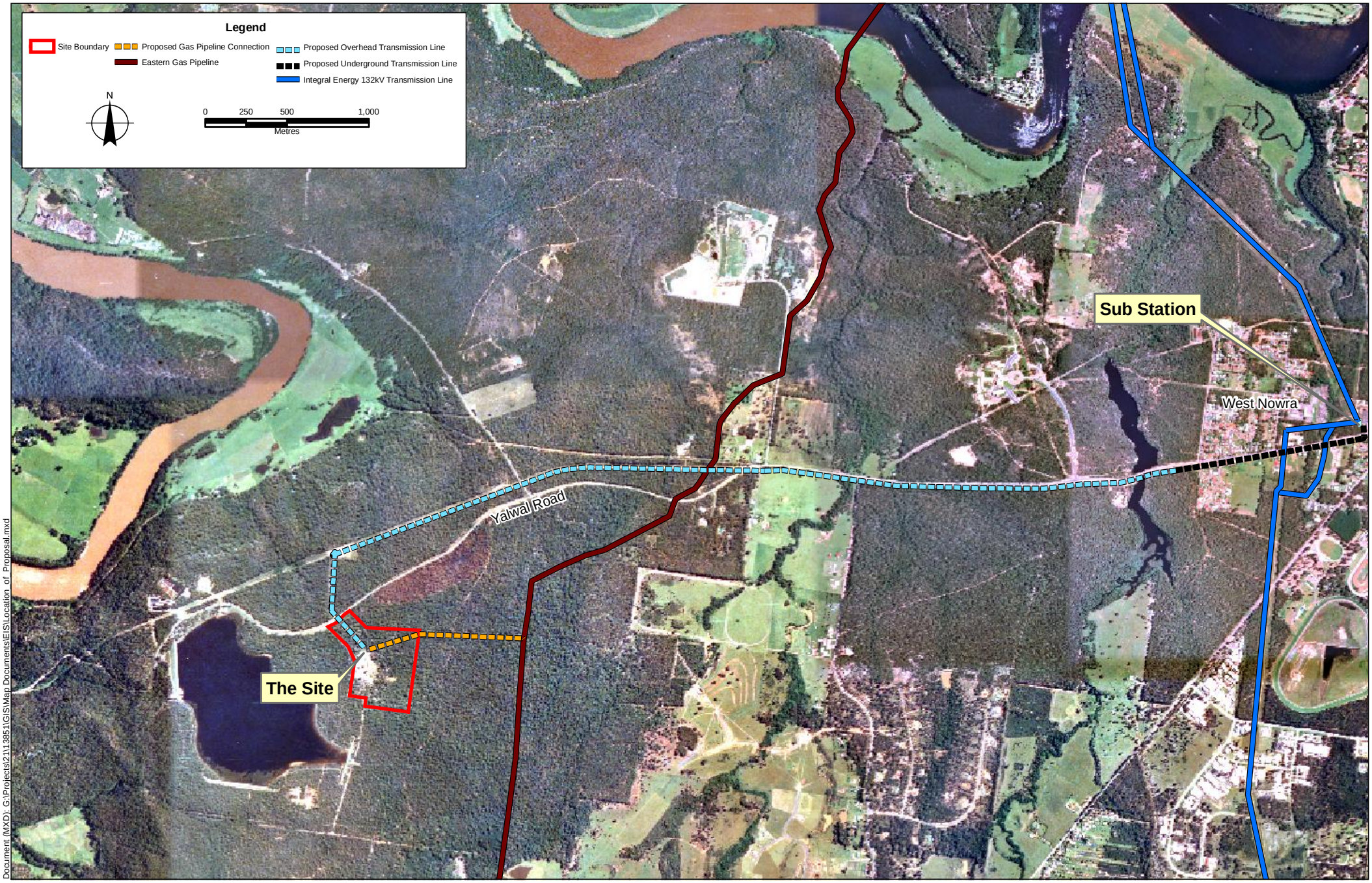


Figure 1.1 Location of the Proposal

1.6.3 Contents of the environmental assessment

The environmental assessment is structured as follows:

» **Part A Introduction and context** – provides an introduction to the environmental assessment (Chapter 1); a description of the location and existing environmental features of the site and surrounds (Chapter 2); information on the assessment requirements under relevant legislation and environmental planning instruments (Chapter 3); and a summary of the consultation that occurred during the assessment process (Chapter 4).

» **Part B Information on the proposal** – describes the strategic justification for, and background to, development of the proposal (Chapter 5); the features of the proposal (Chapter 6); and alternatives considered (Chapter 7).

» **Part C Environmental assessment** – describes the results of the assessment of key environmental issues as identified by the Director-General's Requirements (Chapter 8) and considers how other environmental issues would be managed (Chapter 9).

» **Part D Conclusion** – provides a draft statement of commitments made by the proponent in relation to the mitigation, management and monitoring of potential environmental impacts (Chapter 10) and provides the project justification and conclusion to the environmental assessment (Chapter 11).

» **Specialist technical reports** – Volume 2 contains specialist technical/background reports prepared as part of the environmental assessment process:

  – Stability Studies (HMA Consulting)
  – Air quality impact assessment (Heggies Australia Pty Ltd)
  – Ecological assessment (GHD)
  – Bushfire risk assessment (GHD)
  – Water cycle management (GHD)
  – Noise impact assessment (GHD)
  – Preliminary hazard analysis (Advitech Pty Ltd)
  – Aboriginal cultural heritage assessment (Navin Officer Heritage Consultants Pty Ltd)
  – Historical cultural heritage assessment (Navin Officer Heritage Consultants Pty Ltd)

Chapter 2. Location and setting

2.1 Regional setting

Bamarang is located approximately 7 kilometres from the Nowra urban area, with the closest suburb being West Nowra. Nowra is located approximately 160 kilometres south of Sydney and 80 kilometres south of Wollongong. The town is located on the banks of the Shoalhaven River, which provides a significant natural water resource to Shoalhaven Water and Sydney Water.

Nowra is the main commercial and administrative centre for the Shoalhaven local government area (LGA). Shoalhaven City Council is the local Council responsible for administering the LGA.

The Shoalhaven LGA, with an area of approximately 4,660 square kilometres, extends for approximately 85 kilometres along the coast. The LGA is bounded by the Illawarra Escarpment to the west and the Pacific Ocean to the east. Its topography includes mountainous terrain, flat coastal plain, bays, inlets, lakes and rivers.

The natural environment is a major attraction of the Shoalhaven area. Within its boundaries are 109 beaches and 300,000 hectares of reserves. Jervis Bay and Kangaroo Valley are popular natural tourist attractions.

Manufacturing, defence, tourism, retail and agriculture represent the core income generating economic activities for the Shoalhaven LGA. Major industries in the Nowra area include flour, paper, timber, tourism and vegetables. Major local employers in Nowra include the Department of Defence, Australian Paper, the Manildra Group of companies, Dairy Farmers and local and state government.

The population of the Shoalhaven LGA is approximately 91,300. Between 1996 and 2001, the population growth was on average 2.2% or 1,803 per annum. The Nowra-Bomaderry population of 28,876 represented approximately 33% of the Shoalhaven population in 2001.

The regional location is shown in Figure 2.1.

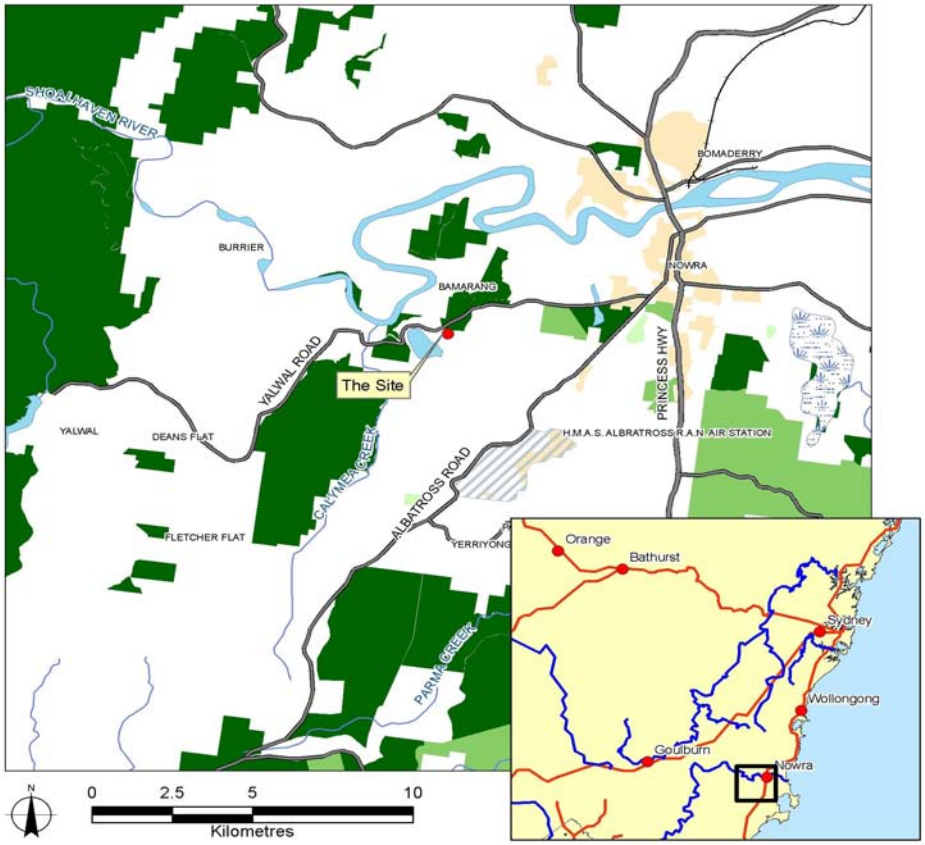


Figure 2.1 Regional location

2.2 The existing environment

2.2.1 Land uses

Existing land uses

The main land uses in the study area are shown in Figure 2.2.

Site for the proposed facility

The site was originally developed (although never operated) for an abattoir, and a number of abandoned buildings remain on site. Buildings include stockyards, an amenities building, storage shed and a large processing building. Some of the buildings have been partially demolished. Remaining buildings would be demolished during construction of stage one of the proposal.

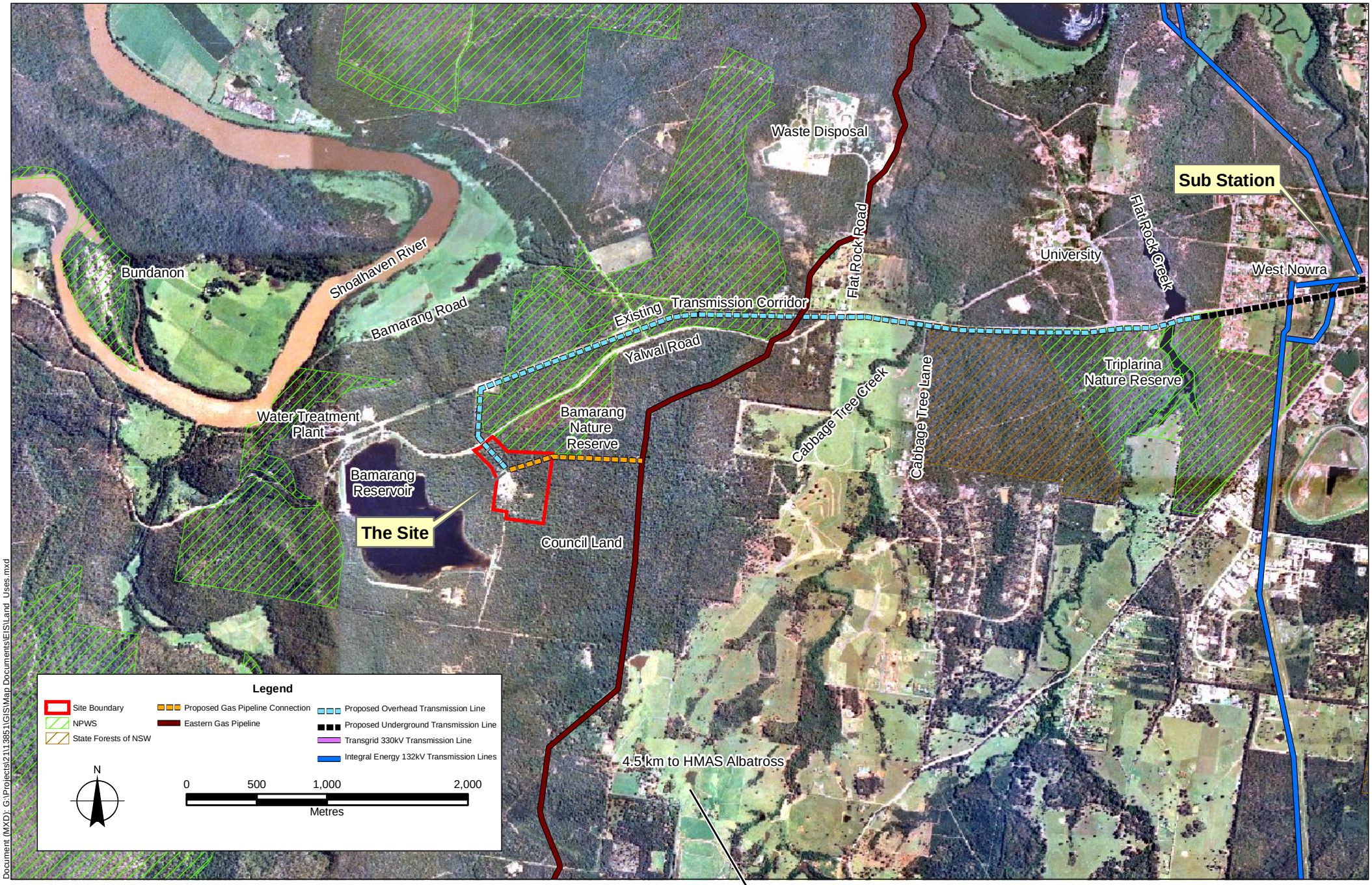


Figure 2.2 Land Uses

Proposed pipeline

The pipeline would be located on an easement to be acquired over Council land. The land is zoned for rural uses and is currently covered in bushland.

Proposed transmission line

The majority of land on which the above ground section of the transmission line would be located is used as an existing transmission corridor and/or road easement.

Surrounding land uses

The main land uses in the western portion of the study area (in the vicinity of the site for the proposed facility) are reserves and rural land. Residential areas, including the suburb of West Nowra and the rural residential subdivision in the vicinity of Cabbage Tree Lane, are located towards the east.

A variety of other land uses are located throughout the study area. These include:

» Scattered rural dwellings;

» Public utilities and associated infrastructure;

» Tourism/accommodation (Bamarang Bush Cabins on Bamarang Road);

» Education; and

» Manufacturing.

Land uses in the vicinity of the site for the proposed facility

The site for the proposed facility is bounded by Yalwal Road and Bamarang Nature Reserve to the north, and bushland (owned by Council) to the south, east and west. Further to the north (approximately 750 metres from the site) on the opposite side of Yalwal Road is a mudbrick manufacturing business (Make it Mudbricks).

The nearest existing residential dwellings to the site are:

» A caretaker's caravan located on the site of Make it Mudbricks. It is noted that a development application for a permanent dwelling on this property has been lodged with Council;

» Dwellings located along Bamarang Road (approximately 1.25 kilometres to the north); and

» Rural residential dwellings approximately 2 kilometres to the east.

Other land uses in the vicinity of the site include:

» Public utilities and associated infrastructure:

  – Radio transmission mast approximately 1 kilometre to the northeast;

  – Waste disposal facility located approximately 3.5 kilometres to northeast;

  – Water treatment plant approximately 1 kilometre to the northwest;

  – Transmission corridors, including the corridor through Bamarang Nature Reserve (which includes a water pipeline and 33 kilovolts electricity transmission line) to the north, the 132 kilovolts line to the east, and the Eastern Gas Pipeline; and

  – Bamarang Reservoir approximately 500 metres to the west.

» Bundanon, Arthur Boyd's property (managed by the Bundanon Trust) is located near the northern banks of the Shoalhaven River below the escarpment, approximately 2.5 kilometres to the northwest;

» The Shoalhaven campus of Wollongong University located approximately 4.5 kilometres to the northeast; and

» HMAS Albatross (Royal Australian Navy Naval Air Station Nowra) approximately 4.5 kilometres to the southeast.

Natural features in the vicinity of the site include the Shoalhaven River (approximately 1.8 kilometres to the north) and Pulpit Hill (2 kilometres to the northwest).

Land uses surrounding the proposed pipeline

Land uses surrounding the proposed pipeline corridor include Bamarang Nature Reserve to the north; bushland (Council land) to the south; the site to the west; and the Eastern Gas Pipeline to the east.

Land uses surrounding the proposed transmission line

The main land uses in the vicinity of the transmission line are as follows:

» Western section (the site to Yalwal Road) – the line would be mainly located within an existing transmission corridor. Land uses include Bamarang Nature Reserve and Make it Mudbricks.

» Middle section (between Flat Rock Road and Flat Rock Creek) – the line would be located mainly in the road reserve. The main land uses include:

  – Scattered rural dwellings;

  – A private farm/paddocks, the Triplarina Nature Reserve and Crown land to the south of Yalwal Road; and

  – Rural holdings and the Shoalhaven campus of the University of Wollongong to the north of Yalwal Road.

» Eastern Section (between Flat Rock Creek and the substation) – the line would be located underground beneath the road reserve. Residential land uses are located in the vicinity.

Future land uses

Nowra – Bomaderry Structure Plan

Shoalhaven Council has prepared a draft structure plan for Nowra – Bomaderry. Public exhibition of the draft plan is expected to commence towards the end of 2005. The structure plan provides strategic direction and guidance in relation to future development in Nowra – Bomaderry. It identifies land that will be further investigated for possible rezoning and development.

The area around Cabbage Tree Lane has been identified by the draft plan as a 'new living area'. Land to the west of this area is identified as a 'future investigation area'. The plan notes that this land may have the potential for future residential use, subject to further investigation.

Regional services corridor

A corridor of land, identified by council planning documents as the regional services corridor, passes north-south through the study area between Cabbage Tree Lane and the University. This corridor is proposed as a location for a western road bypass of Nowra.

2.2.2 Cultural heritage

Aboriginal heritage

The Aboriginal cultural heritage assessment undertaken for this proposal (refer Appendix J) identified that 26 sites are listed on the DEC Aboriginal Heritage Information Management System (AHIMS) as occurring in the general vicinity of the study area for the proposal. Two of these sites were listed as being located close to the Eastern Gas Pipeline, however they were not re-found or identified during field investigations undertaken for the current assessment. The other sites listed on the AHIMS are not located within the vicinity of the proposal.

The assessment did not identify any Aboriginal sites within the site for the proposed facility. The archaeological sensitivity of the area is considered to be low. The study noted that there are no obvious foci for Aboriginal occupation in the area, which is typified by upper catchment topography and ephemeral drainage lines. There are no sandstone shelters in the study area and in this region it appears that the more intense Aboriginal occupation was concentrated in the entrenched sandstone landscapes associated with the Shoalhaven River and its tributaries.

Two Aboriginal sites and one possible historic Aboriginal site were identified during the field survey of the study area, located in the vicinity of Yalwal Road. These are described below.

The first site (referred to as BG1) comprises an artefact scatter with associated potential archaeological deposit (PAD)). The three artefacts that comprise site BG1 are situated 22 metres apart on the southern side of Yalwal Road. The area in which the site is located is a cleared and gravelled section of the road reserve. The potential archaeological deposit associated with BG1 extends approximately 100 metres north of Yalwal Road. In terms of the significance of the site, the cultural heritage assessment report identified that the artefacts are common in type and raw material, and that the site type is the most commonly occurring in southeastern NSW. It noted that the archaeological significance of the potential archaeological deposit cannot be determined from surface indications.

The second site (BG2) is an isolated artefact located on the southern side of Yalwal Road, within the existing cleared transmission line easement. The report identified that the site has minimal potential to be associated with more artefacts or in situ archaeological deposits, and is not considered significant based on the assessment criteria.

The final site (BG3) is a tree with a series of foot-hole scars of possible historic Aboriginal origin. The tree is located 24 metres south of Yalwal Road, 16 metres from the existing overhead powerlines. The report identified that the scarring probably occurred within the last thirty years, and that the ethnic or cultural context of the scarring could not be determined. The report noted that this site may have an Aboriginal origin, and if an Aboriginal origin is accepted, it may have significance within a local context. However as an Aboriginal origin has not been definitively established, the assessment remains provisional.

The location of the sites is shown on Figure 2.3. Information on the management of Aboriginal heritage is provided in Section 9.6.

Historic cultural heritage

The historical cultural heritage assessment undertaken for this proposal (refer Appendix K) identified that that there are no heritage sites listed on national, state or local heritage registers and inventories located within the vicinity of the proposal.

One historic site was identified during field investigations undertaken for the assessment. The site consists of the remains of a house and its grounds and is situated on an elevated terrace adjacent to the eastern bank of Cabbage Tree Creek, to the north of Yalwal Road. Four planted deciduous trees, apparently associated with the grounds of the former house, are located parallel to the northern side of Yalwal Road. In terns of the significance of the site, the historic cultural assessment report identified that the site falls below the threshold where it would be considered significant based on NSW Heritage Office assessment criteria.

Information on the management of non-Aboriginal heritage is provided in Section 9.6.

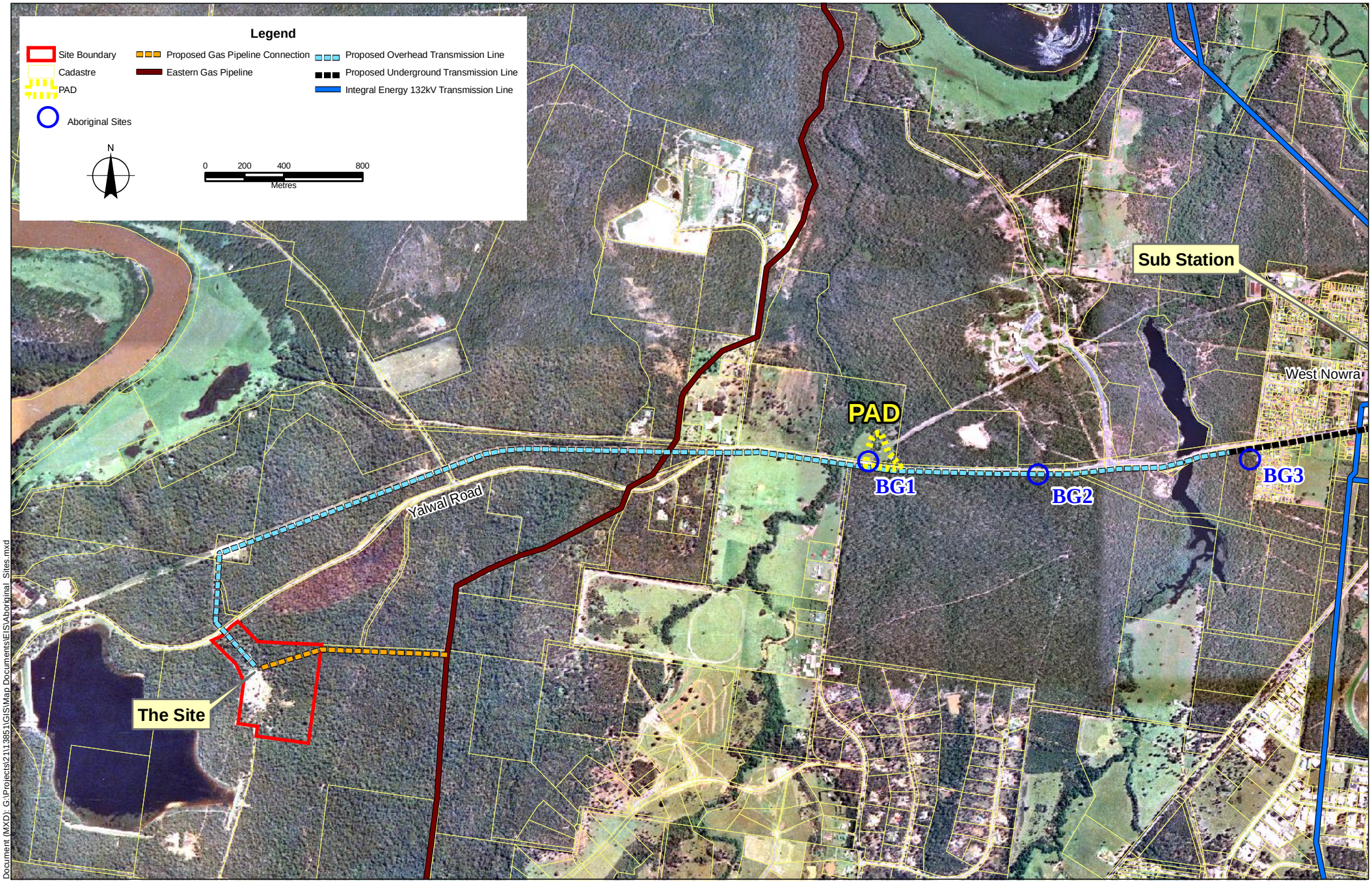


Figure 2.3 Aboriginal Sites

2.2.3 Traffic

Existing Road Network Characteristics

Yalwal Road

Yalwal Road is classified as a local road and travels between Yalwal and Nowra. Based on the review of the traffic data along the eastern section of Yalwal Road (between George Evans Road and Albatross Road) and the road hierarchy classifications developed by RTA, the eastern section of Yalwal Road would be classified as a sub-arterial or a collector road.

Yalwal Road is a two-way road with a speed limit of 100 km/h adjacent to the proposed site. The speed limit along urban sections of Yalwal Road is reduced to 60 km/h, which occurs near the intersection with Albatross Road. Yalwal Road is generally in good condition, except for some deterioration of the road shoulder conditions in the vicinity of the site.

Albatross Road

Albatross Road is classified as a sub-arterial road and provides an important link between Yalwal Road and Kalandar Street. Albatross Road typically has a 6 metres wide sealed carriageway incorporating one lane in each direction. According to RTA's B-Double map routes, Albatross Road has been designed to accommodate B-Double type vehicles.

Kalandar Street

Kalandar Street is classified as a sub-arterial road and provides an important east west road link between Worrigee, the Princes Highway and Albatross Road. Kalandar Street typically has a sealed carriageway width of approximately 7 metres wide, which incorporates one lane in each direction. According to RTA's B-Double map routes, Kalandar Street has been designed to accommodate B-Double type vehicles.

Princes Highway

Princes Highway is a classified State Road, also known as National Route No.1. The route runs north south from Sydney, Wollongong and Nowra along the south coast. The section of Princes Highway that passes through Nowra has three travel lanes in each direction and is designated to accommodate B-Double type vehicles.

Traffic volumes

Traffic data obtained from Shoalhaven City Council was reviewed to understand annual average daily traffic along Yalwal Road. The traffic data was provided for 1997 for a site located to the east of the site, and in 2004 for a count site located near Albatross Road. The data indicated that daily traffic levels ranged from approximately 200 vehicles per day (vpd) to the west of Longreach Road to 5,400vpd as the road travels towards Albatross Road.

No peak hour traffic data was available for Yalwal Road. In order to understand the potential capacity constraints during peak periods it was assumed that typical peak hour conditions represent approximately 10% of total daily traffic (that is, annual average daily traffic). As a result, it is assumed that two way traffic volumes at the eastern end of Yalwal Road would be in the order of 540 during both AM and PM peak hours under current traffic conditions.

Key findings of traffic investigations undertaken by GHD include:

» Yalwal Road accommodates low to moderate volumes of daily and peak hour traffic;

» Peak hour traffic volumes along the eastern section of Yalwal Road are acceptable for a sub-arterial road;

» Peak hour traffic volumes along the western section of Yalwal Road are acceptable for a local road;

» Yalwal Road has some available capacity for additional traffic; and

» Traffic levels along Yalwal Road increase near Albatross Road.

2.2.4 Climate

The nearest Bureau of Meteorology monitoring station is located within the HMAS Albatross base, to the southeast of the site. The climate in the region is characterised by mild conditions, with annual average daily air temperatures ranging between 21.3^{o}C (maximum) and 11.3^{o}C (minimum).

Rainfall within the area is described as moderate, with the HMAS Albatross base station receiving on average 1,093 millimetres per annum.

The relative humidity is described as medium to high, with the mean 9 am and 3 pm relative humidity being 70 percent and 58 percent respectively, with little variation between seasons.

Section 8.1 provides information on air quality and an assessment of the potential impacts of the proposal.

2.2.5 Topography

The site is situated on a plateau, at an elevation of approximately 110 metres Australian Height Datum (AHD). The plateau extends approximately 0.5 kilometres east, before trending downwards to Cabbage Tree Flat and Cabbage Tree Creek, situated at an elevation of approximately 60 metres AHD, some 2 kilometres east of the site.

Land to the north and west slopes downwards toward the Shoalhaven River (approximately 1.8 kilometres north of the site). The land is heavily vegetated, and river flats along the banks of the Shoalhaven River are used for agricultural purposes.

To the south of the site the topography has similar characteristics to the site and does not fall until approximately 1.5 kilometres to the south.

2.2.6 Geology and soils

The site is underlain by quartz sandstone ('Nowra Sandstone'), which is part of the Megalong Conglomerates[1]. The Nowra Sandstone overlies various layers of sandstone, siltstone and shale horizons forming part of the Berry Formation.

The substantial topographical change east of the site is due to a transitional change in lithology, from the Nowra Sandstones to the Berry Formation.

[1] Wollongong 1:250,000 Geological Map Sheet (1966)

Natural soil profiles at the site are likely to comprise a relatively thin veneer of sands and clayey sands, resulting from the weathering of the underlying Nowra Sandstones. These soils, although sandy in nature, are considered to be stable and the site is not expected to require filling or excavation for stabilising works.

There are no known occurrences of acid sulphate soils within the study area.

2.2.7 Hydrology

The following creeks are located in the study area:

» Sandy Creek;

» Cabbage Tree Creek;

» Flat Rock Creek; and

» Nowra Creek.

These creeks drain generally northwards towards the Shoalhaven River.

Two tributaries of Sandy Creek convey surface water west to east across the site. Only a small area of the site drains to Bamarang Reservoir to the west. The majority of the site drains towards Sandy Creek, located to the east.

Further information on the existing hydrological environment of the site and surrounds, and an assessment of the potential impacts of the proposal, is provided in Section 8.5.

2.2.8 Ecology

The site is located within a predominately rural bushland setting. The central portion of the site (approximately 2.5 hectares) was cleared as part of the abattoir development.

Some regrowth has occurred since the site was cleared. Scattered native trees occur on the cleared areas, with groundcover mainly comprising native grasses. The remainder of the site contains bushland that extends into and beyond the adjoining properties owned by the Crown and Shoalhaven City Council.

There are ten ecological communities within the study area, one of which is identified as an endangered ecological community under the *Threatened Species Conservation Act 1995*. Additionally, a number of rare or threatened Australian plants and endangered or regionally significant ecological communities have been identified within the study area.

The existing transmission line corridors/easements located near the site contain mainly grass cover. The use of existing corridors/easements would ensure minimal disturbance to existing vegetation.

Further information on the ecological environment, and an assessment of the potential impacts of the proposal, are provided are provided in Section 8.3.

2.2.9 Noise

Potentially sensitive receivers within the vicinity of the site are limited to isolated residences on rural allotments. The site is approximately 750 metres from the nearest residence, which is a caravan located on the site known as ‘Make it Mudbricks’, located on the northern side of Yalwal Road.

Noise monitoring was undertaken at three representative receivers, including two to the north of the site (the 'Make it Mudbricks' site and a dwelling on Bamarang Road) and one to the east (in Gannet Road near the rural residential subdivision). These were considered to be representative of the local noise environment.

No significant traffic or existing industrial noise sources are present within the vicinity of the site. The noise monitoring results indicate a noise environment that is primarily dominated by local fauna (birds). Background noise levels are relatively low which is indicative of a rural environment with low traffic levels.

Section 9.2 provides information on the management of noise.

Chapter 3. Statutory framework

3.1 Permissibility of the proposal

3.1.1 Shoalhaven Local Environmental Plan 1985

The site for the proposal falls within Shoalhaven LGA and therefore the Shoalhaven Local Environmental Plan 1985 (the Shoalhaven LEP) applies. The permissibility of the proposal under the LEP is considered below with respect to its main components.

Proposed facility

The site for the proposed facility is zoned 1(d) Rural "D" (General Rural) under the Shoalhaven LEP (refer to Figure 3.1). Power generation works (excluding wind-power generators) are not listed as a prohibited use, or a use not requiring development consent in zone 1(d). As a result, the proposed facility is permissible with consent.

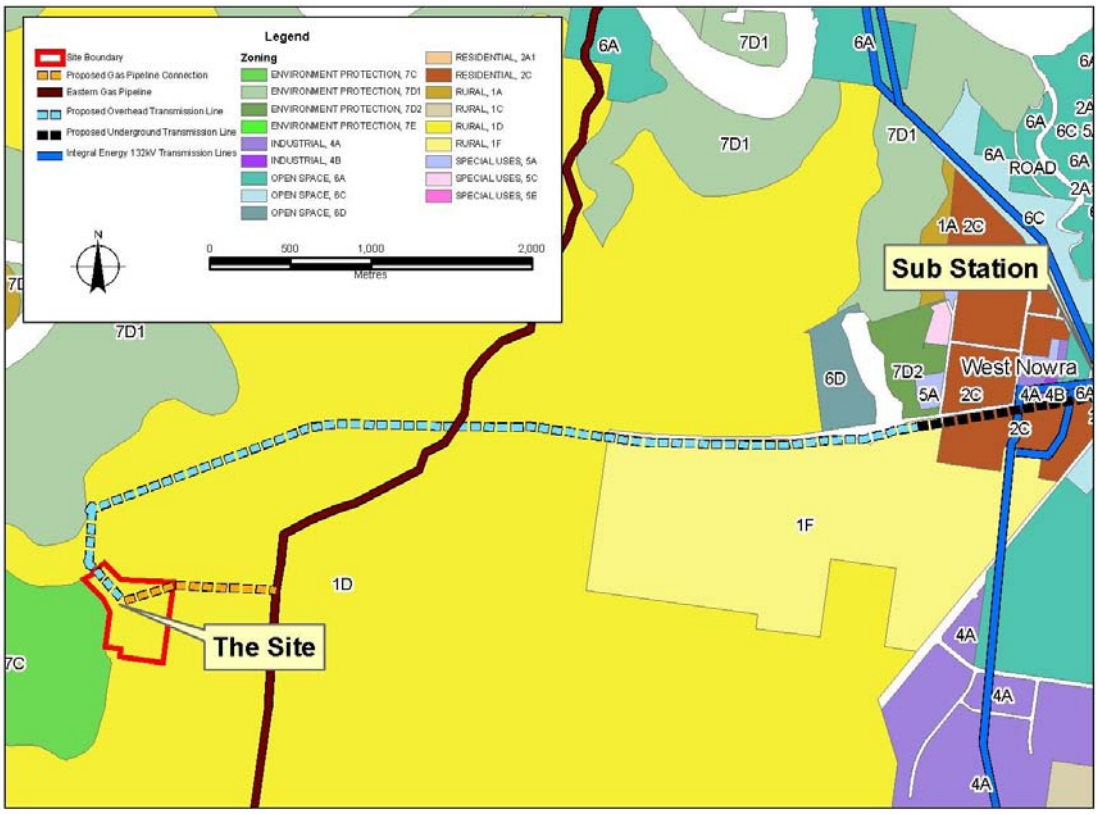


Figure 3.1 Zoning (Shoalhaven LEP 1985)

Proposed pipeline and transmission line

The proposed pipeline is located in land zoned 1(d). Under the LEP, utilities such as gas supply lines are not included as a prohibited use, or a use not requiring development consent in zone 1(d). As a result, the proposed pipeline is permissible with consent.

The above ground section of the proposed transmission line passes through zones 1(d), 1(f) Rural "F" (Forest) Zone and 7(d1) (Environment Protection "D1" (Scenic) Zone), as well as unzoned land (land shown uncoloured on the zoning map).

In zone 1(d) the transmission line is not listed as a prohibited use, or a use not requiring development consent. As a result, they are permissible with consent according to the requirements of this zone.

Utility installations are permissible with consent in zones 1(f) and 7(d1).

Clause 36 of the Shoalhaven LEP indicates that development consent is required for works within land shown uncoloured on the zoning map:

> *'36 Development of land shown uncoloured on the map*
>
> *(1) Development, including the clearing of vegetation and trees, shall not be carried out on any land shown uncoloured on the map without the consent of the Council.*
>
> *(2) Notwithstanding subclause (1), a public authority does not require Council's consent to clear vegetation or trees within road reserves shown uncoloured on the map.'*

The need for development consent for the proposed transmission line is overridden by clause 54D of the LEP, which states:

> *'54D Certain development by public authorities*
>
> *If, in the absence of this clause, development by or on behalf of a public authority, being:*
>
> *(a) the construction of water storage dams, or*
>
> *(b) sewage treatment works, or*
>
> *(c) electricity transmission lines,*
>
> *may be carried out with development consent, the development may be carried out without that consent.'*

Furthermore, clause 5 of the Shoalhaven LEP adopts selected model provisions from the *Environmental Planning and Assessment Model Provisions 1980,* including Clause 35 (except for clause 35(c)):

> *'35 Savings*
>
> *Nothing in the local environmental plan shall be construed as restricting or prohibiting or enabling the consent authority to restrict or prohibit:*
>
> *(a) the carrying out of development of any description specified in Schedule 1,*
>
> *(b) the use of existing buildings of the Crown by the Crown.'*

Schedule 1, paragraph 2 states (in part):

> *'The carrying out by persons carrying on public utility undertakings, being water, sewerage, drainage, electricity or gas undertakings, of any of the following development, being development required for the purpose of their undertakings, that is to say:*
>
> *(a) development of any description at or below the surface of the ground …*
>
> *(d) the provision of overhead service lines in pursuance of any statutory power to provide a supply of electricity'*

As the proposed pipeline and transmission line fall within the definition of 'public utility undertakings' listed in Schedule 1, clause 35 overrides the need for development consent for this infrastructure.

In summary, under the Shoalhaven LEP, development consent is required for the proposed facility, but not for the proposed pipeline or transmission line. However, in accordance with the requirements of Part 3A of the EP&A Act, approval is required from the Minister for Planning for the proposal as a whole. Further information is provided in the following section.

3.2 Approval authority

3.2.1 Part 3A of the Environmental Planning and Assessment Act 1979

Part 3A of the EP&A Act commenced on 1 August 2005. The new part of the Act consolidates the assessment and approval regime for all major projects that need the approval of the Minister for Planning. Previously these were dealt with under Parts 4 and 5 of the Act. The new Part 3A applies to State government infrastructure projects, developments previously classed as State significant, and other projects, plans or programs declared by the Minister. It provides a separate streamlined and integrated development assessment and approvals regime for major infrastructure and other projects of significance to the State.

Clause 75B states:

> *'(1) General*
> *This Part applies to the carrying out of development that is declared under this section to be a project to which this Part applies:*
>
> *(a) by a State environmental planning policy, or*
>
> *(b) by order of the Minister published in the Gazette.'*

Additionally, clause 75B(3) states:

> *'If part of any development is a project to which this Part applies, the other parts of the development are (subject to subsection (4)) taken to be a project to which this Part applies.'*

According to Clause 75D, the Minister is the approval authority for Part 3A projects:

> *'(1) A person is not to carry out development that is a project to which this Part applies unless the Minister has approved of the carrying out of the project under this Part.*
>
> *(2) The person is to comply with any conditions to which such an approval is subject.'*

According to *State Environmental Planning Policy (Major Projects) 2005*, the proposed facility component of the proposal is a project to which Part 3A of the EP&A Act applies (see Section 3.2.2).

Delta intends to seek concept approval for the project in accordance with clauses 75M-P of the Act. A concept plan assessment and approval process provides for a proponent to obtain an approval upfront of the concept of a major, complex project prior to undertaking more detailed studies in relation to implementing the various components of a project (as required). This provides for matters such as the suitability of a site/route and environmental issues to be resolved up-front and provides for the simplification of subsequent approvals where environmental impacts can be avoided or minimised.

Concept plan approvals are used for the assessment and approval of more complex projects where there is a benefit in having strategic issues (including the overall justification of the project and suitability of a site) determined up-front, prior to undertaking more detailed assessment if required.

Delta is seeking a concept approval for the proposal for the following reasons:

» The proposed facility is a staged project and there is uncertainty regarding timing of the second stage, which requires large volumes of water to be supplied. As a result, it is not possible at this time to confirm and secure the water resource (from either current wastewater streams or the existing fresh water supply network) and determine a water pipeline route. If water were not available, Delta would have to revert to dry cooling for the stage two operations, which is more costly and less efficient. Prior to commencing stage two, Delta would need to further investigate and confirm the availability of water.

» The detailed design of the infrastructure connections is dependent on the input of operators of the gas and electricity networks. Preferred routes have been identified for the environmental assessment, however the detail of power pole locations and gas pipeline construction would be decided later.

3.2.2 State Environmental Planning Policy (Major Projects) 2005

State Environmental Planning Policy (Major Projects) 2005 (the Major Projects SEPP) was gazetted on 25 May 2005. The Major Projects SEPP clarifies what constitutes a major project for the purposes of Part 3A of the Act.

The aims of the SEPP are:

> *'(a) to identify development to which the development assessment and approval process under Part 3A of the Act applies,*
>
> *(b) to identify any such development that is a critical infrastructure project for the purposes of Part 3A of the Act,*
>
> *(c) to facilitate the development, redevelopment or protection of important urban, coastal and regional sites of economic, environmental or social significance to the State so as to facilitate the orderly use, development or conservation of those State significant sites for the benefit of the State,*

(d) to facilitate service delivery outcomes for a range of public services and to provide for the development of major sites for a public purpose or redevelopment of major sites no longer appropriate or suitable for public purposes,

(e) to rationalise and clarify the provisions making the Minister the approval authority for development and sites of State significance, and to keep those provisions under review so that the approval process is devolved to councils when State planning objectives have been achieved.'

Clause 6 of the SEPP defines Part 3A projects:

'(1)Development that, in the opinion of the Minister, is development of a kind:

(a) that is described in Schedule 1 or 2, or

(b) that is described in Schedule 3 as a project to which Part 3A of the Act applies, or

(c) to the extent that it is not otherwise described in Schedules 1–3, that is described in Schedule 5,

is declared to be a project to which Part 3A of the Act applies.'

The proposed facility is considered to meet the definitions included within Schedule 1 as it is an electricity generation facility with a capital investment value of more than $30 million. Schedule 1 (Part 3A projects—classes of development) includes under group 8 (transport, energy and water infrastructure):

'24 Electricity generation

Development for the purpose of an electricity generation facility that:

(a) has a capital investment value of more than $30 million for gas or coal-fired generation, or co-generation, or bioenergy, bio-fuels, waste gas, bio-digestion or waste to energy generation, or hydro or wave power generation, or solar power generation, or wind generation'

3.2.3 Summary

» The proposed facility is a project to which Part 3A of the EP&A Act applies.

» Under clause 75B(3) of the EP&A Act, the other parts of the development (that is, the proposed pipeline and transmission line) are also subject to Part 3A.

» The environmental assessment and approval requirements specified by Part 3A of the EP&A Act applies to the proposal as a whole.

» The Minister for Planning is the approval authority for the proposal, and an application for approval must be made to the Department of Planning.

» Delta intends to seek a concept approval for the proposal.

3.3 The application process

The application and assessment process for the proposal is summarised below.

3.3.1 Assessment requirements

Planning focus meeting

For complex projects, the Department of Planning convenes a planning focus meeting with relevant government authorities. The meeting provides a forum for participants to obtain information on the proposal, and discuss key issues and potential environmental impacts. Following the meeting, the Department seeks written comments from agencies on issues that should be addressed in the environmental assessment.

A planning focus meeting was convened by the Department of Planning on 18 July 2005 at Shoalhaven City Council's office. It involved a presentation on the project and a site visit. The meeting was attended by the following organisations:

» Department of Planning;

» Department of Energy, Utilities and Sustainability;

» Department of Environment and Conservation (NPWS);

» Shoalhaven City Council and Shoalhaven Water;

» Delta; and

» GHD.

Director-General's Requirements

Under clause 75F of the Act, the Director-General is required to prepare and issue the proponent with requirements for undertaking the environmental assessment. These identify key issues to be addressed and the level of assessment required.

The Director-General's Requirements for the proposal were issued on 18 August 2005. A copy of the requirements is included in Appendix A. The matters raised by the Director-General for consideration are outlined in Table 3.1 together with the section of this report that addresses the matter.

Table 3.1 Director-General's Requirements

Issue category	Requirement	Document reference
General requirements	Executive summary	Executive summary
	Design of the proposal	Chapter 6
	Location of the proposal	Chapter 2
	Applicable environmental planning provisions	Chapter 3
	Consideration of alternatives	Chapter 7
	Assessment of impacts with a focus on the key assessment requirements	Chapter 8 and 9
	Mitigation/management of residual impacts	Chapter 10
	Justification for undertaking the project	Chapter 11
	Draft statement of commitments	Chapter 10
Key assessment requirements	Strategic justification	Chapter 5
	Greenhouse gases	Section 8.2
	Air quality	Section 8.1
	Infrastructure provision	Section 6.4
	Flora and fauna	Section 8.3
	Water consumption and water cycle management	Section 8.5
	Bushfire safety	Section 8.4
Consultation requirements	Need to consult with nominated agencies	Chapter 4

Exhibition

If the environmental assessment is considered to meet the requirements, the Department will place it on public exhibition for at least 30 days. During the exhibition period, submissions will be invited from relevant agencies and members of the public.

The Department will provide Delta with a copy of the submissions or a summary of the issues raised in the submissions. Delta will be asked to respond to the issues and may modify the project and the draft Statement of Commitments to minimise impacts on the environment if required.

If the proposal or statement of commitments is modified in response to issues raised, a Preferred Project Report would be prepared to describe the scope of the revised project. The Director-General would make this report public.

Assessment and determination

Following the exhibition period, the Department will, on behalf of the Minister, review the environmental assessment, any preferred project report, and submissions received. Once the Department has completed its assessment, a draft assessment report will be prepared for the Director-General, which may include recommended conditions of approval.

The recommended conditions will refer to the Statement of Commitments and may modify them and/or add additional provisions.

The assessment report will then be submitted to the Minister for determination. The Minister may refuse the project, or approve it with any conditions considered appropriate.

The Minister's determination and the Director-General's report will be published on the Department of Planning's web site immediately following determination.

3.4 Other relevant environmental planning instruments

3.4.1 Regional environmental plans

The Illawarra Regional Environmental Plan (REP) No. 1 (gazetted in 1986) applies to the Shoalhaven LGA. The stated aim of this plan is to

> *'maximise the opportunities for the people of the region and the State to meet their individual and community economic and social needs with particular reference to the way in which these needs are related to the allocation, availability, accessibility and management of the region's land resources having regard to the objectives specified in Parts 2–16, by:*
>
> *(a) identifying regional planning issues and provisions applicable or potentially applicable:*
>
> *(i) to actual development which may be carried out on land within the region, and*
>
> *(ii) to the overall planning of the region consistent with the policies for draft local environmental plan preparation specified in Part 2–16,*
>
> *(b) advising Government, public authorities and other persons in determining the way in which they may:*
>
> *(i) manage their land resources,*
>
> *(ii) exercise their functions,*
>
> *(iii) order their priorities and allocation of their funds in relation to the planning of the region, having regard to the principles specified in Parts 2–16, and*
>
> *(c) establishing parameters and controls relating to development, particularly as they relate to the environmental quality and social well-being of residents of the region.'*

Relevant provisions of the REP are summarised below:

Part 2 Rural lands

The proposal is consistent with objective (i) 'to provide for developments which by virtue of their character require siting away from urban areas.'

No specific requirements for rural lands under the REP are relevant to the proposal.

Part 5 Energy

The objectives relating to energy are:

> *(a) to ensure that planning decisions take into account the need to safeguard energy resources for future use and to reduce or limit energy use in new development,*
>
> *(b) to facilitate, with respect to transport and power generation, a reduction from dependence on petroleum to greater dependence on coal resources, and*
>
> *(c) to ensure that planning decisions are made having regard to the need to provide electricity generating and transmission facilities to satisfy present and future needs for electrical energy.*

Clause 45 (Provision of sites for generation of electricity) states:

> *'Adequate provision of suitable sites for the generation of electricity, drawing on reliable water resources, and for transmission of power to centres of demand, is necessary and should be facilitated by the planning system.'*

3.4.2 State environmental planning policies

Other SEPPs that potentially apply to the proposal are considered below.

State Environmental Planning Policy No. 11 - Traffic Generating Developments

The objectives of State Environmental Planning Policy (SEPP) 11 are to ensure that the Roads and Traffic Authority (RTA) is made aware of the implications of developments likely to generate significant traffic impacts, and to provide the RTA an opportunity to make representations in respect of such developments.

Developments to which the Plan applies are listed in Schedules 1 and 2 of SEPP 11. The proposal does not meet the descriptions in these schedules. As a result, SEPP 11 does not apply to the proposal. However, the RTA was consulted during the environmental assessment process. The issues raised by the RTA are summarised in Chapter 4.

State Environmental Planning Policy No 33 - Hazardous and Offensive Development

SEPP 33 aims to identify proposed developments that have the potential for significant off-site impacts, in terms of risk and/or offence. If a development is likely to result in significant risks and/or offences to off-site receptors (for example as a result of storage of significant quantities of dangerous goods, noise and odour impacts), it is considered to be a hazardous and/or offensive development.

SEPP 33 requires that, in determining whether a development is hazardous, consideration must be given to current circulars or guidelines. The guideline relevant to SEPP 33 is 'Applying SEPP 33 – Hazardous and Offensive Development Guidelines'.

Hazardous Developments (Risk Impacts)

SEPP 33 defines a 'hazardous industry' as 'a development for the purposes of an industry which, when the development is in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed would pose a significant risk in relation to the locality: (a) to human health, life or property; or (b) to the biophysical environment.'

A potentially hazardous industry is one that would impose significant risks if it were to operate without measures to mitigate risk.

SEPP 33 requires that a preliminary hazard analysis (PHA) be prepared for potentially hazardous industries. SEPP 33 also applies to hazardous storage establishments.

Advitech prepared a PHA for the proposal. The PHA concluded that the cumulative risk values were below the Hazardous Industry Planning Advisory Paper criteria for all adjacent land uses. Appropriate risk management and mitigation procedures would form part of the design of the proposal. This would ensure that the potential hazards and risks are maintained at an acceptable level. Further information is available in Chapter 9.

Offensive Developments (Offence Impacts)

SEPP 33 defines an 'offensive industry' as 'a development for the purposes of an industry which, when the development is in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed would emit a polluting discharge … in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land in the locality.'

A potentially offensive industry is one that would emit a polluting discharge in a manner that would have a significant adverse impact, if it were to operate without measures to mitigate these impacts.

As the proposal requires an environmental protection licence from the Environment Protection Authority (EPA) under the *Protection of the Environment Operations Act 1997* (POEO Act) it is a 'potentially offensive development'.

If the EPA considers that the proposal can be issued with an environmental protection licence to monitor and manage offensive impacts, it will not be considered an offensive development, and the requirements of SEPP 33 will be met.

Following consideration of potential air, noise and water impacts (refer Chapters 8 and 9) it is concluded that, subject to the implementation of recommended mitigation measures, the proposal would not emit a polluting discharge leading to significant adverse impacts on the locality.

State Environmental Planning Policy No 44 – Koala Habitat Protection

SEPP 44 aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas. As the Shoalhaven LGA is included in Schedule 1 of the SEPP, SEPP 44 needs to be considered.

According to SEPP 44, it is necessary to determine whether the site is subject to the proposal is 'potential koala habitat'.

The site would represent potential koala habitat if it supported any of the tree species listed in Schedule 2 of the SEPP and their presence representing at least 15% of the total number of trees in the upper or lower strata of the tree component. If the site is not potential koala habitat then all requirements of SEPP 44 have been met. However, if the site *is* potential koala habitat, the environmental assessment needs to establish whether the site is core koala habitat (that is, an area of land with a resident population of koalas, evidenced by attributes such as breeding females (females with young) and recent sightings of and historical records of a population).

Core koala habitat requires a plan of management to be prepared, either at the environmental assessment stage, or prior to site clearing/construction.

Considering most recent record 1986 (DEC 2005) and the amount of survey effort that has been undertaken in that area in the recent past and the current farmland areas, it is considered unlikely that koalas would inhabit the site. As a result, it would not represent core koala habitat. Given that core koala habitat was not identified at the site, a plan of management is not required.

State Environmental Planning Policy No. 55 – Remediation of Land

The aims and objectives of SEPP 55 are to provide a state-wide planning approach to contaminated land remediation. It also promotes the remediation of contaminated land to reduce the risk of harm.

SEPP 55 restricts consent authorities from issuing a consent for development on land that may be contaminated. Consent may be granted if the consent authority is satisfied that the land is suitable for development or would be suitable for development if appropriate remediation were undertaken.

Site contamination issues are considered in Section 9.3.

3.5 Other legislative requirements

3.5.1 NSW legislation

Protection of the Environment Operations Act 1997

Activities required to obtain a licence under the POEO Act are detailed in Schedule 1 of the Act. Schedule 1 includes:

> *'Electricity generating works (including associated water storage, ash and waste management facilities) that:*
>
> *(1) supply or are capable of supplying more than 30 megawatts of electrical power from energy sources (including coal, gas, bio-material or hydro-electric stations), but not including from solar powered generators*

The proposal satisfies this definition, as it would produce more than 30 megawatts of power. An environmental protection licence under the POEO Act will be required.

Threatened Species Conservation Act 1995

The potential impact of the proposal on matters covered by the TSC Act is considered in Section 8.3. The flora and fauna assessment concluded that the proposal is unlikely to have a significant impact on threatened species or endangered ecological communities.

National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* provides the basis for legal protection and management of Aboriginal sites in NSW. The implementation of the Aboriginal heritage provisions in the Act is the responsibility of the Department of Environment and Conservation (DEC).

An Aboriginal cultural heritage assessment was undertaken for the proposal (refer to Section 9.6). Three Aboriginal objects and sites were identified. The assessment concluded that the sites are of low archaeological significance in the regional context, however, mitigation and management measures have been proposed to ensure that any potential impacts can be managed effectively.

Rivers and Foreshores Improvement Act 1948 and the Water Management Act 2000

Under Part 3A of the EP&A Act, approvals under Part 3A of the Rivers and Foreshores Improvement Act 1948 and Sections 89-91 of the Water Management Act 2000 are not required. Nevertheless, the works still need to comply with all relevant Government policy. The need to minimise the potential for erosion and sedimentation to impact on local waterways has been considered during development of the proposal. Potential impacts and mitigation measures are detailed in Chapter 8.5.

3.5.2 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The primary objective of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) is to 'provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance.'

Environmental approvals under the EPBC Act may be required for a 'action' likely to have a significant impact on:

(a) matters of national environmental significance (known as 'NES matters'), or

(b) the environment on Commonwealth land (whether or not the action is occurring on Commonwealth land).

Approval for such an action may be required from the Commonwealth Minister for Environment and Heritage.

An 'action' is considered to include a project, development, undertaking, activity or series of activities. NES matters include:

» World Heritage Areas;

» National Heritage Places;

» Ramsar wetlands of international importance;

» Nationally listed threatened species and ecological communities;

» Listed migratory species;

» Nuclear actions;

» Commonwealth marine areas; and

» Commonwealth heritage places.

There is no Commonwealth land affected by the proposal.

Chapter 4. Consultation

4.1 Community consultation

4.1.1 Consultation activities during the environmental assessment

Community scan

A community scan was conducted to identify key stakeholders. This involved:

» Discussions with Shoalhaven City Council and Delta;

» An online search of the Shoalhaven City Council Community Services Directory and the NSW Community Services Directory; and

» Review of stakeholders identified as part of previous planning activities for the proposal.

Feedback mechanisms

At the beginning of the environmental assessment process the following contact facilities were established to provide the community with a range of ways to contact the project team, gain access to information and provide comment.

Information line:	1800 810 680
Email:	communityinput@ghd.com.au
Freepost address:	Gas Power Facility EIS GHD Reply Paid 65079 10 Bond Street Sydney NSW 2000
Website:	www.bamaranggasturbines.com.au

Contact and issues database

A contact and issues database (an MS Access application) was set up to manage the contact details, contacts made and the issues in raised in submissions received.

Each stakeholder was assigned a unique stakeholder identification number and all contacts made with the project team were recorded in the database. The database was used to track any enquiries or submissions received.

Advertisement

An advertisement was placed in the South Coast Register on 17 August 2005 and the Shoalhaven & Nowra News on 18 August 2005. The advertisement announced the proposal and the commencement of technical feasibility and environmental assessment studies. It gave a brief outline of the proposal, canvassed submissions and provided contact details for members of the community who required more information.

Media release

A media release was distributed to local newspapers, TV and radio stations. News coverage occurred on the following dates:

» Friday 19 August 2005:
  – 6.30am news, Nowra 2ST 999am radio
» Monday 29 August 2005:
  – 6.05pm, Wollongong WIN TV
  – 6.30am, 7.30am & 8.30am, news, Nowra 2ST 999am radio
» Tuesday 30 August 2005:
  – 7.30am news, Illawarra NSW Radio

Newsletters

Newsletter 1

A newsletter (including a returnable feedback form) was prepared to introduce the proposal to the community and provide information on the ways that people could find out more information and have their say. A mailing list for the study area was developed based on information provided by Council. Over 700 newsletters were mailed out in mid August 2005. Newsletters were also sent to local community and environmental groups; councillors; State and Federal government members; and others who requested copies by contacting the project team. Copies of the newsletter were left in the Shoalhaven City Council foyer and the Nowra City Library. Copies were also made available for a meeting of the Industrial Development & Employment Committee.

Newsletter 2

A second newsletter was prepared and distributed in early November 2005 to all households that received newsletter 1, and any stakeholders who had contacted the project team since the beginning of the project. The newsletter listed matters raised by the community during the consultation period and provided an update on the progress of the environmental assessment.

Consultation with potentially affected landowners

Property owners who adjoined the site or the proposed transmission corridors were contacted by telephone to notify them of the proposal and seek their permission to enter their property to conduct investigations as part of the environmental assessment. Those contacted were offered the opportunity to meet with members of the project team to discuss the proposal in more detail.

Meetings were held with potentially affected landowners in August 2005. They were provided with an outline of the proposal and given an opportunity to ask further questions of the project team and raise concerns and issues for consideration in the environmental assessment.

Summary of community contacts

Community contacts received by the project team (to 9 November 2005) are summarised in Table 4.1.

Table 4.1 Community contacts

Method of contact	Number of contacts
Calls to the project team	12
Feedback forms returned	24
Emails	7
Letters	2
Internet	1
Total	46

4.1.2 Key issues raised

Of the 24 feedback forms received, seven people expressed their support for the proposal, and two objected to the proposal. A summary of the key issues raised is provided in Table 4.2.

Table 4.2 Community issues

Issue category	Key issues	Document reference
Air quality	Air pollution controls to minimise pollution.	Sections 7.5.3 and 8.1.5
	Impacts of emissions on surrounding areas.	Section 8.1
	The climatic conditions in the area.	Section 8.1.3
	The potential for air pollutants to affect drinking water quality.	Section 8.5.5
Flora and fauna	Impacts on the surrounding nature reserves and wildlife in the area, including habitats supporting threatened species.	Section 8.3
	The extent of clearance of vegetation required for power lines.	Section 8.3.3
Bushfire	Bushfire risk and protection of the facility from bushfire.	Section 8.4
	Access for fire fighting authorities.	Section 8.4.3
Water quality and drainage	Impacts on water quality, including impacts on Bamarang Reservoir.	Section 8.5.5
	The quality and disposal of wastewater.	Section 8.5.4
	The sources of water for stage two.	Section 8.5.2
Noise and vibration	Potential for noise impacts, level of noise, and area of affectation.	Section 9.2

Issue category	Key issues	Document reference
	Whether the turbines would be housed in a building to contain the noise.	Section 9.2.2
	Potential for vibration impacts.	Section 9.2.4
	Noise emissions during stage two, when the steam generators are installed.	Section 9.2.2
Risks and hazards	Potential for the facility to increase risk (including bushfires).	Section 9.4
	Risks associated with the storage and handling of gas.	Section 9.4
Visual impact	Appearance of the facility.	Figure 9.1
	The appearance of the transmission lines.	Figure 9.2
	Visual impact and visibility of the facility.	Section 9.5
	Impacts of more power lines along Yalwal Road.	Section 9.5.1
Traffic	Condition of Yalwal Road and safe access to the facility.	Section 9.7
	Traffic generation (including heavy vehicles) as a result of the proposal.	Section 9.7.1
Other	Electromagnetic radiation.	Section 7.3
	Employment generation.	Sections 6.5.4 and 6.6.2
	Potential for impacts on significant heritage items and sites.	Section 9.6

4.2 Statutory consultation

The following agencies were requested by the Department of Planning to provide input into the Director-General's Requirements:

» DEC; and

» Shoalhaven City Council.

GHD sent the following agencies were sent a letter requesting identification of issues for consideration as part of the environmental assessment:

» Forests NSW;

» Department of Primary Industries, Agriculture & Fisheries Division (DPI);

» Department of Lands;

» Southern Rivers Catchment Authority;

» Roads & Traffic Authority (RTA);

» State Emergency Services (SES);

» NSW Rural Fire Service (RFS);

» NSW Police Service; and

» Commonwealth Department of Defence.

The responses received are outlined in Table 4.3, together with a cross reference to where the issues are addressed in the environmental assessment.

Table 4.3 Issues raised by agencies

Stakeholder	Key issues	Document reference
DEC	Air emissions associated with the operation of the facility.	Section 8.1
	Water issues associated with the water for cooling and boiler feed for Stage two and how this may affect the local environment.	Section 8.5
	Noise associated with construction and operation.	Section 9.2
	Waste issues related to generation and management and storage and disposal methods proposed.	Section 6.4.4
	Impacts of the pipeline construction and operation, water supply and wastewater discharge pipelines.	Chapters 8 and 9
	Construction phase issues relating to erosion and sediment controls, dust and noise abatement measures and construction operational issues.	Chapter 10
	Proposed management and monitoring programs.	Chapters 8 and 9
	Procedures for managing any form of contaminated land on the site.	Section 9.3
Shoalhaven City Council	Consideration of Nowra/ Bomaderry Structure Plan Expansion Areas.	Section 2.2
	Clarification of the visual impacts.	Section 9.5
	Section 94 contributions. A further discussion with Council is recommended.	Noted
	Bushfire planning provisions and regulations.	Section 8.4
	Service corridor from Bamarang into West Nowra.	Section 2.2
	Traffic assessment.	Section 9.7
	Economic/employment implications during construction and operation.	Section 6.5 and 6.6
	Electricity network implications on NSW grid and Shoalhaven/Nowra.	Chapter 5
	Threatened species assessment for works and future expansions.	Section 8.3
	Noise impact assessment.	Section 9.2
	Sustainability assessment.	Section 11.2
	Air emissions assessment.	Section 8.1

Stakeholder	Key issues	Document reference
	Potential contaminated lands.	Section 9.3
	Effluent disposal and wastewater, Storm water measures.	Section 8.5
	Expansion plans.	Chapter 6
	Water availability.	Section 8.5
Department of Primary Industries	Potential impacts on aquatic species and habitats, riparian habitats (temporary and permanent) and water quality, and safeguards to mitigate impacts.	Section 8.3 and 8.5
	Outline water supply requirements of the gas power facility and how these would be met.	Section 8.5
NSW Rural Fire Service	An operation plan detailing measures to prevent fires igniting during construction should be developed in the planning stages (not necessarily in the EA).	Section 8.4
	Observance of the principles of *Planning for Bushfire Protection 2001*, in particular provision of Asset Protection Zones.	Section 8.4
	Consideration of the proposal in relation to *AS3959 – Construction of buildings in bushfire prone areas*.	Section 8.4
	Access arrangements and evacuation procedures outlined in Section 4.3 of *Planning for Bushfire Protection 2001* should be considered.	Section 8.4
	Daily notification of the local RFS control centre of any work to ensure weather conditions are appropriate.	Section 8.4
Southern Rivers Catchment Management Authority	Erosion and sedimentation control.	Section 8.5
	Potential impact on water quality.	Section 8.5
	Potential riparian issues.	N/A
NSW Roads & Traffic Authority	Include evaluation of expected additional traffic resulting from the proposal.	Section 9.7
	Potential impacts on road safety and efficiency of the road network.	Section 9.7
	Identify the type of vehicles associated with the proposal and the routes to be taken.	Section 9.7
	Assess the impact of construction traffic on road safety and efficiency of the road network.	Section 9.7
Department of Defence	The proposed stacks will not infringe any Obstruction Clearance Surface (OCS) for the Naval Air Station Nowra.	Noted
	Need to provide information on plume velocity.	Section 8.1.4

During the environmental assessment process, meetings and/or telephone discussions were undertaken with:

» Shoalhaven City Council;

» DEC;

» National Parks and Wildlife Service (NPWS);

» NSW Rural Fire Service;

» HMAS Albatross;

» Burrier Progress Association; and

» Australian Conservation Foundation.