MAJOR PROJECT ASSESSMENT
Newcastle Coal Infrastructure Group
Coal Export Terminal

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

April 2007

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EXECUTIVE SUMMARY

The Newcastle Coal Infrastructure Group (the Proponent) has lodged a major project application and Environmental Assessment to construct and operate a 66 million tonne per annum (Mtpa) Coal Export Terminal, including associated rail and coal handling infrastructure and wharf/shiploading facilities, on Kooragang Island near the mouth of the Hunter River in the Newcastle local government area.

The project would be constructed and operated in a phased manner, subject to growing market demand. This is likely to result in two general stages of the project: development initially up to 33 million tonnes per annum; and then expansion to 66 million tonnes per annum. The capital cost of the first stage of the project (33 million tonnes per annum) will be in the order of $540 million, with additional investment of $382 million (total $922 million) required to expand the project to 66 million tonnes per annum. The project would employ up to 500 people during its construction phase and up to 100 people during operations (at the maximum capacity of 66 million tonnes per annum).

Over the last twenty years the international demand for coal, more specifically thermal coal which is used to generate electricity has experienced strong growth together with sharp price increases. Australia is the world's largest exporter of coal and accounts for a third of the world's coal trade. The Australian coal industry employs 28,000 people and in 2005-2006 exported coal to the value of $24.5 billion. According to the Australian Bureau of Agricultural and Resource Economics (ABARE), the world's demand for coal is driven by the international coal price and if unconstrained, by the capacity of the coal chain. ABARE adds that Australia's ability to respond to the continuing strong demand for coal, in particular in the Hunter Valley, has been limited as a result of constraints associated with the transport and handling infrastructure of the coal supply chain to the Port of Newcastle.

An Independent Panel of Experts was established by the Minister for Planning on 4 October 2006 to assess specific aspects of the proposal. The Panel held public hearings on the project in November 2006. The Panel's report indicates that the Panel is satisfied that the project could be undertaken within acceptable environmental limits, subject to the imposition of conditions.

The Department has assessed the Environmental Assessment, Statement of Commitments, Response to Submissions Report, the 736 submissions received from the exhibition of the proposal and the Panel's report. The assessment indicates that greenhouse gas emissions, ecological impacts, air impacts and noise impacts were highlighted as requiring further consideration. The Department has generally adopted the Panel's recommendations, where those recommendations directly relate to the project and can be lawfully imposed as conditions of approval. The Department is satisfied that the impacts of the project can be mitigated and/or managed to ensure an acceptable level of environmental performance.

The Department received 736 submissions from the public exhibition of the Environmental Assessment. Many of these submissions centred on the global greenhouse and climatic change impact from the burning of the coal overseas for power generation. The Proponent has provided estimates of Scope 1, Scope 2 and Scope 3 greenhouse gas emissions directly and indirectly associated with the project. While the Department recognises the significant challenges posed by global warming, it is cognisant of the fact current global demand for energy will not be abated through refusal of the proposal for a third coal export terminal in Newcastle Port. Rather, to address global warming in the medium term, a more considered and active approach must be taken at a national and international level to manage energy demands, influence energy/ fuel choice through market-based instruments and introduce and encourage less-greenhouse gas intensive energy generation. A refusal of the subject application will not address or ameliorate global warming impacts, but will prevent the economic benefits of the project from being realised.

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1. BACKGROUND

The Newcastle Coal Infrastructure Group Pty Limited (the Proponent) is a consortium comprising of the following six companies:

- Hunter Valley Energy Coal Limited;
- Centennial Coal Company Limited;
- Donaldson Coal Pty Limited;
- Excel Coal Limited;
- Felix Resources Limited (formerly White Mining Limited); and
- Whitehaven Coal Mining Pty Ltd.

The Proponent proposes to construct and operate a 66 million tonne per annum (Mtpa) Coal Export Terminal, including associated rail and coal handling infrastructure and wharf/shiploading facilities, on Kooragang Island near the mouth of the Hunter River in the Newcastle local government area.

1.1 Location

The project site is located on Kooragang Island approximately 6 km north-west of the Newcastle central business district (CBD). The project is located on lands that are currently administered by the Regional Land Management Corporation (RLMC), NSW Maritime and the Minister for Public Works and Services. The description of the land that makes up the site and its tenure is outlined below in Table 1. The site comprises part of the Kooragang Island Waste Emplacement Facility (KIWEF) and reclaimed land located between the south arm of the Hunter River and existing industrial development on the island. The location of the site in relation to the residential area of Newcastle is shown on Figure 1.

Table 1 - Land Tenure

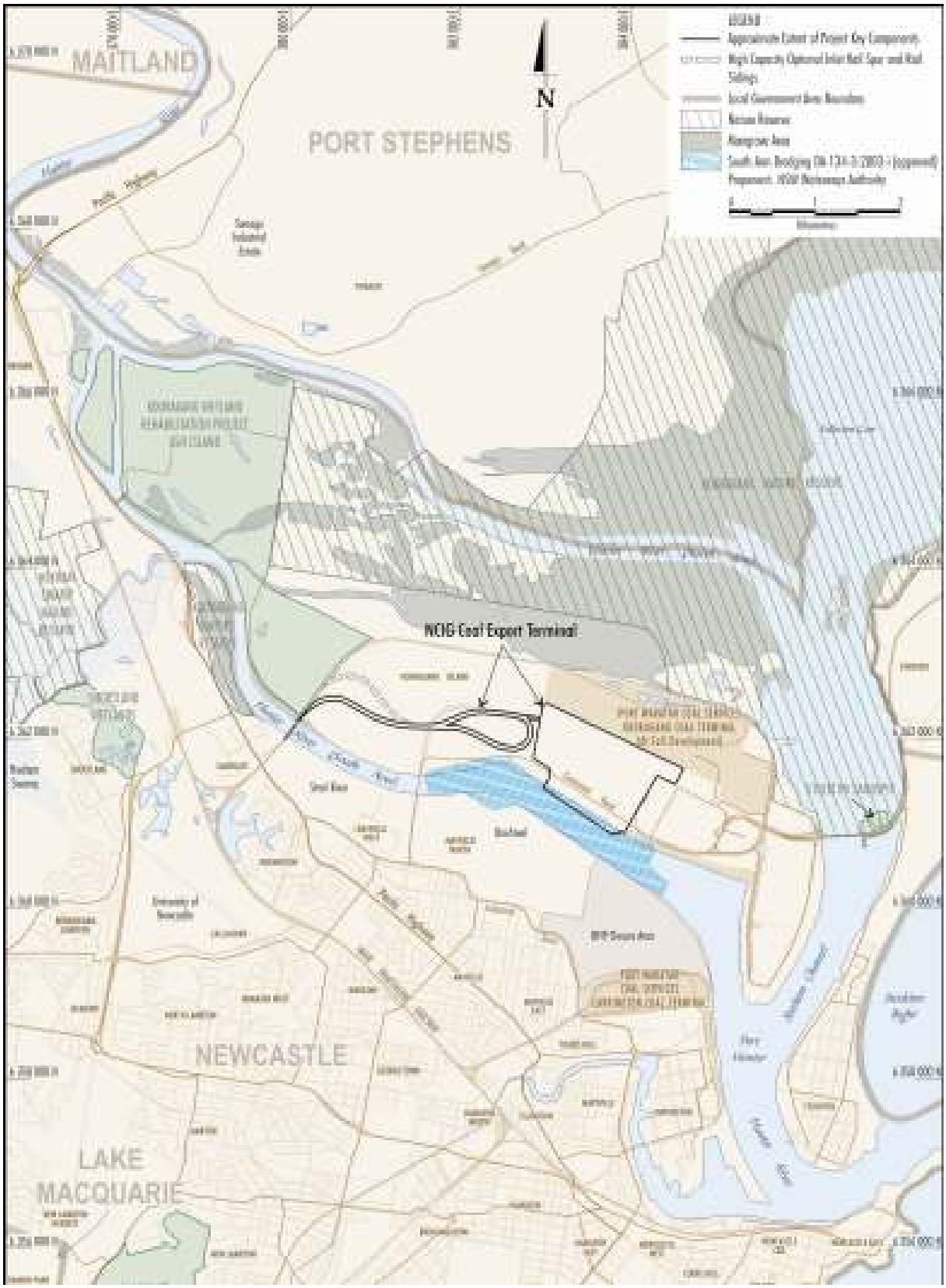
Lot/Deposited Plan (DP)	Land Administrator	Land Owner
Part Lot 122 DP 874949	RLMC	Crown (NSW Treasury Crown Property Portfolio)
Part Lot 7 DP 1015754	RLMC	Minister for Public Works and Services
Part Lot 6 DP 1015754	RLMC	Minister for Public Works and Services
Part Lot 20 DP 262325	NSW Maritime	NSW Maritime
Part Lot 2 DP 581473	Minister for Public Works and Services	Minister for Public Works and Services

1.2 Surrounding Land Use

Kooragang Island is characterised by a combination of port, marine and industrial land uses in the south, the Kooragang Nature Reserve in the north and the Kooragang Wetland Rehabilitation Project to the west. The project site is located on the southern side of Kooragang Island on the south arm of the Hunter River. The current land use of the site comprises licensed landfill facilities and vacant industrial land. Land use in the immediate proximity of the site includes:

- a rail easement (Kooragang Island main line) to the north and west of the site; and
- the Kooragang Wetland Rehabilitation Project to the west of the site beyond the Kooragang Island main line; and
- the south arm of the Hunter River which also forms the southern boundary of the site; and
- public roads (Cormorant Road, Egret Street, and Raven Street) and private roads (Pacific National access road and Delta access road); and
- Blue Circle Southern Cement, Origin Energy and vacant land to the east of the site; and
- Kooragang Island Nature Reserve, Port Waratah Coal Services' Kooragang Coal Terminal and fines disposal area, and Delta EMD Australia's licensed landfill to the north of the site.

Figure 1 - Project Location



Source: Figure 1-2 of Proponents EA (Resource Strategies, 2006)

Figure 2 - Site and Surrounding Land Use

Source: Figure 1-3 of Proponents EA (Resource Strategies, 2006).

2. PROPOSED DEVELOPMENT

2.1 Project Description

The Proponent proposes to construct and operate a 66 million-tonne per annum Coal Export Terminal on Kooragang Island. The general arrangement of the proposed facility which is based on the planned maximum capacity of the site is shown on Figure 3. A schematic flow diagram of proposed operations is provided as Figure 4.

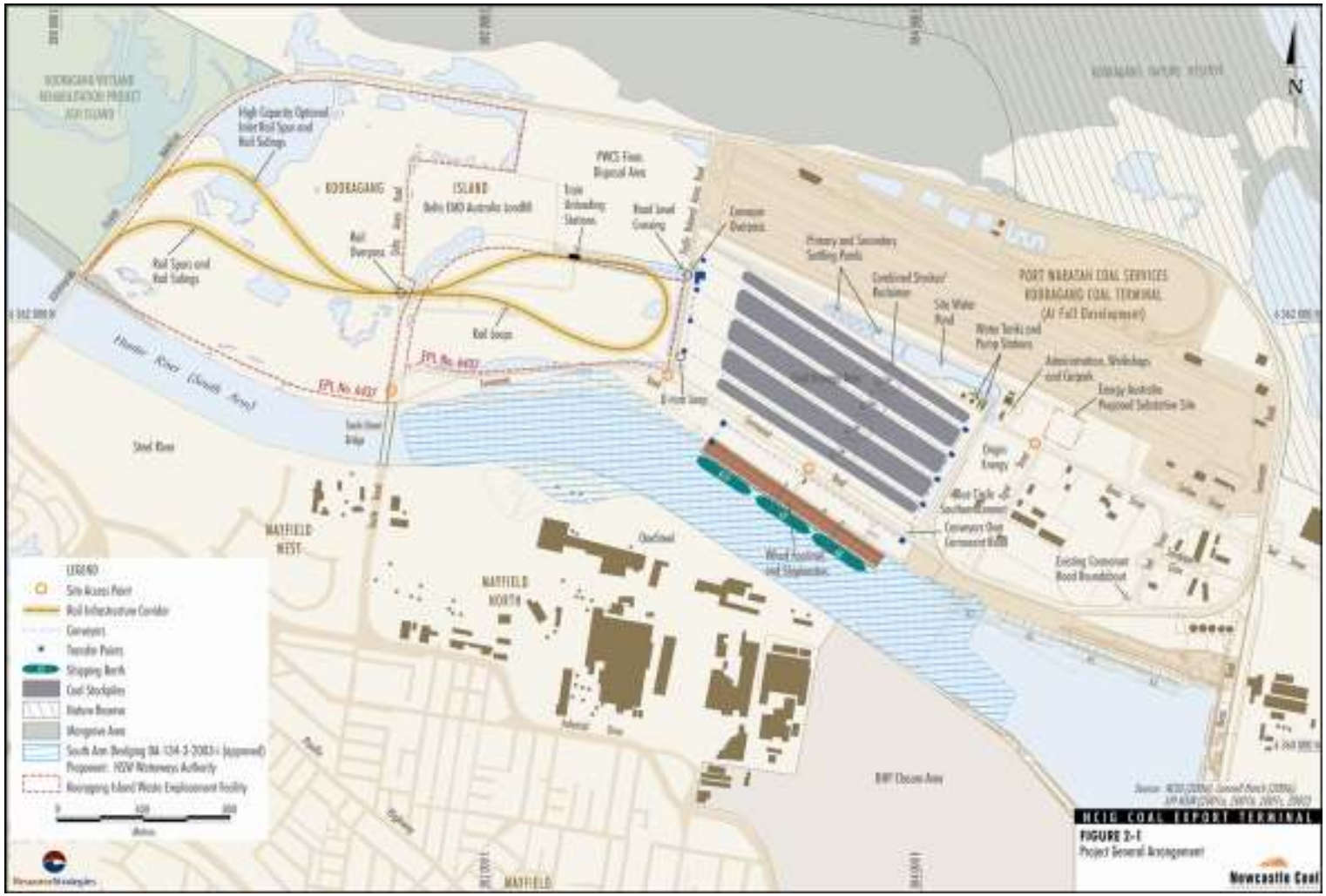
The proposal involves the following activities:

- foundation preparation/capping of a rail corridor traversing the existing KIWEF for the development of the rail spurs, rail sidings and rail loops;
- construction of rail spurs, rail sidings and rail loop, rail overpass, train unloading stations and connecting conveyors;
- re-use of dredged materials from the south arm of the Hunter River as preload and engineering fill for construction of the coal storage area, rail corridor and wharf facilities;
- construction of a coal storage area including coal stockpiles, conveyors, transfer points and combined stacker/reclaimers;
- construction of wharf facilities (three shipping berths), two rail-mounted shiploaders, conveyors and two buffer bins, each capable of storing 2,000 tonnes of coal;
- development of water management infrastructure including site drainage works, stormwater settlement ponds, primary and secondary settling ponds, site water pond, water tanks and stockpile spray system;
- installation of electricity reticulation and control systems;
- development of access roads and internal roads;
- construction of administration and workshop buildings;
- other associated minor infrastructure, plant, equipment and activities; and
- operation of the Coal Export Terminal up to a capacity of 66 Mtpa, including the unloading of coal trains, the stockpiling of coal, and the loading of coal to ships via wharf facilities and shiploaders.

The following three main activities (as shown on Figure 3 and Figure 4**)** would be undertaken during project operations at its maximum capacity of 66 Mtpa:

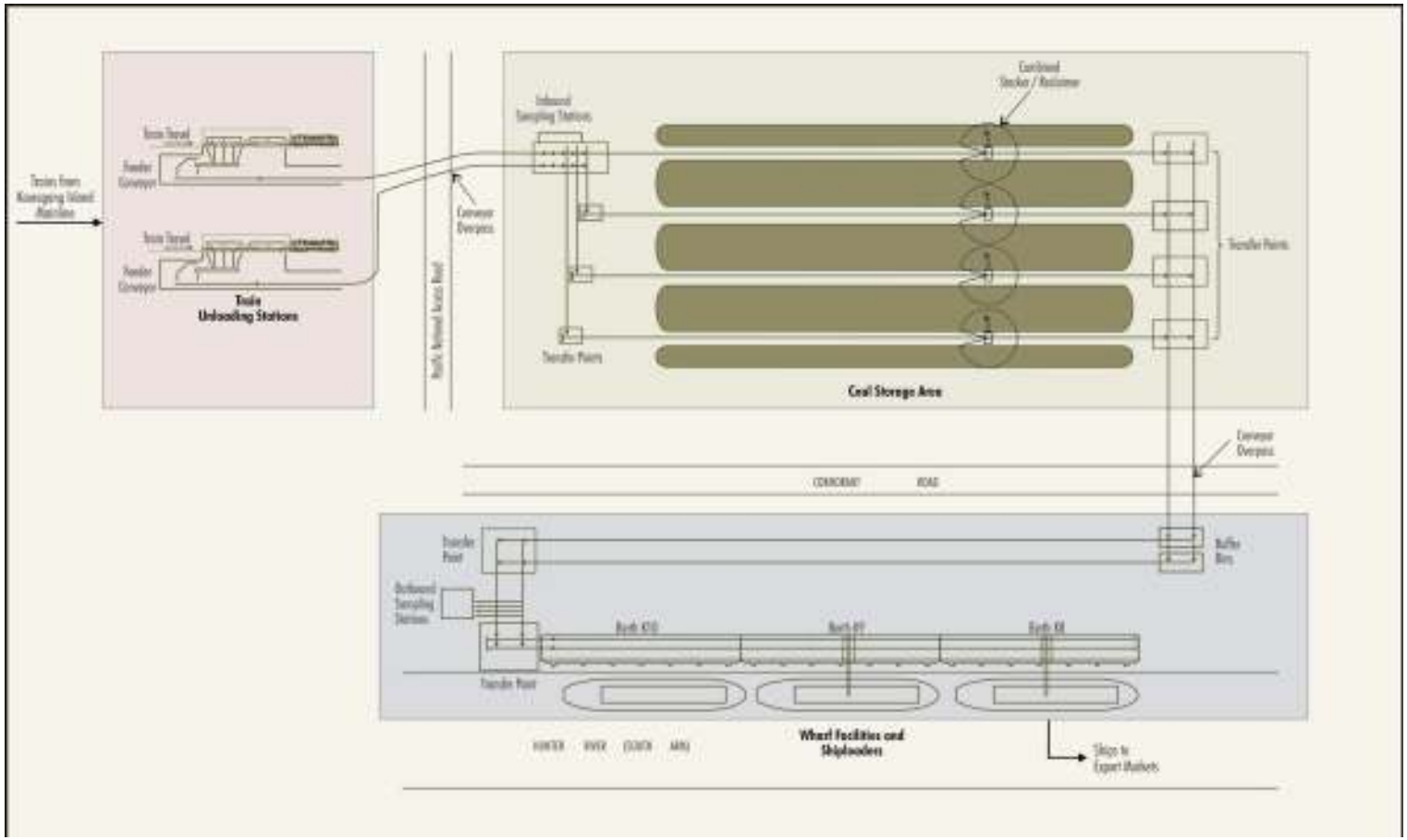
- **Train unloading** – coal trains would enter the site from the Kooragang Island main line, travel along the proposed rail spurs and empty their coal wagons into one of two train unloading stations. Empty trains would then travel around the proposed rail loops and rejoin the mainline. Each train unloading station would have the capacity to unload up to approximately 8,500 tonnes of coal per hour. The project would only receive coal by rail transportation. Based on a nominal 7,000 tonne capacity train, the Proponent expects that an average of 26 trains would be unloaded each day. Allowing time to manoeuvre trains and equipment, the Proponent estimates that the infrastructure on the site would have the capacity to receive up to a maximum of 40 trains per day.
- **Coal handling/stockpiling** – coal would be transferred from the train unloading stations to the coal storage area for stockpiling via stacking conveyors or conveyed directly to the wharf facilities and shiploaders. Up to four combined stacker/reclaimers would be used to stack coal onto the coal stockpiles and reclaim coal via a bucket-wheel. The combined stacker/reclaimers would each have a stacking capacity of up to 8,000 tonnes per hour and a reclaiming capacity of up to 10,500 tonnes per hour. Coal would be reclaimed from the coal storage area and conveyed to the wharf facilities and shiploaders as required.
- **Shiploading** - Shiploaders would operate at a 10,500 tonne per hour nominal capacity and peak at up to 12,500 tonnes per hour when drawing coal from the buffer bins. Based on a 180,000 tonne capacity ship, and allowing for the time taken to manoeuvre ships and equipment, the Proponent expects that up to 12 ships would be loaded per week.

Figure 3 - Project Site Layout



Source: Figure 2-1 of Proponents EA (Resource Strategies, 2006)

Figure 4 - Schematic Flow Diagram



Source: Figure 2-2 of Proponents EA (Resource Strategies, 2006

The construction phase would involve construction and commissioning of rail infrastructure, the coal storage area, wharf facilities and shiploaders. The Proponent expects that an initial construction period of 33 months is required for a project capacity of 33 Mtpa. The expansion of the project to cater for a maximum of 66 Mtpa would occur progressively over time to meet increases in coal export demand as they occur. The Environmental Assessment (EA) indicates that up to 500 people would be employed for the construction of the project.

The southern rail spur, associated three rail sidings, one train unloading station and rail loop would be required for the project to be developed to its initial capacity of 33 Mtpa. The northern rail spur, additional rail sidings, the second train unloading station and duplicated rail loop would be constructed as the throughput capacity is progressively increased up to 66 Mtpa. Similarly, two shipping berths would be constructed for the initial stage with the third berth installed as the project reaches its maximum throughput capacity. On the berth, of the two rail-mounted shiploaders proposed, only one would be required for the initial capacity of 33 Mtpa.

Construction of the project is proposed to commence in 2007 enabling the first shipment of coal to be exported from the site in 2009. The Proponent has indicated that audible construction activities are proposed to take place during daytime hours up to seven days per week.

The Coal Export Terminal is proposed to operate 24 hours per day, seven days per week. The project would employ up to 100 people when operating at its maximum capacity of 66 Mtpa.

The Proponent has estimated that the capital cost of the first stage of the project (33 Mtpa) will cost in the order of $540 million with an additional cost of $382 million to ramp the terminal capacity up to 66 Mtpa.

2.2 Project Need and Justification

2.2.1 World Coal Trade

Coal is currently used to generate 39% of the world's electricity and it is predicted that this figure is likely to remain at this level for the next 30 years.[1] The seaborne trade of thermal coal[2] has increased an average of 8% per year over the last twenty years together with a sharp increase in price. This increase in coal demand is driven mainly by the developing Asian markets, particularly Japan, Korea, Malaysia, India, Chinese Taipei and China.

China is currently both an importer and an exporter of thermal coal, however, although China has considerable coal reserves, it is predicted that it will become an important import market due to a number of factors, including: difficulties in transporting coal from the north of China (where most of its coal reserves are located) to the manufacturing centres in China's south east; closing of small and unsafe coal mines and increases in electricity demand associated with its strong economic growth.[3] China's imports of thermal coal are projected to increase by nearly 40 per cent to 50 million tonnes by 2012. Strong demand for thermal coal is also predicted from the ASEAN (Association of South East Asian Nations) region to an average increase of 4 to 5 per cent due to increasing demand for coal for electricity generation. Similar increases are also expected from the Republic of Korea. The increase in demand for thermal coal is expected to be met by countries such as Indonesia, Australia, South Africa and Colombia. In regards to meeting the Asian demand, both Australia and Indonesia would play an important role since transportation costs account for a large percentage of the total cost of coal. To minimise the transportation costs, world coal trade has been divided into two regional markets; the Atlantic and the Pacific. The Pacific market covers the developing Asian market and it currently accounts for 60% of the world trade.

2.2.2 The Australian Coal Market

Australia is the world's largest exporter of coal with total coal exports valued at $24.5 billion in 2005-2006.[4] The Australian coal industry employs 28,000 people throughout the country concentrated mainly in Queensland and NSW. Australia's coal exports are projected to increase at an average annual rate of 2.7% to reach 395 million tonnes by 2025 (an increase of 30% on 2005 figures). In its projections, ABARE has also employed two other scenarios: high and low export scenarios due to the uncertainties in the coal export market, particularly for

[1] World Coal Institute. *The Global Coal Market.*

[2] The discussion in this section concentrates on thermal coal since this type of coal is heavily represented in the coal exported out of Newcastle Port – the split is 87% thermal coal and 13% metallurgical coal.

[3] abare – australian commodities: march quarter 2007.

[4] ABARE research report 06.15: australian coal exports to 2025.

thermal coal. Table 1 gives an indication of the projected coal exports expected under the different scenarios for both thermal coal which is mainly exported out of NSW and metallurgical coal which is mainly exported out of Queensland:

Table 1: Projected Australian Coal Exports

	2005	2025		
		Low	Reference	High
	Mtpa	Mtpa	Mtpa	Mtpa
Thermal	108	146	184	225
Metallurgical	125	210	210	210
Total	233	353	394	435

Source: ABARE research report 06.15: *australian coal exports to 2025*

The above table highlights that the demand for Australian coal can range anywhere from a low estimate of 146 Mtpa to high estimate of 225 Mtpa in the 2025 timeframe.

2.2.3 Demand for Hunter Valley Coal and the Coal Chain

NSW currently has three export coal terminals; two at Newcastle Port (Kooragang Island and Carrington) with the third located at Port Kembla. The two coal export terminals at Newcastle make Newcastle Port the largest coal exporting port in the world and as such provide significant economic benefits at the regional, state and national levels.

Currently there is substantial pressure on the Hunter Valley coal supply chain, including the existing Hunter Valley Port Facility and the rail network. Bottlenecks in the supply chain are constraining the production and export of coal from the region. If these constraints can be overcome, coal exports from the Hunter Valley are expected to grow.

The Australian Rail Track Corporation (ARTC) is currently proposing upgrades to the capacity of the Hunter Valley rail corridor, with the planned enhancement program expected to move system capacity ahead of anticipated demand.

The Federal Department of Industry, Tourism and Resources recently commissioned the Australian Bureau of Agricultural and Resource Economics (ABARE) to undertake a study to examine the bottlenecks in the development of the coal transport industry in Australia. ABARE was commissioned to assess the following:

- current and future demand for coal in the Hunter Valley;
- capacity of coal producers to meet current and expected future demand for coal in the Hunter Valley;
- whether current rail and port infrastructure is sufficient to support estimated coal exports from the Hunter Valley over the medium term; and
- potential economic costs of infrastructure constraints in the Hunter Valley coal supply chain.

The report: *Infrastructure Issues in the Hunter Valley Coal Supply Chain* (ABARE 2005), predicts a higher international demand for Hunter Valley coal. This report quotes a predicted demand which ranges between 130 Mtpa and 200 Mtpa by 2015**.** In addition, Hunter Valley coal exports will continue to grow beyond the current capacity of the coal chain[5]. PWCS's current customers have provided binding commitments for future coal shipments which exceed the current combined approved capacity of 102 Mtpa for both Carrington and the Kooragang Island terminals.

According to ABARE it is important to note that there is some level of uncertainty in terms of future medium to long term demand for Hunter Valley coal especially due to the Kyoto Protocol coming into force and the potential for Japanese climate change policies resulting in a decrease in demand for both thermal and metallurgical coal. ABARE adds that any potential decrease in demand is likely to be offset by the increase in demand from countries such as China, as discussed above.[6]

[5] The term 'coal chain' refers to the cycle of coal production from mining to end-use.

[6] *Delivering Reliable Australian Coal Exports to the World – Coal Transport Infrastructure* – A report commissioned by xxxx

The world demand for coal is driven by international coal prices, and if unconstrained, by the capacity of the coal chain capacity. A recently released report by ABARE entitled *australian coal exports to 2025,* quotes that:

> *Constraints in coal transport and handling infrastructure in New South Wales and Queensland in recent years have limited Australia's capacity to respond to the unforseen strong growth in world coal consumption.*

The above statement particularly relates to thermal coal and the Hunter Valley 'coal chain' and its limitations to meet the increasing demand for coal from the rapidly growing Asian markets. Based on 2006 figures, the coal exported from Newcastle Port is destined for Japan (59%), Taiwan (14%), Korea (10%), Mexico (7%), and others (10%).

2.2.4 Queueing at Newcastle Port

The ability of individual Hunter Valley coal producers to meet potential market demand depends on there being sufficient capacity in the coal supply transport chain, namely the infrastructure associated with rail and port facilities. In February 2007, Newcastle Port experienced record numbers of ships (78) queuing offshore waiting to be loaded with coal. PWCS loads on average 80 ships per month but currently the size of the queue is 71 vessels. The average waiting time per ship is up to 25 days which is impacting on the coal producers through demurrage[7] cost which can be up to $1 million per day. The subject proposal would alleviate existing shipping delays by providing additional berths (3 berths at full capacity), thereby, increasing the overall capacity and efficiency of Newcastle Port. The Proponent expects that up to 12 ships per week would be loaded from the proposed coal export terminal.

2.2.5 Department's Position

The current approved capacity of the Kooragang Coal Terminal is 77 Mtpa and according to 2006 figures, it is already handling 60 Mtpa. The NCIG proposal would provide increased capacity in the order of 66 Mtpa, therefore, the overall capacity of Newcastle Port would be 211 Mtpa (120 KCT plus 25 Carrington plus 66 NCIG). Considering the buoyancy of the coal export market as noted above, Australian exporters require that the 'coal chain' is unrestricted to meet the rapid growth in demand for thermal coal especially from markets in Asia. The PWCS and NCIG proposals ensure that there is enough capacity in the coal chain well beyond 2015.

If one considers the worst case scenario, that is, continued constraints to the Hunter Valley 'coal chain,' ABARE estimates that losses in coal export revenue would be in the order of up to $7.9 billion in net present value terms in the ten years to 2015. Losses to the NSW Gross State Product would be in the order of $8.6 billion and 1934 coal industry jobs.

If unconstrained by the limitations of the coal supply chain, ABARE estimates that coal producers in the Hunter Valley could supply over 200 Mtpa of coal by 2015. However, even with the proposed expansion of the existing coal terminals by PWCS[8] and the planned upgrade of the railway system by ARTC the ability of the Hunter Valley coal producers to meet the expected export demand is constrained by the Port of Newcastle. There would be lost export potential every year from the present to 2015 and beyond if the existing supply chain infrastructure is not significantly expanded to cater for the expected growth in coal export. The socio-economic assessment undertaken as part of the EA indicates that the lost opportunity to export coal would represent a significant economic cost to the coal industry and therefore also to the NSW and Australian economy.

Role of the Project

The project would enable the construction and operation of a Coal Export Terminal up to a maximum capacity of 66 Mtpa to meet the market export demand for coal. It is considered that once the project is operational in its first stage of 33 Mtpa there would be no constraint for coal producers to meet market demand to 2015 provided that

[7] Where vessels are required to wait longer than specified time to load goods, the vessel owners charge demurrage to users such as coal producers.

[8] The Department of Planning is currently assessing a Project Application (Application No. 06_0189) and Environmental Assessment as part of plans by Port Waratah Coal Services Limited to increase the capacity throughput of its Kooragang Coal Terminal to 120 million tonnes per annum (current approved capacity 77 million tonnes per annum). The increase in capacity would be undertaken through operational efficiencies and upgrades to plant and equipment.

rail infrastructure capacity upgrades also keep pace. On the basis of market forecasts, the timing of the second stage of the project (i.e. to 66 Mtpa) would occur after 2015. The timing of the second stage would be sensitive to changes in world coal prices and the demand for coal.

If the project and ARTC upgrades of rail infrastructure are not approved and the existing capacity restriction in the Hunter Valley coal supply chain remains, the socio-economic assessment indicates that this would result in an opportunity cost to society between approximately $700 million and $6,000 million net present value. While there is uncertainty regarding future coal prices and export demand, there are potentially significant benefits to the NSW and Australian economies that would be foregone if the proposal was not developed due to the existing limitations on the coal supply chain in the Hunter Valley.

According to the Australian Coal Association's website, coal produces 24% of the global energy demand, second only to oil (35%) and is used to produce 39% of the world's electricity. It is expected that the demand for coal will continue to rise in the global market as Third World countries increasingly develop and therefore demand coal for their energy requirements. The construction and operation of the proposed Coal Export Terminal would ensure that port capacity constraints are removed and both NSW and Australia can capture the economic benefits of meeting increasing world coal demand for coal.

The project may also provide competition to the Port of Newcastle for coal export shiploading services and therefore this could potentially reduce demurrage costs borne by coal producers associated with current delays in shipping.

2.3 Related Planning Approvals and Applications

The environmental assessment of the proposed coal export terminal potentially interacts with a number of planning approvals and applications:

- the development consent granted by the Minister for Planning on 9 August 2005 with respect to the dredging and remediation of the South Arm of the Hunter River;
- the current project application for the upgrade and expansion of the existing Kooragang Coal Loader; and
- other current and potential future applications for planning approvals for new and/ or expanded coal mines in New South Wales.

Submissions received during the exhibition of the subject project application and Environmental Assessment have raised concerns over the interaction of the project with other planning approvals and applications, particularly with respect to the scope of the assessment for the dredging of the South Arm of the Hunter River and the potential for the project to drive demand for the proliferation of coal mining.

Dredging and Remediation of the South Arm of the Hunter River

NSW Maritime holds a development consent (DA-134-3-2003-i) granted by the Minister for Planning on 9 August 2005 for the extension of shipping channels within the port of Newcastle. This consent includes the dredging, excavation, treatment and disposal of sediments from the South Arm of the Hunter River. The Proponent clearly states in the Environmental Assessment that dredging of the South Arm of the Hunter River, adjoining to and on the project site, does not form part of the current project application. The Environmental Impact Statement prepared for dredging operations (Waterways Authority, 2003) specifically contemplates co-ordination of the dredging authorised under the dredging consent with the development of associated "land-based facilities" and the beneficial reuse of clean dredged spoil. Therefore, the Proponent or its contractor could undertake dredging of the South Arm of the Hunter River on behalf of NSW Maritime in accordance with the dredging consent.

The Proponent has reiterated as part of its Response to Submissions Report that only clean sediment dredged from the South Arm of the Hunter River would be used as fill on the project site.

The Department is satisfied that the impacts of the dredging and remediation works within the South Arm of the Hunter River have been adequately and appropriately assessed and determined in accordance with the *Environmental Planning and Assessment Act 1979*. No further assessment of that development is required. It is highlighted that the use of clean materials dredged from the Hunter River was assessed by the Proponent in the Environmental Assessment for the coal export terminal.

Cumulative Impacts with the Expansion of the Kooragang Coal Terminal

Port Waratah Coal Services' proposal to increase capacity throughput of its coal terminal at Kooragang Island has been assessed side by side with the NCIG proposal. This is because both projects potentially would have similar impacts on the surrounding environment and amenity, particularly in terms of noise and air impacts. The recommended conditions of approval have addressed this issue by including a specific condition which requires both NCIG and PWCS (if it secures planning approval) to prepare a *Coordinated Environmental Monitoring and Management Protocol*. Prior to the commencement of construction NCIG, in consultation with PWCS, is required to prepare the Protocol which would include a framework for the coordinated and cooperative monitoring and management of environmental impacts from the developments, particularly in relation to dust and noise emissions.

Interaction with Coal Mining Proposals in New South Wales

The Environmental Assessment prepared for the project does not seek the approval for any new mining operations as part of the project. The Environmental Assessment, however, indicates that there is a strong global demand for coal which has, in turn, led to a sharp increase in world coal prices. There is currently substantial pressure on the Hunter Valley coal supply chain which includes the Newcastle Port and the associated rail network. Bottlenecks in the supply chain are currently constraining the production and export of coal. The socio economic assessment undertaken for the project indicates that if these bottlenecks are overcome, coal exports from the Hunter Valley are expected to grow. Australian Rail Track Corporation is currently proposing upgrades to the capacity of the Hunter Valley rail corridor.

The proliferation of new coal mines in the Hunter and surrounding regions was raised as an issue by a large number of submissions (81%). Many of the submissions indicated that the project would not be viable without a large increase in coal production as a result of an increase in coal mining activity. It was also suggested that new coal mines proposed to be opened in the Gloucester Basin, Gunnedah Basin as well as in the Hunter would be linked to the coal export terminal.

Many submissions have argued that assessment of the project must take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity proposed. The submissions indicate that the impacts of the proposed coal export terminal cannot be credibly or accurately assessed in isolation from the impacts of increased mining activity generated from the construction and operation of the project. The submissions also state that the project would not be viable without a large increase in coal production – requiring a major expansion of coal mining activity throughout NSW.

The Department considers that it is in fact global energy demand that is driving the need for the new coal export terminal and for additional coal mining proposals in New South Wales. The coal export terminal does not generate the need for additional coal mining in and of itself – it will, however, connect supply and demand for coal. Construction and operation of the coal export terminal in the absence of international demand for coal would not lead to a proliferation of new and/ or expanded coal mines.

Environmental impact assessments will be undertaken for each new coal mine in New South Wales, in accordance with and required by the *Environmental Planning and Assessment Act 1979*. The Department does not consider that any current or future coal mining proposal is sufficiently proximate to the proposed coal export terminal to be defined as part of the current project application.

3. STATUTORY CONTEXT

3.1 Major Project

The project is declared to be a Major Project under *State Environmental Planning Policy (Major Projects) 2005* because it is development for the purposes of port and wharf facilities which have a capital investment value of more than $30 million (clause 22). On 19 April 2006, the Director-General, under delegation from the Minister, formed the opinion that the project meets the requirements of the Major Projects SEPP and thus declared the project to be a major project under Part 3A of the *Environmental Planning and Assessment Act 1979* (the Act).

3.2 Director-General's Requirements and Adequacy of Environmental Assessment

The Director-General's requirements for the preparation of an Environmental Assessment were issued on 26 April 2006. For the purpose of section 75I(2)(g) of the *Environmental Planning and Assessment Act 1979*, the Environmental Assessment for the project complied with the Director-General's requirements and the Proponent was notified of this compliance on 1 August 2006.

3.3 Environmental Planning Instruments

There are no State Environmental Planning Policies (SEPP) that apply to the proposal that substantially govern the carrying out of the development with the exception of *State Environmental Planning Policy No. 74 – Newcastle Port and Employment Lands*. SEPP 74 applies to land in the south-west of the project site. The aims of this Policy are to:

- Promote and co-ordinate the orderly and economic development of certain land in the local government areas of Port Stephens and Newcastle City.
- Promote the economic development of the Port of Newcastle while promoting the conservation of natural and cultural heritage in the lower Hunter.
- Facilitate the carrying out of certain types of industrial and infrastructure development of State significance with a strong commitment to sustainable environmental performance.
- Enable public involvement and participation in the assessment of applications for consent to carry out this development.

It is considered that the project complies with the aims of the SEPP. Clause 10 outlines additional matters that are required to be considered by the consent authority, as follows:

- The cumulative air and other environmental impacts of the development or activity and any other development in the vicinity of a development or activity to which this Policy applies.
- The efficiency of the utilisation of resources, including energy, water and raw materials.
- The minimisation and management of waste.
- The minimisation of visual impacts, including the restoration of native vegetation.
- The likely effects of the development on local and regional societies and economies.
- The adequacy of consultation undertaken by the applicant or proponent with potentially affected land owners and communities.
- Minimisation of direct or indirect impacts to National Parks and Wildlife Service estate, Ramsar estate and other habitat for wildlife.
- Minimisation of direct or indirect impacts to natural and cultural heritage values, including important vegetation communities, threatened species and migratory species and key habitats and corridors.
- The impact of the development or activity on the distribution of floodwater within the Hunter River estuary.

The Department has considered the above matters as part of its assessment of the project.

The *Newcastle Local Environmental Plan, 2003* applies to the site. The site includes land zoned Zone 4(b) (Port and Industry Zone) and Zone 5(a) (Special Uses Zone – Arterial Road). The Hunter River is unzoned under the *Newcastle Local Environmental Plan, 2003*. The project would be permissible on lands zoned Zone 4(b), Zone 5(a) and the unzoned land of the Hunter River. The project is therefore not partially prohibited or "wholly prohibited" within the meaning of section 75J(3) of the Act.

The principal objectives of Zone 4(b) (Port and Industry Zone) are to:

- accommodate port, industrial, maritime industrial, and bulk storage activities which by their nature of the scale of their operations require separation from residential areas and other sensitive land uses.
- require that development of land within 750 metres from the high water mark of the shores of the Port of Newcastle, capable of docking ocean-going vessels, is used for purposes that:
  - require a waterfront location that provides direct access to deep water, or
  - depend upon water-borne transport of raw materials or finished product, or
  - have a functional relationship that necessitates proximity to the activities described above.
- facilitate sustainable development through the application of industrial ecology.
- provide for other development which will not significantly detract from the operation of large scale industries or port-related activities, that is primarily intended to provide services to persons employed in such industries and activities.

The Department considers that the project is consistent with the above objectives.

3.4 Exhibition and Notification

The project application and Environmental Assessment were placed on public exhibition from Thursday 10 August 2006 to Friday 8 September 2006 and submissions invited in accordance with section 75H of the Act. Exhibition locations were as follows:

- Department of Planning's head office in Sydney;
- Department of Planning's regional office in Newcastle;
- Newcastle City Council; and
- Nature Conservation Council.

The Environmental Assessment was also provided for download on the Department's internet site, and the Proponent's site making it quicker and easier for the public to access the document at any time of the day or night. Notification of the exhibition period was made through two separate advertisements in the Newcastle Herald on 10 August 2006 and again on 24 August 2006.

When the Minister appointed an Independent Panel of Experts to review the proposal, an advertisement was also placed in the Newcastle Herald on 19 October 2006 to inform the community of the appointment. In addition, letters were sent to everyone who made a submission about the project giving them information about the Panel and requesting them to contact the Department if they were interested in either talking to the Panel or making a presentation of their submission to the Panel during the round table meetings held in November at Newcastle City Hall.

3.5 Role and Activities of the Independent Panel

Given the high level of community interest in the project and concerns over impacts by local residents, special interest groups and government agencies, on 4 October 2006, the Minister for Planning directed that an Independent Panel of Experts be established to assess specific aspects of the proposal in accordance with section 75G(1)(a) of the Act. The Minister appointed Mr Allen Kearns (Chair), Mr Peter D'Abreton and Mr Neil Gross to constitute the Panel. The Minister also directed that the Panel was to consider and advise on the following terms of reference:

1. *The following aspects of the project:*
   - *Noise and vibration impacts associated with the project.*
   - *Air quality impacts, particularly dust and cumulative dust impacts.*
   - *Ecological impacts, particularly on amphibian and avian species, endangered ecological communities, and surface water and groundwater dependent ecosystems.*
2. *Relevant issues raised in submissions in regard to these impacts.*
3. *The adequacy of the Proponent's response to the issues raised in submissions.*

The Panel was provided with a copy of all the submissions received during the exhibition period (names of individual submitters were blacked out for privacy reasons), a draft copy of the Proponent's Response to Submissions Report as well as the Environmental Assessment document to review and consider in light of the above terms of reference.

The Panel presented its report, including detailed findings and recommendations, to the Director-General of the Department of Planning on 7 February 2007. A copy of the Panel's report is included as Appendix D to this report, with the Panel's findings and recommendations considered in the relevant sections of this report.

The Department has generally adopted the Panel's recommendations, where those recommendations directly relate to the project and can be lawfully imposed as conditions of approval. The Department has, however, diverged from the Panel's recommendations in the following key areas:

1. in consultation with the DEC, the Department has recommended imposition of more stringent noise limits than recommended by the Panel. The more stringent noise limits are based on what the Proponent has demonstrated as being reasonably and feasibly achievable. The Proponent has accepted the more stringent noise limits.
2. the Panel recommended that the Department leads discussions with other State Government agencies and stakeholders to establish a regional cumulative impact assessment study of the social, ecological and economic costs and benefits of the coal mining industry and coal supply chain in the Hunter Valley. As this is a much broader issue than the proposed coal export terminal, the Department has not recommended conditions of approval to give effect to this recommendation.
3. the Panel has recommended that a levy of at least $1 per tonne of coal exported be applied to all new coal exports, with proceeds invested in an ethical coal trust to support community initiatives and sustainable development in the Hunter Valley. The Department considers that this issue is beyond the scope of the current project application, and potentially beyond the scope of the planning system, and has therefore not recommended conditions of approval to give effect to this recommendation.

Notwithstanding, the Department will separately pursue these recommendations with the relevant Government agencies and in the broader policy context of State and Commonwealth jurisdictions. This is the most appropriate approach to address the broader recommendations made by the Panel, outside the scope of the subject project application.

3.6 Objects of the Environmental Planning and Assessment Act 1979

Public submissions received in response to the exhibition of the Environmental Assessment for the project, and presentations made at the public hearings of the Independent Panel have placed a strong emphasis on the principles of ecologically sustainable development. In general terms, submissions have argued that the project is not consistent with these principles, and if not refused on that basis, should be refused as being in contravention of the objects of the *Environmental Planning and Assessment Act 1979* which themselves refer to the need to encourage ecologically sustainable development. Some submissions go so far as to suggest that the project would be in contravention of *all* of the objects of the Act. While perhaps not as explicitly stated as in public submissions, the report prepared by the Independent Panel also places an emphasis on the principles of ecologically sustainable development.

It is a recognised principle that the objects of a particular statute provide the overarching framework that informs the purpose and intent of the legislation, and gives guidance to the application and operation of the sections of the legislation. This is particularly relevant when one considers discretionary and/ or decision-making functions such as the determination of the subject project application by the Minister for Planning. In this circumstance, the Minister's consideration and determination of the application must be informed by the relevant provisions of the *Environmental Planning and Assessment Act 1979*, consistent with and against the backdrop of the objects of the Act. Section 5 of the *Environmental Planning and Assessment Act 1979* details the objects of the legislation, as follows:

The objects of this Act are:

(a) to encourage:

- *(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
- *(ii) the promotion and co-ordination of the orderly and economic use and development of land,*
- *(iii) the protection, provision and co-ordination of communication and utility services,*
- *(iv) the provision of land for public purposes,*
- *(v) the provision and co-ordination of community services and facilities, and*

(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and
(vii) ecologically sustainable development, and
(viii) the provision and maintenance of affordable housing, and

(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and

(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.

Of particular relevance to the environmental impact assessment and eventual determination of the subject project application by the Minister are those objects stipulated under section 5(a). Relevantly, the objects stipulated under (i), (ii), (vi) and (vii) are significant factors informing determination of the application (noting that the project does not raise significant issues relating to matters such as public lands, community services or affordable housing). With respect to ecologically sustainable development, the *Environmental Planning and Assessment Act 1979* adopts the definition in the *Protection of the Environment Administration Act 1991*, including the precautionary principle, the principle of inter-generational equity, the principle of conservation of biological diversity and ecological integrity, and the principle of improved valuation, pricing and incentive mechanisms.

In light of the above, the Department generally concurs with statements in submissions that the principles of ecologically sustainable development are relevant matters framing the assessment and determination of the project application for the proposed coal export terminal. It is important to recognise, however, that while the *Environmental Planning and Assessment Act 1979* requires that the principles of ecologically sustainable development be encouraged, it provides other objects that must equally be included in the decision-making process for the subject project application.

The Proponent undertook an assessment of how the project satisfies the principles of ecologically sustainable development as part of its Responses to Submissions Report (Additional Responses to Submissions (December 2006). This document also outlined the downstream impacts of the project in relation to the generation of greenhouse gas emissions from the end combustion of fuel overseas. The coal that will be transported from the proposal will be exported overseas and subsequently burned to produce energy and result in the generation of 161M TCO_{2e} per annum which represents 0.5% of total global greenhouse gas emissions in 2010. While this is an increase in global greenhouse gas emissions, the Department does not consider that the increase is significant when balanced with the many benefits that the project would provide, particularly to the local and regional economy of New South Wales.

The Proponent has stated that mineral-based industrial materials and the provision of adequate, reliable and affordable energy are essential to meeting the needs of people in both developed and developing countries. Access to energy remains a critical development need, particularly for the one-third of the world's population without electricity. Therefore, a balance is required between the promotion and co-ordination of the orderly and economic use and development of land, the proper management and development of our resources and the protection of the environment and ecologically sustainable development.

4. CONSULTATION AND ISSUES RAISED

The application for the project and accompanying Environmental Assessment were publicly exhibited from Thursday 10 August 2006 to Friday 8 September 2006. During the exhibition period a total of 736 submissions were received. Submissions were received from state and local government agencies, various private organisations and special interest groups, and the local community. Of the total submissions received, 97.8% objected to the proposal, 0.4% clearly stated support for the project, and the remaining 1.8% did not explicitly state a position on the project, but raised concerns or made comments on the proposal. The submissions ranged from various versions of form letters to more substantial individual letters.

Approximately 40% of submissions were received from post code areas in and around Newcastle, Maitland and Port Stephens (those areas potentially directly affected by aspects of the project). The remainder of submissions were received from the Sydney region (27%), rural and regional NSW (17%) and locations outside NSW (16%).

In addition to the abovementioned submissions, a petition organised by Climate Action Newcastle was received, dated 17 November 2006, containing 699 signatures indicating objection to the proposal based on environmental, social and economic grounds (particularly the stated contribution of the project to global climate change from the burning of coal overseas).

4.1 Submissions from State and Local Government

Submissions were received from four State government agencies and from Newcastle City Council:

- NSW Department of Environment and Conservation – **does not object to the project** subject to a number of conditions being imposed. The DEC considers that the project can operate within relevant air quality criteria and has suggested that the Proponent and the operator of the existing Kooragang Coal Terminal jointly establish and maintain a comprehensive ambient dust monitoring program to monitor dust using real-time technology. In addition, the DEC recommended conditions with respect to noise and vibration, implementation of off-sets for creation of habitats and supports the creation of habitat for the Green and Golden Bell Frog and shorebirds/saltmarsh. The DEC does not support the use of Hunter Water Corporation potable water supply to supplement stormwater harvesting for dust control.
- NSW Department of Primary Industries – **raises concerns** over the loss of three hectares of saltmarsh and 50 hectares of freshwater wetland habitats, and suggests that compensatory habitat on a 2 for 1 replacement basis should be pursued. DPI considers that the focus should be on migratory birds and threatened amphibians. DPI also recommends that investment areas should be located further upstream from Kooragang, for example the Big Pond as proposed by DEC for the Austeel project.
- Hunter-Central Rivers Catchment Management Authority – **raises a series of concerns** over impacts on ecology, water management, cumulative impacts and traffic. The Authority does not believe that the current rehabilitation within the Kooragang Nature Reserve (KNR) and KWRP should not be considered as compensation for the proposal since KWRP is compensation for habitat lost in the estuary prior to 1993 and KNR is already a designated conservation area. The Authority considers that compensatory habitat should establish new areas of environmental conservation in addition to existing conservation areas and has suggested that options could exist on parts of the KWRP not presently designated for rehabilitation and also land on Ash Island. The Authority also raises concerns and provides recommendations in relation to the impact of the railway spur on Green and Golden Bell Frog and waterbird habitat, the management of hydrological connections between Deep Pond and Pond H, the extent of financial contributions for rehabilitation works and the impact of upgrading electrical infrastructure on wetland hydrology. The Authority also considers that the Flora and Fauna Management Plan should have been part of the Environmental Assessment and be reviewed prior to the project's determination. The Tourle Bridge should accommodate four lanes of traffic to allow for increased traffic and emergency contingencies and an allowance made for cyclists.
- Newcastle Port Corporation – **supports the proposal**, but has indicated that the precise location of berths K8, K9 and K10 along the south arm of the Hunter River is not consistent with the location agreed between the Corporation and the Proponent. The Corporation has also recommended a number of specific requirements for consideration as conditions of approval related to prevention of the pollution of waters, prevention of marine pests, port security, dangerous goods, navigational aids, port operations and design approval requirements.

- Newcastle City Council – **raises concerns**, particularly in relation to the lack of detailed information provided for flora and fauna mitigation measures and the timing of compensatory habitat. Council has a number of concerns related to the proposal including that compensatory habitat should be constructed or established prior to the disturbance of existing habitat on site, the impacts of the route for the high capacity optional rail spur on Deep Pond and associated flora and fauna species (Council recommends that the northern rail spur be removed from the current application), noise and vibration impacts from construction works outside normal construction hours, noise impacts from increased rail traffic in the region, dust from construction activities, air quality impacts from increased shipping, the suitability of the site for its intended use, and flood and stormwater management issues.

4.2 Submissions from Private Groups and Organisations

Submissions were received from the following community and special interest groups and organisations:

- Nature Conservation Council of NSW;
- Johnsons Creek Conservation Committee;
- Central West Environment Council Inc;
- Australian Student Environment Network;
- The Wilderness Society Newcastle Branch Inc;
- Hunter Community Environment Centre;
- Mudgee District Environment Group Inc;
- Sutherland Shire Environment Centre;
- Rising Tide Newcastle;
- Newcastle University Students Association;
- Greenpeace Australia Pacific Ltd;
- Hunter Bird Observers Club Inc;
- Nambucca Valley Conservation Association;
- Total Environment Centre;
- Anvill Hill Project Watch Association;
- Hornsby Conservation Society;
- Climate Action Newcastle;
- EcoNetwork – Port Stephens Inc;
- Clarence Environment Centre; and
- Citizens and Kooragang Alliance.

The main issues raised by the abovementioned organisations included impacts from the proposal on greenhouse gas emissions and global climatic change, the proliferation of new mines in the Hunter Region and the Gunnedah Basin as a result of the operation of the proposal, impacts to threatened species and endangered ecological communities including the Green and Golden Bell Frog, impacts of dredging the south arm of the Hunter River and impacts to migratory bird species and Ramsar wetlands. Many of the submissions received also stated that the Environmental Assessment was considered to be inadequate as it did not contain an assessment of the proposal's contribution to climate change from exported coal or the impacts from potential new mines that would result in the region.

Only one private organisation and/or industry group made a submission regarding the proposal and this was from the operator of the existing Kooragang Coal Terminal, Port Waratah Coal Services Limited (PWCS). PWCS is concerned with the potential hydraulic interaction associated with shipping movements to the new berths past PWCS existing and future berths K4, K5, K6 and K7. Hydraulic interaction can cause a moored vessel to move relative to the berth which has the potential to damage operational shiploaders. PWCS indicates that the Environmental Assessment does not assess the potential impact of hydraulic interaction between vessels and has requested that the proposal not be determined until it is confirmed that shiploading activities at PWCS berths will not be adversely affected by vessel movements associated with the Proponent's activities.

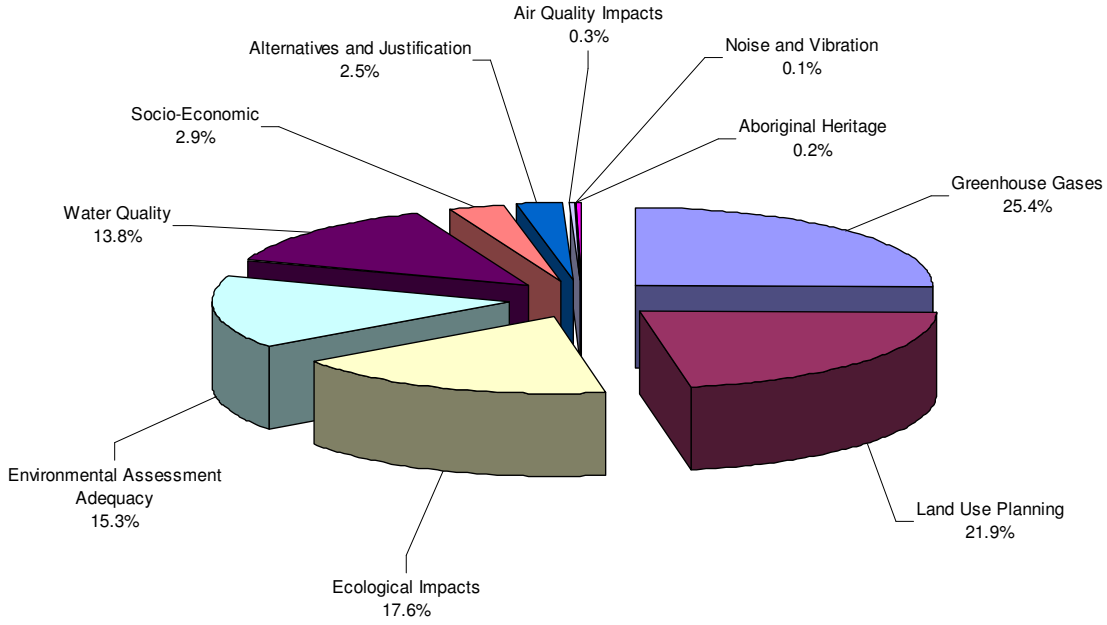
Since the close of the exhibition period, the Department has received correspondence from PWCS (dated 8 November 2006) indicating that a meeting was held between the Proponent, PWCS and Newcastle Port Corporation on 4 October 2006 to discuss and resolve the issue of hydraulic interaction between vessels along the South Arm of the Hunter River. Three key points were made at the meeting by the Harbour Master with regard to the impact of port expansion on hydraulic interaction:

- there will be no change to the impact of vessel hydraulic interaction effects on Kooragang Berths 4, 5 and 6;
- any hydraulic interaction effects at K7 will be less than that experienced as Dyke Berths 4 and 5; and
- once future berths are operational, Newcastle Port Corporation through the Harbour Master and pilots, will continue to manage vessel interaction issues with the terminal operators to ensure impacts are minimised.

4.3 Summary of Issues Raised

A breakdown of the issues raised in the submissions is presented in Figure 5. The frequency of each issue raised in submissions has been calculated based on its occurrence relative to the total number of issues raised, rather than the fraction of total submissions that raise a particular issue.

Figure 5 - Breakdown of Issues Raised in Submissions



Issues raised in submissions can be generally divided into three distinct groups: those related to the direct impacts of the proposal on its immediate environment; the indirect impacts of the proposal; and the environmental assessment process.

The first group of submission issues, being those direct impacts of the proposal on the surrounding environment (ecology, air quality, water quality, noise and vibration and Aboriginal heritage) cover 32% of all issues raised in the submissions. Of these, the impact on ecology (comprising impacts to migratory birds, Ramsar wetlands, endangered ecological communities, threatened flora and fauna species and compensatory habitat measures) constitute the most frequently raised issue of concern at 17.6 % of all issues raised in submissions. Water quality amounts to 13.8% of all issues raised in submissions with many of the submissions concerned with the impacts of dredging the South Arm of the Hunter River. The dredging of the South Arm of the Hunter River was the subject of a separate development application (DA-134-3-2003-i) lodged by NSW Maritime. Approval for this development was granted by the Minister for Planning in August 2005. The impacts of dredging contaminated material were therefore previously considered as part of that assessment and no additional assessment is required. All other remaining direct impacts are raised infrequently in submissions, representing less than 1% of all issues in the case of each impact.

Indirect impacts generated by the proposal relate to the perceived proliferation of new mines in the Hunter Region and the Gunnedah Basin that may result from the approval of the CET proposal. These indirect impacts have been grouped as land use planning impacts and make up 21.9% of all issues raised in submissions.
By far the largest indirect impact that was raised in submissions relates to the greenhouse gas emissions and the impact the proposal would have on global climate change as a result of the supply of up to 66 Mtpa of coal to be used overseas to produce electricity. This issue comprises 25.4% of all issues raised in the submissions. In addition, many submissions were concerned that the Environmental Assessment prepared for the proposal was inadequate (15.4% of all issued raised) as it did not address in sufficient detail the greenhouse gas emissions of the project and its impact on global climate change. Therefore, 40.8% of all issues raised in submissions were either concerned with climate change/greenhouse impacts or claim that the Environmental Assessment was inadequate due to the lack of information provided on climate change/greenhouse impact assessment.

Some submissions raised the issue of alternatives and justification for the proposal as an area of concern. This issue made up 2.5% of all issues raised. In this regard, a number of submissions indicated that the Environmental Assessment did not consider the alternative action of not undertaking coal export capacity expansion at all. Many submissions stated that because the "no expansion/do nothing" alternative was not assessed as part of the Environmental Assessment, a credible consideration of alternatives has not been provided.

Table 2 below indicates where each issue raised in submissions has been considered in this report.

Table 2 – Issues Raised in Submissions

Issue	Number of Submissions Raising Issue	Where Addressed in this Report
Greenhouse gas impacts	691	Section 5.1
Increased coal exports and proliferation of new coal mines	596	Section 2.3
Ecological impacts	479	Section 5.2
Inadequate Environmental Assessment report	415	Section 3.2
Dredging impacts to Newcastle Harbour and associated water quality and management	376	Section 2.3
Socio-economic impacts	78	Section 5.6
Alternatives considered and justification	69	Section 2.2
Air quality impacts	7	Section 5.3
Impacts to Aboriginal heritage	5	Section 5.5
Noise and vibration impacts	4	Section 5.4

5. ASSESSMENT OF ENVIRONMENTAL IMPACTS

Key issues raised in the submissions in response to the public exhibition of the project and/or identified during the Department's assessment included:

- generation of greenhouse gases;
- ecological impacts;
- air quality impacts;
- noise and vibration impacts;
- Aboriginal heritage; and
- socio-economic impacts.

All other issues raised in submissions are considered to be minor and have been addressed as part of the Proponent's Statement of Commitments.

5.1 Generation of Greenhouse Gases

Issues

The Director-General's requirements did not specify that the Environmental Assessment for the project should consider greenhouse gas impacts that may be directly or indirectly be associated with the project. Notwithstanding, the Environmental Assessment includes estimates of the direct (diesel and petrol consumption) and upstream (electricity consumption) greenhouse gas emissions generated in association with the project.

Given the significant number of submissions that raised the issue of greenhouse gas impacts during the public exhibition process and through the Independent Panel hearings, the Proponent provided a more detailed consideration of greenhouse gas implications as part of its Submissions Report, including downstream greenhouse gas generation associated with the combustion of coal exported through the project.

The greenhouse gas assessment presented in the Submissions Report was prepared having consideration of:

- the World Business Council for Sustainable Development and World Resources Institute *Greenhouse Gas Protocol 2004*;
- the Australian Greenhouse Office *Factors and Methods Workbook December 2005*; and
- the NSW Department of Planning and Department of Energy, Utilities and Sustainability draft *Energy and Greenhouse in EIA* (2006).

The Submissions Report considers greenhouse gas emissions in terms of Scope 1 (direct emissions from the project), Scope 2 (indirect emissions associated with electricity consumption) and Scope 3 (indirect downstream impacts). While the Proponent has presented information with respect to Scope 3 emissions, it has argued strongly and consistently that Scope 3 emissions should not be attributed to the project. In particular, the Proponent has highlighted that the *Greenhouse Gas Protocol 2004* includes Scope 3 emissions as an optional reporting requirement and that the draft *Energy and Greenhouse in EIA* guideline provides that the relevance Scope 3 emissions to a particular project should be considered on a case-by-case basis (avoiding double-counting where Scope 3 emissions are also the Scope 1 or Scope 2 emissions from another development).

A summary of greenhouse gas emissions data presented by the Proponent in the Environmental Assessment and Submissions report is provided in Table 3. The emissions figures are based on full-scale operation of the project at an export capacity of 66 million tonnes of coal per annum. An estimated 1,782 tonnes of CO_2 (equivalent) liberated during construction of the project have not been included in the data below.

Table 3 - Summary of Greenhouse Gas Emissions

Scope 1 (tonnes $CO_{2\text{-}e}$/ year)	Scope 2 (tonnes $CO_{2\text{-}e}$/ year)	Scope 3 (tonnes $CO_{2\text{-}e}$/ year)
810	68,950	161,000,000

The Proponent argues that only those greenhouse gas emissions attributable to the operation of the project (Scope 1 and Scope 2) should be considered as part of the assessment and determination of the project application, and those emissions beyond the control of the Proponent (Scope 3) should be recognised as a

separate issue. Based on this line of reasoning, the Proponent suggests that greenhouse gas emissions attributable to the project are in the order of 69,760 tonnes per annum of CO_{2-e} (at full-scale operation). Compared with an Australian greenhouse gas emission estimate of 550,000,000 tonnes in 2005, the project is expected to result in a national increase of approximately 0.001%.

The Submissions Report presents quantification of Scope 3 emissions, with the Proponent reinforcing that this information has been provided for completeness and should not be a factor carrying determining weight when assessing the project. For comparison, the Proponent presents information indicating that global CO_2 emissions were in the order of 25 gigatonnes in 2005, and estimates suggest that this figure will increase to 30 gigatonnes by 2010 and 47 gigatonnes by 2030 (CO_2 only, not including other greenhouse gases). While not explicitly stated by the Proponent, these figures suggest that the Scope 3 data for the project is in the order of 0.6% in 2005, and likely to be in the order of 0.5% and 0.3% in 2010 and 2030, respectively, based on the global forward estimates reproduced in the Submissions Report. These percentage figures are overestimates given that other greenhouse gases, such as methane, have not been included in the estimated future global greenhouse emissions data.

In comparison, the combined Scope 1 and Scope 2 emissions associated with the project are estimated by the Proponent to be in the order of 0.0002% and 0.0001% of global emissions in 2010 and 2030, respectively.

Submissions

The majority of submissions received (94%) during the exhibition period and presentations made to the Independent Panel outlined concerns related to greenhouse gas emissions from the project and the potential of the project to contribute to global climate change from the export and subsequent burning of coal. A number of submissions indicated that the burning of 66 million tonnes of coal translates to 170 million tonnes of equivalent carbon dioxide being emitted into the global atmosphere every year, dramatically increasing global climate change and directly threatening the survival of protected World Heritage Areas such as the Great Barrier Reef, the Blue Mountains and the Wet Tropics.

Many of the submissions (56%) also stated that the impact on global climate change from the project should have been addressed as part of the Environmental Assessment.

Recommendations from the Independent Panel

It is the Panel's view that the Proponent has adequately responded to the Director-General's requirements for the Environmental Assessment and has calculated the local scale contribution to greenhouse gas effects from the proposal's operation on Kooragang Island. The Panel does, however, consider that a calculation of the expected carbon dioxide released from the final combustion of the coal overseas could have been more openly and transparently presented. Following the Panel hearings, the Panel met with several CSIRO climate and energy experts to better understand the complex range of issues surrounding climate change. The Panel believes that new mechanisms are now necessary to reduce adverse effects of enhanced greenhouse effect and to encourage innovation for sustainable regional development in the Hunter Valley.

One of the major recommendations made by the Panel regarding greenhouse gas issues/climate change is that the Proponent agree to become a partner in the establishment of the Hunter Valley Ethical Coal Trust in order to:

- self-impose a levy to be paid into the charitable trust;
- collect a minimum of $1/tonne (with provision for CPI increases) on all new coal exports, additional to existing coal exports from the Port of Newcastle;
- develop a covenant setting up a charitable trust with a skills-based board made up of community and industry representatives and a broad written mandate for initiating sustainable development activities in the Hunter Valley; and
- establish the objectives of the Trust to broadly pursue ethical investment of the Trust's funds in sustainable regional development and local activities that address concerns over the contribution of the coal industry to the ecological impacts of human induced climate change.

The Panel's report makes it clear that the Trust would provide an ongoing funding stream derived from new coal exports to help the people of the Hunter Valley to enhance sustainable regional development and low carbon technology in the Hunter Valley.

Consideration

The Department is satisfied that the Proponent has applied appropriate data and calculation methodologies in deriving the Scope 1, Scope 2 and Scope 3 greenhouse gas emissions figures related to the project. It is important to note that the figures calculated by the Proponent present the likely *magnitude* of greenhouse gas emissions and include a minor and acceptable level of uncertainty based on assumed scenarios, combustion equipment and fuel efficiencies. For the purpose of considering the greenhouse gas implications of the project, the Department is satisfied that the uncertainty generated through particular assumptions applied to the Proponent's calculations do not significantly alter the outcome of the assessment process. For example, public submissions have presented a number of different estimates of the Scope 3 emissions figure, generally through the range 160,000,000 to 170,000,000 tonnes per annum – the Department's own calculation places this figure in the order of 174,000,000 tonnes of $CO_{2\text{-}e}$ per annum. These minor variations are not considered fundamental to the outcome of the assessment process.

Of particular note is the fact that the Proponent has not explicitly calculated the greenhouse gas emissions associated with the transport of coal from the project by sea. In this regard, the Department notes that the *Study of Greenhouse Gas Emissions from Ships* (Norwegian Maritime Technology Research Institute, 2000) estimates that combined emissions from international shipping were approximately 1.8% of global greenhouse emissions in 1996 (based on emission of approximately 24 gigatonnes of CO_2 in that year). The Proponent indicates that the project will generate 12 additional ships per week, which is considered minimal in the context of total global ship numbers. As such, the shipping-related greenhouse gas emissions associated with the project are considered minimal and within the levels of (un)certainty inherent in the greenhouse gas emissions figures calculated by the Proponent.

With respect to Scope 1 and Scope 2 emissions associated with the project, the Department considers that greenhouse gas emissions are minimal in a global context (less than 0.0003% on 2005 data) and when compared with Australian emissions (0.01%). The principal contributors to these emissions are petrol and diesel consumption on site, and the use of electricity from the grid. While the Proponent may apply measures from day to day to minimise the consumption of fuel and electricity, the Department does not consider that the emissions savings likely to be achieved through these measures would significantly alter the Scope 1 and Scope 2 emissions from the project. Nonetheless, the Proponent has committed to active implementation of energy minimising measures, and auditing of those measures, as part of the project.

The most contentious and vigorously debated aspects of the project are the calculation of Scope 3 greenhouse gas emissions, any responsibility the Proponent may bear for those emissions, and the weight that should be applied to the Scope 3 emissions data when the Minister determines the project application. As noted above, the Proponent, the Department and relevant submitters generally agree on the magnitude of Scope 3 emissions calculated based on an assumption of combustion of 66 million tonnes per annum of coal. However, positions on how Scope 3 emissions data should be used are divided. The Proponent argues that the emissions should not be directly assigned to the project and it should not be held directly responsible for mitigating those emissions. The majority of submissions that raise concern over greenhouse gas impacts take the contrary view that the project should be seen as entirely responsible for Scope 3 emissions, and that the project should be refused on the basis of these emissions (and the resultant impacts with respect to global warming, biodiversity loss, sea level rises and implications for future generations).

In the first instance, it is important to reinforce that the significance of greenhouse gas impacts, global warming and the resultant impacts on human settlements and ecology is not in question. There is sufficient evidence in support of the links between greenhouse gas emissions and changes to the environment to pursue a reasoned and proactive global approach to arrest and reverse the effects of global warming. In this regard, the Proponent has at no stage argued that these effects are not real or do not present a clear challenge on a global scale.

There is likely to be on-going debate over whether the Scope 3 emissions estimates presented by the Proponent are significant in a global context, and for that matter, what level of emissions from any particular development could be considered acceptable. The reality is, however, that the Scope 3 emissions are driven purely by a current, existing global demand for energy, independent of the proposed coal export terminal. Whether or not the subject project is approved, this energy demand will remain. In the medium term, global energy demand will need to be addressed through demand management, market and pricing mechanisms to influence energy/ fuel choice and substitution of less greenhouse gas intensive energy generation technologies. Until these measures

are in place on a broad scale, there will be an on-going need for the supply of coal for the purpose of energy production. Refusal of the project application for a new coal export terminal on Kooragang Island will not alleviate the current demand for energy, the need for coal to supply that energy or the resultant greenhouse gas emissions. A refusal would instead mean the loss of the economic benefits likely to be realised through the operation of the project.

On balance, the Department recognises that the predicted Scope 3 greenhouse gas emissions are likely to eventuate whether or not the project is approved. These emissions and their global impacts must be addressed outside and above the scope of the New South Wales planning system. How best to address the issue of greenhouse gas emissions and global warming requires further concerted effort at national and international levels, and is clearly a matter that is independent of whether or not the current project application is approved.

5.2 Ecological Impacts

Issues

The Environmental Assessment indicates that only one threatened flora species (*Zannichellia palustris*) listed under the *Threatened Species Conservation Act 1995* was recorded on the project site in Ponds A, H, I and L. Only Pond H would be partially disturbed by the proposed rail corridor associated with the project. This species is also recognised as rare nationally by Briggs and Leigh, 1996. In addition, two endangered ecological communities (EECs) were also recorded on the site:

- Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions EEC; and
- Coastal Saltmarsh in NSW North Coast, Sydney Basin and South East Corner Bioregions EEC.

The site is highly disturbed as a result of past industrial practices as well as historical and existing solid waste landfill operations and the Proponent indicates that most of the terrestrial areas on the site are dominated by herbaceous weeds and introduced grasses including noxious weeds such as Bitou Bush and Pampas Grass. The land use history of the site is such that much of the original vegetation cover has been covered by fill and as a result of the embankments and excavations that have occurred, created conditions for wetlands and marshes of varying conservation value. The Proponent considers that the ecosystem processes that operate on the site are dynamic although sub-optimal from a conservation perspective. This view is supported by the flora assessment undertaken for the project. The flora assessment concludes that the project is unlikely to have a significant effect on threatened flora or EECs.

In terms of fauna, several threatened species were identified through project site surveys undertaken for the assessment. Of the five threatened fauna species that exist on site, one is a frog and the remaining four are birds, as follows:

- Green and Golden Bell Frog.
- Black-tailed Godwit.
- Blue-billed Duck.
- Freckled Duck.
- Australiasian Bittern.

The Green and Golden Bell Frog was recorded on the site during recent targeted surveys undertaken on the site and surrounding area. The frog was located at 15 out of the 33 ponds located in the area particularly in the area near the north-western portion of the site, to the east and west of Deep Pond and to the south of the proposed rail spur. The majority of the ponds (A, AB, I, J, O, AC, C, F, G, L, W, X, Y, Z and V) would not be directly disturbed by the project.

Five Black-tailed Godwits were recorded during recent surveys at Deep Pond. Vegetation and aquatic habitat in the project site and surrounding area provides known and potential foraging and roosting habitat resources for this species. A small portion of Deep Pond would be disturbed as a result of the project, however, the Proponent has indicated that the area disturbed would be minimised and that the projects mitigation and compensatory habitat measures would further reduce the impact to this species.
Vegetation and aquatic habitat in the project site and surrounding area also provides known and potential foraging and roosting habitat resources for the Blue-billed Duck and the Freckled Duck. The Blue-billed Duck has

been recorded at Pond H as well as in the western and central parts of Deep Pond and four Freckled Ducks were recorded at Deep Pond during fauna surveys undertaken for the project.

While not recorded on the site during recent targeted surveys, a tentative sighting of an Australasian Bittern flying over the western end of Pond A was recorded. Another survey recorded the species north-west of Pond I near the Delta access road. A sighting of this species was also made during site investigations undertaken as part of the Port Waratah Coal Services' proposed increase in capacity of the Kooragang Coal Terminal.

The Eastern Bent-wing Bat was recorded near ponds in the adjacent PWCS coal terminal site and the Red-backed Button-quail was recorded west of the Delta access road near the project's proposed rail corridor. In addition, given the site's close proximity to the Hunter Estuary Wetlands including Kooragang and Hexham Swamp Nature Reserves and the Shortland Wetlands, 81 migratory birds were recorded within the project site and surrounds, 45 of which are presently listed under either the JAMBA or CAMBA international agreements between the Australian and Japan/China Governments respectively. The Hunter Estuary Wetlands are also listed as a Wetland of International Importance under the Ramsar Convention. The abovementioned estuaries provide important habitat for migratory shorebirds.

The Proponent considers that the project would avoid or minimise direct impacts on threatened species and to ensure that adverse impacts do not occur, has formulated the preparation of a Flora and Fauna Management Plan to be implemented prior to the commencement of the construction phase of the project. The Plan would include a range of management measures that would be implemented during the construction and operational phases of the project to reduce impacts to flora and fauna on the site including measures such as:

- a Vegetation Clearance Protocol;
- Design and construction of rail culverts suitable for the movement of the Green and Golden Bell Frog.
- pest management measures;
- on-site amphibian chytrid fungus management measures; and
- habitat replacement and annual monitoring for the Green and Golden Bell Frog, Australasian Bittern and shorebirds.

The Proponent has outlined the provision of compensatory habitat as an offset for the potential impact the proposal would have on existing flora and fauna on the site. Compensatory measures which were outlined in the Environmental Assessment documentation include making a financial contribution to the Kooragang Wetland Rehabilitation Project, creating habitat on the site for the Green and Golden Bell Frog, making a financial contribution to the University of Newcastle to fund research into the Green and Golden Bell Frog and making a financial contribution to the Hunter Wetlands Centre for their annual exhibition regarding the Green and Golden Bell Frog.

Submissions

The Lower Hunter Estuary has been quoted in submissions as "the most important site in NSW for a variety of migratory and wading birds". A number of submissions indicated that a range of species utilise the proposed project site including the Freckled Duck, Blue-billed Duck, Black-tailed Godwit, Australasian Bittern, Sharptailed Sandpiper, Common Greenshank, Marsh Sandpiper, Curlew Sandpiper and the Latham's Snipe. Compensatory measures proposed by the Proponent to create habitat for shorebirds was not favoured by respondents due to national and international studies indicating a high failure rate regarding compensatory habitat of this kind.

In addition, concerns were raised with the potential impact of the proposal on threatened fauna species such as the Green and Golden Bell Frog and the impact on a number of endangered ecological communities, namely "Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions" and "Coastal Saltmarsh in NSW North Coast, Sydney Basin and South East Corner Bioregions". Submissions indicate that the project would disturb 50 hectares of the EEC Freshwater Wetlands on the site and a further three hectares of EEC Coastal Saltmarsh. A financial contribution to the Kooragang Wetlands Rehabilitation Project was not favourably considered as an option to offset the disturbance to the above communities.

Concern was raised in submissions that the Proponent's plan to build two compensatory artificial habitat ponds for displaced Green and Golden Bell Frog individuals will not ensure the survival of the Kooragang population. Submissions stated that the short term and unsustainable coal industry should not be permitted to jeopardise the

long term survival of the species and that relying on creation of compensatory habitat as a fauna management strategy is flawed and far too risky for the species.

Recommendations from the Independent Panel

The Panel considers that the Proponent undertook an adequate assessment of potential ecological impacts of the project and adequately responded to the local scale ecological issues that were raised in submissions. The Panel indicates in its report that the Proponent would need to adequately address the recommendations for the construction of compensatory habitat and the northern spur line embankment across Deep Pond. Specifically, the Panel considers that if the following participatory engagement processes are undertaken as part of the project then there would be a sound platform for achieving habitat rehabilitation outcomes for the Green and Golden Bell Frog, avian fauna and other species:

- on-going consultation with stakeholders;
- integrated planning and design of restoration outcomes before commencing design and construction of compensatory habitat works; and
- effective monitoring and evaluation of ecological changes at the species, population and community levels.

The Panel has made a number of recommendations in relation to ecology. In terms of local scale issues, the following recommendations have been made:

- the Proponent, in consultation with the DEC and KWRP, should clearly identify and define the governance structures, mutually agree on long term financial commitments, management arrangements, habitat targets and timelines entered into by NCIG to successfully achieve compensatory habitat outcomes;
- the Proponent recognise the regional importance of Deep Pond as a coastal bird refuge and continue to explore options to avoid crossing Deep Pond in order to integrate biodiversity conservation as well as engineering and economic considerations into the industrial development. If there is no feasible alternatives to the embankment construction, the Proponent should consider developing shallow wading habitat along the edges of the embankment to enhance habitat diversity in Deep Pond;
- the Proponent agree to fund a series of bird behavioural ecology studies in addition to the presence/absence monitoring of bird species on Deep Pond. An experimental treatment needs to be established to study how birds might change their behaviour if an embankment was to be constructed across Deep Pond and to identify how any adverse effects could be designed out of future construction.

Consideration

The project site is located in close proximity to the Kooragang Nature Reserve, immediately north of the Hunter River and approximately 2.5 km from the Hexham Swamp Nature Reserve. The Environmental Assessment indicates that both nature reserves are significant for the conservation of migratory shorebirds and form part of the Hunter Estuary Wetlands which are listed on the Register of the National Estate as a result of their international recognition as waterbird habitat for migratory species presently listed under JAMBA and /or CAMBA. The Hunter Estuary Wetlands are also listed as a Wetland of International Importance under the Ramsar Convention. This is consistent with the views expressed in submissions received regarding the locality of the proposal and surrounding area on Kooragang Island.

The site has a long history of disturbance and much of the original vegetation has been covered by fill from landfill operations. A large number of the ponds on the site have been created as a result of excavations and fill embankments that have been undertaken over a period of years. Nevertheless these ponds provide habitat and opportunities for foraging, breeding, nesting and predator avoidance for a wide range of fauna species including threatened species and migratory birds. With the exception of the potential impacts to Deep Pond (see discussion below), the Department agrees with the Proponent and the results of the studies undertaken, that the likely impact of the proposal on flora and fauna is not expected to result in significant adverse impacts. Even so, the Proponent has indicated that a Flora and Fauna Management Plan would be prepared and implemented prior to the construction of the project. The Department considers that this Plan is an important mitigation measure for the protection of flora and fauna on the site and to actively conserve biological diversity within the site surrounds. Specifically, the Department has recommended a number of conditions as part of the approval of the project related to the protection of Green and Golden Bell Frog (*Litoria aurea*) individuals that occur within the ponds on site. The Department has requested that a pre-construction survey of all areas to be affected by the project be inspected by a suitably qualified ecologist (to be approved by the Director-General) for the presence of Green and

Golden Bell Frog and should individuals be located a specific management plan is to be prepared addressing management procedures for the species, ongoing monitoring and the relocation of individual frogs prior to the commencement of construction works. Other conditions which have also been recommended include the employment of an ecologist to provide advice during construction works on the management of the species and design and constructing specific items of infrastructure associated with the project to include culverts or underpasses to permit the movement of *Litoria aurea*.

The Proponent has indicated that design and implementation of compensatory habitat creation measures would commence from the date of Project Approval in parallel with the construction and operation of the project. In this regard the Department considers that a specific Compensatory Habitat and Ecological Monitoring Program be developed as part of the project to inform ecological management of the site and has recommended a specific condition as part of the recommended conditions of approval. The proposed program shall be developed, in consultation with the DEC and include, but not be limited to, ecological surveys, ongoing ecological studies and migratory bird monitoring and provision for funding of works and for ongoing research for the Green and Golden Bell Frog in the locality. Therefore, the Department considers that these additional mitigation measures would ensure that the project effectively meets the objectives of the Act, specifically the proper management development and conservation of our resources, the orderly and economic use and development of land while also including the protection of the environment, specifically threatened species and endangered ecological communities and the protection and conservation of biological diversity.

A number of submissions were concerned with the provision of the optional rail spur proposed as part of the project. The Proponent has indicated that this spur may potentially not be required until maximum throughput capacity of 66 Mtpa is reached. Given a number of factors such as the uncertainty regarding the need for the optional link, the fact that the link may not be required until some time in the future, and the potential impacts that such a piece of infrastructure could have to the ecology of Deep Pond, the Department has recommended, as a condition of approval, that the optional rail spur not be constructed until the Compensatory Habitat and Ecological Monitoring Program be implemented to the extent agreed by the Director-General. In addition, the Department recommends that the Proponent be required to undertake a review of the need of the optional rail spur in consultation with the owner/operator of the Kooragang Coal Terminal and ARTC to confirm the need for the infrastructure in light of circumstances and operational requirements that would exist just prior to the spur's implementation. The Department has recommended that the results of the review be submitted to the Director-General to ensure that the required investigations have been undertaken and the need for the infrastructure is fully justified.

The Department has had discussions with representatives from ARTC regarding the optional rail spur to obtain their views on the justification for its construction. ARTC has indicated that they have concerns that there may be conflicts between the main line and the entry into the project site as a result of empty trains moving along the line to access Port Waratah Coal Services terminal or further afield to the Port Walsh rail line and the industries beyond. ARTC indicate that if the industries located further along the rail line grow, the resultant congestion may be untenable. ARTC have indicated that this situation would be particularly unacceptable when the capacity of the project exceeds 33 Mtpa. Grade separation as part of the provision of the rail spur would definitely be a requirement when the project reaches its maximum capacity of 66 Mtpa.

The Panel has indicated in their report that they consider that the Proponent has adequately responded to the local scale ecological issues raised in submissions. The Panel has outlined that the Proponent will need to adequately address the recommendations for construction of compensatory habitat and, in particular, to undertake consultation with stakeholders to ensure integrated planning and design of restoration outcomes are carried out before the commencement of the construction of compensatory habitat works. Effective monitoring and evaluation of ecological changes at the species, population and community level would also be a requirement.

A recommendation made by the Panel is that the Proponent consult with DEC and KWRP to clearly identify and define the governance structures, mutually agree to long term financial commitments, management arrangement, habitat targets and timelines for successfully achieving compensatory habitat outcomes. The Department has recommended that such a requirement form part of the conditions of approval for the project and be developed as an integral part of the Compensatory Habitat and Ecological Monitoring Program for the project.

In relation to the impact to endangered ecological communities on the site, the Department is of the opinion that the mitigation measures proposed in the Environmental Assessment are adequate. This view is supported by the Panel in that the Panel considers the offer by the Proponent to finance the removal of six hectares of mangroves that have invaded saltmarsh habitat on Ash Island is an example of suitable compensation for the loss of three hectares of Coastal Saltmarsh on the project site. The Panel also considers that the loss of Big Pond and the degraded Freshwater Wetlands of Coastal Floodplains EEC have been previously compensated for under other plans proposed by the NSW Government and therefore no further compensation is necessary by the Proponent in relation to this EEC. The recommended condition of approval regarding the Compensatory Habitat and Ecological Monitoring Program includes provision for ameliorative works to be undertaken on land surrounding the project site to improve or restore natural hydrology and ecosystems, remove mangrove communities and restore locally endemic EECs.

5.3 Air Quality Impacts

Issue

The Environmental Assessment indicates that air quality impacts during construction would largely result from dust generated during earthworks and other engineering activities. Air emissions associated with the operation of the project would include coal dust from transfer points, stacking/reclaiming, and loading/unloading operations and wind blown emissions from the surfaces of coal stockpiles and a small contribution from diesel train exhausts.

The air quality modelling undertaken as part of the Environmental Assessment shows that the annual average dust deposition from the project alone would not exceed the 2 g/m^2/month DEC amenity goal at any receiver. The Environmental Assessment also indicates that the annual average dust deposition from the project when combined with background dust levels would not exceed 4 g/m^2/month.

Background air quality data indicates that there are occasional exceedances of the 24 hour average PM_{10} goal of 50$\mu g/m^3$ and therefore no additional exceedances should occur as a result of a new project. The modelling indicated that there would be no additional exceedances of the 24-hour average PM_{10} criteria as a result of the operation of the project. Predicted annual average PM_{10} and annual average TSP concentrations were not above the DEC criterion and NHMRC goal respectively at any receiver in the surrounding area.

The Environmental Assessment outlines a number of controls that the Proponent would implement to minimise the generation of dust from the site including:

- use of water sprays to control dust;
- minimising the surface area disturbed by excavation at any one time;
- confining vehicle movements to designated access routes;
- limiting the speed of vehicles on unpaved roads; and
- immediate encapsulation of materials considered unsuitable for use as construction fill.

The Proponent's Statement of Commitments indicates that a Soil and Excavation Management Plan would be prepared for the project detailing the methods for the control of dust on the site, particularly to minimise contaminates soils and dust generation during construction works. In addition, the Statement of Commitments indicates that the Proponent will prepare an Air Quality Monitoring Program for the project which will describe:

- Air quality monitoring to be undertaken for the project.
- Project mitigation measures with respect to air.
- A protocol for the ongoing management of air quality during construction.
- Procedures to be followed in the event of an exceedance of the criteria.
- Complaint response protocols.

A network of up to six dust depositional gauges would be installed on Kooragang Island and in the surrounding residential area and analysed for ash content and insoluble solids in accordance with DEC guidelines. In addition, a high volume air sampler (HVAS) would be installed at Stockton to facilitate monitoring of particulate matter smaller than 10 microns in size and would measure dust over a 24 hour period every six days.

Submissions

Of the issues raised in submissions, only 0.3% related to air quality impacts (other than greenhouse gas impacts). Key issues raised with respect to air quality can be summarised as follows:

- air quality assessment undertaken excluded $PM_{2.5}$ from the assessment criteria modelled;
- increased dust in the local area;
- workers on-site and the community (including schools) must be safeguarded from dust impacts;
- transport of coal by rail results in large increases of air pollution along the entire route from coal dust and diesel fumes;
- satisfaction that the project can operate within relevant air quality impact assessment criteria; and
- possibility of a joint air quality monitoring program with the adjacent existing Kooragang Coal Terminal.

Recommendations from the Independent Panel

The Panel found that the air quality assessment undertaken as part of the Environmental Assessment adequately addresses the local scale issues associated with the project, particularly in relation to dust and cumulative impact assessment. The Panel indicated that the air quality issues of most concern were:

- global climate change;
- regional cumulative impacts; and
- establishment of an adequate particulate monitoring program.

Global climate change impacts are addressed in section 5.1 of this report. The issue of regional air quality impacts was a concern to the Panel and was also raised during the Panel hearings. Concern was expressed about the "piecemeal" approach to air quality management in the lower Hunter Valley with assessments for each facility being conducted in isolation from other sources or associated infrastructure. The Panel recommended that an integrated regional air quality study be undertaken for the Hunter Valley. The Panel's report does not specify who should conduct the study. The study would model all existing and future sources of total suspended particles (TSP), PM_{10} and $PM_{2.5}$. In terms of the specific consent conditions for the coal export terminal, the Panel recommended that an integrated air quality monitoring program be installed and be operated jointly between the Proponent and Port Waratah Coal Services. The Panel recommended that the monitoring program not be restricted to the hi-volume air samplers (HVAS) and dust deposition gauges as proposed in the Environmental Assessment but also include continuous monitoring through the use of a Tapered Element Oscillating Microbalance (TEOM).

Consideration

The Department is satisfied that the Proponent has undertaken an adequate level of assessment of the impacts of the proposed CET on local air quality and this is supported by the Panel. The Department also agrees with the Proponent that the proposal would not have a significant impact on local air quality provided strict adherence of mitigation measures are implemented during the construction and operation of the project. These measures are outlined in the Environmental Assessment and re-stated in the Proponent's Statement of Commitments. Due to the potential impacts that dust generation from the handling of coal could cause, the Department has reiterated the Proponent's commitments as recommended conditions of approval and has recommended additional measures to limit potential dust impacts from the project.

The potential for dust generation from operations is therefore highest at the coal transfer points and during stacking and reclaiming of coal stockpiles. The Environmental Assessment indicates that a dust extraction system would be provided at the train unloading stations which would be within an enclosed structure. In addition, moisture levels of the coal stockpiles would be monitored and maintained to minimise dust emissions through the use of water sprays. Coal transfer conveyors on site would be covered or enclosed on three sides and any conveyors over roads, transfer points, or buffer bins would be fully enclosed.

A number of submissions queried the possibility of joint air quality monitoring to be undertaken for the project in association with PWCS. Due to the proximity of PWCS being located immediately east of the site, it would be in the best interests of both the Proponent and PWCS to amalgamate resources and equipment to provide a more cost effective and practical way of monitoring local air quality in order to gain an appreciation of any potential impacts from their combined operations on the surrounding residential areas, particularly those located at Fern

Bay and Stockton. The DEC has suggested a reliable and cost effective real time ambient dust monitoring system be implemented for the area.

The Panel agrees that the establishment of a robust air quality monitoring program is a critical component of the air quality management strategy for Kooragang Island. The Panel also believes that the establishment of a joint monitoring program between the Proponent and PWCS should be encouraged, however, it does not consider that the air quality monitoring program should be restricted to HVAS and dust deposition gauges. The Panel is concerned that the HVAS sampling for 24 hours every six days may lead to instances of high particulate concentrations not being detected and has therefore recommended that continuous monitoring also be undertaken through the implementation of a Tapered Element Oscillating Microbalance (TEOM). The TEOM should be installed as part of the air quality monitoring network and located within the closest residential area likely to be affected by potential dust emissions from the proposal and the results of monitoring regularly reported to the community via various popular media (i.e. local newspapers, newsletters, company webpage). The use of a continuous dust monitor will also allow for all peaks in particulate concentration to be identified and quantified and be a useful tool in the air quality management of the site as well as for model validation purposes. The Department has considered the Panel's recommendation in light of its own assessment and agrees that continuous monitoring should also be undertaken as part of the air quality management of the site and has recommended that this form of dust monitoring form part of the conditions of approval for the project. Therefore, the Department considers that the objectives of the Act have been met by promoting and co-ordinating the orderly and economic use and development of land while also protecting and managing the surrounding environment.

5.4 Noise and Vibration Impacts

Issue

A construction, operation and road transport noise assessment was undertaken by Heggies Australia Pty Ltd as part of the Environmental Assessment. The results of the assessment indicated that predicted construction noise emissions are below the relevant assessment criteria for all noise sensitive receivers and predicted operational intrusive and amenity noise emissions are also below the relevant assessment criteria for all noise sensitive receivers under all scenarios assessed. The road transport assessment found that the anticipated 3% increase in vehicle movements along Cormorant Road would represent an increase in the $L_{Aeq(15\ hour)}$ noise level of 0.1 dB.

The Proponent indicates in the Environmental Assessment that a number of mitigation measures would be implemented to reduce noise emissions from the site to ensure that the construction and operation of the project remains within acceptable assessment criteria noise limits. These mitigation measures include:

- ensuring that fixed plant and equipment is commissioned and maintained to remain below specified maximum operating sound power levels as presented in Appendix A of the Environmental Assessment;
- construction of an earth bund approximately 1,500 m in length on the northern side of Cormorant Road;
- construction of an acoustic barrier approximately 600 m in length, 5 m above the rail level and with an offset distance no greater than 3 m from the outer rail (the Proponent, however, has indicated that this measure is not likely to be required until the capacity of the project approaches 66 Mtpa);
- undertaking further noise modelling incorporating various noise mitigation measures to assess their relative effectiveness; and
- development and implementation of Noise Monitoring Program.

Submissions

Concern over the impact from construction and/or operational noise represented 0.1% of all issues raised in submissions. Both the DEC and Newcastle City Council raised specific issues with regard to noise impacts from the proposal, summarised as follows:

- characterisation of Fern Bay and Stockton as suburban or urban;
- background and existing industrial noise levels;
- setting project specific noise level criteria;
- uncertainty regarding timing and position of noise barriers;
- uncertainty regarding conveyor routing;
- rail noise;
- ship noise;
- cumulative noise; and

- use of alarms on-site.

Recommendations from the Independent Panel

The Panel found the noise and vibration assessment to be comprehensive, however, the Panel concluded that the areas of Fern Bay and Stockton should have been classified as suburban rather than urban as part of the assessment. The Panel has recommended noise criteria to address both the short term "intrusiveness" issues and the longer term amenity issues in the surrounding residential areas which are slightly different from those nominated by the Proponent or the DEC. The Panel recommended that an Operational Noise Management Plan be prepared for the project to include all the noise control measures listed in Section 4.4 of the Noise Impact Assessment and specifically address the timing of the rail noise barrier.

Consideration

The Department is generally satisfied that the Proponent has undertaken an adequate level of noise assessment and has appropriately responded to issues raised in submissions as part of its Submissions Report.

The Department agrees with the DEC and Newcastle City Council regarding the fact that the residential areas of Fern Bay and Stockton should have been assessed with reference to the "suburban" criteria as opposed to being considered "urban". The Panel specifically considered this issue as part of its report. The Panel report states that the suburban or urban classifications have a range of noise levels of 5 dBA from the "acceptable" limit to the "maximum" limit such that the "maximum" limit for a suburban area is the same as the "acceptable" limit for an urban area. The Department confirms that the remaining residential areas of Carrington, Mayfield and Warabrook have been correctly classified as urban.

The DEC has commented on the uncertainty of the estimation of industrial noise made in the noise assessment. The Panel has independently addressed this issue and considers that the industrial noise levels presented by the Proponent are conservative and suggests that existing noise contributions are likely to be in the order of 3 dBA lower than detailed in the assessment. The project is proposed to operate 24 hours per day, seven days per week and therefore the night time amenity criteria will be the most sensitive and will therefore govern the acoustics of the project. The Panel has reviewed the base information used in the assessment in light of the comments made above and has established a preferred night time amenity criteria for the project as indicated in Table 4. From the data in Table 4, the Panel has recalculated the intrusiveness and amenity criteria that should apply to the project as outlined in Table 5 below.

Table 4 - Variability of Determining Night Time Amenity Criteria

Location	Area	Existing Industrial (Heggies Estimate)	Criterion using INP	Existing Industrial (Heggies Estimate - 3dBA)	Criterion using INP approach	Panel preferred Criterion considering sharing	Comment
Fern Bay West	Suburban	48	38	45	35	37	*
	Urban	48	38	45	37	-	
Fern Bay East	Suburban	43	33	40	32	36	
	Urban	43	41	40	43	-	
Stockton West	Suburban	48	38	45	35	37	
	Urban	48	38	45	37	-	
Stockton East	Suburban	44	34	41	32	36	
	Urban	44	39	41	43	-	
Warabrook / Mayfield West	Urban	43	41	40	43	40	^
Mayfield	Urban	44	39	41	43	40	
Carrington	Urban	42	42	39	44	40	

* Levels only increase by 1 dBA in short term (and possibly remain above the "maximum" limit). When existing noise is reduced will result in levels between acceptable and maximum.
^ Levels allow for future sharing of noise amongst existing and future industry.

Table 5 - Recommended Criteria for the Project (as recommended by the Panel)

Location	Classification	Intrusiveness Criteria $L_{Aeq,15min}$			Amenity Criteria $L_{Aeq,period}$			Sleep Disturbance $L_{A1,1min}$
		Day	Evening	Night	Day	Evening	Night	Night
Fern Bay West	Suburban	55	47	49	50	40	37	59
Fern Bay East	Suburban	45	49	47	50	40	36	57
Stockton West	Suburban	47	49	49	50	40	37	59
Stockton East	Suburban	46	48	48	50	40	36	58
Warabrook/ Mayfield West	Urban	50	51	46	55	45	40	56
Mayfield	Urban	51	52	48	55	45	40	58
Carrington	Urban	47	46	42	55	45	40	52

The Department is not entirely satisfied that the criteria outlined in Table 4 is consistent with the DEC's Industrial Noise Policy and has been involved in a number of discussions with the DEC representatives regarding appropriate project specific noise limits that should apply to the project. In particular, the Department considers that the Panel may have recommended higher noise limits for the project than can be reasonably and feasibly be achieved. The Department considers that consistent with best environmental practice, the project should be required to meet the lowest noise levels predicted to be achievable for the project.

The Department has reviewed all the information provided to it including the Environmental Assessment and Panel report and recommends that the limits outlined in Table 5 should be the limits that form the noise limits as part of the conditions of approval for the project. These limits have been proposed as part of the recommended conditions of approval for the project.

Table 6 - Recommended Maximum Allowable Noise Contribution (dBA)

Location	Day, Evening, Night At all times	Night 10.00 pm to 7.00 am Monday to Saturday 10.00 pm to 8.00 am on Sundays and Public Holidays	
	$L_{Aeq\ (15\ minute)}$	$L_{Aeq(night)}$	$L_{A1(1\ minute)}$
Fern Bay West	41	37	57
Fern Bay East	39	36	55
Stockton West	41	37	57
Stockton East	38	35	56
Mayfield West	45	40	55
Mayfield	44	39	62
Carrington	36	33	52

In order to meet the above noise emission limits, the Department also recommends that the Proponent prepare a Construction and Operational Management Plan for the project specifically related to the management of noise on site. It is proposed that a compliance monitoring protocol be outlined as part of the Management Plan so that noise can be monitored on an ongoing basis to the satisfaction of the Director-General of the Department of Planning. The Department recommends that these measures be transferred as conditions of approval for the project.

In terms of rail noise, the noise assessment took into account train noise associated with locomotive use of the rail spur and rail loop within the site. Noise associated with train movements on the Australian Rail Track Corporation (ARTC) rail network is regulated by ARTC's Environment Protection Licence 3142. Any upgrade works undertaken by ARTC to expand the rail network in the area would be subject to separate assessment including specific noise impact assessment for rail noise. The Department has recommended, as a condition of

approval, that the Proponent undertake actions to ensure that trains operated on the site also meet the noise limits specified in Table 5 above.

The Proponent has indicated as part of its Response to Submissions that the use of alarms on site was not included as part of the noise assessment for the project. The Proponent has indicated that alarms will be subject to procurement specifications detailing the tone frequency, noise emission levels, directionality and coverage and will be installed to optimise safety and minimise off-site noise leakage. The Proponent has stated that in the unlikely event that alarms cause noise disturbance as a result of their use on site, then further investigations would be undertaken in relation to on-site optimisation measures and/or adjustments that could be implemented to potentially provide further noise reduction without compromising safety standards.

Although in some residential receiver areas the contribution from the project may be small compared with either traffic or other industrial noise it is the cumulative noise effect from a number of industrial sources which may result in overall noise levels creeping too high. In some areas in proximity to the site it is accepted that noise levels are already too high and therefore it is important that all new noise sources strictly meet their noise limits at all times, even if their overall contribution is not significant. In this regard, the Department has recommended, as a condition of approval, that the Proponent undertake a noise audit within 90 days of the commencement of the project to confirm the noise performance of the project and ensure that it is compliance with the maximum allowable noise contribution from the project. In addition the Department has recommended that the Proponent develop a Co-ordinated Environmental Monitoring and Management Protocol in consultation with the owner/operator of the Kooragang Coal terminal to provide a framework for the co-ordinated and cooperative monitoring and management of the site, including noise emissions. This co-ordinated approach specifically meets the objectives of the Act and safeguards the surrounding community while allowing for the orderly and economic use and development of land.

5.5 Aboriginal Heritage Impacts

Issue

The Environmental Assessment states that the project site falls within an area that was inhabited by the Worimi Aboriginal tribal group. The site, and for that matter much of the delta that has since been formed into Kooragang Island, has been heavily disturbed through a number of different land uses including grazing, land reclamation and the long term disposal of dredge spoil and industrial waste. A preliminary heritage assessment was undertaken to determine the potential impacts from the proposal on heritage values. Due to the heavily disturbed nature of the site and the fact that land reclamation and disposal of spoil has occurred over a number of years, the heritage assessment concluded that there is little likelihood of any Aboriginal objects remaining on the site.

Submissions

Concern over the impact on indigenous heritage items represented 0.2% of all issues raised in submissions. Most of the issues raised, however, related specifically to concerns over the Anvill Hill proposal as opposed to the proposed coal export terminal.

Consideration

The Department is satisfied that the Proponent has undertaken an adequate and appropriate level of assessment of the impacts of the project of Aboriginal heritage (as well as non-Aboriginal heritage). The Department agrees with the Proponent that the proposal would not have a significant impact on heritage. Nevertheless, during construction, the Proponent has indicated in the Environmental Assessment that a site monitor from the Worimi Local Aboriginal Land Council would be present to facilitate the identification and salvage of any buried artefacts in the unlikely event that any are uncovered during excavation works. Other specific heritage mitigation strategies will also be undertaken during construction in the event that an indigenous heritage item is found during construction activities. The Department agrees with the precautionary approach that has been adopted by the Proponent in this case.

5.6 Socio-Economic Impacts

Issues

The Environmental Assessment estimates that the project is expected to employ up to 500 people during the initial construction period and approximately 100 people when operating at full capacity (66 million tonnes of coal per annum). In addition, the project is expected to facilitate flow-on employment in the region with an estimated 187 indirect employment opportunities being generated during construction and 251 opportunities expected during operation. The Proponent has indicated that the predicted increases in population as a result of construction of the project would be short term and are unlikely to place any strain on existing community services, facilities and infrastructure in the region.

Submissions

Concern over socio-economic issues represented 2.9% of all issues raised in submissions. Key issues raised in submissions covered wide-ranging concerns associated with the project, including:

- decline in tourism and adverse impacts on the wine growing industry in the region;
- consideration of future generations;
- importance of employment but not as a trade-off for the destruction of the Hunter Valley;
- impact of a reduction in coal prices in the future;
- social and economic costs from climate change impacts effects from the flow-on of greenhouse gas emissions;
- Hunter Valley being too dependent on coal rather than a mix of industries;
- Newcastle being considered as a valuable tourist destination not an industrialised city;
- erosion of quality of life for residents;
- implications for investment in an out-of-date energy source;
- no consideration of impacts from loss of jobs in the wine industry from impacts on climate change;
- cost of banning commercial and recreational fishing in Newcastle Harbour – has this been taken into consideration in the cost-benefits analysis?;
- project will provide short term benefit during construction; and
- never-ending sale of our resources.

Consideration

The proposal is being pursued by the Proponent due to current capacity constraints associated with the export of coal from the Port of Newcastle and to meet world demand for coal. The project would be located on Kooragang Island on land designated as Zone 4(b) (Port and Industry), Zone 5(a) (Special Uses Zone – Arterial Road) and on unzoned land (Hunter River) under the Newcastle Local Environmental Plan. One of the objectives of the 4(b) (Port and Industry) Zone is to accommodate port, industrial, maritime industrial, and bulk storage activities which by their nature of the scale of their operations require separation from residential areas and other sensitive land uses. In addition, the objectives state that this zone is to provide for other development which will not significantly detract from the operation of large scale industries or port-related activities, that is primarily intended to provide services to persons employed in such industries and activities. It is considered that the project meets the objectives of the LEP.

The proposal is not located in proximity to any major tourist facility or close to any wineries within the Hunter Valley and therefore would not, in the opinion of the Department, have any impact on tourism in Newcastle or the existing and future wine industry in the Hunter Valley. The Environmental Assessment and associated project application does not seek approval for new coal mine proposals or any mining operations. Such proposals would be subject to separate environmental assessment and approvals being obtained by the individual mine owners.

6. CONCLUSIONS AND RECOMMENDATIONS

The Department has assessed the EA, Statement of Commitments, Response to Submissions Report, submissions on the proposal, and the report prepared by the Independent Panel of Experts constituted for the project and is satisfied that the impacts of the project can be mitigated and/or managed to ensure an acceptable level of environmental performance. The Department recommends that the Minister approve the project, subject to conditions.

A number of environmental commitments have been outlined to ensure that the project would not result in any significant impacts to the surrounding environment. With these measures implemented during construction and operation, the Department does not consider that the project would result in significant adverse impact to the surrounding environment. The implementation of the mitigation measures proposed as part of the Statement of Commitments provided in the Environmental Assessment, as well as additional measures outlined as part of the recommended conditions of approval would ensure that any potential impacts are minimised to an acceptable level and the project does not unduly impact on the surrounding community.

The Department has recommended that the northern optional rail spur not be constructed until the Proponent can demonstrate that conditions associated with compensatory habitat and ecological monitoring have been implemented as part of the project and the need for the rail infrastructure is fully justified following consultation with both the owner/operator of the Kooragang Coal terminal and ARTC.

Based on its assessment, the Department is satisfied that the project is necessary to alleviate the current capacity constraints associated with the port of Newcastle and the remaining Hunter Valley coal supply chain. The Department believes that the project will alleviate the current capacity constraints associated with the port of Newcastle and will allow an increased level of coal to be exported from the port providing significant benefits to the regional and national economy.

Many of the submissions centred on the global greenhouse and climatic change impact from the burning of the coal overseas for power generation. The Proponent has provided estimates of Scope 1, Scope 2 and Scope 3 greenhouse gas emissions directly and indirectly associated with the project. While the Department recognises the significant challenges posed by global warming, it is cognisant of the fact current global demand for energy will not be abated through refusal of the new coal export terminal. Rather, to address global warming in the medium term, a more considered and active approach must be taken at a national and international level to manage energy demands, influence energy/ fuel choice through market-based instruments and introduce and encourage less-greenhouse gas intensive energy generation. A refusal of the subject application will not address or ameliorate global warming impacts, but will prevent the economic benefits of the project from being realised.

The Proponent has assessed a worst-case scenario and assumed that all the coal exported from the project would be burned overseas to produce energy. Global warming/climate change presents a clear threat of serious or irreversible environmental damage and is also predicted to adversely impact on biodiversity. While the proposal would contribute to this threat, the contribution is considered to be very small on a global scale. Similarly, increased greenhouse gas emissions would have an effect on global warming/climate change which in turn has the potential to adversely impact on future generations. The Department considers that the proposal would contribute, albeit in a very small manner, to this impact. However, it must also be acknowledged that the downstream energy and other socio-economic benefits produced by the project would also benefit future generations, particularly through the shoring up of national and international energy needs and the maintenance of quality of life in a number of developing countries.

The Department believes that the need for the proposal is justified, as outlined in Section 2.2 of this report and does not consider that the impact on the global climate is sufficient to warrant specific measures, additional to those committed by the Proponent in its Statement of Commitments, as part of the proposed conditions of approval. The development of the proposed coal export terminal would include numerous mitigation measures to protect the surrounding environment and ensure that the proper management of the project in accordance with the objectives of the Act, The Proponent has outlined a large number of mitigation measures throughout the Environmental Assessment and its Statement of Commitments and the Department has recommended additional

measures as part of its conditions of approval to further mitigate impacts to the surrounding environment. On balance, the Department considers that the project can be undertaken in an ecologically sustainable manner while also alleviating the existing constraints associated with the coal supply chain and ensuring the continued economic development of the industry and the region.

APPENDIX A – RECOMMENDED CONDITIONS OF APPROVAL

APPENDIX B – STATEMENT OF COMMITMENTS

APPENDIX C – SUBMISSIONS REPORT

APPENDIX D – INDEPENDENT PANEL REPORT

APPENDIX E – ENVIRONMENTAL ASSESSMENT