Proposed Expansion of General Cargo Handling Facility

ENVIRONMENTAL ASSESSMENT REPORT

- Final Report
- December 2005

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Submission of Environmental Assessment

Prepared under the *Environmental Planning and Assessment Act, 1979* (as amended)

EA prepared by	
name	Ingrid Ilias Senior Environmental Scientist
qualifications	B. Sc. (Hons)
address	Sinclair Knight Merz 100 Christie Street PO Box 164 ST LEONARDS NSW 1590
in respect of	Proposed Expansion of General Cargo Handling Facility, Inner Harbour, Port Kembla.
Development application	
applicant name	Port Kembla Port Corporation
applicant address	Corner Darcy and Military Roads PORT KEMBLA NSW 2505
land to be developed	Part Lot 2 DP 1077813
proposed development	The construction and operation of an expanded general cargo handling facility, comprising land based and dredging components, including: ■ Development of land immediately north of the general cargo handling facility for cargo storage and motor vehicle processing and storage. Tom Thumb Road to be reconstructed north of the new site. ■ Redevelopment of Eastern Basin Berth No. 4. ■ Construction of Multi-Purpose Berth No. 3. ■ Easterly extension of existing Multi-Purpose Berth by 80 metres. Dredging of approximately 630,000m^3 of material from the Eastern Basin and Western Basin. Approximately 300,000m^3 is to be relocated to the Outer Harbour and approximately 330,000m^3 is to be disposed at sea.
Environmental Assessment	An Environmental Assessment (EA) is attached
Certificate	I certify that I have prepared the contents of this Environmental Assessment and to the best of my knowledge: ■ it is in accordance with the Environmental Planning and Assessment Act and Regulation ■ it is true in all material particulars and does not, by its presentation or omission of information, materially mislead.
Signature	
Name	Ingrid Ilias
Date:	12 December 2005

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Introduction

An environmental impact statement for the General Cargo Handling Facility in the Inner Harbour was submitted to the then Department of Infrastructure, Planning and Natural Resources for consideration on 1 September 2004. Development consent for the development (DA No. 105-5-2004-i) was granted on 4 April 2005. Since that time, an application to modify the development in relation to its site layout was made in accordance with Section 96(1) of the *Environmental Planning and Assessment Act, 1979* with approval received on 30 June 2005 (MOD-64 -4-2005- i).

The approved facility would be used to temporarily store imported containerised and break-bulk cargo prior to either being dispatched by road or rail to local and regional markets or being exported from the site by ship. The ultimate development would handle 100,000 twenty foot equivalent units (TEU) per year, 170,000 tonnes of break-bulk cargo (including motor vehicles) per year and the existing trade of 600,000 tonnes on the Multi-Purpose Berth, or an equivalent combined tonnage of 2,770,000 tonnes.

Since the general cargo handling facility proposal was developed, the operations of the facility have been reviewed in light of the NSW Ports Growth Plan and operations currently undertaken in the Sydney Region. Port Kembla Port Corporation in association with Australian Amalgamated Terminals now proposes to expand the approved facility to enable the motor vehicle loading and unloading facility from Glebe Island to be relocated to Port Kembla. Consolidation of the car import trade in Port Kembla's Inner Harbour requires more land space and larger berths to be provided to cater for future cargo mix.

As a result of the relocation of the motor vehicle importing operations, the mix of cargo is now proposed to be made up of 160,500 tonnes of general break-bulk (not including motor vehicles), 30,000 TEU, 240,000 motor vehicles and the existing 600,000 tonnes of dry and break-bulk currently associated with the Multi-Purpose Berth.

The proposed expansion of the General Cargo Handling Facility is classified as a Major Project under *State Environmental Planning Policy (Major Projects) 2005* being "Port and Wharf Facilities". The Minister for Planning is the approval authority under Part 3A of the *Environmental Planning and Assessment Act, 1979*.

The Proposal

The proposed expansion comprises land based and dredging components. The total land area required for the expanded operations amounts to approximately 45 ha which is almost double the land area previously approved.

The land based components include:

- Development of land immediately to the north of the general cargo handling facility for cargo storage and motor vehicle processing and storage. Tom Thumb Road is proposed to be relocated and reconstructed to the north of the expanded site.
- Redevelopment of Eastern Basin Berth No. 4, formerly known as the Australian National Line Roll-on Roll-off Terminal for cargo handling and storage.
- Construction of Multi-Purpose Berth No. 3 for the unloading of cargo.
- Easterly extension of existing Multi-Purpose Berth by 80 metres to enable the berth to accommodate two car carriers simultaneously.

In terms of the dredging, approximately 200,000 m^3 of material would be required to be removed from the Eastern Basin area of the Inner Harbour for the construction of Eastern Basin Berth No. 4 and an additional 430,000 m^3 of material would be required to be removed from the Western Basin area of the Inner Harbour for the construction of Multi-Purpose Berth No. 3. Based on the results of sediment sampling and testing, it is proposed to dispose of approximately 300,000 m^3 within the Outer Harbour and approximately 330,000 m^3 is proposed to be disposed at sea within Commonwealth waters.

Once operational, Australian Amalgamated Terminals would be able to operate the expanded facility, encompassing Eastern Basin Berth No. 4, as one facility. This would enable cargoes to be interchanged and cargo mixes to be varied between the two separate sites (Inner Harbour and Eastern Basin) as the need arises providing greater flexibility in the allocation of berth space.

The proposed expansion would operate 24 hours a day seven days per week in accordance with the approved facility.

Need for the Proposal

Port Kembla Port Corporation's growth strategy is to continue to diversify and increase its trade base to secure the organisation's long term viability. The expansion of the general cargo handling facility is required to facilitate the revised trade mix and to secure long term tenancy within the harbour to meet the medium to long term growth strategy as well as the aims of the NSW Government's Ports Growth Plan. Additional land is required for cargo storage and additional berth space is required to cater for the diverse range of shipping vessels expected as a result of the relocation of the motor vehicle importing operations from Glebe Island to Port Kembla.

If the proposed expansion is not approved, the objectives of the NSW Government's Ports Growth Plan would not be achieved. Australian Amalgamated Terminals have also indicated that they would need to reconsider their options and may not be in a position to relocate to Port Kembla as originally planned should the proposed expansion not proceed. Given the existing pressures

regarding urban development and traffic and transportation constraints in Sydney, costs associated with the movement of cargo to and from existing Sydney facilities would continue to rise and this could in turn result in potential negative impacts for Sydney and the regional economy.

The consequences of not proceeding would also result in the loss of potential trade and employment benefits to the Illawarra Region and associated multiplier effects. A port facility that can provide for the efficient distribution of a wide range of cargo would continue to attract trade opportunities and continually provide employment benefits to the local and regional economy. The provision of an efficient road network and a rail system with spare capacity for freight such as that provided at Port Kembla would also contribute to the efficient operation of the port and the attraction of the facility to shipping companies and international business.

Environmental Assessment

Land Use and Planning

The proposed site for the expanded operations is adjacent to the Inner Harbour of Port Kembla and is surrounded by various industrial activities associated with the operation of the port and the close proximity of BlueScope Steel. The proposed expansion of the general cargo handling facility is not expected to have any impact on the land uses in the surrounding port environment. The proposal is consistent with the strategies outlined in the Illawarra Regional Environmental Plan, the objectives of the Wollongong Local Environmental Plan, and with the NSW Ports Growth Plan.

Traffic and Transportation

The main traffic and transport related impact of the proposal would occur during the operational phase of the project. An assessment of the anticipated traffic movements during the construction period on the surrounding road network would not be significant.

Results of the traffic impact assessment indicate that for Mount Ousley Road and the Southern Freeway, the road network would be at capacity due to normal background traffic growth and the impact of the proposed expanded facility would not create any significant additional burden. Mount Ousley Road and the Southern Freeway would have reached their peak hour capacity by 2006 based on the historic growth rate regardless of the development of the proposed expanded facility. The additional trucks on these roads due to the proposal would have little impact on the performance levels. These roads still remain the most suitable roads for the heavy vehicles associated with the proposed facility due to their arterial status and their ability to keep truck traffic off local roads.

The results of the assessment indicate that the average delays and degree of saturation would increase slightly as a result of the operation of the expanded facility, but would not significantly change the overall intersection performance. Intersection performance remains at an acceptable

level for the intersection of Springhill Road and Masters Road and a good level for the intersection of Springhill Road and Tom Thumb Road with the operation of the expanded facility.

Mitigation measures to minimise potential traffic impacts from the site include the use of designated heavy vehicle routes, the use of B-Doubles and backloading wherever possible and maximising the use of rail where practicable.

Air Quality

Port Kembla is a heavily industrialised area and air quality within the Illawarra region is strongly influenced by surrounding industrial activities, as well as transport operations and domestic/commercial sources. Inter-regional transport of pollutants from Sydney can also occur, depending on meteorological conditions.

Community concern regarding air quality within the Port Kembla area typically relate to air emissions associated with industries such as the BlueScope Steel operations, Port Kembla Copper (currently not operational), Orica and other industrial and chemical manufacturing operations within the Port area. Complaints typically relate to visible emissions, odours, dust and atmospheric fallout.

The potential air quality impacts associated with the construction of the proposed expansion would be similar to the air quality impacts associated with the construction of the approved development. Provided adequate mitigation measures are adopted, the nearest residential dwellings to the site are not likely to experience adverse air quality impacts from the construction works.

The potential air quality impacts associated with the operation of the proposed expansion would be similar to the air quality impacts associated with the operation of the approved development, as the ultimate cargo capacity of the facility would not be exceeded. As the ultimate cargo throughput of the proposed development would be similar to the approved development, the number of truck and ship movements to and from the site is not expected to significantly alter.

Noise

The results of the noise impact assessment indicate that noise levels from the expanded facility are expected to reduce compared to the approved development due to the quieter nature of the activities as a result of the revised mix of cargo. Predicted night time noise impacts indicate that the noise emission level as the result of the expanded facility, at the nearest residential properties is approximately L_{Aeq} 39 dB(A), which meets the most stringent night-time design objective of L_{Aeq} 42 dB(A) for the night time period.

When the combined operations of the expanded facility and noise from two cargo vessels at the Multi-Purpose Berth are assessed, the resultant noise level at the nearest residential receiver is predicted to be L_{Aeq} 40 dB(A). This level is expected to be a typical level when up to two vessels

are in port simultaneously. When all berths are occupied, noise levels may increase slightly (less than 1 dB(A)) above the predicted values. It is however unlikely that all four berths would be occupied and unloading at the same time.

The increase in long-term average road traffic noise levels adjacent to the proposed transport routes is predicted to be less than 1 dB(A) under all scenarios. An increase of this order is not likely to be detectable at the nearest residential dwellings adjacent to the routes. Potential acoustic impacts on nearby residential areas from traffic noise associated with the proposal are therefore not likely to be significant.

The increased frequency of freight train movements as a result of the proposal may increase the L_{Aeq} 24 hr noise levels. The maximum predicted impact, however, on the $L_{Aeq\ 24hr}$ would be less than half of 1 dB(A).

Construction noise levels generated by the proposed expansion of the general cargo handling facility would not have a significant impact on the nearest residential receivers located in the suburbs of Coniston, Mount St Thomas or Wollongong.

Water Quality and Hydrology

The potential water quality impacts associated with the construction and operation of the proposed expansion would be similar to the water quality impacts associated with the approved development. However, reclamation works were not assessed in the EIS for the general cargo handling facility and as such, need to be considered as part of the construction of Multi-Purpose Berth No. 3 and Eastern Basin Berth No. 4.

Stormwater management measures similar to those developed for the approved development would be implemented for the proposed expansion of the facility. These include the implementation of stormwater pits (including oil separation devices) and trash racks.

Turbidity curtains would be installed around proposed dredging activities and around the disposal area to minimise potential adverse water quality effects.

Landscape Character and Visual Quality

The local visual catchment is restricted to areas within the topographic basin, in particular the residential areas of Mount St Thomas, Coniston, Mangerton, Lake Heights, Warrawong, Port Kembla and Cringila, and the major transport corridors of Springhill Road, Masters Road and Five Islands Road. From the adjacent road corridors, the areas of land proposed for the expansion of the general cargo handling facility are not readily visible. Buildings and structures associated with BlueScope Steel effectively screen the areas from passing traffic on these roads.

Many areas within the visual catchment of the port and steelworks are commercial and residential areas that draw employment and business opportunities from the industrial developments. The operations undertaken in the port contribute significantly to the regional economy and as such, the significance of the impacts (both positive and negative) may be perceived quite differently by local businesses and residents, when compared with people who are visitors travelling through the area.

The potential visual impacts associated with the construction of the proposed expansion would be similar to the visual impacts associated with the construction of the approved development. Expansion of the general cargo handling facility to the north of Tom Thumb Road would have a negligible impact on the appearance of the approved development as it would involve an expansion of the storage facilities available for cargo.

Redevelopment of Eastern Basin Berth No. 4 would have a minor impact on the appearance of the existing port and would alter the basic physical appearance of the area when viewed from a distance. However, the visual impact of the berth is expected to be minor. The combination of operating the two extra parcels of land (north of Tom Thumb Road and Eastern Basin Berth No. 4) is not expected to result in any adverse visual impact considering the dominance of the neighbouring developments such as the Coal Loader, the Grain Handling Terminal and BlueScope Steelworks. The grain bins associated with the Grain Handling Terminal are approximately 68 m high from ground level to the top of the bins. The bins are painted white and dominate the visual landscape from residences that overlook the general area.

Flora and Fauna

The site to the north of the existing Tom Thumb Road and the area adjacent to the Eastern Basin comprises vacant land which lacks vegetation and suitable habitat for terrestrial fauna. Therefore, no impact on local terrestrial flora and fauna would occur as a result of the development of the expanded facility in this area.

Heritage

No specific archaeological or heritage studies have been undertaken in the area. The land proposed for the expansion of the general cargo handling facility is within an industrial area and as such has been previously disturbed. It is highly unlikely given the disturbed nature of the land that any indigenous archaeological deposits or sites would be present. Furthermore, the land to the north of Tom Thumb Road is reclaimed land and would not contain any archaeological material. No further archaeological investigations are therefore required.

Social and Economic Considerations

The operation of the expanded facility would create employment opportunities and prospects and also significantly contribute to both the local and regional economy as it is expected that the facility would employ approximately 150 people.

Environmental Management

A range of environmental mitigation measures would be implemented as part of the proposal to manage potential environmental impacts. These measures or commitments would be incorporated into the proposal as part of its approval.

Conclusion

The essence of an expanded general cargo handling facility is to provide a modern intermodal facility which would secure and enhance the long term viability of the port of Port Kembla. The relocation of the motor vehicle importing operation from Glebe Island as well as general and containerised cargo from Darling Harbour East to Port Kembla sooner than outlined in the NSW Government's Ports Growth Plan would lead to many benefits including:

- Provision of direct and indirect job opportunities thereby providing a valuable contribution to the local and regional economy.
- Diversification and increase of Port Kembla's trade base while also significantly contributing to the local and regional economy.
- Extending the life of public infrastructure in Sydney.
- Utilisation of existing road and rail infrastructure.
- Reducing heavy vehicle movements and associated congestion in the inner areas of Sydney, particularly Balmain.
- Ability to operate 24 hours a day without causing adverse impacts to the residential areas to the north and north-west of the site.

The potential environmental impacts of the proposed expansion have been examined and detailed in this report. The levels of impact identified have been assessed as not significant and do not significantly alter the impacts associated with the approved development (DA 105-5-2004-i and MOD 64-4-2004-i). The implementation of mitigation measures and safeguards would reduce the impacts identified and protect the surrounding environment and maintain community amenity.

1. Introduction

1.1 Background

An environmental impact statement (EIS) for the proposed general cargo handling facility in the Inner Harbour of Port Kembla was prepared by Sinclair Knight Merz (SKM) on behalf of Port Kembla Port Corporation (PKPC) and submitted to the then Department of Infrastructure, Planning and Natural Resources (DIPNR) for consideration on 1 September 2004. The then Minister for Infrastructure and Planning declared the proposal "State Significant Development" under Section 76A(7) (b) (iii) of the *Environmental Planning and Assessment Act, 1979* (EP&A Act). Development consent for the development (DA No. 105-5-2004-i) based on the EIS was granted on 4 April 2005 subject to 45 conditions of consent. Since that time, an application to modify the development has been made in accordance with Section 96(1) of the *Environmental Planning and Assessment Act, 1979* (EP&A Act) predominantly regarding the site layout. Approval for the modification was received on 30 June 2005 (MOD-64 -4-2005- i). A locality plan is provided as **Figure 1-1**.

The approved general cargo handling facility would be used to temporarily store imported containerised and break-bulk cargo prior to either being dispatched by road or rail to local and regional markets or being exported from the site by ship. Operations at the facility would involve general stevedoring activities, truck and train unloading and loading, container and break-bulk storage and maintenance of equipment. The ultimate development of the general cargo handling facility, as described in the EIS (September 2004) would handle 100,000 twenty foot equivalent units (TEU) per year, 170,000 tonnes of break-bulk cargo (including motor vehicles) per year and the existing trade of 600,000 tonnes on the Multi-Purpose Berth, or an equivalent combined tonnage of 2,770,000 tonnes. The EIS indicated that this volume would be expected to be achieved within 10 years of commencement of operations.

1.2 Strategic Ports Policy

1.2.1 NSW Ports Growth Plan

The NSW Government released the *NSW Ports Growth Plan* in October 2003. It is the principal government policy in relation to future development of the major ports in NSW, which include Sydney Harbour, Port Botany, Port Kembla and Newcastle Port.

Figure 1-1: Locality Plan

The publicly available information in relation to the Ports Growth Plan is a summary on the NSW Department of Transport web page[1]. The NSW ports each serve specific functions that contribute to the economy of NSW. Port Botany has, for the past 30 years, handled virtually all of the container trade in NSW. Newcastle and Port Kembla each have a strong export focus, and primarily handle bulk exports of coal, grain, and steel to overseas markets.

The key directions of the *NSW Ports Growth Plan* are to consolidate trade through the major ports, re-direct some trade from Sydney Harbour to other ports to respond to land use pressure and growth in trade, and to develop new infrastructure at Port Kembla and Newcastle Port to cater for forecast growth. Elements of the Plan specifically relevant to Port Kembla are:

- Cars, containers and general cargo that currently pass through Port Jackson (Darling Harbour) will be relocated to Port Kembla in 2006.
- Cars from Glebe Island to be relocated to Port Kembla when the current lease expires, around 2012 (now brough forward to 2008).
- Sydney will remain the main cruise ship hub for Australia's east coast (the implication of this is that Port Kembla will remain an industrial port rather than developing as a passenger destination).
- Newcastle will be developed as the next major container terminal in NSW, after Port Botany reaches capacity (the implication for Port Kembla is that it is unlikely to develop as a major container port, subject to expansion of Port Botany proceeding and development of container facilities at Newcastle port).
- The focus of land based transport will be on increasing the mode share of rail to and from the ports to intermodal terminals in the Sydney metropolitan area and regional NSW.

PKPC has responded to the *NSW Ports Growth Plan* by seeking development consent for major new port infrastructure, including upgrades to wharves and development of new terminal space within the Inner Harbour. This includes upgrades and extensions to the existing multi-purpose berth and the recently approved General Cargo Handling Facility in the Inner Harbour as mentioned above. This facility approved the increase of total trade through the Multi-Purpose Berth from 600,000 tonnes per annum to 2.77 million tonnes per annum.

Port Kembla is predicted to continue to handle a wide range of general cargoes. As ports in Sydney downsize and cargo relocates, substantial opportunities exist for Port Kembla to capture an

[1] http://www.transport.nsw.gov.au/ports/port-growth-plan-info.html

increased proportion of this trade. With Newcastle focusing on growth in container trade, this limits opportunities for expansion of other cargo that cannot be accommodated in Sydney. In addition, Port Kembla is closer to Sydney markets, making the transfer of cargo from Sydney to Port Kembla viable, when compared with Newcastle.

Trade in dry bulk and coal is likely to remain constant over the next 20 or so years. Local sources of coal will continue to exist over the next 15-20 years, and are likely to continue to use the Port Kembla Coal Loader for export of at least a proportion of product.

Based on the *NSW Ports Growth Plan*, it is expected that the role of Port Kembla, in the context of other major NSW ports, will be to serve a variety of cargo types. The main cargo movements through Port Kembla are expected to be general break-bulk cargo (including cars), iron ore, coal, grain, steel products, and other dry bulk. The majority of bulk liquids are likely to be moved through Port Botany, however, existing infrastructure at Port Kembla provides some scope to maintain and increase volumes.

1.2.2 Port Kembla Development Strategy

PKPC prepared the draft *Port Kembla Development Strategy*[2]. The actions in the Development Strategy have now been underpinned by the *NSW Ports Growth Plan*. While future trade scenarios in the *Port Kembla Development Strategy* have been somewhat altered by the *NSW Ports Growth Plan*, the general pattern of development in Port Kembla under the Development Strategy remains. In particular, the general layout of cargo handling facilities within the Inner Harbour is expected to remain as outlined in the Strategy.

The primary guidelines for development of Port Kembla are to retain waterfront land for port related uses and to encourage growth and diversification of trade through the port. There are significant opportunities within Port Kembla to achieve these aims, given the availability of land and waterfront for growth in existing trade and creation of facilities to handle a broader range of cargo.

1.3 Regional Strategies and Plans

1.3.1 The Metropolitan Strategy

The NSW Government is developing the Metropolitan Strategy to guide planning and development across the greater metropolitan region (GMR) for the next 30 years. The GMR includes the Sydney metropolitan area, Lower Hunter and Central Coast, and Illawarra regions. A number of

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[2] Port Kembla Ports Corporation (2001) draft *Port Kembla Development Strategy.* Port Kembla Ports Corporation.

key directions have been devised to guide the development of the Metropolitan Strategy, including (among others):

- Strengthening employment centres including commercial centres such as Wollongong CBD and around major infrastructure including ports.
- Providing appropriate transport to link major centres, including developing transport infrastructure to ensure appropriate access to ports.
- Targeting the development of infrastructure to meet the needs of the population and economic development.

Port Kembla is the major industrial area and port within the Illawarra region. It is therefore highly significant in terms of meeting the directions to be established by the Metropolitan Strategy for the Illawarra region and the GMR as a whole.

1.3.2 Illawarra Regional Environmental Plan

Illawarra Regional Environmental Plan (REP) No. 1 provides a framework for coordinated action to ensure best use of land resources in the Illawarra region, incorporating social, economic and environmental considerations. The following principles within REP 1 relate specifically to Port Kembla:

1) A strategy plan for the utilisation of the port of Port Kembla, including the Outer Harbour, should be developed as a matter of priority.
2) The plan referred to in subclause (1) should address the potential of the port for further expansion of its function beyond the handling of coal, steel and related bulk products.
3) The advantages of the port which led to the decision to build the new Grain Terminal there and the opportunities associated with the Maldon/Dombarton rail link which will directly connect the port to the rural areas of the State should be promoted.

The proposed expansion of the General Cargo Handling Facility would meet the objectives of the strategic plans and policies outlined above. A wide range of stakeholders would obtain significant benefits from the expansion of the approved General Cargo Handling Facility at Port Kembla.

1.4 Review of Approved Development

Since the original general cargo handling facility proposal was developed, the operations of the facility have been reviewed in light of the NSW Ports Growth Plan as outlined above and operations presently undertaken in the Sydney Region. Australian Amalgamated Terminals (AAT) is proposing to relocate its motor vehicle loading and unloading facility from Glebe Island to Port Kembla by 2008/2009 ahead of the 2012 timeframe indicated by the NSW Ports Growth Plan. Consolidation of the car import trade in Port Kembla's Inner Harbour requires more land space and

larger berths to be provided as part of the general cargo handling facility than previously envisaged to cater for future cargo mix.

AAT operates multi-user facilities with open access to all stevedores and pre-delivery inspection operators. Its role within the expanded general cargo handling facility would be facility development, maintenance and administration, provision of security, cargo delivery and receival services, mobile equipment and terminal operating systems. Stevedoring services would be provided by independent stevedoring companies who would be required to enter into a Stevedoring Licence Agreement with AAT.

The mix of cargo likely to be handled at the general cargo handling facility has also been reviewed and is proposed to change from what was outlined in the EIS (September 2004) with the likely decrease in the number of containers (i.e TEU). However, the proposed maximum capacity detailed in the EIS and the Minister's conditions of consent (2,770,000 tonnes per annum) is not proposed to be exceeded.

1.4.1 Outline of Proposed Expansion

PKPC, in association with AAT propose to expand the already approved general cargo handling facility (DA No. 105-5-2004-i) within the Inner Harbour of Port Kembla. PKPC is keen to enable vehicle operations to be relocated to Port Kembla's Inner Harbour so as to meet the objectives of the NSW Government's Ports Growth Plan as well as secure long term tenancy within the harbour and meet their medium to long term growth strategy.

To enable the transfer of the motor vehicle import operations from Glebe Island and to continue to service existing and future cargo handling operations at Port Kembla, an expansion to the approved facility is required.

The proposed expansion would include the following components:

- Development of land immediately to the north of the already approved General Cargo Handling Facility for cargo storage.
- Redevelopment of Eastern Basin Berth No. 4 (EB4), formerly known as the Australian National Line (ANL) Roll-on Roll-off (Ro Ro) Terminal for cargo handling and storage.
- Construction of Multi-Purpose Berth No. 3 (MPB3) for the unloading of cargo.
- Easterly extension of the existing Multi-Purpose Berth by 80 metres to enable the berth to accommodate two car carriers simultaneously.

A detailed description of the proposed expansion is described in **Section 3**.

1.4.2 Project objectives

The objectives of the proposed expansion of the General Cargo Handling Facility are:

- To provide additional land to store the revised mix of cargo arriving within the Inner Harbour prior to being dispatched by either road or rail or a combination of transport modes to local and regional markets.
- To provide additional berths to receive the revised mix of cargo efficiently.
- To provide a modern expanded facility which utilises the latest technology for the efficient storage and handling of mixed cargo.
- To encourage potential customers to utilise the facility, thereby diversifying and increasing Port Kembla's trade base and, as a result, boosting both the local and regional economy.
- To provide a viable alternative port for general cargo when facilities close in Port Jackson as part of the NSW Ports Growth Plan.

1.5 Need for the Proposal

PKPCs growth strategy is to continue to diversify and increase its trade base to secure the organisation's long term viability. As a result of the NSW Ports Growth Plan, and in accordance with PKPCs short to medium term strategy, PKPC, in association with AAT propose to expand the already approved General Cargo Handling Facility (DA No. 105-5-2004-i and MOD-64-4-2005-i) within the Inner Harbour of Port Kembla. It has been determined by AAT and PKPC that the expanded facility is required to facilitate the revised trade mix and to secure long term tenancy within the harbour to meet the medium to long term growth strategy as well as the aims of the NSW Government's Ports Growth Plan. Additional land is required for cargo storage and additional berth space is required to cater for the diverse range of shipping vessels expected as a result of the future mix of cargo. It should be noted, however, that approval for the expanded facility would not exceed the approved capacity of the development which is 2.77 million tonnes per annum.

The Inner Harbour of Port Kembla is located at a sufficient distance from residential housing to ensure that community amenity is not affected by port operations. The local road network is also sufficient to cater for the distribution of a significant proportion of the cargo by road without impacting on community amenity of the local area.

The proposed expansion of the facility would provide many benefits to a number of different stakeholders. These benefits include:

- Public infrastructure in Sydney would have an extended life.
- Port and transport infrastructure at Port Kembla would be better utilised.

- Businesses engaged in trade would be better served via a long term position in a port dedicated to industrial use.
- Increased generation of employment opportunities and associated multiplier effects.
- The long term viability of the Port and the Illawarra Region would be enhanced.

1.6 Consequences of Not Proceeding

If the expansion as proposed in this document is not approved by the Department of Planning (DoP), the objectives of the NSW Government's Ports Growth Plan would not be achieved. AAT has indicated that they would need to reconsider their options and may not be in a position to relocate to Port Kembla as originally planned. Given the existing pressures regarding urban development and traffic and transportation constraints in Sydney, costs associated with the movement of cargo to and from existing Sydney facilities such as Glebe Island would continue to rise and this could in turn result in potential negative impacts for Sydney and the regional economy.

The consequences of not proceeding with the proposed expansion, as described in this report, would also result in the loss of potential trade and employment benefits to the Illawarra Region and associated multiplier effects. A port facility that can provide for the efficient distribution of motor vehicle trade and the consolidation of containerised and other break-bulk trade would continue to attract trade opportunities and continually provide employment benefits to the local and regional economy.

The provision of an efficient road network and a rail system with spare capacity for freight such as that provided at Port Kembla would also contribute to the efficient operation of the port and the attraction of the facility to shipping companies and international business. The relocation of the existing motor vehicle trade from Glebe Island in the immediate future as opposed to when the lease expires in 2011/2012 would also result in substantial amenity benefits to residents surrounding the existing car storage operations, particularly those located adjacent to White Bay, in the Sydney suburb of Balmain. Existing car storage at White Bay is in close proximity to medium density urban development. Loading of car carriers for distribution to local and regional markets from this area has resulted in decreased amenity to the surrounding community. The road network surrounding White Bay, for example, is extremely narrow and results in conflicts between local traffic and car carriers needing to deliver cargo to local and regional markets. Noise complaints are also an issue given the close proximity of the wharf to existing medium density residential developments.

1.7 Consultation

PKPC regularly undertakes consultation with the Port Kembla Pollution Committee and the Port Kembla Harbour Environment Group regarding activities within the Port. The Port Kembla

Pollution Committee comprises representatives from various government agencies, community interest groups and representatives from PKPC. PKPC has provided written and verbal reports regarding the future development proposals within the Port including the proposed expansion works. No objections have been raised regarding the proposed expansion from either group.

Specific Commonwealth and State agency consultation was undertaken by Patterson Britton & Partners Pty Ltd as part of the sea dumping permit application process. The following agencies were consulted:

- NSW Department of Planning.
- Department of Environment and Conservation (DEC).
- NSW Fisheries.
- NSW National Parks and Wildlife Service.
- Waterways Authority.
- NSW Roads and Traffic Authority.
- Wollongong City Council.
- Wollongong Fisherman's Co-operative.
- The Nature Conservative Council of NSW.
- Australian Maritime Safety Authority.
- National Native Title Tribunal.
- The Nature Conservation Council of NSW.
- NSW Aboriginal Land Council.
- Department of Lands (Nowra).
- Australian Hydrographic Office.
- Australian Fisheries Management Authority.
- South East Trawl Fishing Industry Association.

Responses from agencies can be found within the documentation provided in **Appendix B**.

2. Statutory Planning Considerations

2.1 Previous Approvals

The site for the approved General Cargo Handling Facility is located to the north of the existing Multi-Purpose Berth, south of Tom Thumb Road and west of Farrer Road. The approved facility covers a total area of approximately 29 ha (DA No. 105-5-2004-i) and comprises a number of components including:

- Site paving, lighting and security.
- Civil works including fencing, access road/truck receival area, car park and stormwater drainage structures.
- Building works including administration, amenities, maintenance and gatehouse facilities.

In addition, the existing rail spur is to be relocated and aligned along the western side of Farrer Road. The layout of the approved facility is shown on **Figure 2-1**.

Since approval, an application to modify the facility was approved by the then DIPNR under Section 96(1) of the EP&A Act on 30 June 2005 (MOD-64-4-2005-i). The approved modifications were designed to enhance the operational efficiency of the site and to improve local traffic management and involved the following components:

- Relocation of the site entry.
- Construction of a round-a-bout at the intersection of Tom Thumb Road and Products Berth Road.
- Introduction of a dry bulk materials gate for direct transfer of dry bulk materials via Farrer Road.
- Introduction of a truck marshalling area.
- Relocation and resizing of cargo sheds for weather-sensitive cargo (steel, paper, timber etc).
- Relocation of administration, amenities and stevedores offices complex including car park.
- Relocation of wash bay and maintenance building.

The consent for the Section 96 application (MOD-64-4-2005-i) also provided clarification regarding the approved operation of the facility 24 hours a day, seven days per week.

The layout of the modified approved facility is shown on **Figure 2-2**.

Figure 2-1: Approved Development Proposal

Figure 2-2: Layout of Modified Activity

2.2 Major Project Approval Process

As indicated in **Section 1**, PKPC in association with AAT propose to expand the approved General Cargo Handling Facility to facilitate the relocation of the motor vehicle import operations from Glebe Island to Port Kembla.

The proposed expansion of the General Cargo Handling Facility is classified as a Major Project under *State Environmental Planning Policy (Major Projects) 2005* being "Port and Wharf Facilities" which are defined as

> *"Development for the purposes of shipping berths or terminals or wharf-side facilities (and related infrastructure) that has a capital investment value of more than $30 million"*

Given that the proposed expansion has a capital investment value in the order of $80 million (mainly comprising wharf construction), and is a type of development to which the Major Project SEPP applies, the Minister for Planning would be the approval authority in accordance with Part 3A of the EP&A Act.

Following the submission to the Department of Planning (DoP) of a Project Outline and Preliminary Environmental Assessment report, the Department issued Director-General Requirements for this environmental assessment (EA). A copy of the Director-General's requirements is provided in **Appendix A**.

This EA would be publicly exhibited and submissions invited following consultation with the relevant government agencies. PKPC may also be asked to prepare a report on the submissions and revise its statement of commitments. It would also consider modifications to the project to minimise environmental impacts. The DoP would consider this EA, and the public submissions in recommending to the Minister for Planning whether the project should be approved.

2.2.1 Other Approvals Required

Section 75U of the EP&A Act identifies the legislation and approvals that do not apply to a project approved under Part 3A of the EP&A Act and Section 75V identifies the legislation and approvals that cannot be refused if they are necessary for the carrying out of an approved project.

The dredging works would require approval from the Commonwealth Minister for Environment and Heritage as a proportion of the dredged sediment is proposed to be relocated offshore into Commonwealth marine waters. An application regarding the proposed offshore relocation of dredged spoil was submitted to the Commonwealth Department of Environment and Heritage on 15 July 2005. A permit for the disposal of the material at sea was recently granted (refer **Appendix B**).

Approvals which are required for the project and that cannot be refused as a result of the project being approved under Part 3A of the EP&A Act, include the issuing of an Environment Protection Licence required for the dredging works being a scheduled activity under the *Protection of the Environment Operations Act 1997* (Department of Environment and Conservation).

Due to the need to construct new berths as part of the proposal, approval would also be required from NSW Maritime under section 13T (obstructions and encroachment in waters) of the *Maritime Services Act, 1935*.

As the land proposed to be used for the expansion of the facility forms part of the assets owned by Maritime NSW, Port Kembla Port Corporation would formally advise NSW Maritime of the lodgement of the Development Application and this accompanying EA upon its receipt.

3. Description of Proposal

3.1 Project Outline

The mix of likely cargo to be handled is likely to change from what was proposed in the EIS with the likely decrease in the numbers of containers (i.e TEU) expected. However, it should be noted that the proposed maximum tonnage detailed in the EIS and the Minister's conditions of consent (2.77 million tonnes/year) would not change.

The proposed expansion can be divided into land based works and dredging works, as outlined below and described in more detail in the following sections:

Land Based Works

- Development of land immediately to the north of the general cargo handling facility for cargo storage and motor vehicle processing and storage. Tom Thumb Road is proposed to be relocated and reconstructed to the north of the expanded site.
- Redevelopment of Eastern Basin Berth No. 4 (EB4), formerly known as the Australian National Line (ANL) Roll-on Roll-off (Ro Ro) Terminal for cargo handling and storage.
- Construction of Multi-Purpose Berth No. 3 (MPB3) for the unloading of cargo.
- Easterly extension of existing Multi-Purpose Berth by 80 metres to enable the berth to accommodate two car carriers simultaneously.

The total land area required for the expanded operations amounts to approximately 45 ha which is almost double the land area approved for the general cargo handling facility. The proposed land components that make up the expanded facility are shown on **Figure 3-1**.

Dredging Works

- Dredging works involving the removal of material from two sites within the Inner Harbour for the creation of berthing basins and approaches for the EB4 and MPB3 wharf structures as outlined above.

The expanded general cargo handling facility, encompassing EB4, would enable AAT to operate the expanded operations at Port Kembla as one facility. Therefore, the proposed expanded facility would enable cargoes to be interchanged and cargo mixes to be varied between the two separate sites (Inner Harbour or Eastern Basin) as the need arises. Factors that would need to be considered in determining what berth would be used for cargo unloading or loading operations include the destination of cargo and whether it could be transported by rail and the availability of berth space. Cargo can arrive within the port anytime of the day or night and therefore, flexibility in terms of the allocation of berth space is important in managing the facility.

Figure 3-1: Proposed Land Components

3.2 Land Based Works

The proposal involves an expansion of the operational areas from what was proposed in the EIS (September 2004). Although the proposed expansion would result in more land being required for the general cargo handling facility (an additional 20 ha), it is not considered that the expanded activities would result in significantly greater impacts than described in the EIS (September 2004) as the annual maximum capacity of 2,770,000 tonnes is not proposed to be exceeded. A layout of proposed operations is provided on **Figure 3-2**.

The proposed expansion involves the:

- Modification of the mix of cargo expected to be received and dispatched from the facility.
- Development of land immediately to the north of the general cargo handling facility for cargo storage and for usage as a automotive processing precinct inclusive of pre-delivery inspection (PDI) facilities.
- Redevelopment of EB4 (formerly known as the ANL Ro Ro Terminal) for cargo handling and storage.
- Construction of Multi-Purpose Berth No. 3 (MPB3) for the unloading of predominantly motor vehicle cargo.
- Extension of the existing Multi-Purpose Berth by 80 m to allow two car carrier vessels to be accommodated simultaneously along the berth.

Each of the above components is described in more detail in the following sections. While they are described as separate components, once operational the facility would be operated as one entity.

3.2.1 Mix of Cargo

The general cargo handling facility is approved to handle a total of 2,770,000 tonnes of cargo per annum, made up of 100,000 TEU of containerised cargo per year, 170,000 tonnes of break-bulk cargo per year and the existing trade of 600,000 tonnes on the Multi-Purpose Berth, or an equivalent combined mix of cargo. Therefore the Minister's conditions of consent (dated 4 April 2005) allowed the mix of cargo to vary through the facility provided the total annual capacity did not exceed 2,770,000 tonnes.

As a result of the NSW Ports Growth Plan, the mix of cargo to be handled by Port Kembla was required to change. The relocation of the Glebe Island car importing operations to Port Kembla and further assessment of the break-bulk and container trade has resulted in the mix of cargo modified to that stated in the EIS. The proposed development is now proposed to accommodate 160,500 tonnes of cargo (general break-bulk cargo not including motor vehicles), 30,000 TEU, 240,000 motor vehicles and the existing trade of 600,000 tonnes of dry bulk and break-bulk currently handled on the Multi-Purpose Berth.

Figure 3-2: Layout of Proposed Expanded Operations

This translates to a combined tonnage of approximately 1,720,500 tonnes which is well below the approved capacity for the general cargo handling facility of a combined tonnage of 2,770,000 tonnes and therefore allows for growth. It is expected that cargo would grow at different growth rates per year from the volumes initially outlined above, however, it is not expected that growth would continue indefinitely. Therefore, an upper limit of 230,000 tonnes of general break-bulk cargo, 50,000 TEU, 375,000 motor vehicles and the existing trade of 600,000 tonnes has been calculated as a reasonable forecast to expect to occur within 10 years of initial operations. This would amount to a combined tonnage of 2,392,500 tonnes which is still below the approved capacity for the facility. It is not sought, however, to decrease the approved volume limit of 2.77 million tonnes.

While the mix of cargo has changed as a result of the implementation of the NSW Ports Growth Plan, the maximum throughput of the development would be the same (in the long term) as the approved maximum throughput for the approved facility. Of this cargo, the existing 600,000 tonnes of dry bulk and break bulk cargo is expected to be transferred from the existing Multi-Purpose Berth to EB4, however this would be dependent on the specific cargo involved and whether the berth was available at the time of cargo arrival. For example, import and export of material related to the manufacture of fertiliser products may remain at the existing Multi-Purpose Berth given that the fertiliser manufacturing plant (owned by Incitec) is located adjacent to the corner of Farrer and Tom Thumb Roads.

3.2.2 Expansion of the Cargo Handling Facilities

The site for the approved general cargo handling facility is located to the north of the Multi-Purpose Berth, south of Tom Thumb Road and west of Farrer Road. PKPC is now proposing to expand this facility to the vacant port land north of Tom Thumb Road in order to cater for the required mix of cargo. Tom Thumb Road is also proposed to be relocated to the north of the expanded facility.

The additional land area would primarily be used for the short term storage of mobile equipment such as agricultural items and tractors (predominantly to the north of the existing rail spur) and the remaining area as a short term storage facility and automotive processing area.

The existing surface of the land to the north of the existing Tom Thumb Road would be excavated to subgrade design. The surface would be proof rolled and any soft material replaced and reconsolidated prior to the installation of additional pavement so as to ensure an adequate foundation for the site. The land has not been used for any industrial purpose in the past and therefore the risk of excavating any contaminated material during site preparation works is very low. Depending on operational requirements, a total pavement thickness over the existing slag sub base of between 300 and 800 mm would be provided for the site. The type of pavement that would be used would be determined during detailed design. PKPC and AAT would ensure that all hard

stand areas on the site are designed, constructed and maintained to allow for the operation of terminal machinery without breaking up hardstand surfaces. This would also prevent rutting and surface ponding caused by vehicle traffic and prevent any groundwater pollution.

The components proposed to make up the expanded general cargo handling facility in this area are outlined separately below.

Relocation of Tom Thumb Road

The section of Tom Thumb Road which runs in an easterly direction from Products Berth Road to Farrer Road is proposed to be closed and relocated to the northern perimeter of the expanded general cargo handling facility (north of the automotive processing area). It would link to the existing Farrer Road adjacent to the existing intersection. This would allow the land to the north and south of the existing Tom Thumb Road to be consolidated as one land parcel providing for the efficient utilisation of the land and the efficient movement of cargo within the facility.

The concept design for the relocation of Tom Thumb Road would adopt the following design criteria:

- One lane in each direction (minimum pavement width of 7.5 metres) with shoulders on each side to allow for passing trucks turning right into adjacent sites.
- Total road reservation of 20 metres including 7.5 metres sealed pavement, full width sub-grade construction of 7.5 metres and 3.0 metre shoulders.
- Design speed of 60 km/h resulting in a minimum horizontal curve of 90 metres. This is compatible with the existing posted speed limit of 50 km/h.
- Enable the accommodation of B-Double vehicles as defined by AUSTROADS.

The type of intersections that would be constructed with the relocated Tom Thumb Road and Farrer Road and between the existing alignment of Tom Thumb Road and the proposed access road to EB4 would be subject to final design and survey, however, it is expected that either a T-intersection or a round-a-bout design would be utilised. Similarly, the intersection design of the relocated Tom Thumb Road and the existing Tom Thumb Road to the north of Products Berth Road would also be determined during detail design.

It is proposed that swale drains be provided on either side of the relocated road to capture runoff from the road. These drains would direct runoff to the existing open stormwater channel located adjacent to the existing Tom Thumb Road. It is also proposed that street lighting at 50 metre centres be provided along the relocated Tom Thumb Road.

Relocation of Tom Thumb Road would eliminate the conflict between Tom Thumb Road and the level railway crossing that exists to the west of Farrer Road. This issue was raised by the Minister

for Infrastructure and Planning under Condition of Consent 3.15 associated with the relocation of the rail spur along the western side of Farrer Road. The Minister indicated that PKPC was required to "consult with Rail Infrastructure Corporation to reach agreement on the detailed design and operational aspects of the rail infrastructure component of the development", specifically:

f) Works to be undertaken to the Tom Thumb Road rail crossing.

j) Measures to treat any safety issues associated with the relocation of the level crossing on Tom Thumb Road.

The relocated road would result in either a T-intersection or roundabout being formed with it and Farrer Road in the vicinity of the Incitec feritliser facility. Given the low traffic numbers associated with Farrer Road and the relocation of the general cargo handling facility car park to the west of the site (as part of MOD - 64-4-2005i) traffic congestion at the new intersection is not expected to occur.

Back-up Vehicle Storage

A back-up vehicle storage area is also proposed to be provided within the automotive processing precinct (refer **Figure 3-2**) for the short term storage of vehicles prior to processing and transport offsite. The back-up area is proposed to provide hailmesh protection of vehicles. A similar area would be provided to the north of the rail spur for the short term storage of mobile equipment such as tractors and other machinery.

Vehicle Processing Facility

A Vehicle Processing Facility to the north of Tom Thumb Road is proposed to be provided for new vehicles. The facility would accept new vehicles from the adjacent site (south of Tom Thumb Road) for "processing" which may involve one or more minor improvements and/or repairs being undertaken on the vehicle in order to complete the vehicle for registration on Australian roads. Processing tasks would be undertaken within a new Processing Shed which would typically comprise a metal clad building measuring approximately 10 m in height with adjacent amenity facilities. Tasks undertaken within the new shed would typically include the following:

- Fit out Works

  Fit out works typically include the installation of audio equipment, vehicle manufacturer badges, towbars and air conditioners. Most vehicles that arrive at the wharf would require at least one item to be fitted. Fit out products would be stored in a secure area adjacent to the fit out facility and be easily accessible by fit out operators.

- Fleet and Truck Build

  Fleet and truck build works could also be undertaken and would typically include fitting of bumper bars, roof racks and the like to prepare vehicles for commercial use.

- Paint and Panel Rectification

  Minor spray painting and panel rectification works as a result of minor damage that could result in transit would also be carried out in the new Processing Shed in a separately partitioned area. Spray painting works would be completed inside fully enclosed paint booths and include colour coding of bumper bars on new vehicles and repairs to external paint damaged during transit. Panel rectification works would also be undertaken in this area for vehicles that were damaged during transit.

- Vehicle Washing

  Vehicles would be washed inside a six car capacity covered vehicle washbay. Washing with high pressure washing equipment removes sediment and dust collected during transit. Some vehicles would also require "de-waxing" to remove the protective film of wax applied to the vehicle by the manufacturer. The water used in the washbay is fully recycled within the facility. Any sediment is collected separately in a recycling water storage tank and transferred off-site for disposal to a licensed waste facility.

Depending on the number of vehicle processing operators that intend to operate from this area, either one or more separate Processing Sheds would be constructed so that the operators can work independently. The number of operators that would be operating from the expanded facility and the number of buildings that would be required has yet to be determined.

As indicated above, the automotive processing area is proposed to include a range of services to allow vehicles to be processed immediately following receival and transported direct to the required dealerships. This would effectively eliminate the need for vehicles to be transported to the vehicle processing and storage facility at Ingleburn and therefore reduce truck movements on the road network.

Lighting and Security

The expanded general cargo handling facility is also proposed to be fenced and lit similar to the area already approved to the south. That is, a 2.1 metre high security chain link fence topped with three strands of barbed wire would be used around the perimeter of the site. A number of 30 metre high light towers would be installed in the areas of general cargo, each fitted with floodlights to illuminate the area for proposed night time processing and transfer operations. In areas where shade mesh is provided, lighting would be provided under the mesh.

In accordance with Condition of Consent 3.26 (DA 105-5-2004-i), all new external lighting associated with the expanded general cargo handling facility would be mounted, screened and directed in such a manner not to create a nuisance to surrounding land uses. The lighting would be at the minimum level of illumination necessary and generally be in accordance with *AS 42882-1997 Control of the Obtrusive Effects of Outdoor Lighting*.

Stormwater Management

Similar to the already approved site to the south of Tom Thumb Road, a drainage network would be designed for the area to the north of the existing Tom Thumb Road to accommodate a 1 in 20 year storm event. Runoff from the land would be collected by a series of stormwater pits and then would drain via box culverts and pipes to an open stormwater channel. The stormwater channel would be constructed from the Western Basin northward to the automotive processing precinct. The proposed stormwater channel would be aligned to the east of Products Berth Road and to the east of Tom Thumb Road as shown on **Figure 3-2**. Stormwater pits would be strategically constructed around the site to ensure that all runoff from the site firstly passes through these pits prior to being discharged to the new stormwater channel.

The stormwater channel bed would consist of gravels no less than 100 mm and would have a slope of approximately 0.3 to 0.4% which is similar to natural ground fall. The base of the channel is proposed to be planted with reeds and the surrounding landscaping would comprise plants from the "Plants Suitable for Wollongong" list in Section 6 of the Wollongong City Council's Draft Landscape Guidelines (Technical Policy No. 98/4).

The stormwater pits would be fitted with a series of oil and grease separators and trash racks to ensure that any grease and rubbish is trapped within the pit and prevented from being discharged into the stormwater channel. The vegetation within the channel would assist with the removal of additional impurities from the runoff prior to it being discharged to the Inner Harbour or groundwater.

The final design of the stormwater system including the number of oil and grease separators and trash racks required would be determined during detailed design.

3.2.3 Berths

The key directions of the NSW Ports Growth Plan are to consolidate trade through the major ports of Sydney Harbour, Port Botany, Port Kembla and Newcastle, re-direct some trade from Sydney Harbour to other ports to respond to land use pressure and growth in trade, and to develop new infrastructure at Port Kembla and Newcastle Port to cater for forecast growth. As a result of the Plan, six berths in Port Jackson would be closed and this cargo is to be accommodated by four berths at Port Kembla. Due to the mix of cargo scheduled to be received by Port Kembla, the existing berths within the Inner Harbour and Eastern Basins are not adequate to provide loading and unloading operations, particularly for the importation of motor vehicle cargo and therefore there is a need for the existing berths to be upgraded and/or lengthened to accommodate future cargo vessels.

The existing land area approved for the general cargo handling facility is also not adequate to cater for the expected motor vehicle trade and other cargo and therefore the approved facility is proposed to be expanded to provide more land for cargo storage and motor vehicle processing facilities.

The wharf construction and associated land based components that are proposed to be provided as part of the proposed expanded cargo handling operations are detailed in the following sections.

3.2.3.1 Development of Eastern Basin Berth No. 4

Additional loading/unloading and storage capacity is proposed to be provided at EB4 as part of the proposed expansion of the general cargo handling facility. The site is bounded by the Western Drain and Eastern Basin to the west, the Coal Terminal to the south, the Coal terminal access road to the east and Tom Thumb Road to the north. EB4 is an existing port facility that was scheduled for refurbishment, albeit at a later date than is now proposed.

The ANL Berth was constructed 30 years ago to accommodate dedicated stern ramp Ro-Ro ships of up to approximately 20,000 dead weight tonnage (DWT). ANL ceased use of the berth for regular shipping about seven years ago and the condition of the existing berth, stern ramp and dolphins has since deteriorated.

The existing terminal comprises a small office building, a large shed and the Ro-Ro Berth. The terminal area is extensively paved. The site is fully serviced in terms of water supply, sewerage, drainage and power supply.

The existing 3.5 ha terminal is now proposed to be redeveloped to accommodate a wider range of vessels on a conventional berth and would be suitable for handling a range of cargo. This berth and associated pavement area would form an important component of the proposed expansion of the general cargo handling facility. It is expected that the existing trade of 600,000 tonnes from the Multi-Purpose Berth, comprising predominantly dry bulk cargo and break-bulk cargo would be relocated to EB4 as part of the proposed expansion works. The redevelopment of EB4 is proposed to accommodate Panamax vessels up to 71,000 DWT and 235 metres in length.

As part of the redevelopment, an area behind the berth would be reclaimed and terminal pavements and services would be provided. An access road between the berth and Tom Thumb Road is also proposed to be constructed. The redeveloped EB4 (including access to the berth) would occupy a total area of approximately 5 ha.

The main elements of the development of EB4 comprise the following components:

- Demolition of the existing wharf structures, stern ramp, foundations, some buildings, sediment pond, pavements and some of the existing stormwater, hydraulic and electrical services.

- Refurbish or replace existing cargo storage building so that it typically measures 100 m in length, 50 m in width and 10 m in height.
- Relocation and reuse of stormwater lines, light poles, guard rails, fences and gates, temporary structures, navigation markers and survey marks.
- Earthworks including ground preparation and minor reclamation of land behind the berth, northern embankment and western drain by filling with dredge and imported material.
- Creation of armoured revetments to the eastern bank of the western drain, the northern embankment and the southern embankment in the coal terminal lease property.
- Construction of new interim and permanent pavements in the terminal, and rehabilitation of existing pavements.
- Construction of a new paved access road, linking the north western end of the site to the existing Tom Thumb Road.
- Modifications to the site drainage system, and installation of new stormwater drainage to the terminal and western access road.
- Installation of new site water and fire main reticulation and installation and connection of a new supply line from Tom Thumb Road.
- Upgrading of the power supply to 500KVa, including provision of a new site feeder cable, transformer, switchboard and associated cabling, and construction of a new building to house these facilities.
- Installation of new electrical reticulation on site, and provision of single and three phase power outlets, reefer points, cope lighting, site lighting, and provision for future crane supply.
- Removal and relocation of light towers, construction of new foundations, and refurbishment for reuse.
- Construction of a piled bulkhead berth wall, a piled southern return wall, and the initial section of the piled northern headwall. All piled walls would be suitable for the ultimate dredge depths.
- Installation of capping beams for the bulkhead, return wall, and a portion of the northern headwall.
- Installation of piled deadman anchors, tie rods, and associated steelwork.
- Foundations and retention system for 100 tonne shore bollards.
- Installation of 60 tonne berth bollards, double 100 tonne hook powered shore bollards, fenders, and access ladders.
- Installation of corrosion protection systems to piles, bulkhead walls, steelwork and tie rods, including impressed direct current supply and circuitry.
- Miscellaneous concrete and construction works including foundations and retaining walls.

Existing pavement areas within the terminal would be tested and rehabilitated to provide a structural life of 20 years. Preliminary testing has indicated that about 10% of the existing terminal pavement area would need to be replaced as it would not meet design requirements.

New pavement would be constructed within the terminal area, as required, and for the terminal access road from Tom Thumb Road. The pavement would typically comprise a 300 to 800 mm base depending on operational requirements.

The existing surface of the site would be excavated to subgrade design. The surface would be proof rolled and any soft material replaced and reconsolidated prior to the installation of additional pavement so as to ensure an adequate foundation for the site.

The redeveloped EB4 would have the capacity to accommodate 600,000 tonnes of cargo from the Multi-Purpose Berth and could be used as an additional storage area for other cargo as the need arises. It is proposed that one or two mobile harbour cranes would also be provided.

Depending on berth availability, there may be times when motor vehicles would also be unloaded at EB4 and transferred to the automotive processing area by road, although it is expected that this would be rare.

A detailed description of the components that make up the proposed EB4 works in this area is provided below.

Site Entry and Car Park

The main access to EB4 would be via a new access corridor along the western drain from Tom Thumb Road. Access to EB4 from the Coal Loader Access Road would be restricted subject to the operational requirements of the Port Kembla Coal Terminal and PKPC.

It is proposed that an at-grade T-intersection or round-a-bout be constructed off Tom Thumb Road to EB4 and operated by traffic control. All traffic entering and exiting the site would be required to give way to traffic already on Tom Thumb Road. This access road would provide the main service road into and out of EB4 for trucks, delivery of equipment, machinery, containers, bulk and break-bulk cargo destined for export. The road would be sealed and would include two traffic lanes (one lane in each direction) and be approximately 10 m wide.

The access road would be constructed from flexible materials comprising base and sub base courses with an asphalt wearing surface. The subgrade would be suitably compacted to provide an adequate foundation for the road.

Trucks entering the site would proceed along the entrance road to the gatehouse for check-in, then continue on to the designated cargo storage area to deliver or pick up containerised, bulk or break-

bulk cargo. It is not anticipated that queuing would be an issue at EB4, based on the current truck movements at the Multi-Purpose Berth. However, there is sufficient hardstand area at the site to accommodate queuing if it is required.

A car parking area would be provided within the terminal area of EB4, in the north-eastern corner of the hardstand area and accommodate 40 designated car spaces.

Gate House

An existing gate house is located on the eastern side of the site and contains amenities and office space. It is proposed that the existing gate house be demolished as part of the proposed works. New gate entry infrastructure would be constructed off Tom Thumb Road.

The gatehouse could operate 24 hours per day seven days per week although it would be staffed on an "as needs" basis. It would provide trucks entering the site during operation hours with the necessary clearance to proceed into the facility. Similarly, trucks exiting the site would need to present the necessary documents at the gatehouse and obtain authority to leave the facility.

Cargo Storage Shed, Administration Facilities and Amenities

An existing cargo storage shed, which contains office space and amenities, would be refurbished or replaced to accommodate the needs of the proposal. The existing building is located on the northern side of the site. The new or refurbished building would measure approximately 100 m in length, be approximately 50 m wide and 10 m high.

Australian Quarantine Inspection Service and Wash Bay

Australian Quarantine Inspection Service is an operating group within the Commonwealth Department of Agriculture, Fisheries and Forestry which provides quarantine inspection for the arrival of international cargo into Australia. An area would be provided within the proposed facility for Australian Quarantine Inspection Services to inspect imported containers, bulk cargo and break-bulk cargo. Should washdown be required the washdown bays behind the Multi Purpose Berth would be utilised. This is considered to be acceptable as all areas are within the port confines and would be made available for such use.

An area of land would be made available at EB4 for fumigation of cargo as required. This area would be sealed to prevent any aspect of the fumigation process from entering the ground.

Fencing, Signage and Lighting

Temporary fencing would be installed and maintained along the boundary of the works areas. The temporary fence would comprise 1.8m high temporary chain wire fencing. A 2.1m high permanent chain wire fence with 3 strand barbed wire, would be installed between the access corridor from Tom Thumb Road and the Coal Terminal land.

Signage for the site would be in accordance with industry signage standards, including the required colour scheme and layout for signs. Adherence to these requirements would ensure that any signs required for the proposal would be in keeping with other signage throughout the surrounding industrial area.

Similar to the approved general cargo handling facility, EB4 would be lit using 30 metre high light towers, each fitted with floodlights to illuminate the proposed cargo stacking, service and access areas.

Utilities

A new incoming water main is proposed to be connected to the existing 375 mm diameter main in Tom Thumb Road and extend along the new access road to the site boundary. A new site water and site main reticulation system is also proposed to be constructed. Water supply would be required for maintenance activities, equipment wash down, fire fighting and potable water for domestic use.

Domestic sewage would be generated from facilities such as showers, toilets and wash basins, and wastewater would be generated from the AQIS wash bay. The existing sewer connection to the site would be maintained and domestic sewage would be discharged via the rising main along the Coal Terminal access road. The wastewater from the AQIS wash bay may also be directed to the sewer, however, this would be subject to a Trade Waste Agreement with Sydney Water. Sewage would be treated at the existing Port Kembla STP located to the east of the Western Drain and Port Kembla Road.

Power would be supplied to the site via an upgraded 500Kva supply line. A substation chamber and adjacent main switchroom structure would be constructed as a freestanding building. Internal walls would be of solid construction and external walls would be of cavity construction.

A fire fighting system would be installed to meet the requirements of the NSW Fire Brigade.

Stormwater Management

The size of the hard paved area would generate significant water flow in design storm events. Hence, stormwater runoff would be collected and disposed of in an appropriate manner to minimise the potential impacts on the surrounding Inner Harbour. The stormwater management system would remove gross suspended solids and hydrocarbon pollutants via a Humes interceptor device or equivalent unit.

The existing drainage network would be augmented and modified to accommodate a 1 in 20 year storm event. Similar to the general cargo handling facility, stormwater runoff would be collected by a series of stormwater pits and would drain via box culverts and pipes. Prior to the discharge of stormwater from the site to the Inner Harbour, all water would pass through a series of oil and

grease separator pits and trash racks. Any motor vehicle contaminants such as oil and rubbish would be contained within the pits and prevented from being discharged into the Inner Harbour or groundwater.

3.2.3.2 Construction of Multi-Purpose Berth No. 3

MPB3 is proposed to be constructed for use in conjunction with the recently extended Multi-Purpose Berth for the loading and unloading of cargo and discharge of motor vehicles as well as accommodating growth of the existing Multi-Purpose Berth operations. This would allow three ships to be stevedored at the same time as required to provide the necessary level of service to each vessel.

The area proposed to be used to develop MPB3 is part of the former reclaimed casting basin and the Western Basin of Port Kembla. The site is also a part of the former Tom Thumb Lagoon which was dredged in the 1950/60s to create the Port. ***Plate 3-1*** shows the existing nature of the area for MPB3.

Plate 3-1: Looking south towards the Existing No. 2 Products Berth and BlueScope Steel

Part of the proposed berth comprises reclaimed land (including slag) associated with its use as a former casting basin. It is therefore proposed that this land be excavated in order to develop the new berth and berthing basin.

Following excavation and dredging works and subject to final wharf design, an armoured revetment is proposed to be constructed on the northern and western sides of the new berthing basin as well as the northern part of the eastern side, suitable for the basin dredge level of RL-12.3 m. The construction of the revetment wall would utilise an igneous armour rock such as basalt. Excavation of the existing reclamation and revetments would be required to accommodate the new berth. The berth and revetment would be constructed to tie in to the extended Multi-Purpose Berth.

The area behind the bulkhead is proposed to be reclaimed with approximately 50,000 m^3 of uncrushed slag, some of which would be sourced from the existing hardstand area (within the site of the general cargo handling facility) and some imported to the site from Australian Steel Mill Services. Australian Steel Mill Services is a company that processes the slag from BlueScope Steel and markets the product as a fill material.

A bulkhead (i.e. a driven vertical steel tube to form a quay wall) would also be constructed on the eastern side and possibly the northern side of the basin. This would provide ship berthing advantages as it creates a dampening effect on the berthing forces. It is also cost effective and allows maximum flexibility for future use options. In addition a stern ramp landing would be constructed at the northern end of the basin. This would comprise a steel piled concrete deck structure at the head of the dock and would allow the stern loading ramp of the vessel to rest on it when it berths port side. Smaller ships would probably berth starboard side to and therefore use a mid ship ramp onto the wharf structure and a stern ramp at the southern end of the new bulkhead berth.

Dredging of the Western Basin is also proposed to allow for the construction of the new berth and to provide an adequate shipping channel. Spoil material to be dredged from the Western Basin is proposed to be disposed partly offshore to a site that has previously been used for this purpose and partly to a site located in the Outer Harbour which has also been used for this purpose. The attached environmental assessment prepared by Patterson Britton & Partners Pty Ltd describes in detail the dredging proposal and forms part of the application to DoP seeking project approval for the expansion under Part 3A of the EP&A Act.

The proposed drainage network would be consistent with the General Cargo Handling Facility immediately to the north. Stormwater runoff would be collected by a series of stormwater pits and all water would pass through these pits which are proposed to trap any oil and grease and trash racks before being discharged to the Inner Harbour. The final configuration of the stormwater management system would be determined during the detail design phase of the project.

Other activities that are proposed to be undertaken as part of the construction of MPB3 include:

- Wharf furniture including fenders and shore bollards, kerbs, pits, power outlets and water points.
- Protection of steelwork and piling, including a Cathodic Protection system, painting and Petrolatum wrapping of steel piles in splash and tidal zone.
- Provision of electrical services, including cable reticulation, single and 3 phase power outlets, berth face lighting, and tower lighting.
- Provision of suitable power supply and mains.
- Provision of hydraulic services, including ships water main reticulation and filling points, wash down points, fire hydrant ring mains and hydrant points.
- Provision of new pavements suitable for intended berth traffic over 25 years.
- Security fencing.

3.2.3.3 Extension of Existing Multi-Purpose Berth

The existing Multi-Purpose Berth is proposed to be extended by 80 m to the east of the existing berth to allow two car carrier vessels to be accommodated simultaneously. Car carriers require longer berth lengths than other vessels in order for their stern ramps to rest on the berth to allow motor vehicles to be efficiently unloaded from the vessel.

The proposed eastern extension of the berth would be compatible in function, components, dimensions and materials to the existing berth, which is an open deck on pile structure. Other activities that would be undertaken as part of the proposed extension include:

- Demolition of any existing structures required to tie in the berth extension.
- Wharf furniture including fenders and deck bollards at similar spacings to the existing berth, kerbs, pits, power outlets and water points.
- Protection of steelwork and piling, including a Cathodic Protection system and Petrolatum wrapping of steel piles in splash and tidal zone.
- Provision of electrical services, including cable reticulation, single and 3 phase power outlets, berth face lighting and tower lighting. Conduits would also be provided for future crane power supply.
- Provision of suitable power supply and mains.
- Provision of hydraulic services, including ships water main reticulation and filling points, wash down points, fire hydrant ring mains and hydrant points.
- Provision of a stormwater drainage system, compatible with that on the existing berth, and discharging via suitable stormwater control pits.

- Provision of new pavements suitable for intended berth traffic over 25 years, compatible with, and tied into the existing berth pavements.

An armoured revetment is proposed to be constructed beneath the open deck structure suitable for the basin dredge level of RL -16.25m. The revetment would be constructed to tie in to the existing revetment beneath the Multi-Purpose Berth and extend eastward to tie in with the existing revetment adjacent to the Grain Berth.

Dredging of soft sediments would be required to be undertaken beneath the future berth structure to allow for the construction of the extension. Separate environmental studies have been undertaken for the proposed dredging works as outlined in **Section 4**.

Once completed, two car carriers would be able to efficiently unload motor vehicles from the berth simultaneously thereby increasing the operational efficiency and capacity of the Multi-Purpose Berth.

3.3 Dredging Works

Approximately 230,000 m^3 of material would be required to be removed from the Eastern Basin area of the Inner Harbour for the construction of EB4 and an additional 400,000 m^3 of material would be required to be removed from the Western Basin area for the construction of MPB3. Based on the results of sediment sampling and testing, it is proposed to dispose of approximately 300,000 m^3 within a reclamation area in the Outer Harbour and 330,000 m^3 is proposed to be disposed at sea. Disposal of dredged material at sea requires a permit under the *Environment Protection (Sea Dumping) Act 1981* from Commonwealth Department of Environment and Heritage. A permit for the disposal of the material at sea was recently granted (refer **Appendix B**).

An assessment of the potential impacts from dredging and disposal operations was undertaken by Patterson Britton & Partners Pty Ltd. A summary of the assessment is provided in **Section 4** and a copy of the report, including all appendices, is provided in **Appendix B**.

3.3.1 History of Dredging and Land Use at MPB3

In the late 1950s and early 1960s, Tom Thumb Lagoon was dredged to create the Inner Harbour of Port Kembla. The No. 2 Products Berth and the adjacent Roll on Roll off (Ro Ro) Berth were dredged in the early 1970s. The existing MPB was initially dredged in 1980 and then again in 1994 when it was extended for the Esso Oil Rig Project. In 1988, the Casting Basin for the Sydney Harbour Tunnel project was dredged and the material stockpiled to the north of Tom Thumb Road. In 2000, PKPC and BHP used 2 million tonnes of slag together with the original clay and silt that was removed from the Casting Basin to reclaim the site. The onland portion of the proposed MPB3 has had no use since the filling/restoration of the Casting Basin.

3.3.2 History of Dredging and Land Use at EB4

In 1980, the Coal Loader berthing basin located in the Eastern Basin of the Inner Harbour and south of the proposed EB4 dredge footprint was dredged. In 1985, the Grain Terminal berthing basin located to the south west of the EB4 footprint was dredged. The land adjacent to the proposed EB4 dredge area was first developed in 1971 when the ANL Ro Ro terminal was constructed and used to export steel. Between 1993 and 1994 the terminal was used as a Ro Ro service with most of the cargo being containerised. No other ongoing activity has occurred on the site since this time.

3.3.3 Description of Material

The material that is required to be removed generally comprises very soft dark grey to black silty estuarine clay overlying very stiff alluvium/residual clay and/or soft to hard sandstone. Bands of sand and clayey sand were also observed in some locations but are generally less than 0.5 m thick.

Sediment sampling and chemical testing of the material has been undertaken and therefore there is a high degree of information available regarding sediment characteristics.

As indicated in **Section 3.1**, a total of 630, 000 m^3 of material is proposed to be removed from the Western Basin and Eastern Basin areas of the Inner Harbour. Based on the results from sediment sampling and testing, approximately 300,000 m^3 is deemed to be contaminated and the remaining material (approximately 330,000 m^3) uncontaminated.

A detailed description of the type and quantity of the dredging material is provided in Section 3.2.2 of **Appendix B**.

3.3.4 Alternatives to Ocean Disposal

PKPC considered land disposal as an alternative to the sea disposal option for the dredged sediment.

PKPC proposes to re-use the contaminated material retrieved from the harbour in the vicinity of the proposed MPB3 and EB4 wharfs for reclamation within the Outer Harbour of Port Kembla. Therefore, PKPC want to use the contaminated portion of the dredged sediment and store it within a contained area within the Outer Harbour. By using the contaminated material within an enclosed reclamation area, PKPC can ensure that the material is re-used without mobilising the contaminants.

Unfortunately, due to geotechnical and commercial constraints, not all of the dredged material can be placed within this area and therefore with the lack of other storage disposal areas within the port, PKPC need to dispose of the remaining approximately 330,000 m^3 of uncontaminated material to

sea. Other land disposal options were considered for the uncontaminated material but were not viable economically and therefore not considered further.

3.3.5 Description of Ocean Disposal Site

It is proposed to dispose of the uncontaminated material at the same location that was used for the disposal of spoil for the construction of the casting basin for the Sydney Harbour Tunnel construction project in 1989. This spoil ground, known as Spoil Ground C1, is located approximately 8 km south-east of Port Kembla. The water depth at the site ranges between 75 and 95 metres below Chart Datum. The site has an area of approximately 3.5 km^2.

3.3.6 Description of Outer Harbour Reclamation Site

The proposed reclamation area in the Outer Harbour is located between Jetty No. 6 and Jetty No. 3. The area has been used previously for disposal of dredged material including:

- 120,000 m^3 of material in 1994 from dredging operations undertaken for the extension of the Multi-Purpose Berth as part of the ESSO Operations.
- 26,000 m^3 of material in 1999 as part of modifications to the Inner Harbour Restoration Project.
- 50,000 m^3 of material in 2005 as part of the recent MPB130 extension.

Material would be dredged using mechanical dredging equipment such as a backhoe dredger or grab dredger loading self-propelled hopper barges, operating 24 hours per day seven days per week. The barges would have a hopper capacity of approximately 350 to 500 m^3 and a fully loaded draft of up to 3.5 m. It is likely that a minimum of two barges would be involved in the disposal operations to the Outer Harbour. Further detail of proposed operations is provided in **Appendix B**.

3.4 Construction Methods, Plant and Equipment

3.4.1 Land Based Works

It is expected that the construction of each of the components that comprise the proposed expansion works would take the form of separate conventional principal design contracts which would then be subject to a competitive tender process for construction. It would be the responsibility of each successful tenderer and its contractors to determine the actual means of construction, scheduling of works and overall timing. Each successful tenderer would be required to comply with the concepts provided in this environmental impact assessment document and with all adopted environmental safeguards and conditions imposed by the Minister for Planning as part of his determination.

Temporary site facilities such as a site office, amenities, carpark, and materials storage areas would be provided for the construction contractors for each of the components that make up the proposed

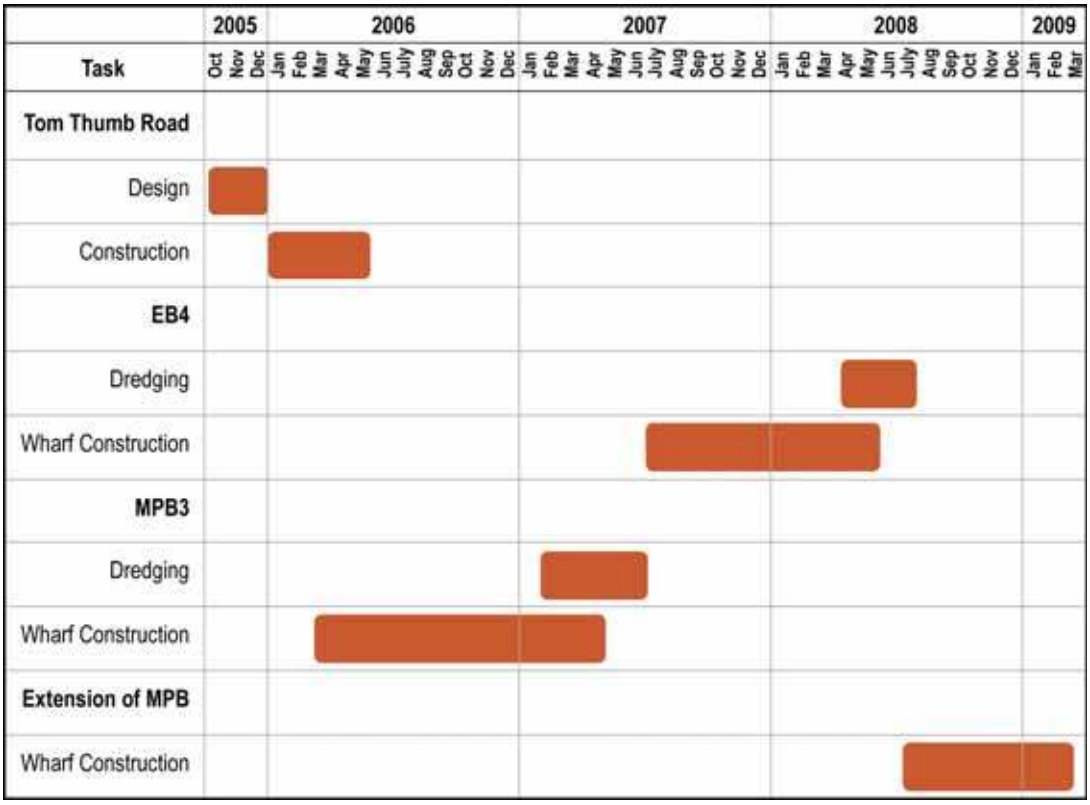
expansion works. It is expected that the construction of the proposed expansion would be staged so that the peak construction workforce on site at any one time would be approximately 50-70 people.

Construction traffic for each component would include traffic from the construction workforce as well as heavy vehicles delivering material and equipment to each site. It is expected that Springhill Road and Tom Thumb Road would form the main access to the sites and would be utilised by construction traffic. It is not expected that any construction material would be delivered by rail.

In accordance with the Department of Environment and Conservation's *Environmental Noise Control Manual*, construction activities for the land based works would be restricted to between 7.00 am and 6.00 pm Mondays to Fridays and 7.00 am to 1.00 pm on Saturdays. If construction noise is audible at the closest residential locations, then construction would not commence until 8.00 am on Saturdays. No audible construction work would be undertaken on Sundays or public holidays.

The construction schedule for the proposed expansion of the General Cargo Handling Facility is outlined in **Figure 3.3**.

Figure 3-3: Proposed Construction Schedule



Construction activities would vary for each component of the proposed expansion and therefore they have been outlined separately below.

Northern Extension of General Cargo Handling Facility North of Tom Thumb Road

The main activities that would be undertaken to the north of Tom Thumb Road would include:

- Site establishment works.
- Installation of temporary erosion and sedimentation control measures.
- Excavation for sewer, water supply and services distribution.
- Drainage construction including stormwater quality measures.
- Pavement construction.
- Relocation of Tom Thumb Road including the provision of two additional access points for the vehicle processing area.
- Construction of new buildings as part of vehicle processing area.
- Lighting and fencing.
- Installation of on-site services such as water, sewerage and electricity.
- Line marking and signposting.
- Installation of hailmesh protection within the vehicle processing area.
- Landscaping.

All services would be buried below the ground. Trenches accommodating the pipes and cables would be excavated using backhoes. The excavated material would be retained beside the trench for backfilling after the pipes have been laid. A small number of additional vehicles would be required to deliver the pipes and other materials associated with the provision of services.

The establishment of the stormwater system would involve the construction of inlet pits, a series of box culverts and gross pollutant traps. Activities that would be associated with the installation of the stormwater system include excavation using backhoes, pouring of concrete and installation of pre-cast concrete sections.

Construction of the Tom Thumb Road would involve laying and compacting sub-base material, followed by placing and compacting of asphaltic concrete.

Construction of EB4

The main tasks that would be undertaken for the construction of EB4 would include:

- Site establishment.
- Demolition of existing structures and some services.
- Pile driving.

- Temporary erosion and sedimentation control measures.
- Earthworks for land reclamation and revetments.
- Pavement construction.
- Drainage construction including sedimentation controls.
- Refurbishment or replacement of cargo storage shed.
- Lighting and fencing.
- Provision of on-site services such as water, sewerage and electricity.
- Provision of gate entry infrastructure.
- Line marking and sign posting.
- Landscaping.

The existing Ro-Ro wharf would be completely demolished and removed from the site, and existing marine piles would be extracted. Some of the bollards, light masts, fittings and guard rails would be retained and reused. All demolished and excavated material, debris and rubbish would be contained within the area of the demolition site, prior to being transported to a licensed waste facility for disposal.

Earthworks would be undertaken to improve existing reclamation areas and to form new reclamation areas, as well as to allow the installation of services and structures. The two areas to be reclaimed are the northern reclamation area and the southern reclamation area. The northern reclamation area is bounded by the northern embankment to the berth and the Western Drain, whilst the southern reclamation area comprises an area behind the proposed bulkhead and southern return wall and west of the crest of the existing reclamation embankment. These areas would be reclaimed using dredged material (if geotechnically suitable), slag or other good quality engineering fill. As indicated previously in **Section 2**, a separate environmental impact assessment has been undertaken for proposed dredging works associated with the proposed expansion of the general cargo handling facility and is attached and forms part of the DA. Commonwealth approval for any offshore disposal of spoil has also been sought.

Subject to final design, it is likely that tubular 1500mm diameter piles and sheetpiles would be used to construct the bulkhead wall. It is anticipated that a combination of land-based and water-based piling would be required. A site investigation shows that the bedrock is approximately 26m below datum and if the piles can be driven to required toe levels then a pile driving barge would be deployed with either a diesel or hydraulic pile driving hammer, as determined by the successful Contractor. If rock socketing is required then a drilling barge would also need to be deployed to cut sockets into the bedrock. It has been estimated that approximately 50 days of pile driving would be required based on the rig driving four piles per day.

It is expected that construction materials would be sourced from the established ready mixed concrete, gravel/aggregate and asphalt/bitumen suppliers in the region.

Various trucks, such as flatbed trucks and dump trucks, would be used to haul construction materials. Bulldozers, scrapers, graders, steel drum vibrating rollers, compactors, and paving machines would be used for ground preparation works. Hydraulic excavators would be used to prepare the required building foundations. Backhoes would excavate trenches to allow the installation of services below ground, security fencing, light masts and the stormwater drainage system. Cement trucks and concrete pumps would be used to pour the building foundations. Mobile cranes would transport equipment around the site. Water trucks would spray the surface of exposed areas to minimise dust generation. Line marking equipment would be used to delineate the entry and exit to the site as well as the car spaces within the proposed car park.

Construction traffic vehicles would use Springhill Road and Tom Thumb Road to access to the site. Alternative site access could be obtained from the Coal Terminal access road if required.

Construction of MPB3

The major activities associated with the construction of the proposed MPB3 would include:

- Demolition of any existing revetments.
- Dredging of the Multi-Purpose Berth No. 3 berthing basin to RL –12.3 metres.
- Dredging within the Western Basin to RL –11.75 metres.
- Pile driving to allow for the berth construction and stern ramp loading platform.
- Earthworks for revetment.
- Dredging of existing reclamation and revetment to tie in with new works.
- Concrete works for bulkhead capping beam and stern ramp loading platform.
- Provision of electrical services.
- Provision of hydraulic services, including ships watermain reticulation and filling points, wash down points, fire hydrant ring mains and hydrant points.
- Provision of pavement.
- Installation of light towers.
- Installation of security fencing.
- Removal and disposal of construction and demolition waste.
- Stormwater drainage system.

Geotechnical investigations to be undertaken during the detail design stage of the project would determine whether all the piles can be driven. Some piles may need to be rock socketed. If the piles can be driven then a pile driving barge would be deployed with either a diesel or hydraulic

pile driving hammer, as determined by the successful Contractor. If rock socketing is required then a drilling barge would also need to be deployed to cut sockets into the bedrock. The number of piles required would be determined during detail design.

Construction vehicles to be used would include excavators, front-end loaders, backhoes, cement trucks, concrete pumps, flatbed trucks and dump trucks. A mobile crane may also be used to transport some equipment and a pile driving barge may be used for piling activities. Other construction equipment to be used for the proposal may include jackhammers, concrete vibrators, compactors, welders, electric drills, angle grinders, diesel generators, and various hand tools.

All the Contractor's operations, equipment compounds and storage areas would be located in the vicinity of the existing vacant land located to the north of the existing Multi-Purpose Berth so as to cause as least an interference as possible with existing operations. All sites used for these purposes would be securely fenced. If diesel is required to be stored on site it would be appropriately bunded to minimise the impact of potential spills thereby protecting the surrounding environment.

Extension of Existing Multi-Purpose Berth

The major activities associated with the eastward extension of the berth include:

- Demolition of any existing structures required to tie in the berth extension.
- Dredging within the Inner Harbour.
- Pile driving to allow for the berth extension.
- Earthworks for revetment.
- Excavation of existing reclamation and revetment to tie in with new works.
- Concrete works.
- Provision of electrical services.
- Provision of hydraulic services, including ships watermain reticulation and filling points, wash down points, fire hydrant ring mains and hydrant points.
- Provision of pavement.
- Installation of security fencing.
- Removal and disposal of construction and demolition waste.
- Stormwater drainage system.

Construction vehicles similar to those required for the construction of MPB3 would be utilised to extend the existing Multi-Purpose Berth.

All the Contractor's operations, equipment compounds and storage areas would be located in the vicinity of the existing wharf so as to cause as least an interference as possible with existing

operations. All sites used for these purposes would be securely fenced. If diesel is required to be stored on site it would be appropriately bunded to minimise the impact of potential spills thereby protecting the surrounding environment.

It is expected that there will be some operational interference at the eastern end of the existing berth during the construction phase as the eastern mooring bollard will not be available to ships. PKPC would endeavour to manage this inconvenience during the construction period and every attempt would be made to manage vessels needs. This inconvenience is only expected to be an issue during larger ship placements or when another vessel is already berthed at the western end.

3.4.2 Dredging Works

PKPC plans to ensure that 300 mm of "over-dredging" of the upper contaminated material occurs to ensure that no contaminants mix with the underlying uncontaminated material identified for offshore disposal. It is anticipated that mechanical dredging equipment would be used such as a backhoe dredger or grab dredger loading self propelled hopper barges to remove the remaining uncontaminated material for sea disposal.

The successful contractor would ultimately determine the details of the equipment that would be used for dredging and disposal operations during the detail design stage of the project. Dredging activities are proposed to be undertaken 24 hours a day seven days a week. It is not expected that dredging activities would be audible at the closest residential location and therefore noise impacts from dredging works are not expected to result (refer **Appendix B**).

3.5 Operation of the Expanded General Cargo Handling Facility

AAT propose to manage the expanded general cargo handling facility for the stevedoring of automotive, break-bulk, bulk and containerised cargo. The stevedoring operations would be carried out by general stevedores and would involve similar activities to those currently undertaken at the Multi-Purpose Berth and those described as part of the approved development (SKM, 2004).

The proposed site layout was previously shown on **Figure 3-2**. Activities that are proposed to be undertaken are detailed below.

3.5.1 General Cargo and Container Handling

General cargo (including break-bulk and bulk) and containerised goods would be imported and exported to and from the expanded facility by ship. Ships would dock at Multi-Purpose Berth No. 1, 2 or 3 and EB4 whilst goods are loaded/unloaded on to the wharf apron using mobile harbour cranes or ships gear and/or forklift equipment. Typical cargo that would be handled include containers, steel, timber, clinker and fertiliser. It should be noted that bulk cargo such as clinker and fertiliser forms part of the existing trade on the Multi-Purpose Berth.

General cargo and containers for export would be transported to the site by either road or rail. Similarly, general cargo and containers would be collected and transported offsite by either road or rail.

Different custom zones would apply to the expanded facility such that it is expected that the area south of Tom Thumb Road would be within one zone and the area to the north of Tom Thumb Road subject to another zone. Because of this, once vehicles are transferred to the vehicle processing area they will not be permitted to be transferred back to the general cargo and vehicle storage area to the south of the existing Tom Thumb Road and would need to leave the site from the north.

A traffic and transport assessment of the proposed expanded facility has been undertaken and is provided in **Section 4.2**.

3.5.2 Vehicle Handling

Vehicles (comprising motor vehicles, trucks, and farm machinery) would be imported to the facility by car carrier vessels. These vessels would dock at either of the four berths and vehicles would be driven from the ship onto the wharf, via the vessel's ramp, to a set down area on the site. Vehicles would then be transferred to the vehicle processing area for processing or to an adjacent area for short term storage prior to leaving the site via road truck hauling car carrier or rail. A 10 m wide car way would be provided between Farrer Road and the relocated rail spur for vehicles wishing to access the vehicle processing area to the north of the rail spur.

Short term storage of vehicles would occur on site and be protected by hailmesh.

Vehicles leaving the site by road would so via two proposed access points from the vehicle processing area to Tom Thumb Road.

3.5.3 Hours of Operation

The expanded facility would operate 24 hours per day seven days per week. These hours are consistent with the original development consent (DA No. 105-5-2004-i). These hours were also confirmed as part of the consent for the Section 96 modification (MOD - 64-4-2005i).

3.5.4 Personnel

On-site personnel would include AAT employees, stevedoring and pre-delivery inspection (PDI) operators, associated wharf contractors, visitors, security operations and Government regulatory agency staff. The number of personnel on-site would vary significantly depending on the number of vessels alongside, the shift worked and the types of cargo being handled. Personnel numbers could exceed 150 staff on the rare occasions when all berths are occupied during receipt and delivery operations. An indicative average for day shift operations (Monday to Friday) however,

would be approximately 115 staff. During evening and night time operations (Monday to Friday and weekend shifts) the average personnel would decrease to approximately 23 staff.

3.5.5 Traffic Management

Traffic management on-site is critical to the efficient operation of the facility. The Section 96 modification changed the location of the staff car park to the western side of the approved facility as well as the site entry in order to increase traffic management on site and reduce potential traffic conflicts between light and heavy vehicles and other machinery.

A staff car park is also proposed to be provided at EB4.

During operations, the total truck traffic associated with the expanded general cargo handling facility is expected to between 190 and 243 truck movements per day and a peak of between 299 and 386 truck movements per day, based on low and high projected cargo throughput for the site respectively. These movements are based on the scenario that 80% of all cargo would be transported from the site by road and that 20% would be transported by rail.

The operational area of the expanded facility would generally comprise unobstructed pavements with the exception of light towers and cargo storage sheds. The pavement would be extensively linemarked for the allocation of cargo. Due to the required flexibility of cargo throughput through the site, i.e. the use of either Multi-Purpose Berths No. 1, 2, 3 or EB4 for the importation and export of cargo, and the subsequent short term storage of cargo within the facility, no permanent internal roadways are proposed to be delineated. The only internal roadways that are proposed to be linemarked include the site entry road, staff car parks, gatehouses and truck marshalling areas. Computer allocation of cargo would be used and drivers would be directed to various areas within the facility to maintain efficient operations and traffic circulation.

A traffic and transport assessment of the proposed expansion works is provided in **Section 4.2**.

4. Environmental Assessment

Detailed investigations were undertaken for the previous EIS (DA No. 105-5-2004-i) and these investigations were revised to assess the potential impacts from the expansion of the General Cargo Handling Facility. A summary of the investigations and the results is provided in the following sections.

In addition, Patterson Britton & Partners Pty Ltd was commissioned by PKPC to assess the potential impacts from dredging and reclamation works. The environmental assessment undertaken by Patterson Britton & Partners Pty Ltd is provided in **Appendix B**.

4.1 Land Use

4.1.1 Existing Environment

The major land uses around Port Kembla include light and heavy industry, mining and extractive industry, urban development, nature and recreation reserves, manufacturing and agricultural activity. Major manufacturing activities are also conducted in the corridor between Port Kembla and Unanderra.

Several coal mining operations are located west of Port Kembla, both above and below the escarpment. These coalfields produce high quality coking coal, used by industry both locally and overseas. Other extracted materials include coarse aggregate, gravel, shale and sand.

The Illawarra Region has areas of significant natural attractions with a number of reserves in the area. Located along the escarpment are the Bulli Pass Scenic Lookout, the Mt Keira Lookout, the Illawarra Escarpment State Recreation Area and the Macquarie Pass National Park. To the south beyond Lake Illawarra is the Minnamurra Rainforest Reserve.

Despite the fact that only 7.5% of the Illawarra Region is regarded as prime crop and pasture land, agriculture contributes significantly to the regional economy every year. Significant agricultural industries in the region include dairy (Wingecarribee and Shoalhaven Shires), beef cattle and sheep production (Wingecarribee Shire), vegetables (Robertson, Shoalhaven and Wollongong Shires), and agricultural production (Shoalhaven Shire).

The area proposed for the expanded general cargo handling facility is located within the Inner Harbour of Port Kembla and as such is surrounded by various industrial activities associated with the operation of the port and BlueScope Steel. Facilities in the surrounding area include the Grain Handling Terminal, Port Kembla Rural Service Centre, Port Kembla Coal Terminal and steelmaking activities. The Inner Harbour was developed specifically as an all-weather shipping port and covers 60 ha with 2,900 m of commercial shipping berths. The heaviest concentration of wharfage for industry is in the Inner Harbour.

The area immediately surrounding the Port Kembla industrial area is occupied primarily by residential development, much of which was originally established to provide housing for those employed in heavy industry.

The urban areas provide small and large scale residential developments, retail outlets, community services (e.g. medical facilities, hospitals, schools and sporting facilities) and commercial facilities (e.g. banking and post office services). The residential area which is closest to the proposed development is within the suburbs of Mount St Thomas and Coniston located to the north of Springhill Road, approximately one kilometre north-west of the site.

In recent years, further residential development has occurred to the north of the site in and around Ross and Swan Streets, Wollongong. Discussions with Wollongong City Council indicate that approval has recently been provided for a number of multi-storey apartments and associated independent living and nursing home facilities on 5,000 square metres of land in this area and once constructed may have views over the port of Port Kembla although views may be partially obstructed by Wollongong City's Greenhouse Park (former builder's landfill site).

4.1.2 Construction Impacts

During construction, the proposed expansion is not expected to have any negative impacts on the land uses in the surrounding port environment. The existing Multi-Purpose Berth would continue to operate, thereby, ensuring the import and export of cargo from the port is not affected.

4.1.3 Operational Impacts

The proposed expansion is not expected to have any negative impact on the land uses in the surrounding port environment, but rather would complement the mining, manufacturing and steel industries within the local area and region. The proposal is consistent with the strategies discussed in the *Illawarra Regional Environmental Plan* and with the objectives of the *Wollongong LEP, 1990* and the *NSW Ports Growth Plan*.

4.1.4 Proposed Mitigation Measures and Safeguards

Safeguards relating to the control of noise levels and the mitigation of impacts on water quality, air quality, traffic and transportation and visual matters would be implemented (as detailed in the following sections of this report) to ensure that the proposed expansion is managed in an effective and efficient manner. The implementation of these safeguards would mean that the operation of the proposed expansion would have minimal or no potential adverse impact on existing or future land uses in the surrounding area.

4.2 Traffic and Transportation

A traffic and transportation assessment of the proposed expanded general cargo handling facility was undertaken by Sinclair Knight Merz, the results of which are presented in this section.

4.2.1 Existing Transport Network

Road

The study area under investigation and the surrounding road network is shown on **Figure 4-1**.

The key roads in the Port Kembla and Wollongong road network are:

- Southern Freeway (F6) – a limited access freeway linking Sydney and Wollongong, forming part of the National Highway 1 route. The Mount Ousley Road splits the freeway into a northern (Waterfall – Bulli) and southern (Mount Ousley – Albion Park) section. The speed limit on the Southern Freeway is 100-110km/h.
- Mount Ousley Road – the principal road access to Wollongong over the Illawarra escarpment, which also forms part of the National Highway 1 route. Its speed limit varies between 80 and 100 km/h for general traffic and 40 km/h for heavy vehicles.
- Princes Highway – connects Sydney with the South Coast of NSW and also provides an important arterial road function through Wollongong City.
- Springhill Road – provides a southern arterial link into Wollongong City. It also passes through the Port Kembla industrial area making it one of the main access roads into the area. The speed limit of Springhill Road is 80 km/h.
- Masters Road – connects Springhill Road to the Southern Freeway making it an important link for trucks travelling to and from destinations in the rest of NSW. The speed limit of Masters Road is 80 km/h.
- Five Islands Road – the second major link to the Port Kembla area. It connects to the Southern Freeway and Princes Highway. The speed limit on Five Islands Road is 80 km/h.
- Tom Thumb Road – a local industrial road within the port boundary that is the principal access for the general cargo handling facility onto Springhill Road. The speed limit on Tom Thumb Road is 50 km/h.
- Farrer Road – also a local industrial road within the port boundary currently providing access for cargo to the Multi-Purpose Berth. The speed limit on Farrer Road is 40 km/h.

Roads are generally classified according to a road hierarchy, in order to determine their functional role within the road network. The Roads and Traffic Authority has set down the following guidelines for the functional classification of roads, shown in **Table 4-1**.

Figure 4-1: Local Road Network

Insert figure

Table 4-1: Functional Classification of Roads

Road type	Traffic volume (AADT)	Through Traffic	Inter-connections	Speed limit (km/h)	Heavy vehicle Restrictions
Arterial	No limit	Yes	Sub-arterial	70 - 110	No
Sub-arterial	<20,000	Some	Arterial / Collector	60 - 80	No
Collector	<5,000	Little	Sub-arterial / Local	40 - 60	Yes, if residential
Local	<2,000	No	Collector	40	Yes, if residential

Source: "Updated Guidelines for Functional Classification of Roads in Urban Areas". RTA, 1993

Note 1: AADT - Average Annual Daily Traffic = number of vehicles passing a point during a 24 hour period averaged over a period of one year.

Traffic data for the study area were collated from several sources. Data for 2002 obtained from the Roads and Traffic Authority were supplemented by traffic surveys collected for the original EIS. The existing traffic volumes, and the appropriate road types, are shown in **Table 4-2**.

Table 4-2: Study Area Traffic Volumes

Road	2002 AADT (Two Way)	Heavy Vehicles (%)	Road Type
Mount Ousley Road, 2.2km south of MR186 [1]	38,941	25% [4]	Arterial
Southern Freeway, south of Gipps Road overpass [1]	64,168	18% [4]	Arterial
Princes Highway, at American Creek Bridge [1]	28,511	10% [4]	Arterial
Springhill Road, east of Keira Street [2]	17,789	15% [4]	Arterial
Springhill Road, north of Masters Road [2]	36,735	15% [4]	Arterial
Masters Road, west of Springhill Road [2]	28,035	15% [4]	Arterial
Five Islands Road, east of Springhill Road [1]	41,122	12% [4]	Arterial
Tom Thumb Road, south of Springhill Road [3]	1,242	35% [4]	Local

Note 1: NSW Roads and Traffic Authority data, 2002.

Note 2: Estimated based on long term (1980-2000) line of best fit (no 2002 AADT data available for non-permanent RTA stations)

Note 3: SKM surveys undertaken 18-23 March 2001.

Note 4: Roads and Traffic Authority of NSW Southern Region, "Northern Distributor Extension Wollongong" May 2000

To assess the performance of major roads, traffic flows were compared with mid-block capacities. Typical mid-block capacities for urban roads with interrupted flows are shown in **Table 4-3** below as adapted from **Table 4-1**. Road capacity is affected by many factors such as property access, bus stops and pedestrian crossings. Using this information, the volume/capacity ratio (v/c) for each road has been determined and is shown in **Table 4-3.** It should be noted that where peak hour volumes were not available, they were approximated using surrounding counts.

Table 4-3: Road Hierarchy in the Study Area and Existing Volume/Capacity (V/C)

Road	Direction	Functional Classification	Mid-block Capacity (Peak Hour)*	Average Peak Hour	V/C Ratio
Mount Ousley Road, 2.2km south of MR186	NB	Freeway	2,073	1,664	0.80
	SB	Freeway	2,073	1,789	0.86
Southern Freeway, south of Gipps Road overpass	NB	Freeway	3,375	3,092	0.92
	SB	Freeway	3,375	3,133	0.93
Princes Highway, at American Creek Bridge	NB	Arterial	1,900	1,458	0.77
	SB	Arterial	1,900	1,233	0.65
Springhill Road, east of Keira Street	NB	Arterial	2,900	817	0.28
	SB	Arterial	2,900	853	0.29
Springhill Road, north of Masters Road	NB	Arterial	2,900	1,687	0.58
	SB	Arterial	2,900	1,762	0.61
Masters Road, west of Springhill Road	EB	Arterial	2,900	1,344	0.46
	WB	Arterial	2,900	1,287	0.44
Five Islands Road, east of Springhill Road	EB	Arterial	2,900	1,972	0.68
	WB	Arterial	2,900	1,888	0.65
Tom Thumb Road, south of Springhill Road	NB	Local Industrial	300	99	0.33
	SB	Local Industrial	300	63	0.21

* Based on AUSTROADS Guide to Traffic Engineering Practice Part 2, Roadway Capacity 1988.

The v/c ratio compares the adopted capacity on a road with the actual traffic volume on the road. If the v/c is greater than one, it is interpreted that the road is operating beyond its ideal capacity. Conversely, if the v/c is less than one, the road is operating at less than capacity, indicating available capacity for future growth, although the practical capacity is likely to be 85-95% of the nominal capacity. **Table 4-3** shows that the roads within the vicinity of the proposed expansion are currently operating within their functional capacity. The Southern Freeway and Mount Ousley Road are operating close to their capacity in the peak hour, and future growth in traffic is likely to result in further congestion on these roads. However, it should be noted that much freight movement occurs outside the network peak, where there is some excess capacity available.

Within the study area two intersections were surveyed for both the AM and PM peak periods on Tuesday 23 March 2004, to determine peak turning volumes. The weekly profile at the RTA permanent count station in Five Island Road indicates that during the peak hours assessed Tuesday has the maximum volume during the PM peak period, and during the AM peak period the difference between Tuesday and Thursday, which has the maximum volume, is very small. The results of the intersection surveys are presented in **Appendix C**. The intersections surveyed were:

- Springhill Road and Masters Road.
- Springhill Road and Tom Thumb Road.

The turning movement counts at these intersections were analysed using the INTANAL computer analysis program. The program analyses the operating conditions which can be compared to various performance criteria as set out in **Table 4-4**.

Table 4-4: Level of Service Criteria for Intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays	At capacity, requires other control mode
F		Roundabouts require other control mode	

Source: Guide to Traffic Generating Developments, RTA 2002.

The results for the 2004 base case are shown in **Table 4-5** below.

Table 4-5: Results of Intersection Analysis

Intersection	Degree of saturation [1]	Average delay (seconds)	Level of service
AM Peak			
Springhill Rd & Masters Rd	0.90	26	B
Springhill Rd & Tom Thumb Rd	0.50	3	A
PM Peak			
Springhill Rd & Masters Rd	0.89	23	B
Springhill Rd & Tom Thumb Rd	0.46	4	A

Note 1: The degree of saturation is the ratio of demand to capacity for the most disadvantaged movement at the intersection.

The results of the intersection analysis indicate that both intersections analysed are operating within their theoretical capacity. The average delays for vehicles exiting Tom Thumb Road were predicted as 73 seconds per vehicle and 47 seconds per vehicle for the most delayed movements in the AM and PM peak periods respectively, as opposed to the average delay for all vehicles at the intersection as presented in **Table 4-5**. This range of delay was confirmed on site when vehicles exiting Tom Thumb Road were seen to wait for a long time.

Freight Rail Operation

Major rail and road routes in the study area are shown on **Figure 4-2**.

Freight and passenger rail services both use the Illawarra Rail Line between Sydney and Wollongong. Freight services also use the Moss Vale Line. Freight rail operation on the Illawarra Line is restricted by a curfew through the Sydney Metropolitan Region. This curfew operates generally during the morning and afternoon peak commuter times between 6am and 9am and between 3pm and 6pm. This is done to maximise the available rail capacity for commuter train services.

The capacity of the Illawarra Line between Sydney and Port Kembla was discussed with staff of the Ministry of Transport, the Rail Infrastructure Corporation (RIC) and CityRail. The main capacity constraints are the single track section through the Coalcliff tunnel and the freight curfew on the Sydney metropolitan network.

The current timetable (April 2005) provides for 14 northbound and southbound coal train paths through Sydney (up to 850m in length) and three Metropolitan Colliery coal paths. Daily utilisation of coal paths is generally five paths for western coal, three Metropolitan Colliery and one ex Mount Thorley. There are a further 12 freight paths via the Illawarra line, seven of which are currently used on a regular basis. The cargo moved by rail comprises gravel and rail ballast, flour, containers, steel and ore concentrates.

There are up to five available freight paths and eight available coal paths per day currently timetabled on the Illawarra Line, although the coal industry is generally reluctant to release any paths allocated to them.

The other main rail line which provides rail freight access to Port Kembla is the Moss Vale Line, which passes through Robertson and Dombarton, across the escarpment. This line is primarily used for bulk freight, and for diverted traffic off the Main Southern and Illawarra Lines during track closedowns for maintenance.

The Moss Vale Line is also the primary access route for grain to Inner Harbour, limestone to Port Kembla steel works, Tahmoor coal and for ore concentrates from the North Parkes and Cobar area mines. Track capacity of this link is constrained by the line being single tracked between Dombarton and Moss Vale, steep grades and slow operating speeds. Current loop lengths set track capacity, and limit the line's use by longer trains. There are 13 timetabled paths per day each way on this line, comprising four Tahmoor coal paths, one ore path, one limestone path, and seven paths for grain or other potential product.

Figure 4-2: Regional Rail and road routes

Insert figure

An alternative route for western traffic between Maldon (on the Main South Line) and Dombarton was started in the 1980s. Construction was suspended in 1988 after a significant coal industry recession. Since then, the original forecasted tonnages have failed to materialise to justify the line's completion as a coal haulage route.

Shipping

Currently the port of Port Kembla has approximately 600 ship visits per year. This represents less than two visits a day. Based on existing shipping levels at Glebe Island and Darling Harbour, an additional 11 ships per week could be expected with the expanded facility in operation. This additional activity would result in an average of just over three ship visits per day, which is considered to be a manageable increase on existing levels.

There are no constraints on shipping movements into Port Kembla. The additional ships expected to result from the implementation of the NSW Ports Growth Plan within Port Kembla would be easily accommodated within the Port. Given this, PKPC have advised that there would be minimal or no waiting associated with increased ship numbers.

Public Transport

The Port Kembla area is well served by public transport. However, the location of the proposed expanded facilities to the nearest bus stop varies in distance depending on which land component is referred to. The area to the north of Tom Thumb Road is located approximately 250 m from the nearest bus stop while EB4 is located over two kilometres away. Coniston Railway Station is located approximately 800 m from the corner of Springhill Road and Tom Thumb Road. There are buses available from Coniston Railway Station and along Springhill Road.

Trains to Port Kembla and Sydney via Wollongong on the Illawarra Rail Line depart from Coniston Rail Station. During the morning peak two hours (7-9 am) there are eight services from Wollongong and eight services to Wollongong. During the afternoon peak two hours (5-7 pm) there are 11 services from Wollongong and six services to Wollongong.

Premier Illawarra operates buses on three routes that stop at Coniston Railway Station. Route 23 is a return service between Wollongong and Figtree, while Routes 10 and 11 operate anti-clockwise and clockwise loops respectively via Wollongong, Coniston, Figtree, Keiraville and Wollongong University. The frequency of these bus services during peak hours is shown in **Table 4-6**.

Bus and train services are less frequent during off-peak times.

Table 4-6: Peak Hour Bus Service Frequency

Route	AM Peak (7-9am)	PM Peak (5-7pm)
10 (loop)	2	2
11 (loop)	2	2
23 (return)	3 from Wollongong, 1 to Wollongong	1 service in each direction

Pedestrians and Cyclists

Minimal pedestrian and cyclist activity was observed either along Tom Thumb Road or Farrer Road. There are no specific facilities for pedestrians or cyclists along these roads. A shared bike/pedestrian path follows the eastern side of Springhill Road south of Tom Thumb Road, connecting with another path along Five Islands Road.

4.2.2 Cargo Handling Characteristics

It is proposed that all existing general and auto shipping cargo which are current Sydney operations would be transferred to the new expanded general cargo handling facility at Port Kembla. Although it is likely that in practice the facility will operate as a single entity with multiple berths, it has been assumed for the purpose of traffic and transport analysis that the existing activity at the Multi-Purpose Berth (600,000 tonnes of break-bulk and bulk cargo per annum) would ultimately be transferred to EB4, and that activity transferred from Glebe Island and Darling Harbour would be handled by the expanded General Cargo Handling Facility (Multi-Purpose Berths 1, 2 and 3). The initial mix of cargo through the facility (2005 levels) is outlined below:

- 30,000 containers per annum (TEU)
- 160,500 tonnes of general cargo per annum
- 240,000 motor vehicles per annum
- 200,000 tonnes of existing bulk cargo per annum
- 400,000 tonnes of existing break-bulk cargo per annum.

Assuming an average of 20 tonnes per TEU and 1.5 tonnes per car, this equates to an annual tonnage of 1.72 million tonnes. By 2016 (approximately 10 years after opening) the following throughput is anticipated:

- 50,000 TEU per annum
- 230,000 tonnes of general cargo per annum
- 375,000 motor vehicles per annum
- 200,000 tonnes of existing bulk cargo per annum
- 400,000 tonnes of existing break-bulk cargo per annum

This is equivalent to approximately 2.39 million tonnes per year.

4.2.3 Access Arrangements

Truck access to the site of the proposed facility would be from the existing alignment of Tom Thumb Road, west of the rail spur. Rail access would be provided via the Illawarra Rail Line and container and break-bulk ship access to the Tasman Sea would be via the Inner and Outer Harbours.

It is proposed that truck access to the proposed expanded facility would be set to a limited number of routes which are of the appropriate standard and geometry to allow truck, and more specifically, B-Double traffic. These routes have been planned to avoid residential and urban areas as much as possible. The routes are described below and are shown in **Figure 4-3**.

It is estimated that 90% of the container and break-bulk freight transported by road would have its origin or destination in Sydney or further north. The remaining 10% would be local or rural product.

Truck Route To/From Sydney

The proposed truck route to and from Sydney has been planned to take advantage of the close proximity of the site to the arterial road network. The route includes:

- Tom Thumb Road.
- Springhill Road.
- Masters Road.
- Southern Freeway.
- Mount Ousley Road.

Picton Road or Appin Road could also be used to access western Sydney. All of these roads are approved for B-Double access and are currently used for truck travel.

Local / Rural Access Route

It is proposed that the following roads be used for access to and from local and rural areas from the expanded facility.

- Tom Thumb Road.
- Springhill Road.
- Masters Road.
- Five Islands Road.
- Southern Freeway.
- Princes Highway (as far as Nowra).

Figure 4-3: Truck Access Routes

Insert figure

Again, all of these roads are approved for B-Double access and are currently used for truck travel. B-Double use is restricted on the Illawarra Highway (Macquarie Pass) and the Princes Highway south of Nowra, but these routes could also be used by semi trailers for access to the south and west.

4.2.4 Construction Impacts

As outlined in **Section 3**, it is assumed that the maximum number of construction staff on site at any one time would be 100 and that the construction phase would require 10 truck deliveries per day. This amounts to 210 car movements and 20 truck movements per day.

It is expected that the majority of construction vehicles would utilise Springhill Road, Masters Road Five Islands Road and the Southern Freeway while some would also gain access to the site via Corrimal Street. The additional number of trucks on these streets would not have an impact on the performance of the existing road network.

The additional 100 cars that would be required to transport construction workers to and from the site was added to the INTANAL intersection model to gain an appreciation of the impacts from construction traffic on intersection performance. The results (refer to **Appendix C**) show that the additional traffic would have little impact on either the intersection of Springhill Road/Masters Road or Springhill Road/Tom Thumb Road.

Therefore, resultant traffic impacts on the surrounding road network from the construction of the proposed expansion would not be significant.

4.2.5 Operational Impacts

It is proposed that cargo would be moved to and from the expanded facility by either road (semitrailers and B-Double vehicles) or rail transport modes. At this stage, the exact split between road and rail is not known and therefore to provide as robust an assessment as possible, a number of different scenarios were assessed in order to determine the likely traffic and transportation impacts from the operation of the expanded facility. The exact mix between road and rail would depend on the nature of the freight and its origin or destination. For the purposes of this environmental impact assessment, three possible scenarios investigated were:

- Activity transferred from Sydney: 80% by road, 20% by rail; existing MPB activity: 100% by road.
- Activity transferred from Sydney: 50% by road, 50% by rail; existing MPB activity: 100% by road.
- Activity transferred from Sydney: 20% by road, 80% by rail; existing MPB activity: 100% by road.

These scenarios were included in the EIS for the original facility and therefore a direct comparison with the proposed expanded facility can be made. For the purpose of analysis, it has been assumed that the existing MPB activity would be transferred to EB4, which does not have direct rail access.

As described in **Section 3**, the greatest number of personnel on-site would generally be staff working during the day shift (Monday to Friday), when an estimated average of 115 staff could be employed. This would include approximately 70 operational staff (stevedores, receipt/dispatch, customs/AQIS, administration, contractors, visitors etc) plus 45 pre-delivery and inspection (PDI) staff. There would generally be three 8-hour shifts per day: 6am to 2pm, 2pm to 10pm and 10pm to 6am. Thus the maximum number of staff working at any one time would be around 23 staff. It would be rare for the maximum number of staff on-site to exceed 150 personnel at any one time.

If every staff member were to drive their own car to and from work, there would be an average of around 230 trips per day in and out of the facility. The peak time in terms of staff journeys would be when the change over of shift occurs, but these would normally not coincide with the road network peaks. However, in order to assess a worst-case scenario, the peak hour traffic assessments presented in this paper include an allowance for staff travel.

No information was available on the number of visitor and service vehicle trips which the expanded facility would attract. It was therefore assumed that 10 visitor and service vehicle journeys would occur per day for the initial stage and 20 per day for the ultimate development. It was also assumed for the purposes of the assessment that these trips would occur during business hours in the off-peak traffic period.

Truck movements were estimated for each road/rail modal scenario by dividing the annual capacity of each stage and breaking it up into an average and a peak day. This was then converted into the number of trucks by assuming an average load per truck. The following assumptions were made:

- Landside delivery and dispatch is in operation seven days per week, 24 hours per day.
- 20% of the trucks are B-Doubles in the initial scenario increasing to 30% for the ultimate development scenario.
- Average capacity of an 800 metre train is 100 TEU, 1,200 tonnes of break-bulk cargo or 320 cars.
- Average loading on a B-Double is 2.5 TEU, 30 tonnes of break-bulk cargo, 37 tonnes of clinker or fertiliser, or 13 cars.
- Average loading on a semi trailer is 1.5 TEU, 17 tonnes of break-bulk cargo, 27 tonnes of clinker or fertiliser, or eight cars.

The estimated numbers of trucks for the various development scenarios and truck/train mode options are shown in **Table 4-7**.

In order to assess the likely range of impacts of the proposed facility, a peak day was also estimated by assuming a factor of 150%. It is expected that peak days would occur occasionally although only as part of the ultimate development. There would be no increase in the number of trains, with the increase in cargo absorbed by increased truck movements. The predicted numbers of trucks and trains for a peak day is shown in **Table 4-8**.

Table 4-7: Number of Truck and Train Movements for an Average Day

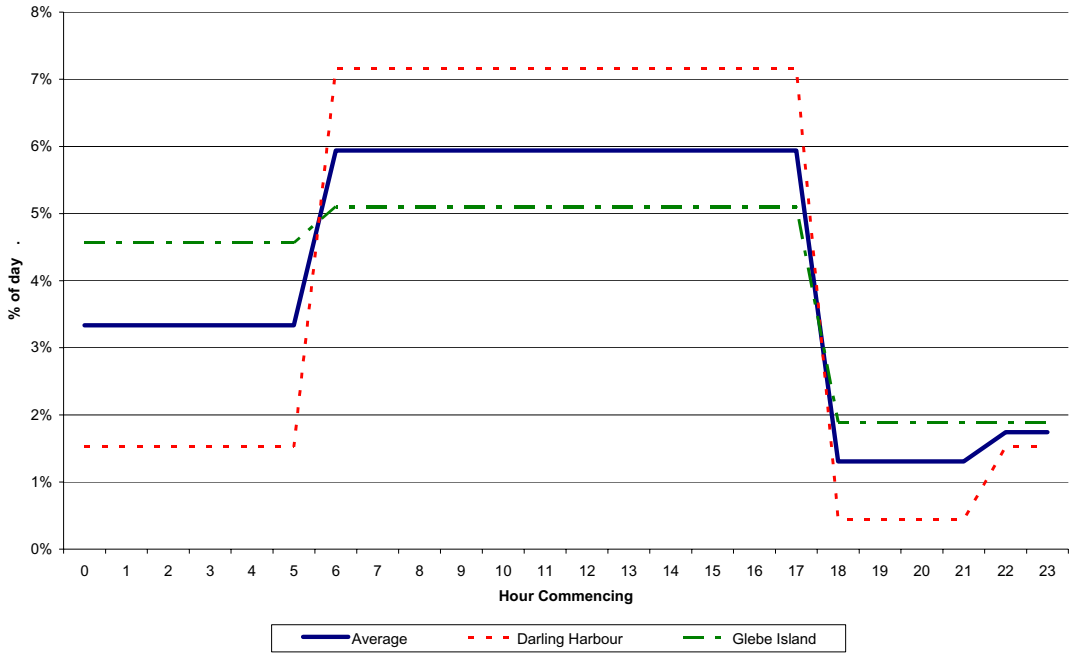
Facility Capacity Scenario	Road/Rail Transport Option					
	80% Road, 20% Rail		50% Road, 50% Rail		20% Road, 80% Rail	
	Trucks	Trains	Trucks	Trains	Trucks	Trains
Low	190	1	147	2	104	3
High	243	1	178	3	113	4

Table 4-8: Number of Truck and Train Movements for a Peak Day

Facility Capacity Scenario	Road/Rail Transport Option					
	80% Road, 20% Rail		50% Road, 50% Rail		20% Road, 80% Rail	
	Trucks	Trains	Trucks	Trains	Trucks	Trains
Low	299	1	257	2	214	3
High	386	1	322	3	258	4

It was assumed that truck traffic generated by the proposed expanded facility would have a similar profile to the existing truck activity at AAT's Glebe Island and Darling Harbour terminals. Data was obtained from AAT showing the average volume of truck activity during each shift during April/May 2005. The resultant profiles, as well as a weighted average used for the Port Kembla assessment, is shown on **Figure 4-4**.

Figure 4-4: Daily Truck Activity Profile



The data indicate that traffic generation is highest during the day (6am – 6pm), averaging around 6% of the daily activity in each hour. The predicted peak hour number of trucks and trains (assuming trains arrive or depart during the peak hour) is shown on **Table 4-9**. These peak-hour volumes are less than previously approved in the EIS for the General Cargo Handling Facility.

Table 4-9: Number of Truck and Train Movements for the Peak Hour of a Peak Day

Facility Capacity Scenario	Road/Rail Transport Option					
	80% Road, 20% Rail		50% Road, 50% Rail		20% Road, 80% Rail	
	Trucks	Trains	Trucks	Trains	Trucks	Trains
Low	19	1	17	1	14	1
High	24	1	20	1	17	1

Predicted Traffic Volumes and Impacts to the Road Network

The amount of traffic on the road network is predicted to increase based on historical growth patterns. The growth rates were estimated using 1992 and 2002 traffic volumes from the Roads and Traffic Authority and used to estimate traffic volumes for 2006 and 2016 for analysis of the future traffic flows, assuming a linear growth rate. The growth rates and volumes are shown in **Table 4-10**.

Table 4-10: Historic Growth Rate and Estimated 2006 and 2016 Traffic Volumes

Road	1992	2002	Growth p.a.	2006	2016
Mount Ousley Road, 2.2km south of MR186 [1]	27,645	38,941	4.1%	45,306	63,818
Southern Freeway, south of Gipps Road overpass [1]	49,158	64,168	3.1%	72,005	93,992
Princes Highway, at American Creek Bridge [1]	25,940	28,511	1.0%	29,641	32,579
Springhill Road, east of Keira Street [1]	20,091	17,789 [2]	0.0% [4]	17,789	17,789
Springhill Road, north of Masters Road [1]	36,600	36,735 [2]	0.0% [4]	36,735	36,735
Masters Road, west of Springhill Road [1]	27,746	28,035 [2]	0.0% [4]	28,035	28,035
Five Islands Road, east of Springhill Road [1]	36,112	41,122	1.4%	43,404	49,426
Tom Thumb Road, south of Springhill Road [3]				1,242	1,242

Note 1: NSW Roads and Traffic Authority traffic volume data.

Note 2: 2002 volume estimated based on long term line of best fit (no 2002 AADT data available for these nonpermanent RTA stations)

Note 3: SKM surveys undertaken 18-23 March 2001 (no background growth assumed for future scenarios).

Note 4: The long term trend at these locations shows significant fluctuation, but a general decline. The adoption of zero growth was considered more appropriate than either a negative growth rate or a small positive growth as exhibited on nearby roads.

Using the predicted 2006 and 2016 traffic volumes and the estimated traffic flow generated as a result of the proposed expanded facility, traffic volumes on the surrounding road network were estimated. The traffic scenarios for both the initial (2006) and ultimate (2016) development scenarios were analysed for the 80% road and 20% rail transport option which represents the likely maximum traffic and transport impact to the surrounding road network. This does not indicate that this is the preferred modal split. Rather, this represents the likely maximum impact on the road network that could arise from the ultimate development. The results, shown in **Table 4-11,** indicate that apart from Tom Thumb Road, the additional traffic resulting from the expanded general cargo handling facility is only a small fraction of the general traffic on these roads. The predicted capacity and volume to capacity ratios are shown in **Table 4-12** and **Table 4-13**.

These tables show that for Mount Ousley Road and the Southern Freeway, the road network would be at capacity due to normal background traffic growth and the impact of the proposed facility would not create any significant additional burden.

Table 4-11: Predicted Traffic Volumes With and Without Development (AADT)

Road & Location	2006 Base Case (No Facliity)	2006 With Expanded Cargo Handling Facility		2016 Base Case (No Facility)	2016 with Expanded Cargo Handling Facility	
	AADT	AADT	Change (%)	AADT	AADT	Change (%)
Mount Ousley Road, 2.2km south of MR186	45,306	45,844	1.2%	63,818	64,513	1.1%
Southern Freeway, south of Gipps Road overpass	72,005	72,543	0.7%	93,992	94,686	0.7%
Princes Highway, at American Creek Bridge	29,641	29,662	0.1%	32,579	32,600	0.1%
Springhill Road, east of Keira Street	17,789	17,913	0.7%	17,789	17,913	0.7%
Springhill Road, north of Masters Road	36,735	37,501	2.1%	36,735	37,675	2.6%
Masters Road, west of Springhill Road	28,035	28,675	2.3%	28,035	28,849	2.9%
Five Islands Road, east of Springhill Road	43,404	43,467	0.1%	49,426	49,489	0.1%
Tom Thumb Road, south of Springhill Road	1,242	2,132	71.7%	1,242	2,306	85.7%

Table 4-12: 2006 Road Impacts With and Without Development

Road & Location	Direction	2006 Capacity	2006 Base Case (No Facility)		2006 with Expanded Cargo Handling Facility	
			Peak Hour Volume	V/C Ratio	Peak Hour Volume	V/C Ratio
Mount Ousley Road, 2.2km south of MR186	NB	2,073	1,936	0.93	1,953	0.94
	SB	2,073	2,081	1.00	2,099	1.01
Southern Freeway, south of Gipps Road overpass	NB	3,375	3,470	1.03	3,487	1.03
	SB	3,375	3,516	1.04	3,533	1.05
Princes Highway, at American Creek Bridge	NB	1,900	1,516	0.80	1,519	0.80
	SB	1,900	1,282	0.67	1,285	0.68
Springhill Road, east of Keira Street	NB	2,900	817	0.28	835	0.29
	SB	2,900	853	0.29	871	0.30
Springhill Road, north of Masters Road	NB	2,900	1,687	0.58	1,730	0.60
	SB	2,900	1,762	0.61	1,805	0.62
Masters Road, west of Springhill Road	EB	2,900	1,344	0.46	1,369	0.47
	WB	2,900	1,287	0.44	1,312	0.45
Five Islands Road, east of Springhill Road	EB	2,900	2,081	0.72	2,091	0.72
	WB	2,900	1,993	0.69	2,002	0.69
Tom Thumb Road, south of Springhill Rd	NB	300	99	0.33	160	0.53
	SB	300	63	0.21	124	0.41

Table 4-13: 2016 Road Impacts With and Without Development

Road & Location	Direction	2016 Capacity	2016 Base Case (No Facility)		2016 with Expanded Cargo Handling Facility	
			Peak Hour Volume	V/C Ratio	Peak Hour Volume	V/C Ratio
Mount Ousley Road, 2.2km south of MR186	NB	2,073	2,727	1.32	2,749	1.33
	SB	2,073	2,932	1.41	2,953	1.42
Southern Freeway, south of Gipps Road overpass	NB	3,375	4,529	1.34	4,551	1.35
	SB	3,375	4,589	1.36	4,611	1.37
Princes Highway, at American Creek Bridge	NB	1,900	1,666	0.88	1,669	0.88
	SB	1,900	1,409	0.74	1,412	0.74
Springhill Road, east of Keira Street	NB	2,900	817	0.28	835	0.29
	SB	2,900	853	0.29	871	0.30
Springhill Road, north of Masters Road	NB	2,900	1,687	0.58	1,735	0.60
	SB	2,900	1,762	0.61	1,810	0.62
Masters Road, west of Springhill Road	EB	2,900	1,344	0.46	1,374	0.47
	WB	2,900	1,287	0.44	1,317	0.45
Five Islands Road, east of Springhill Road	EB	2,900	2,370	0.82	2,379	0.82
	WB	2,900	2,269	0.78	2,278	0.79
Tom Thumb Road, south of Springhill Rd	NB	300	99	0.33	165	0.55
	SB	300	63	0.21	129	0.43

Table 4-13 shows that the increase in traffic due to background growth has the greatest impact on the amount of spare capacity of the road system. Mount Ousley Road and the Southern Freeway would have reached their peak hour capacity by 2006 based on the historic growth rate regardless of the development of the proposed expanded facility. The additional trucks on these roads due to the proposed expansion of the general cargo handling facility would have little impact on their performance. These roads still remain the most suitable roads for the additional trucks associated with the proposed facility due to their ability to keep truck traffic off local roads and their arterial status.

It should be noted that the flows analysed were for the 80% road and 20% rail transport mode option. The 2016 ultimate development scenario represents the maximum impact of the expanded facility. The analysis has shown that even for this maximum impact scenario, the additional impact experienced on the surrounding roads is minimal.

The impact of the proposal on the two nearby intersections was also assessed taking into account staff movements and trucks arriving at and departing from the facility. The results of the analysis

are shown in **Table 4-14** and shows that the average delays and degree of saturation would increase slightly as a result of the operation of the expanded facility, but would not significantly change the overall intersection performance. Intersection performance remains at an acceptable level for the intersection of Springhill Road and Masters Road and a good level for the intersection of Springhill Road and Tom Thumb Road.

Table 4-14: Estimated Intersection Performance in 2006 with the Development

Intersection	Degree of saturation	Average delay (seconds)	Level of service
AM Peak			
Springhill Rd & Masters Rd	0.90	30	C
Springhill Rd & Tom Thumb Rd	0.57	6	A
PM Peak			
Springhill Rd & Masters Rd	0.90	25	B
Springhill Rd & Tom Thumb Rd	0.68	6	A

The estimated growth rates were applied to the traffic volumes surveyed at the two intersections and a future 2016 base case (i.e. no development) was analysed. The results are shown in **Table 4-15**.

Table 4-15: Estimated Intersection Performance in 2016 Base Case (i.e. No Development)

Intersection	Degree of saturation	Average delay (seconds)	Level of service
AM Peak			
Springhill Rd & Masters Rd	0.90	27	B
Springhill Rd & Tom Thumb Rd	0.51	3	A
PM Peak			
Springhill Rd & Masters Rd	0.89	24	B
Springhill Rd & Tom Thumb Rd	0.46	4	A

The estimated 2016 base traffic volumes were added to the additional traffic predicted from the proposal and the intersection analysis was re-run. The results are shown in **Table 4-16**. The results of the analysis show that the average delays and degree of saturation have increased slightly, but this has only slightly changed the overall intersection performance. Intersection performance remains at a good level for both intersections.

Table 4-16: Estimated Intersection Performance in 2016 with Development

Intersection	Degree of saturation	Average delay (seconds)	Level of service
AM Peak			
Springhill Rd & Masters Rd	0.90	33	C
Springhill Rd & Tom Thumb Rd	0.58	6	A
PM Peak			
Springhill Rd & Masters Rd	0.90	30	C
Springhill Rd & Tom Thumb Rd	0.72	7	A

Impacts to the Rail Network

If rail were to cater for 80% of trade at the Port Kembla facility, four trains per day would be required. Under a more likely scenario, only one train per day would be required. This volume of train activity should be able to be catered for using the existing available train paths (five freight paths and eight coal paths on the Illawarra Line).

The sidings at the proposed expanded general cargo handling facility would be capable of handling up to two 500m trains (or one 1000m train split into two rakes). The relocation of Tom Thumb Road would allow for the shunting of trains on the spur without the need for closures of any level crossings, or disruption to any train movements on the main line.

Prior to the commencement of works, further consultation would take place between PKPC and Rail Infrastructure Corporation to discuss the detailed design and operational aspects of the rail infrastructure component of the proposed modified development. It is expected that design details which would be discussed would include:

- Rail path allocations.
- Arrangement for the need and use of any staging facilities on the rail network between Sydney and Port Kembla for trains awaiting acceptance into the general cargo handling facility.
- Track layouts.
- How the rail siding would connect with the rail network.

Impacts of Shipping on Port of Port Kembla

The expansion of the general cargo handling facility would encourage increased shipping movements within the port of Port Kembla. The impact on shipping movements, however, is not expected to be significant to the operation of the Port. The number of ship visits to the proposed expanded facility would increase by about 11 per week, based on the current activity at Glebe Island and Darling Harbour.

4.2.6 Site Operation

The expanded Cargo Handling Facility would receive ships via the Multi-Purpose Berths 1, 2 and 3 and EB4. The Multi-Purpose Berths would be served by both road and rail, while EB4 would be served by road only.

The existing rail spur to the Multi-Purpose Berth would be relocated 100m to the east. The double rail spur line would allow two 500 metre trains (or one 1000m train split into two rakes) to be loaded/unloaded simultaneously.

Access to the expanded facility would primarily be via the existing alignment of Tom Thumb Road, east of the railway spur. A roundabout would be constructed at the existing bend in Tom Thumb Road, providing access to the facility for trucks and cars. A car park and truck marshalling area would be located at the new roundabout entrance.

Traffic wishing to gain access to Tom Thumb Road east of the rail spur (including EB4) would cross the railway at a level crossing about 300m south-east of the intersection with Springhill Road, and travel via a new road to the intersection of Tom Thumb Road with Farrer Road.

Cargo unloaded from ships at the Multi-Purpose Berths would be moved through the area to the west of the rail spur. There would be large areas for the loading/unloading and storage of cargo, including motor vehicles. North of the existing Tom Thumb Road alignment, motor vehicles would be processed (any required assembly, repairs etc) and moved out through gates direct onto Tom Thumb Road. These vehicles would not be moved via the new roundabout, as they would have left the customs controlled area to enter the processing precinct.

It is not expected that EB4 be in operation until 2008. Thus, prior to this all cargo would be moved through the Multi-Purpose Berths. A bulk cargo bypass gate would be situated at the end of Farrer Road, reducing congestion in the main cargo handling area.

Rail Infrastructure Corporation has been consulted regarding the provision of level crossings arising due to the proposed relocation of Tom Thumb Road. Apart from meeting the relevant technical standards, any new or relocated crossing must demonstrate a reduction in risk to road and rail users. Whilst the level crossing is a matter for the detailed design stage of the project, a reduction in risk would be likely as most of the traffic generated by the expanded development would not cross the proposed level crossing.

The only traffic from the facility which would use the level crossing would be that carrying bulk cargo, either to/from the EB4 component after 2008 or using the Farrer Road exit from the Multi-Purpose Berth prior to the EB4 completion (107 trucks per day would go to/from EB4 in 2016). There would also be a small proportion of trucks carrying vehicles from the part of the vehicle

processing precinct north of the rail spur. This would be a reduced number compared with the previously approved development, where all vehicle movements crossed the level crossing.

In accordance with existing Condition of Consent 3.12 (DA 105-5-2004-i) and the approved proposed modification of the general cargo handling facility (MOD -64-4-2005-i), PKPC shall ensure that all internal roads and parking associated with the expanded general cargo handling facility are designed, constructed and maintained to meet or exceed the following requirements:

- Compliance with the provisions of relevant Australian Standards, RTA standards and guidelines, and Council codes.
- Installation of clear signage to demarcate all vehicle movements within the site.
- Provision of directional pavement arrows on all internal roads and line-marking and signage to indicate designated truck routes and bays.
- Internal roadways wide enough to accommodate through traffic and turning two way traffic.
- Design of site ingress and egress points to ensure that B-Double vehicles enter and exit the site in a forward direction.
- Installation and maintenance of any landscaping on the site so as not to affect driver sight distance for vehicles entering and existing the site.
- Provision for the separation of heavy and light vehicle ingress and egress points.
- Clear demarcation of all visitor, disabled, ambulance and service vehicle parking areas.

4.2.7 Proposed Mitigation Measures and Safeguards

The construction and operation of the proposed expanded general cargo handling facility is not expected to have a significant impact on the surrounding transport system. Nevertheless, a number of mitigation measures have been proposed in order to further minimise the impact of the proposal and improve operation of the facility.

For Construction

- Construction vehicles should use the proposed road freight routes shown in **Figure 4-3** to reduce the impact on surrounding local roads where possible.
- Where possible, encourage the delivery of construction materials to occur during daylight hours (in general between 7.00 am and 6.00 pm, 5.5 days per week).

For Operation

- Road freight vehicles would be encouraged to utilise the road freight routes shown on **Figure 4-3** to reduce the impact on the surrounding local road network.
- Use B-Double trucks where possible and encourage backloading to minimise the total number of truck journeys.

- Maximise use of rail for the transport of cargo where practicable, in order to minimise impacts on the road network.

In accordance with condition of development consent 3.14 (DA 105-5-2004-i) prior to the commencement of the development, PKPC would submit for the approval of the Director-General a Transport Code of Conduct. The Code would outline the management measures for traffic impacts associated with the general cargo handling facility and minimum requirements for the movement of heavy vehicles to and from the site. The Code would address the requirements of Wollongong City Council and include the following:

- Restriction to routes, where relevant.
- Restrictions to the hours of transport operations to minimise or avoid travelling through built up areas late at night or at times of high or peak traffic flows.
- Minimum requirements for vehicle maintenance to address noise and exhaust emissions.
- Use of clean fuels.

4.3 Climate and Air Quality

4.3.1 Existing Environment

Port Kembla is a heavily industrialised area and air quality within the Illawarra region is strongly influenced by these industrial activities, as well as transport operations and domestic/commercial sources. Inter-regional transport of pollutants from Sydney can also occur, depending on meteorological conditions.

Community concern regarding air quality within the Port Kembla area typically relate to air emissions associated with industries such as the BlueScope Steel operations, Port Kembla Copper (currently not operational), Orica and other industrial and chemical manufacturing operations within the Port area. Complaints typically relate to visible emissions, odours, dust and atmospheric fallout.

The Metropolitan Air Quality Study (MAQS) estimated human-generated emissions of a number of key air pollutants within the Illawarra region (NSW EPA, 1996). The study found that industry makes the largest contribution to nitrogen dioxide (NO_2), carbon monoxide (CO), sulphur dioxide (SO_2) and total suspended particulate matter (TSP) emissions in the Illawarra region. Due to the degree of industrial activity in the vicinity of the site, air quality is intensively monitored by both private industry and regulatory authorities including the NSW Department of Environment and Conservation (DEC). Particulate matter (TSP) emissions within the Port Kembla region arise from raw material stockpiling, handling and processing, including coal, coke, metallic ores, non-metallic minerals, grain and other dry bulk products. Nitrogen oxides (NO_x) emitted within the Port Kembla region comprise mainly of nitric oxide (NO) and nitrogen dioxide (NO_2).

Ambient Monitoring Data

The NSW DEC operate a number of ambient air quality monitoring stations within the Port Kembla area, including Albion Park, Kembla Grange, Warrawong and Wollongong. The monitoring data collected at these stations show that the ambient air quality, in terms of PM_{10} (all particles with aerodynamic sizes less than 10 μm) NO_2, and SO_2, generally meets the NSW DEC criteria.

4.3.2 Construction Impacts

The potential air quality impacts associated with the construction of the proposed expansion would be similar to the air quality impacts associated with the construction of the approved development. The potential impacts are likely to be restricted to dust and vehicular emissions arising from the following works:

- Demolition of existing infrastructure;
- Excavation and stockpiling;
- Transfer of materials;
- Earthworks on-shore including ground preparation and reclamation; and
- Wheel generated dust from access roads.

There may also be some odour emissions resulting from the disturbance of slag during construction works, as the slag may contain some sulphides and other potentially odorous substances.

To minimise the air quality impacts arising from construction of the proposed expansion, suitable controls would be implemented (refer to **Section 4.3.4**). Provided these mitigation measures are adopted, the nearest residential dwellings to the site are not likely to experience adverse air quality impacts from the construction works.

4.3.3 Operational Impacts

The potential air quality impacts associated with the operation of the proposed expansion would be similar to the air quality impacts associated with the operation of the approved development, as the ultimate cargo capacity of the facility would not be exceeded.

During operation, there may be some particulate emissions arising from the unloading and loading of bulk cargo including fertiliser and cement clinker at EB4. However, these activities currently occur at the Multi-Purpose Berth and the potential air quality impacts were assessed in the EIS for the approved general cargo handling facility. Other cargo eg. motor vehicles, containerised cargo, steel and timber products are unlikely to cause particulate or odorous emissions.

There would be diesel engine exhaust emissions from ships berthing at the wharf, empty box handlers, forklifts and trucks transporting containers, bulk and break-bulk cargo to and from the

site. There is also expected to be some petrol consumption and associated emissions from light vehicles that access the area and LPG from light duty plant equipment. However, these impacts were assessed in the EIS for the approved general cargo handling facility and it was concluded that the impacts would not be significant.

All trafficked and storage areas on site would be sealed with either a bitumen or asphaltic pavement. The generation of dust from unpaved surfaces due to wind or mechanical action from vehicle movement would therefore be negligible. However, should the unlikely event occur where dry material is deposited onto the hardstand of trafficked areas the spillage would be swept up as soon as practicable to ensure that this material would not be tracked around the site.

As the ultimate cargo throughput of the proposed development would be similar to the approved development, the number of truck and ship movements to and from the site is not expected to significantly alter. The potential air quality impacts associated with ship operations such as the generation of SO_2, NO_x, CO, CO_2, particulates and hydrocarbons were assessed in the EIS for the approved general cargo handling facility and it was concluded that adverse impacts from ship engines are not expected. The proposed truck transport routes are identical to those proposed in the EIS for the approved general cargo handling facility and hence no additional impacts would be incurred as a result of the proposal.

It should also be noted that the potential air quality impacts arising from the proposed development are expected to be minor and compared with regional emissions would not have a significant impact on local air quality.

4.3.4 Proposed Mitigation Measures and Safeguards

To minimise potential impacts on air quality resulting from dust generation the following mitigation measures and controls would be implemented during the construction and operational phase of the proposal. PKPC and AAT would ensure that the expanded general cargo handling facility is designed, constructed, commissioned, operated and maintained in a manner that minimises or prevents the emission of dust from the site in accordance with Condition of Consent 3.24 (DA 105-5-2004-i).

These mitigation measures are the same as those proposed for the approved general cargo handling facility:

Construction

- Trucks transporting spoil and construction materials to/from the site would be covered and the height of the load would not exceed the sides and tailboards.
- All traffic leaving the site would be directed through a rumble grid or similar device to minimise the transport of soil and dust particles attached to wheels and the underside of trucks.

- Disturbed areas, including on-site stockpiles, would be regularly watered especially during dry and windy weather to suppress dust emissions.
- Where practicable, excavation works would be scheduled under favourable meteorological conditions and works would cease when wind speeds exceed 7 m/s.
- The extent of exposed land disturbance would be minimised to reduce potential generation of wind blown dust and possible odour emissions.
- Disturbed areas would be stabilised as soon as possible.
- Potentially odorous materials would be covered to minimise volatilisation and odour emissions.

Operation

- All hoppers at the berth would be fitted with dust containment grates and dust extractors.
- Any spills of non-containerised cargo at the wharf and trafficked areas would be cleaned up as soon as possible.
- All trucks entering and exiting the site that are transporting bulk cargo would be covered unless an exemption has been granted from the NSW DEC.
- B-Doubles would be used where possible, instead of semi-trailers, to minimise the total number of truck journeys and hence, the emissions from trucks.
- All licence terms with regard to dust emissions would be adhered to.

4.4 Acoustic Environment

4.4.1 Existing Noise Environment

In order for the noise environment in the urban residential area to the north and north-west of the facility to be characterised, unattended noise-monitoring was undertaken at 10 Swan Street and 392 Keira Street, Wollongong, between Thursday 6 May and Friday 21 May 2004 (inclusive).

The noise-monitoring locations were selected as being representative of the wider residential area likely to be influenced by the original general cargo handling facility and are also relevant to the proposed expansion works, considering the emissions from the Port area. **Figure 4-5** illustrates the noise-monitoring locations.

The monitor at 10 Swan Street was positioned at the front right-hand side of the residential dwelling and the monitor at 392 Keira Street was positioned at the front left-hand side of the residential dwelling. Observations when setting up the loggers indicated that distant traffic as well as general industry noise from the Port Kembla industrial area to the south influences the local noise environment. This was consistent with the relatively low differential between the daytime and night-time noise levels recorded by the noise logger.

Figure 4-5: Noise Monitoring Location

To be inserted

Analysis of the data from the noise loggers indicated that the measured background $L_{A90,15minute}$ noise levels at the two monitoring locations were very similar even though they are separated by a substantial distance The measured levels are illustrated in **Appendix D** and a summary of the results are presented in **Table 4-17** and **Table 4-18**.

Table 4-17: Summary of Background Noise Levels – 392 Keira Street

Monitoring Time	Daytime	Evening	Night-time
Thursday 6 May 2004	48.7	41.8	40.3
Friday 7 May 2004	49.5	42.3	44.5
Saturday 8 May 2004	47.5	42.3	47.0
Sunday 9 May 2004	48.0	48.0	46.0
Monday 10 May 2004	52.0	49.0	46.8
Tuesday 11 May 2004	48.0	48.0	47.3
Wednesday 12 May 2004	53.5	49.8	46.8
Thursday 13 May 2004	49.5	50.5	46.8
Friday 14 May 2004	49.7	49.8	48.0
Saturday 15 May 2004	45.0	45.5	40.8
Sunday 16 May 2004	41.5	44.3	45.5
Monday 17 May 2004	47.5	45.0	33.3
Tuesday 18 May 2004	46.5	39.0	42.5
Wednesday 19 May 2004	49.5	43.8	41.0
Thursday 20 May 2004	45.7	46.5	43.0
Median	**48 dB(A)**	**45 dB(A)**	**45 dB(A)**

The L_{Aeq} was also determined over each of the time periods to be:

- Daytime – 57.8 dB(A)
- Evening – 54.2 dB(A)
- Night-time – 51.3 dB (A)

Table 4-18: Summary of Background Noise Levels – 10 Swan Street

Monitoring Time	Daytime	Evening	Night-time
Thursday 6 May 2004	43.5	42.0	42.5
Friday 7 May 2004	43.5	40.3	44.5
Saturday 8 May 2004	46.7	43.5	47.0
Sunday 9 May 2004	49.0	49.0	47.5
Monday 10 May 2004	51.5	49.3	46.3
Tuesday 11 May 2004	48.0	48.8	48.5
Wednesday 12 May 2004	53.5	50.5	47.5
Thursday 13 May 2004	48.0	50.5	47.3
Friday 14 May 2004	48.7	50.3	48.3
Saturday 15 May 2004	41.0	47.8	44.0
Sunday 16 May 2004	40.0	46.0	46.3
Monday 17 May 2004	41.0	45.3	37.0
Tuesday 18 May 2004	44.0	40.3	43.5
Wednesday 19 May 2004	41.0	45.3	44.8
Thursday 20 May 2004	46.5	47.3	46.0
Median	**45 dB(A)**	**47 dB(A)**	**46 dB(A)**

The L_{Aeq} was also determined over each of the time periods to be:

- Daytime – 53.8 dB(A)
- Evening – 52.5 dB(A)
- Night-time – 50.9 dB(A)

Attended noise surveys were also conducted at six locations on Wednesday 9 June 2004 between the hours of 12:15am and 3:05am to validate the noise logger results and subjectively determine the noise sources in the area. The measurement locations encompassed both Port and residential areas including 10 Swan Street and 392 Keira Street, Wollongong. The night-time measured background $L_{A90,15minute}$ noise levels at the two residential locations were 45.2 dB(A) and 44.6 dB(A) respectively. Both were very similar to levels previously recorded during the unattended survey. It was noted during these surveys that the night-time background levels were significantly influenced by distant industrial noise from the general direction of the Port.

4.4.2 Review of Noise Criteria

In January 2000, the Environment Protection Authority (now referred to as the Department of Environment and Conservation) released the *NSW Industrial Noise Policy* (INP). This document provides the framework and process for deriving project specific noise limits for assessments and limits for consents and licences that will enable the authority to regulate premises that are scheduled under the *Protection of the Environment Operations Act, 1997*.

While the assessment of noise is complex, the INP is designed to determine an acceptable level of impact expected at a community level, based on reactions to social surveys. Where the criteria are met no adverse noise impacts would be expected at the closest receivers. The Department of Environment and Conservation advocates that the assessment procedure should not be considered in isolation from other social and economic aspects of a development. The specific noise objectives that are determined for the project were derived in accordance with the INP and are to be regarded as design objectives. Compliance with these noise goals is not necessarily mandatory.

The INP requires that the noise from the development under assessment comply with the most intrusive noise criteria. The intrusive criterion is determined by the difference between the industrial noise under assessment being no more than 5 dB(A) above the Rating Background Level (RBL). The amenity criterion is based on the zoning and the land use of the receiver location, and the extent of the existing industrial noise in the area. Where there is an existing influence of industrial noise the INP implements modifying factors to the criteria to account for cumulative noise impacts. The project specific noise goals are then set.

The project specific noise objectives should not be automatically adopted as consent conditions by regulatory authorities. It is important that authorities consider the achievable levels, the limitations of noise control measures that can be applied to a project, community views and the benefits to the wider community that the project can provide. In some instances, it is appropriate that the consent conditions may set higher goals than the project specific noise objectives.

To categorise the range in the background noise levels that prevail from day to day, the Department of Environment and Conservation recommends that for large projects, one week of ambient noise monitoring be undertaken. The Department categorises a 24 hour period into the following three assessment periods:

- Day – 7:00 am to 6:00 pm
- Evening – 6:00 pm to 10:00 pm; and
- Night – 10:00 pm to 7:00 am

Operation Noise Emissions

Intrusive Noise Criteria

A noise source is considered to be non-intrusive if the $L_{Aeq,\ 15\ minute}$ level does not exceed the RBL by more than 5 dB(A) for each of the day, evening and night-time periods, and does not contain tonal, impulsive, or other modifying factors as detailed in Chapter 4 of the INP. The intrusive noise criterion level for the daytime, evening and night-time periods was selected as being the lowest recorded noise levels from both monitoring locations. The intrusive noise criterion level is presented in **Table 4-19**.

Amenity Noise Criteria

Based on site inspections and detailed notes made prior to, during and at the completion of noise surveys, the noise environment for the daytime and evening periods appears to be significantly influenced by road traffic noise and distant industrial activity. The noise environment subjectively observed for the night-time period was primarily due to distant industrial activity. As the project fits the description of an 'urban/ industrial interface', the recommended acceptable noise level for 'urban/ industrial interface' area applies i.e. 65 dB(A) $L_{Aeq,\ day}$, 55 dB(A) $L_{Aeq,\ evening}$ and 50 dB(A) $L_{Aeq,\ night\text{-}time}$. In this case, the existing industrial noise in the survey area is within 5dB(A) of the acceptable noise level for the evening period, and is equal to the acceptable noise level for the night-time period. Hence, the amenity criteria needs to be reduced to control overall levels in the locality to protect amenity, as outlined in Table 2.2 of Chapter 2 of the INP. The amenity noise criterion level is presented in **Table 4-19**.

Table 4-19: Derivation of Project Specific Noise Criterion for Urban/Industrial Interface

	Day	Evening	Night-time
Determination of Intrusiveness Criteria			
Project Specific RBL levels	45 dB(A)	45 dB(A)	45 dB(A)
Intrusiveness Criteria	50 *dB(A)*	50 *dB(A)*	50 *dB(A)*
Determination of Amenity Criteria			
Base Amenity Criteria	65 dB(A)	55 dB(A)	50 dB(A)
Modified Amenity Criteria	65 dB(A)	53 dB(A)	42 dB(A)
Governing Criteria	**50 dB(A)**	**50 dB(A)**	**42 dB(A)**

Boundary Noise Criteria

In order to protect the amenity of nearby commercial premises, the L_{Aeq} level from the expanded facility should not exceed 65 dB(A) at any commercial property boundary.

Project Specific Industrial Noise Emission Criteria

In this case, the intrusive criterion and the modified amenity criterion set the project-specific noise level to be met by the proposed expanded facility. On the basis that the expanded general cargo handling facility could operate at full capacity at any time, and in accordance with the INP, the limiting criteria is an L_{Aeq} level of 42 dB(A) which would apply at any residential dwelling.

Sleep Disturbance Criteria

Noise emissions that may cause sleep disturbance are assessed under Chapter 19-3 of the 1994 Environmental Noise Control Manual, *Noise Quality Objectives, Special Considerations, Sleep Arousal Level.*

Many short-duration high-level noise which occur at night, may comply with the project specific industrial noise criteria, and yet be undesirable because of sleep disturbance effects. Such noise should be given special consideration, and whatever action possible should be taken to abate noise, which is likely to interfere with a person's sleep, particularly between the hours of 10 pm and 7 am.

Noise control should be applied with the general intent to protect people from sleep disturbance. In summary, the main requirements for residential receiving areas are:

- Night-time – from 10 pm to 7 am the L_{A1} noise level of any specific noise source should not exceed the L_{A90} background noise level by more than 15 dB(A) when measured outside the bedroom window.

Based on the L_{A90} noise levels measured at the nearby residential locations, the L_{A1} sleep arousal level criterion is 60 dB(A).

Road Traffic Noise

Noise emissions associated with the movement of road transport vehicles are governed by the guidelines detailed within the Environment Protection Authority's *Environmental Criteria for Road Traffic Noise (ECRTN)*, May 1999.

Under the road traffic noise criteria, the Department of Environment and Conservation provides guidelines for acceptable levels of road traffic noise for a variety of road types and land use categories. For the proposed expansion of the general cargo handling facility, the traffic noise emissions along the road routes to the expanded facility, would be governed under Section 7 of Table 1 *Land use developments with potential to create additional traffic on existing freeways/arterials*.

For this category target noise levels would be:

- Daytime ($L_{Aeq,15hour}$) = 60 dB(A).
- Night-time ($L_{Aeq,9hour}$) = 55 dB(A).

These criteria would apply at any residential dwelling along the route. If the existing road traffic noise already exceeds this base level, modified criteria would apply.

The *Environmental Criteria for Road Traffic Noise (ECRTN)*, 1999 requires that for all land use categories, where exceedance of the criteria is predicted (or currently exists) then reasonable and feasible steps to providing mitigation measures to meet the base criteria should be examined. In all cases traffic arising from the development should not lead to an increase in the existing noise levels of more than 2 dB(A).

Rail Noise

Noise guidelines for rail traffic noise are outlined in Chapter 163 of the Environmental Noise Control Manual, titled *Rail Traffic Noise*. The noise criteria for residential receivers are specified in terms of $L_{Aeq\ (24hour)}$ and the L_{AMax} noise indices, as outlined in **Table 4-20**.

Table 4-20: Planning and Maximum Rail Traffic Noise Levels (dB(A))

Noise Indices	Planning Level	Maximum Level
$L_{Aeq\ (24hour)}$	55 dB(A)	60 dB(A)
L_{AMax}	80 dB(A)	85 dB(A)

Construction Noise

Noise from the construction of the proposed expanded facility is assessed under the guidelines detailed in Chapter 171 of the 1994 Environmental Noise Control Manual. In summary these are:

Hours of Construction

The Department of Environment and Conservation guidelines recommend confining the permissible work times to:

- 7.00 am to 6.00 pm, Monday to Friday.
- 7.00 am to 1.00 pm on Saturdays if inaudible at residences otherwise 8.00 am to 1.00 pm.
- No construction is permitted on Sundays or Public Holidays.

Works outside these hours is usually permissible by the Department if it can be demonstrated that construction activities will be inaudible within all nearby residential dwellings.

Use of Silenced Equipment

All possible steps should be taken to use residential class mufflers or other silencing methods appropriate for construction equipment. This is of particular relevance for works where evening or night-time activities are involved.

Noise Emission Objectives

Typical daytime noise levels of around 45 dB(A) to 48 dB(A) are currently experienced at the residential properties surrounding the site.

Taking 45 dB(A) as the lower typical daytime level, the Department of Environment and Conservation recommends that the L_{A10}(15 minute) noise levels arising from a construction site and measured in the general vicinity of any noise sensitive premises (or within 30 m of the dwelling if assessed as a large property) should not exceed:

- Background plus 20 dB(A) - For a cumulative period of noise exposure not exceeding 4 weeks, the construction noise should not exceed 65 dB(A).

- Background plus 10 dBA - For a cumulative period of noise exposure between 4 weeks and 26 weeks, the construction noise should not exceed 55 dB(A).
- Background plus 5 dBA - For a cumulative period of exposure greater than 26 weeks, the construction works should not exceed 50 dB(A).

The construction activities for the proposed expansion of the general cargo handling facility are estimated to take approximately $3^1/_2$ years to complete although works are not expected to be undertaken continuously for this period of time. With reference to the above noise criteria the appropriate construction noise level would be background plus 5 dB(A), which would be an L_{A10} level of 53 dB(A) during normal operational hours when measured at the nearest Keira Street residence. Normal operational hours are:

- Monday to Friday: 7 am to 6 pm.
- Saturday: 8 am to 1 pm.
- No construction work would take place on Sundays or Public Holidays.

These hours may be varied where necessary by application to the approval authority.

Dredging activities are proposed to be undertaken 24 hours a day seven days per week. Where night time construction is proposed, inaudibility would be approximately equal to the background noise level minus 10 dB(A). At the nearest residences the night time background noise level ($L_{A90\ 10th}$ percentile) is approximately 45 dB(A) and therefore the night time criteria for dredging activities would be approximately 35 dB(A). The estimated noise level at the nearest residences due to emissions from dredging operations alone is 30 dB(A) and therefore construction noise impacts from dredging activities would not exceed the DEC noise criteria (refer **Appendix B**).

4.4.3 Prevailing Meteorological Conditions

The air quality information used as part of the noise impact assessment is based on data sources from the Bureau of Meteorology's weather station at Port Kembla Signal Station and was previously detailed in the original EIS and has not been repeated in this document.

4.4.4 Modelling Procedure

The acoustic modelling predictions were conducted using the CONCAWE algorithms as implemented within the SoundPLAN suite of noise prediction programs.

In determining sound power levels for the expanded facility and process items, information was sourced from measurements taken at two separate container loading facilities where typical noise emissions from port machinery and equipment were recorded.

Predictions made on the data result in the determination of the L_{Aeq} index, and assume that all plant is fully operational, under typical load conditions. The proposed expansion of the general cargo handling facility would have activities in semi fixed (i.e. ship loading and unloading) as well as dynamic locations (i.e. fork lift and truck loading operations). As the expanded facility would be relatively vast in size it would be unfair to model the emissions from a single item of plant in a static position within the site as this may not adequately reflect the average operational noise emissions from the facility. In addition the placement of various items of plant for a static modelling scenario may not necessarily reflect the best or worst case and can only be viewed as a snap shot of operational conditions. For these reasons the expanded facility has been modelled as an area source whose sound power level has been calculated by the overall measurement of a typical port and the measurement of specific port activities. Equipment quantities were then used to estimate the overall sound level and frequency spectrum for typical operational activities. This data was entered into the noise model to predict the noise level at the various receivers and produce operational noise contours for the proposed expanded facility.

Adverse atmospheric conditions can enhance noise emissions from a source due to the strength and direction of prevailing winds and temperature inversions. The source to receiver distances for the proposed expanded facility is approximately 1.4 kilometres. Some increases due to temperature inversions or winds over this distance would be expected, if the frequency of occurrence were sufficient to warrant modelling. Based on the analysis of the long term meteorological conditions detailed in the original EIS consideration of the effects of temperature inversion conditions and winds is not required as part of this assessment. The modelling has been conducted using the meteorological conditions outlined in **Table 4-21.**

Table 4-21: Meteorological Conditions used in Modelling Calculations

Time period	Temperature	Relative Humidity	Stability Category	Wind Conditions
Day	20°C	75%	D	Nil
Evening	12°C	85%	D	Nil
Night	4°C	95%	D	Nil

Of these events, the one likely to result in the higher noise levels is the daytime, since it adopts higher temperatures, and lower relative humidity.

Basis of input data

The input data used in the modelling was based on an operator attended noise survey of the Darling Harbour East Cargo Terminal, a busy inner city port in Sydney, similar in nature to the proposed expanded facility.

The attended noise survey was conducted on Wednesday 21 July 2004 during the daytime period at three different locations within the terminal area:

- Container Pad Area 4 and 4R;
- Car loading/ unloading Area 7; and
- Cargo ship container loading/ unloading area Berth 4

At the time of the noise survey there was only one cargo ship unloading and loading cargo, however, two Leibherr mobile container cranes and four fork lifts (two top lift and two bottom lift) were operational at all times.

The survey locations were considered to be good representative monitoring locations to assess the impact associated with the proposed expanded facility as the movement of forklifts and trucks were not shielded by the intervening stacks of containers. Furthermore, a large number of container impacts (i.e. collisions) were measured during the survey period to assist with sleep disturbance predictions.

Container Pad Area 4 had forklifts moving containers to the mobile container crane at Berth 4, for subsequent loading onto the cargo ship. Container Pad Area 4R had twenty refrigerated containers operating continuously during the survey. The measured noise levels were adjusted to account for the air absorption and ground effects between the source and the monitoring position to determine the sound power levels for the three locations and therefore for the overall site.

During the monitoring the following activity was occurring:

- Truck movements delivering containers to selected bays within the site.
- Truck movements transporting containers and vehicles from the site.
- Forklifts moving containers from the stacks on to trucks.
- Forklifts taking containers from the stacks to the ship.
- The lifting of containers to the ship using a large mobile crane.
- Container impacts (i.e. collisions).
- Reversing alarms from forklifts and trucks.
- Ship noise.

Additional noise measurements were made at the Glebe Island wharf where vehicle unloading and storage occurs. The MV “Melbourne Highway” car carrier vessel was surveyed and the greatest influence to the noise environment was determined to be from the exhaust vents on the upper deck of the ship. These sources were estimated to be from the engine and generator air intake facing the dock and therefore very directional. While not all-maritime vessels have this specific type of noise source, it is recognised that noise sources from shipping while berthed at the wharfs may be a

significant contributor to the noise environment. Due to the variable nature of noise emissions from ships visiting the Inner Harbour, an assessment of impacts has been made using the survey data, which may provide an overly conservative estimate of impacts. Other noise data from shipping studies has also been used to provide a range of noise impacts at the nearest receiver as the result of vessels being stationed at the Multi Purpose Berths.

4.4.5 Results of Noise Predictions

The noise associated with container handling is largely caused by forklifts however impulsive noises from impacts to the metal containers can cause maximum levels that have the potential to disturb sleep. Unloading of motor vehicles would result in only minor increases to the ambient noise levels during transfer from the ship. Exhaust and air intakes from the ships engines and generators can produce a significant source of noise from the upper decks while vessels are docked during cargo unloading. There would be a variety of ships using the port facilities and having a variety of noise emission levels. As noise from car carriers can greatly contribute to the noise environment, the revised noise impact assessment provided in this report has accounted for this scenario.

Quieter activities such as car holding and transport areas would be contained in the northern region of the expanded facility while general cargo handling activities would be confined to the southern area of the site and EB4.

Noise emission contours have been generated based on the following scenarios from the operation of the expanded general cargo handling facility:

- Operations of the expanded facility.
- Noise from cargo ships and the operations of the expanded facility combined.
- Noise from Car carriers and the operations of the expanded facility combined.

The noise contour levels for the second and third scenarios outlined above are shown on **Figure 4.6 a** and **b**.

These scenarios are estimated to be the worst case for noise impacts at the residences in Keira Street and have been assessed against the project specific noise criteria. The overall site area has been expanded from the previous proposal with the site boundary proposed to move approximately 500 metres closer to the northern residences. The nearest residential receiver would be located approximately 650m from the northern most boundary. The noise levels from the expanded facility are however, expected to reduce compared to the original EIS due to the quieter nature of the activities. In terms of cargo throughput, less containers are now proposed as a proportion of the overall capacity of the site and an increase of motor vehicle imports when compared with the original EIS.

Figure 4-6 Operational Noise Emission Contours (a and b)

Insert figures (x 2)

Figure 4-6 b to go here

Predicted night time noise impacts indicate that the noise emission level as the result of the expanded facility, at the nearest residential properties is approximately L_{Aeq} 39 dB(A), which meets the most stringent night-time design objective of L_{Aeq} 42 dB(A) for the night time period.

When the combined operations of the expanded facility and noise from two cargo vessels at the Multi-Purpose Berth are assessed, the resultant noise level at the nearest residential receiver is predicted to be L_{Aeq} 40 dB(A). This level is expected to be a typical level when up to two vessels are in port simultaneously. Where all berths are occupied noise levels may increase slightly (less than 1 dB(A)) above the predicted values. It is however unlikely that all four berths would be occupied and unloading at the same time.

When there are two car carriers in the dock simultaneously, the estimated $L_{Aeq\ night}$ noise emissions from the port activities at Keira Street is 44 dB(A). This represents an exceedance of the noise goal by 2 dB(A). It should be noted that the night time noise level criteria is based on a modified amenity criteria from the Industrial Noise Policy. The site noise emission levels at night time are predicted to be less than or equal to the L_{A90} background noise level in the vicinity of the nearest noise sensitive receiver. While the predicted noise level would exceed the L_{Aeq} noise goal by 2 dBA it is unlikely to exceed the L_{90} background noise level at the nearest residence and therefore the resultant noise emissions would tend to be masked by existing surrounding noise and not be noticeable to residents.

Section 11.1.3 of the INP provides guidance regarding the determination of compliance with consent conditions. This states that if a monitored noise level (attributed to a development) is greater than 2 dB(A) above the criteria, the development is deemed to be non-compliant. Where the predictions of noise impacts for the proposed expanded facility are predicted to be 2 dB(A) greater than the noise goal, non-compliance at the nearest residence would result from noise measurements at 44.5 dB(A) or above.

Sleep Disturbance Predictions

During the attended noise survey at Darling Harbour, a large number of container collisions were measured during the loading of containers onto a cargo ship at Berth 4. The measurements were conducted to assist with sleep disturbance predictions. Fourteen impacts were recorded during the loading of five containers. The L_{Amax} varied from 70 dB(A) to 85 dB(A) at approximately 120 metres. The maximum measured impact level of 85 dB(A) was used in the sleep disturbance predictions.

The container impact level was adjusted to account for the air absorption and ground effects between the source and the nearest residential property 1.4 kilometres away. The maximum predicted noise level arising from container collisions is 58 dB(A) which is 2 dB(A) below the sleep disturbance criteria.

Because the L_{Amax} was used instead of the traditional L_{A1} the predicted level from container collisions would be slightly conservative. Furthermore, the cargo sheds adjacent to the ship berthing areas would act as noise barriers for the majority of container collisions and provide a shielding effect.

Noise generated by reversing alarms were also measured during the attended noise survey at Darling Harbour to establish sleep disturbance impacts. Typical L_{Amax} levels were around 86 dB(A) at 15 metres. The noise generated by reversing alarms was adjusted to account for the air absorption and ground effects between the source and the nearest residential property 1.4 kilometres away. The maximum predicted level arising from reversing alarms is 47 dB(A) which is 13 dB(A) below the sleep disturbance criteria. It is recommended that the use of reversing alarms be reviewed to include the use of "smart" alarms that can adjust noise levels to account for background levels. Flashing lights are also an alternative for night time operations. These recommendations need to be assessed in conjunction with PKPC's and AAT's Occupational Health and Safety policy.

4.4.6 Traffic Noise

Traffic Access Routes

Access to the site for the proposed expanded general cargo handling facility would be restricted to a limited number of routes, which would allow truck and B-Double traffic, while avoiding the residential and urban areas as much as possible. It was assumed that approximately 90% of the freight transported by road would have its origin or destination in Sydney or further north. The remaining 10% would be local or rural product.

The routes for local and regional traffic were previously described in **Section 4.2** and shown in **Figure 4.2**.

Expected On-Road Noise Levels

The assessment of road traffic noise applies to vehicles whilst on public roads, and not when vehicles are within the proposed expanded general cargo handling facility. Consideration of traffic noise impacts along Tom Thumb Road has not been undertaken, due to the fact that this road is classified as a local industrial road with no residential or public uses adjacent to it. The primary use of the road is for access to the Port and industrial areas by workers and service vehicles.

The expected increase in road traffic noise levels, as a result of the expanded general cargo handling facility operating at an ultimate capacity under a number of different modal split options, is summarised in **Table 4-22**. The increase in long-term average road traffic noise levels adjacent to the proposed transport routes is predicted to be less than 1 dB(A) under all scenarios. An increase of this order is not likely to be detectable at the nearest residential dwellings adjacent to

the routes. Potential acoustic impacts on nearby residential areas from traffic noise associated with the proposal are therefore not likely to be significant.

Table 4-22: Calculated Increase in Road Traffic Noise Levels (dB(A))

Road Designation	Assessment Location on Road	Increase in Traffic Noise Levels - dB(A) (Ultimate Development)					
		Heavy Vehicles			Total Vehicles		
		Modal Split (%road / %rail)					
Peak Hour		**80/20**	**50/50**	**20/80**	**80/20**	**50/50**	**20/80**
Mount Ousley Road	2.2km south of MR186	0.2	0.2	0.1	0.0	0.0	0.0
Southern Freeway	south of Gipps Road Overpass	0.2	0.1	0.1	0.0	0.0	0.0
Princes Highway	at American Creek Bridge	0.0	0.0	0.0	0.0	0.0	0.0
Springhill Road	east of Keira Street	0.0	0.0	0.0	0.0	0.0	0.0
Springhill Road	north of Masters Road	0.6	0.5	0.4	0.1	0.1	0.0
Masters Road	west of Springhill Road	0.7	0.6	0.5	0.1	0.1	0.0
Five Islands Road	east of Springhill Road	0.0	0.0	0.0	0.0	0.0	0.0
7am to 10pm		**80/20**	**50/50**	**20/80**	**80/20**	**50/50**	**20/80**
Mount Ousley Road	2.2km south of MR186	0.1	0.1	0.0	0.0	0.0	0.0
Southern Freeway	south of Gipps Road Overpass	0.1	0.1	0.0	0.0	0.0	0.0
Princes Highway	at American Creek Bridge	0.0	0.0	0.0	0.0	0.0	0.0
Springhill Road	east of Keira Street	0.0	0.0	0.0	0.0	0.0	0.0
Springhill Road	north of Masters Road	0.3	0.2	0.1	0.1	0.0	0.0
Masters Road	west of Springhill Road	0.3	0.2	0.1	0.0	0.0	0.0
Five Islands Road	east of Springhill Road	0.0	0.0	0.0	0.0	0.0	0.0
10pm to 7am		**80/20**	**50/50**	**20/80**	**80/20**	**50/50**	**20/80**
Mount Ousley Road	2.2km south of MR186	0.2	0.2	0.1	0.1	0.1	0.0
Southern Freeway	south of Gipps Road Overpass	0.2	0.1	0.1	0.0	0.0	0.0
Princes Highway	at American Creek Bridge	0.0	0.0	0.0	0.0	0.0	0.0
Springhill Road	east of Keira Street	0.0	0.0	0.0	0.0	0.0	0.0
Springhill Road	north of Masters Road	0.6	0.5	0.4	0.1	0.1	0.1
Masters Road	west of Springhill Road	0.7	0.6	0.5	0.2	0.1	0.1
Five Islands Road	east of Springhill Road	0.0	0.0	0.0	0.0	0.0	0.0
Daily		**80/20**	**50/50**	**20/80**	**80/20**	**50/50**	**20/80**
Mount Ousley Road	2.2km south of MR186	0.2	0.2	0.1	0.0	0.0	0.0
Southern Freeway	south of Gipps Road Overpass	0.2	0.1	0.1	0.0	0.0	0.0
Princes Highway	at American Creek Bridge	0.0	0.0	0.0	0.0	0.0	0.0
Springhill Road	east of Keira Street	0.0	0.0	0.0	0.0	0.0	0.0
Springhill Road	north of Masters Road	0.6	0.5	0.4	0.1	0.1	0.1
Masters Road	west of Springhill Road	0.7	0.6	0.5	0.1	0.1	0.1
Five Islands Road	east of Springhill Road	0.0	0.0	0.0	0.0	0.0	0.0

4.4.7 Rail Noise

Rail noise during the transport of cargo to and from the proposed expanded facility has the potential to generate noise impacts at residential dwellings located adjacent to the main Illawarra Rail Line.

Given that current rail movements within the Sydney Metropolitan area are restricted by a curfew during the passenger peak hours from 6-10 am and 3-7 pm, the transport of freight to and from the proposed expanded facility would be dictated, to some extent, by these curfews. Transport times would also be influenced by the origin and destination of the freight and by when the ships are at berth. It is likely that freight train movements to and from the site may be undertaken during any hour of the day or night.

Calculation of Rail Noise Levels

Representative diesel locomotive and electric passenger train L_{Aeq} and L_{AMAX} noise levels were obtained from information prepared by RIC Scientific Services (August 1997, formerly State Rail Authority).

Maximum passby sound pressure levels of electric multiple unit passenger trains travelling at between 60-70 km/hr, with an average of over 33% wheel flats[3] were used in the study to calculate an indicative existing level of passenger train noise (L_{Aeq} 24 hr). The maximum passby sound pressure level used was 85 dB(A) @ 15 metres. The calculations assume that the average train has four carriages and the trains are travelling at 60 km/hr.

Single event level locomotive noise levels for a locomotive travelling between 40-50 km/hr at medium power (90 dB(A) @ 15 metres) were used to determine the existing L_{Aeq} 24 hour noise level due to freight trains passing along the Illawarra Line.

The calculation of existing rail noise (freight and passenger train) levels (L_{Aeq} 24hr) was based on a logarithmic sum of the freight and passenger train noise levels and the number of train movements.

Expected Increase in Rail Noise Levels

The increase in rail noise as a result of the proposed expanded facility was calculated for the various modal split scenarios outlined in the original EIS for comparative purposes. The calculations consider the existing number of freight and passenger trains and the increase in freight movements as a result of the proposal.

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[3] Some train wheels are not uniformly circular, developing deformities and "flat" sections on their circumference. This flat section generates a "clunking" sound as the wheels revolve on the tracks.

The L_{AMAX} noise level as a result of the proposed expanded facility is not expected to change, due to the fact that similar trains and the existing fleet of locomotives are expected to be utilised as part of the proposal. The increased frequency of freight train movements as a result of the proposal may, however, increase the L_{Aeq} 24hr noise levels. The maximum predicted impact on the $L_{Aeq\ 24hr}$ would be less than half of 1 dB(A).

The expected increase in L_{Aeq} (24hr) train noise levels @ 15 metres from the track as a result of the proposal, has been calculated for the various modal split options and is presented in **Table 4-23**.

Table 4-23: Calculated increase in $L_{Aeq\ (24\ hour)}$ Rail Noise Levels 15 m from the track

Road Rail Split	Weekday dB(A)	Weekend dB(A)
20% Road / 80% Rail	0.1	0.2
50% Road / 50% Rail	0.1	0.1
80% Road / 20% Rail	0	0

As outlined in **Table 4-23**, the expected increase in long-term average rail noise levels at 15 metres from the Illawarra rail line is less than 0.5 dB(A), which is not likely to be noticeable at the nearest residential dwellings.

Potential acoustic impacts on nearby residential areas as a result of rail noise associated with the proposed expanded general cargo handling facility would not be significant.

4.4.8 Construction Noise Impacts

The construction of the expanded general cargo handling facility can be divided into a number of components as shown on **Figure 3-3**. The first component of works is proposed to be the relocation of Tom Thumb Road which is expected to last approximately 20 weeks. The remaining components include the construction of MPB3 and EB4.

It is therefore proposed that an L_{A10} construction noise goal of background plus 10 dB(A) is adopted for the relocation of Tom Thumb Road and background plus 5 dB(A) for the remaining components as these are expected to have a construction period in excess of 26 weeks. Based on background noise measurements the resultant noise levels that would need to be complied with during construction are as follows:

- Tom Thumb Road relocation, commencing January 2006 for 20 weeks – L_{A10} level of 55dB(A).
- MPB3 wharf construction, commencing March 2006 for 56 weeks - L_{A10} level of 50 dB(A)
- EB4 wharf construction, commencing July 2007 for 52 weeks - L_{A10} level of 55 dB(A).

Construction on the proposed expanded facility would vary in distance from the nearest residential receiver as the works progress. For example, the relocation and construction of Tom Thumb Road would be located closer to existing residents than the construction activities associated with the proposed expanded general cargo handling facility or EB4. An estimate of the worst case scenario during the construction phase has therefore been used to determine potential noise impacts at the nearest residential receiver. These noise levels can then be assessed against the criteria referenced in **Section 4.4.2**. **Table 4-24** provides an outline of the typical sound power levels that would be expected from equipment during the construction period.

Table 4-24: Equipment Sound Power Level, dB(A)

Descrition	Sound Power Level L_{A10}	Sound Pressure Level @ 7m
Cement/ Concrete Agitator	100	75
Asphalt Paver	103	78
Concrete pump	107	82
Water Cart	107	82
Excavator	107	82
Road Haul Truck	108	83
Bulldozer (D5), Grader	108	83
Crane	110	85
Vibratory Roller	110	85
Front End Loader	112	87

Piling

Piling has been previously assessed at the nearest residential receiver as part of the noise impact assessment undertaken for the upgrade and extension of the Multi Purpose Berth, works which have recently been completed. The assessment assumed that large piling drop heights would be expected, as the piles would need to be driven well into the bedrock. A typical sound power level (SWL) of 125 dB(A) was adopted for the piling impact at that time and this level has also been adopted for proposed piling activities associated with wharf construction as part of the proposed expanded facility.

Indicative noise levels from pile driving at the wharf have been calculated to the nearest residential locations using the CONCAWE noise attenuation algorithms, modified to incorporate the effects of reflective surfaces between the source and receiver.

The results of these calculations at the nearest sensitive receiver locations are shown in **Table 4-25**, and incorporate a 10 dB(A) $L_{A,MAX}$ to L_{A10} conversion calculated by using a 15 dB(A) base $L_{A,MAX}$ to L_{A10} correction minus a 5 dB(A) impulsive noise penalty.

Table 4-25: Calculated Noise Levels During Piling

Location of Receiver	Approx. Distance from Works (m)	Uncorrected maximum noise level $L_{A\ Max}$	Estimated L_{A10} Level
Residences NWN of the site	1700m	33 dB (A)	23 dB (A)
Residences in Keira Street	1850m	32 dB (A)	22 dB (A)

The indicative pile driving noise levels presented in **Table 4-25** show compliance with the DEC's short-term L_{A10} environmental construction noise guidelines of 55 dB(A) during the wharf construction activities at the nearest noise sensitive receiver locations.

Pile driving operations would vary between inaudible to just audible at the closest residents in the vicinity of the works. The predicted maximum levels are approximately 10 dB(A) below the background noise emissions, and approximately 30 dB(A) below the typical levels of road traffic and general community noise.

Construction noise impacts expected at the nearest residential receiver when the works are at their nearest location (i.e. when Tom Thumb Road is being relocated) are predicted to be within the range of L_{A10} 40 to 55 dB(A) depending on the equipment operational at the time. The level of 55 dB(A) is calculated for the worst case and includes all equipment being operated simultaneously. In practice not all equipment would operate at once and more moderate levels of between L_{A10} 40-50 dB(A) would be expected. This represents construction noise levels ranging between 5 dB(A) above and below the noise goals for this type of activity.

The daytime L_{Aeq} of the existing noise environment in the vicinity of the nearest residence was determined to be 59 dB(A). A high proportion of this noise level is attributed to road traffic noise on the nearby road network. This noise would tend to mask the construction noise for the proposed expanded facility during the daytime period and result in minimal impacts to nearby residential areas. As the construction works move further south into the site, the potential for noise impacts and any exceedances of the noise goals would also reduce.

Construction noise levels generated by the proposed expansion of the general cargo handling facility would not have a significant impact on the nearest residential receivers located in the suburbs of Coniston, Mount St Thomas or Wollongong.

4.4.9 Proposed Mitigation Measures and Safeguards

Construction

It is recommended that a community consultation program be established to advise potentially affected residents of the proposed activities and expected construction activities and schedules. A noise management plan would be prepared as part of the Construction Environmental Management

Plan (CEMP) for the project. In addition it is recommended to minimise noise impacts from construction and that all construction work take place during normal construction hours as set out in **Section 4.4.2**.

Operation

Noise level predictions of the proposed expanded general cargo handling facility indicate that noise impacts at the nearest sensitive receivers will not be above the DEC's noise criterion. An active role in noise management can however, ensure that noise creep and therefore non-compliance does not occur in the future. Recommended management practices have been outlined below to assist in managing noise issues for the site.

Condition of development consent 3.11 (MOD -64 -4-2005-i) states that specific management measures are to be included as part of the general cargo handling facility to address potential local amenity issues associated with the movement of heavy vehicles between 6.00 pm and 6.00 am seven days per week. These specific measures are to be developed in consultation with the RTA, Wollongong City Council and the DEC and shall focus on measures to minimise, mitigate and manage traffic volume, traffic safety and acoustic impacts from the movement of heavy vehicles at night.

Adverse noise impacts at nearby residential receivers in the suburbs of Coniston and Mount St Thomas as a result of the operation of the proposal are not anticipated. If, however, noise impacts are reported as a result of the proposed operations, the following management practices would be considered:

- The internal road system used for trucks must be regularly maintained to ensure it is free of potholes, or other characteristics that could result in noise impacts being generated from the movement of the vehicles, or the interaction of the cargo and the body of the truck.
- Reversing alarms on trucks, forklifts and reach stackers could be disabled and a "reversing light" be adopted during the night-time period (subject to approval by Occupational Health and Safety requirements). If the alarms cannot be disabled, then the level of noise emissions could be adjusted to a more suitable level with the adoption of "smart" alarms that measure background noise levels.

In the event that a complaint(s) relating to operation of the proposed expanded facility is made, it is recommended that an investigation into the source of the complaint be undertaken prior to the implementation of mitigation measures. This would allow the most appropriate solution to be determined. Periodic noise monitoring of noise levels in the surrounding suburbs along expected heavy vehicle routes would be undertaken to ensure that any vehicle movement movements undertaken at night are managed consistent with good environmental practice and maintain local amenity levels.

In addition, in accordance with Condition of Consent 4.1 (DA 105-5-2004i), within 90 days of the commencement of the operation of the general cargo handling facility, and during a period where the development is operating under normal operating conditions, PKPC would undertake a program of noise monitoring in order to confirm the noise emission performance of the facility. This would also be applicable to the proposed expansion of the general cargo handling facility. The noise monitoring program would meet the requirements of the DEC and shall include the following:

- Noise monitoring, consistent with the guidelines provided in the *New South Wales Industrial Noise Policy* (EPA, 2000) to assess compliance with the required operating noise levels (i.e. 42 dBA L_{Aeq} (15 minute) level at any residence during day, evening or night time periods and an L_{A1}(1minute) level of 58 dBA during the night time period and a noise level of 65 dBA at any commercial property boundary during either day, evening or night time periods). The basis for noise impact assessment in this report is the INP amenity criteria, which applies to the L_{Aeq} period (day, evening or night time) not the L_{Aeq} (15 minute) period as recommended in the Minister for Infrastructure and Planning's Condition of Consent 3.18 (DA 105-5-2004-i).
- Methodology for noise monitoring.
- Location of noise monitoring.
- Frequency of noise monitoring.
- Identification of monitoring sites at which pre-and post-development noise levels can be ascertained.
- Details of any complaints received in relation to noise generated by the development within the first 90 days of operation.
- An assessment of night-time use of audible alarm systems.
- Details of any noise mitigation measures and timetables for implementation.
- Recommendations and timetables for implementation for any additional measures necessary to ensure compliance with the relevant noise-related conditions of this consent.

4.5 Water Quality and Hydrology

4.5.1 Existing Environment

The harbour can be regarded as a highly modified closed estuary. Natural freshwater inputs into the Inner Harbour are from:

- The Western Drain which discharges into the Eastern Basin carrying urban runoff from Wollongong.
- Allens Creek which discharges into the western end of the Inner Harbour. This creek has for many years been the means of discharge to the harbour of industrial effluent from the industrial area of Unanderra and wastewater consisting chiefly of cooling water from the BHP steelworks.

The main inflow of water to the Inner Harbour is from Allans Creek. This creek carries freshwater from the catchment together with plant cooling and process water outflow from the Integrated Steelworks site of up to 950 ML/day (1999 data, BHP, *pers. comm.*). These waters mix and flow seawards into the harbour as a plume of warm (typically 8-12ºC above ambient temperature), slightly freshwater which is less dense and so flows over the cooler seawater in the harbour (Australian Marine & Offshore Group, 1995). The flows from the Western Drain and several small drains merge with the plume.

Allans Creek and the Western Drain carry fine sediments, organic particulates and some dissolved nutrients into the Inner Harbour. Sources of sediments include runoff from urban and industrial catchments, BlueScope Steel, the port operations and the movement and storage of coal, iron ore and grain. These materials tend to flocculate and settle out near the mouth of the creeks. The total quantity of sediment inflow is not accurately known, but is around several thousand tonnes per year, a figure that is consistent with quantities from maintenance dredging. The inputs of nitrates, phosphates and organic particles from Allans Creek and the Western Drain are a source of nutrients for Harbour biota.

Small quantities of metals and organic chemicals enter the Harbour from the catchment and the industries surrounding the Harbour. The contribution from BlueScope Steel has diminished greatly over the years, through process improvements and wastewater purification measures.

Ecological studies undertaken in Port Kembla have shown that there has been a continued recovery and improvement in the diversity and abundance of species in the upper water column thereby indicating that the water quality within the harbour is quite good.

Existing Licence (POEO Act)

An Environment Protection Licence under the *Protection of the Environment Operations Act, 1997* exists for the water quality and dust controls that are fitted to the Multi-Purpose Berth. The existing water quality controls would be sufficient to treat any stormwater runoff generated from the unloading and loading of cargo at the berth. As a result, no additional licences or approvals would be sought from the Department of Environment and Conservation for the operation of the expanded facility adjacent to the Inner Harbour. It is expected that an Environment Protection Licence would be required for the operation of the Eastern Basin Berth. Even though EB4 would operate as part of the consolidated and expanded general cargo handling facility, the site of EB4 is located to the east of the Eastern Basin and is not physically part of the approved development area.

4.5.2 Construction Impacts

The potential water quality impacts associated with the construction of the proposed expansion would be similar to the water quality impacts associated with the construction of the approved

development. However, reclamation works were not assessed in the EIS for the general cargo handling facility and as such, need to be considered as part of the construction of MPB3 and EB4.

As discussed in **Section 3**, slag may be used for reclamation works. The chemical composition of slag depends on the ingredients of the slag producing process. Typically, slag consists of calcium oxides, silicon dioxide, sulphide, aluminium magnesium and iron in varying proportions. When slag is in contact with water, leachate may be produced. To minimise the potential impacts associated with the production of leachate, the type and quality of the slag would be monitored and the surface area which is in contact with the water would be minimised.

Other potential water quality impacts include the potential for sediment laden runoff as a result of construction works to discharge into the Inner Harbour during times of rainfall. To minimise the likelihood of this occurring, appropriate sediment management procedures would be established to detain sediment on-site as outlined in **Section 4.5.4** below. These measures would be maintained for the duration of construction activities and until such time as all ground disturbed by the works has been stabilised and rehabilitated in accordance with Condition of Consent (DA 105-5-2004-i).

4.5.3 Operational Impacts

The potential water quality impacts associated with the operation of the proposed expansion would be similar to the water quality impacts associated with the operation of the approved development.

Stormwater from rooves and roadways on the site would be drained directly into the proposed stormwater drainage system. The existing EB4 site drainage system would be modified to encompass the newly constructed areas and it would be designed to accommodate a 1 in 20 year storm event. The drainage network would be similar to the one proposed for the general cargo handling facility (i.e. it would comprise a series of stormwater pits and gross pollutant traps to collect and treat the stormwater). Once treated, stormwater runoff would be discharged into the Eastern Basin.

A large number of vehicles would travel over the expanded facility (including various trucks and forklifts) and contaminants such as fuel, oil and rubber from vehicle tyres would be generated. These contaminants could, during time of heavy rainfall, be washed into the Inner Harbour and adjacent Eastern Basin area. Therefore a number of mitigation measures eg. sediment and oil arrester pits would be installed in the expanded terminal areas to reduce any potential adverse impacts to the surrounding environment. The installation of a new stormwater channel complete with a gravel base and vegetation such as reeds would further treat runoff from the site and improve the quality of the stormwater being discharged to the Inner Harbour.

The expansion of the general cargo handling facility would result in an increased level of shipping activity within the port of Port Kembla. Guidelines for ship unloading facilities issued by the then

Department of Infrastructure, Planning and Natural Resources indicate that safeguards or means of preventing or minimising the potential adverse impacts from ships ballast water, wastewater and oil should be addressed as part of an environmental impact assessment.

From 1 July 2001, Australian Quarantine Inspection Service implemented a mandatory ballast water management system for Australia. These protocols prohibit the discharge of "high risk" ballast water into the waters of Australian ports. The Australian Quarantine Inspection Service protocols are the best system currently available world-wide and as Australia has made ballast water reporting and monitoring mandatory, it is currently the best possible management process to minimise or eliminate the risk of the introduction of unwanted marine pests. PKPC has indicated, however, that container vessels do not exchange much ballast water generally being between 0 and 12% of the discharge from similar sized bulk carriers which travel into the port. Therefore, it is not expected that the ballast water from visiting cargo ships would cause any impact on the surrounding marine and water quality environment of the Inner Harbour.

The discharge of wastewater from vessels is not permitted within the port of Port Kembla. This is the combined responsibility of Australian Maritime Safety Authority (AMSA), Australian Quarantine Inspection Services and PKPC and is also policed internationally. Discussions with representatives from PKPC indicate that it is extremely rare to see a cargo ship that does not have special holding and treatment tanks for any wastewater generated. Therefore, there would be no significant impact on the surrounding environment from the increased number of cargo ships entering and leaving the port as a result of the expanded facility.

Cargo could potentially be damaged during transportation. Therefore, absorbent materials would be kept on site in the vicinity of the cargo stacking area to contain any spills that may occur. This would ensure that spills do not enter either the on-site stormwater drainage system or the Inner Harbour.

Slag is proposed to be used as part of minor reclamation works. Sirman (1985), (as quoted in Dames and Moore, 1998) indicates that slag placed in an aqueous environment would cement itself within six months, significantly reducing the surface area exposed to potential leaching. Results of laboratory analyses of leachate material show that alkaline pH and an increase in the hardness of water are the main factors that affect leachate quality (Golder Associates, 1994, as quoted in Dames and Moore, 1998). Past chemical analyses indicate that under neutral conditions, concentrations of potential contaminants within the leachate were below the water quality guidelines for the protection of aquatic ecosystems. The marine waters of the Inner Harbour are such that the pH is generally 8 or above and therefore the potential for contamination of the surrounding environment as a result of reclamation activities is expected to be very low.

4.5.4 Proposed Mitigation Measures and Safeguards

For the construction phase, a Soil and Water Management Plan would be prepared which would form part of the CEMP for the project. Mitigation measures outlined in the management plan would be based on the guidelines *Managing Urban Stormwater: Soils and Construction* (Department of Housing, 1998), and *Managing Urban Stormwater: Treatment Techniques* (NSW Environment Protection Authority, 1997). Mitigation measures that would be incorporated into the plan would include:

- Installation of silt fences/hay bales where required around the site to prevent any sediment laden runoff from entering the Inner Harbour.
- Minimising the area of land that is disturbed at any one time.
- Protection of excavated and soil areas.
- Adequate stabilisation and/or cover of material stockpiles.
- Separation of clean and dirty runoff.

During operation, potential pollutants from the site would be captured within the proposed stormwater system, designed to include a series of stormwater pits, gross pollutant traps (including oil separators) and a new vegetated stormwater channel. Any litter would be collected by a trash rack, located at the downstream end of each stormwater pit.

The implementation of the abovementioned stormwater treatment devices would ensure that any runoff that is discharged from the expanded facility site into the Inner Harbour is first screened and has acceptably low levels of oil, greases, detergents and litter, minimising any potential adverse effects on the surrounding marine and water quality environment.

The final design of the stormwater system would be determined during the detailed design stage of the project. All quarantine and machinery wash down waters and amenities wastewater would be directed to the sewer (subject to the approval by Sydney Water) or to an appropriately licensed liquid waste disposal facility in accordance with the then Minister for Infrastructure and Planning's Condition of Consent 3.23 (DA 105-5-2004-i).

4.6 Landscape Character and Visual Quality

4.6.1 Existing Environment

The Illawarra Region's eastern boundary extends along some 200 kilometres of coastline which is initially rugged and is characterised by sandstone cliffs containing seams of good quality coking coal, before becoming bounded by undulating plains, lakes and river flats. The visual character of the northern part of the region is dominated by the Illawarra Escarpment which rises some 300 m above the coastal cliffs and runs approximately parallel to the coastline. The escarpment moves away from the coast within 20 kilometres of the northern boundary of the region but it continues to

play a dominating visual role in the area. The Illawarra Escarpment forms an abrupt division between the two landform types in the region – the eastern fringe of the tableland and the narrow coastal plain.

The tableland landform type is characterised by a network of elevated ridges and plateaux dissected by numerous intermittent and perennial creeks and gullies. The surface rock of the tableland is Hawkesbury Sandstone.

Port Kembla lies within the Illawarra coastal plain to the south of Wollongong and north of Lake Illawarra. While the lake provides a tranquil natural environment, its immediate surrounds and plain regions to the north (encompassing Port Kembla, Wollongong and beyond) are occupied by industrial and urban development.

The local visual catchment is restricted to areas within the topographic basin, in particular the residential areas of Mount St Thomas, Coniston, Mangerton, Lake Heights, Warrawong, Port Kembla and Cringila, and the major transport corridors of Springhill Road, Masters Road and Five Islands Road. From the adjacent road corridors, the areas of land proposed for the expansion of the general cargo handling facility are not readily visible. Buildings and structures associated with BlueScope Steel effectively screen the areas from passing traffic on these roads.

Many areas within the visual catchment of the port and steelworks are commercial and residential areas that draw employment and business opportunities from the industrial developments. The operations undertaken in the port contribute significantly to the regional economy and as such, the significance of the impacts (both positive and negative) may be perceived quite differently by local businesses and residents, when compared with people who are visitors travelling through the area.

4.6.2 Construction Impacts

The potential visual impacts associated with the construction of the proposed expansion would be similar to the visual impacts associated with the construction of the approved development. Various construction machinery, equipment and vehicles would be present on the land proposed to be utilised for expansion facilities. The visual impact during this time is not expected to be significant, as the presence of such equipment is typical of an industrial site and would only be experienced for a limited period of time.

4.6.3 Operational Impacts

Expansion of the general cargo handling facility to the north of Tom Thumb Road would have a negligible impact on the appearance of the approved development as it would involve an expansion of the storage facilities available for cargo. The predominance of motor vehicle imports in this area is not expected to detract from the appearance of the surrounding port. The presence of shade mesh

for part of the area within the vehicle processing precinct would also screen a portion of the development from residential areas.

Redevelopment of EB4 would have a minor impact on the appearance of the existing port and would alter the basic physical appearance of the area when viewed from a distance. However, the visual impact associated with the proposed expansion is expected to be minor. The combination of operating the two extra parcels of land (north of Tom Thumb Road and EB4) is not expected to result in any adverse visual impact considering the dominance of the neighbouring developments such as the Coal Loader, the Grain Handling Terminal and BlueScope Steelworks. The grain bins associated with the Grain Handling Terminal are approximately 68 m high from ground level to the top of the bins. The bins are painted white and dominate the visual landscape from residences that overlook the general area.

Given the surrounding land use, operational aspects such as the movement of forklifts and trucks and the potential future use of mobile harbour cranes would blend into the surrounding environment without causing any visual impact to nearby residences.

4.6.4 Proposed Mitigation Measures and Safeguards

The proposed expansion would alter the physical outlook of the area, although given the surrounding land uses such as the presence of the large grain silo bins and the buildings and cranes associated with BlueScope Steel, the resultant visual impact is not expected to be significant.

Nevertheless, landscaping treatments would be implemented. It is proposed that fast growing indigenous shrubs, groundcovers and small trees be planted at strategic locations around the expanded operations. While these proposed landscape treatments would not screen the entire development from residential areas that overlook the facility, they would provide some improvement to the visual amenity in this location.

4.7 Flora and Fauna

The site to the north of the existing Tom Thumb Road comprises vacant land, resulting from the reclamation and restoration of the former Casting Basin. As such, it lacks vegetation and suitable habitat and therefore no impact on local terrestrial flora and fauna would occur as a result of the development of the expanded facility in this area.

Both terrestrial and aquatic flora and fauna species could potentially be affected by the development of land comprising EB4, however, an assessment undertaken by Eco Logical Australia (2004) indicates no significant species would be affected for the following reasons:

- The land is already highly disturbed as a result of its initial use as the ANL Ro-Ro Berth.
- The terrestrial flora comprises mainly of weeds and very few native species.

- No terrestrial fauna species have been identified.
- The land is not considered a suitable habitat for threatened terrestrial flora or fauna species.

As no threatened flora or fauna species are likely to be affected by the proposal, the application of an "8 part test" for threatened species, populations or ecological communities or their habitats is not considered to be relevant. Furthermore, no specific mitigation measures relating to flora and fauna have been recommended as part of this environmental impact assessment.

4.8 Indigenous and European Heritage

No specific archaeological or heritage studies have been undertaken in the area. The land proposed for the expansion of the general cargo handling facility is within an industrial area and as such has been previously disturbed. It is highly unlikely given the disturbed nature of the land that any indigenous archaeological deposits or sites would be present. Furthermore, the land to the north of Tom Thumb Road is reclaimed land and would not contain any archaeological material.

No further archaeological investigations are therefore required and there are no objections on archaeological grounds to the proposal proceeding. Should any indigenous artefacts be uncovered during construction, all work would cease and the National Parks and Wildlife Service contacted for advice.

To assess whether any European heritage sites exist within the local area, searches of the following were undertaken:

- Heritage Schedule of the Wollongong Local Environmental Plan.
- Register and Inventory of the Heritage Council.
- Register of the National Estate.
- National Trust Register.

From the searches undertaken, no sites of heritage significance are located within or surrounding the land proposed for expansion of the general cargo handling facility and therefore no impact on indigenous and European heritage would result as a consequence of the construction and operation of the proposed expansion.

4.9 Social and Economic Considerations

4.9.1 Population Characteristics, Social Issues and Concerns

The local government area of Wollongong contains a population of 181,612 (2001 Census), an increase of 2.6% from the previous 1996 Census. The area of influence of the port would, however, be much wider than this, generally comprising the Illawarra Region which contains about 382,000 people. The population of the Illawarra Region has grown steadily in the last thirty years

from 269,0000 in 1976, 360,000 in 1996 to the present 382,000 people (Wollongong City Council, 2004). The city's major industry has historically involved heavy manufacturing and mining (Port Kembla industrial area being the largest in the southern hemisphere) but in more recent times, business services, tourism and education are being recognised as being significant to the local and regional economy.

The age profile of the Wollongong LGA is not significantly different from that of the Illawarra Region or that of NSW, although Wollongong has a higher proportion of people aged 20-24 (7.1%) compared to both Illawarra (5.8%) and NSW (6.5%). Both Wollongong and the Illawarra also have a slightly higher proportion of people aged 65 years and older when compared to NSW.

In both the Wollongong LGA and in NSW overall, the median weekly individual income is $300-$399 and the median weekly family income is $800-$999 (2001 Census).

The 2001 Census recorded a total unemployment rate of 9.1% (7,337 persons) for the Wollongong LGA, compared to 7.2% (213,196 persons) for NSW. This represents a decrease of 2.4% from the unemployment rate of 11.5% from the 1996 Census, however, it is still much higher than that of the state (Wollongong City Council, 2004).

A study on the social impact of industrial development and associated community attitudes within the Wollongong region was undertaken as part of the social impact assessment for the Port Kembla Coal Terminal EIS (Carolyn Stone and Associates, 1992). A number of community concerns were raised as part of the study including:

- Effects on amenity, character or quality of life of the affected area arising from the combined effects of noise, air quality impacts and safety impacts related to transport.
- The social aspects of employment patterns and prospects.

The proposed expansion of the general cargo handling facility within the Inner Harbour would therefore need to take into account the above general concerns of the surrounding residential community and implement measures where possible and practicable to minimise any adverse environmental impacts. The operation of the expanded facility would create employment opportunities and prospects and also significantly contribute to both the local and regional economy as discussed further in the following sections. As indicated in **Section 3.4**, it is expected that the facility would employ approximately 115 people.

4.9.2 Employment and Economic Activity

The economic significance of the port of Port Kembla was assessed in a study undertaken by National Economics (2000). Information extracted from this study is provided below to illustrate the contribution of the existing port to both the local and regional economy.

Ports are important generators of economic activity. The most direct and obvious contribution to economic activity comes from the operations of the port itself. A port's operations requires:

- Employment in stevedoring, pilotage, maintenance and related cargo handling activities.
- Expenditure on goods and services to support the port's operations (e.g. financial and maintenance services).
- Employment and other expenditure in transport industries to bring cargo from factories and warehouses to the port.
- Employment and other expenditures in non-port freight, warehousing, storage, handling and forwarding services.

The goods, services and employment required to operate the stevedoring, terminal, storage and ship control infrastructure directly add to local income and employment. However, in terms of the total transport and distribution value added generated from sea trade, the port services component is relatively small. The majority of the economic activity generated from the trade margin comes from:

- Wholesaling and distribution.
- Road, rail transport.
- Freight forwarding, custom services and other transport services.

4.10 Waste Minimisation and Management

A waste management hierarchical system, which priorities waste avoidance, reduction, reuse, recycling, treatment and disposal, in order of importance, would be adopted during the construction and operational phases of the expanded general cargo handling facility. All relevant legislation and policies including the *Waste Avoidance and Resource Recovery Act 2001*, the *Protection of the Environment Operations Act 1997*, the Environmental Guidelines: Assessment, Classification & Management of Liquid and Non – Liquid Wastes and the National Waste Minimisation and Recycling Strategy would be adhered to at all times.

4.10.1 Waste Generated During Construction

Activities that would generate waste during the construction phase include demolition and site preparation works, relocation of Tom Thumb Road, provision of access road between Tom Thumb Road and EB4, installation of services, and landscaping treatments.

Waste material that would be expected to be generated as a result of the construction phase of the proposed expansion include the following:

- Structural components such as decking which are to be demolished from existing berths such as at EB4;

- Volumes of spoil as a result of excavation works for the subgrade excavation and installation of the sewer system and stormwater drainage system;
- Construction materials including excess material (such as rock, concrete, timber, masonry, bricks, plasterboards, metal, and packaging materials) and offcuts from the building works;
- Waste oils, greases and lubricants from the maintenance of construction plant and equipment;
- Domestic waste (such as glass, aluminium cans, plastic bottles, paper and cardboard, and food waste); and
- Human waste from the construction workforce.

4.10.2 Waste Generated During Operation

Waste material expected to be generated during the operation of the proposed facility include:

- Domestic and human waste from the gatehouse, amenities, and administration buildings;
- Wastewater from equipment wash bay and Australian Quarantine Inspection Service wash bay;
- Maintenance material including disused parts and components, machinery and scrap metal;
- Wastewater and domestic waste from the container ships; and
- Sediment, oils and grease collected in the stormwater pits and gross pollutants traps.

4.10.3 Methods of Waste Management and Minimisation

During the construction and operational phases of the proposed expansion, a strategy for waste minimisation and responsible disposal of waste would be put in place. All site personnel and employees would be advised of the waste management and disposal procedures before commencing any work on the expanded general cargo handling facility.

Construction waste would be minimised by accurately calculating the quantities of material required. Any excess construction materials suitable for reuse would be sold back to the supplier or stored on-site for future use. Waste not able to be reused would be collected by a licensed waste contractor and transported to a recycling facility or a licensed landfill for disposal. Spoil generated during excavation works would be stockpiled on-site for future use.

Dedicated facilities would be provided on site for the storage of domestic waste materials. Where possible, domestic waste such as glass jars, plastic bottles, aluminium cans and paper products would be collected on a regular basis and disposed of off site at an appropriate recycling facility. Domestic waste not suitable for recycling would be transported to a licensed landfill for disposal.

Portable toilet facilities would be provided for the construction period. Emptying of these facilities would be undertaken regularly in accordance with Wollongong City Council and NSW Department of Environment and Conservation requirements. During operation of the expanded facility, staff would utilise the toilet and shower facilities located within the respective administration and

maintenance buildings. These facilities would be connected to the existing sewer which discharges to the Coniston Sewage Treatment Plant located to the north east of the facility. It is likely that wastewater from the Australian Quarantine Inspection Service wash bay would also be directed to the sewer.

Any oils and greases would be collected within the stormwater pits and gross pollutant traps before water is discharged to the new stormwater channel and then into the Inner Harbour. The sludge from the stormwater pits and gross pollutant traps would be removed on an as needs basis by a licensed waste contractor and disposed off site.

All ship waste would be stored onboard the ship whilst it is at port. If necessary, a licensed shore contractor would remove oily water, general waste or sludge from shipping vessels for disposal.

4.11 Dredging Works

A number of studies have been undertaken to assess the impact of proposed dredging works within the Inner harbour and Eastern Basin of Port Kembla. These include:

- Sediment testing of the material to be dredged to determine contamination levels.
- Sediment testing within the Outer Harbour reclamation area to determine the contamination of the existing sediment and the potential impact of spoil disposal.
- Ongoing water quality monitoring of the harbour.
- Noise impact assessment of proposed 24 hour dredging activities.
- Hydrodynamic modelling of the proposed Outer Harbour reclamation area by Lawson & Treloar.
- Aquatic ecological studies to assess the impact of dredging and disposal activities.
- Studies undertaken over the offshore spoil disposal site as required by DEH to determine the acceptability of offshore disposal.

The results of the assessment are provided in **Appendix B**. In summary, the dredging activities and disposal of sediment within the Outer Harbour is not anticipated to result in any long term adverse impacts on the surrounding environment. Mitigation measures would be implemented to minimise the generation of potential impacts during the construction period.

4.12 Cumulative Impact Assessment

In accordance with guidelines issued by the Department of Planning, the cumulative impacts of a development should also be considered as part of the overall environment impact assessment of a proposal.

Cumulative impact assessment in the context of the proposed expansion can be defined as:

> *"The cumulative impacts on the environment, both direct and indirect, which result from the expanded general cargo handling facility, added to other past, present and reasonably foreseeable future development proposals and activities in the region affected by general cargo handling facility."*

Cumulative impacts occur partly due to the compounding effects and synergistic interactions arising from other developments occurring in the same area or over similar time frames which together act on the environment. Typical cumulative impacts in such a project may be decreases in amenity (traffic, visual), reduction in water quality and increases in air and noise impacts.

Possible developments with the potential to contribute to the cumulative environmental impacts alongside the proposed expanded general cargo handling facility were considered to be other projects proposed by PKPC within the Inner and Outer Harbour of Port Kembla as well as other developments expected to occur in the surrounding region. The only other potential development being investigated at present by PKPC includes the reclamation of 30 hectares within the Outer Harbour to provide two new berths and potential for integrated industry cargoes such as forestry products and growth in break-bulk trade.

The combined effects of expanding the general cargo handling facility around the Inner Harbour of Port Kembla would enable PKPC to receive and dispatch sizeable quantities of cargo. Therefore, the cumulative effect of expanding the facility together with the possible redevelopment of the Outer Harbour would provide advantages in terms of reduced transport costs to importers and exporters from local and regional markets. These companies would also benefit from utilising Port Kembla rather than existing terminals in Port Jackson and Port Botany as the proposed expanded facility would be free of many problems that are currently faced in Sydney including curfew and B-Double restrictions. This would in turn provide many cumulative economic benefits to local and regional importers and exporters and would enhance the long term viability of Port Kembla and the Illawarra Region.

Relocating cargo facilities from Glebe Island and Darling Harbour East to Port Kembla sooner rather than the originally planned timeframe of 2012 would also have beneficial cumulative impacts on the Sydney CBD. These benefits include less heavy vehicle traffic movements in and out of the city resulting in less congestion, less wear and tear on the road surface and less noise impacts (i.e. from both transportation and handling facilities) to surrounding areas.

The potential negative cumulative impacts from the development of an expanded general cargo handling facility would include potential increased traffic and noise impacts. However, these impacts are expected to be manageable and do not result in significantly greater impacts than

outlined previously in the EIS for the general cargo handling facility. Provided the mitigation measures outlined in **Sections 4.2** and **4.4** are implemented, the resulted traffic and noise impacts are not expected to be significant.

The proposal to reclaim part of the Outer Harbour for future port uses has yet to be developed and therefore, it is difficult to assess its cumulative impact with other port developments. However, given that the Outer Harbour is relatively distant from the expanded general cargo handling facility and has different traffic access, the cumulative impacts are likely to be manageable.

The following developments are known to be proposed within the surrounding area:

- Multi-storey apartments and associated independent living and nursing facilities to be developed on land in and around Ross and Swan Streets, adjacent to Wollongong Golf Course. This development would be located approximately 1.5 kilometres north of the most northern extent of the site boundary and therefore is not expected to be impacted on by day-to-day operations.
- A copper concentrate export facility is proposed by Port Kembla Gateway Authority Pty Ltd at Jetty No. 6 (The Gateway) in Christy Drive, Outer Harbour. The proposal is to export 200,000 tonnes of copper concentrate per annum. The copper would be sourced from mines in Parkes and Orange and would be transported to the port by rail approximately six times per week. The copper is proposed to be stored in a new transfer shed before being loaded to ships via an enclosed conveyor for export. There would be no truck movements associated with the proposal.
- Brick and Block Company Pty Ltd are proposing to construct a new concrete brick and block manufacturing plant at the former Australian Fertilizers Limited (now Orica) site in Darcy Road, Port Kembla. The initial capacity of the plant would be approximately 200,000 tonnes of concrete product per year and the maximum capacity is expected to be approximately 400,000 tonnes per year. Raw materials would be bought to the site by road and it is also proposed that the concrete products would be transported by road to markets in Sydney, Canberra and the local area. Rail transportation may be utilised in the future if markets are developed further afield. Once the maximum capacity of the plant is reached, there is expected to be approximately 53 deliveries of slag and nine deliveries of cement to the plant per day from local suppliers and approximately 65 truck movements from the site per day to local and regional markets. The main roads that would be affected by increased truck movements include Darcy Road, Five Islands Road, Springhill Road and the Southern Freeway.
- Wollongong City Council has recently approved BlueScope Steel's proposal to build a reheat furnace for their hot strip mill at the Port Kembla steelworks. The new furnace will increase the nominal capacity of the hot strip mill from 2.4 to 2.8 million tonnes per annum. The development will cost $100 million and the upgrade is expected to be completed in 2006. The

product will be sold to both domestic and overseas markets. During the two year construction period there is expected to be an additional 290 vehicle movements per day including 20 to 40 truck movements on Springhill and Masters Roads. During operation there is expected to be an additional 36 truck movements per day and 25 rail wagons travelling to the OneSteel plant located at Whites Gully.

If all of the abovementioned proposals resulted in new operations in the area, the positive cumulative impacts would be increased employment opportunities and associated positive flow-on impacts to the local and regional economy. The negative cumulative impact of the proposals would be increased traffic volumes on the surrounding road network. The estimated additional truck activity on the main roads in the area is presented in **Table 4-26**.

Table 4-26: Additional Truck Movements from Other Proposed Developments

Road	Additional Trucks per day	Additional trucks in the peak hour
Springhill Rd, North of Masters Rd	93	9
Springhill Rd, South of Masters Road	53	5
Masters Rd	40	4
Five Islands Rd, East of Springhill Rd	118	12
Five Islands Road, west of Springhill Rd	65	7
Southern Freeway, north of Five Islands Rd	65	7
Southern Freeway, north of Masters Rd, and Mount Ousley Road	105	11

As previously mentioned in **Section 5.3** some arterial roads within the local and regional road network would have reached their peak hour capacity by 2006 due to general traffic growth. The abovementioned developments together with the expanded general cargo handling facility could therefore have an impact on traffic and congestion levels. However, the combined level of truck activity is not likely to lead to the deterioration of the Springhill Road / Masters Road intersection beyond level of service category C (satisfactory). Similarly, the impact of these proposed developments on arterial road capacity is expected to be small as the roads already support a high volume of traffic.

It should also be noted that the maximum traffic generation assessed as part of this environmental impact assessment would be at the ultimate capacity of the facility, which may not be reached for approximately 10 years. At this point (2016) the network demand would have exceeded the current capacity, regardless of any of the above developments. The marginal contribution to this traffic from all the developments is again negligible in comparison with background growth. This timeframe would therefore provide a substantial planning horizon to institute solutions to cater for the expected growth.

5. Statement of Commitments

Construction and post construction operation of the proposed expanded general cargo handling facility would be a major undertaking by Port Kembla Port Corporation and AAT. Environmental mitigation measures have been discussed in the preceding chapter as related to the main environmental issues associated with the proposed works and also as a result of previous conditions of consent received regarding the general cargo handling facility by the then Minister for Planning and Infrastructure (DA No. 105-5-2004-i and MOD -64-4-2005-i). These measures would also be incorporated into the detailed design phase of the expanded project.

Detailed design and specification of all environmental safeguards and management actions are beyond the scope of this environmental assessment. Should approval be given for the proposed expansion to proceed, a Project Environmental Management Plan (PEMP) would be prepared to define the procedures to be carried out prior to construction, during construction and in the operational phase of the project. This would enable the effective management of potential environmental impacts, thereby protecting the surrounding environment.

All of the environmental requirements described in this environmental assessment and any additional conditions of approval issued by the Minister for Planning would be incorporated into the PEMP. The PEMP would be reviewed to include safeguards developed during the detailed design phase of the project and would become the reference document that ensures the commitments for environmental protection and management in this document and subsequent approvals are fully implemented by Port Kembla Port Corporation and AAT.

The PEMP would be prepared by, or on behalf of, the Port Kembla Port Corporation for pre-construction, construction and operational phases of the project. The mitigation measures and environmental safeguards outlined in the PEMP would be derived from the safeguards and mitigation measures outlined in this document and the conditions of consent provided by the Minister for Planning. .

The mitigation measures and safeguards developed in this document for the construction and operational phases of the expanded project would be detailed within the Construction Environmental Management Plan (CEMP) and PEMP as summarised in **Table 5-1** and **Table 5-2**. The CEMP and PEMP would be prepared in accordance with the requirements of ISO 9001:2000 and ISO 14001:1996. It should be noted that any additional conditions stipulated by the Minister for Planning following his assessment and determination of the proposed expanded general cargo handling facility would also need to be implemented and detailed in the relevant environmental management plans.

Mitigation measures that would be undertaken as part of the construction period for the proposed expanded general cargo handling facility are summarised in **Table 5-1** below and would constitute the Statement of Commitments for the project.

The commitments outlined in **Tables 5-1** and **5-2** build on the mitigation measures outlined in the original EIS (DA 105-5-2004-i) and modify them where relevant for the proposed expanded general cargo handling facility. It should be noted that the following tables also incorporate the Consent Conditions provided by the then Minister for Infrastructure and Planning as part of DA 105-5-2004i and MOD 64-4-2005-i.

Table 5-1: Statement of Commitments Prior to and During Construction

Objective	Action
Traffic and Transportation	
Minimise impact on surrounding local road network	■ Prior to the commencement of works, submit to the Director-General a Transport Code of Conduct for approval outlining management measures for traffic impacts associated with the expanded facility and minimum requirements for the movement of heavy vehicles to and from the site. ■ Ensure that all internal roads and parking areas are designed and constructed in accordance with the relevant Australian and RTA standards, guidelines and Council codes. ■ Ensure construction traffic utilises the nominated freight road routes; ■ Ensure the design of site ingress and egress points to ensure that B-Doubles enter and exit the site in a forward direction. ■ Ensure the design of the facility includes the provision for the separation of heavy and light vehicle ingress and egress points. ■ Where possible, encourage the delivery of construction materials to occur during daylight hours. ■ Liaison with RTA and Council for transporting heavy materials via oversized vehicles to the site; ■ Provision of on site parking for construction workers.
Air Quality	
Minimise air quality impacts being generated during construction	■ Ensure the design and construction of the proposed expanded facility prevents the emission of dust on site. ■ Ensure trucks transporting spoil to/from the site are covered and the height of the load does not exceed the sides and tailboards. ■ Ensure all traffic leaving the site is directed through a rumble grid or similar device to minimise the transportation of dust and sediment outside the site boundary. ■ Undertake regular watering of disturbed surfaces especially during dry and windy weather. ■ Where practicable, schedule any excavation works under favourable meteorological conditions (i.e. low wind speeds). ■ Minimise the surface area of land exposed at any one time in

Objective	Action
	order to reduce potential generation of wind blown dust. ■ Stabilise disturbed areas as soon as possible. ■ Exposed areas of potentially odorous materials should be covered in order to minimise volatilisation and odour emissions. ■ All construction equipment would be properly maintained and operated in a proper and efficient manner
Noise	
Minimise construction noise impacts on surrounding residences	■ Preparation and implementation of a noise management plan; ■ Residents would be advised in advance of the commencement of construction, construction activities and traffic access arrangements and would be kept informed of construction activities. ■ When not in use, plant and equipment would be switched off. ■ Equipment and plant would be maintained and operated in an efficient manner. ■ Working hours for construction would be limited to 7 am to 6 pm weekdays and 7.00 am to 1.00 pm Saturday (if inaudible at nearby residences, otherwise 8.00 am to 1.00 pm Saturday). ■ All noise complaints would be investigated and resolved promptly. ■ A noise complaints register would be maintained.
Water Quality	
No increased sedimentation or pollution of adjacent Inner Harbour	■ Preparation of a soil and water management plan. ■ Divert overland flow away from construction activities. ■ Adequate stabilisation and/or cover of material stockpiles. ■ Progressively stabilise land as works are completed eg seal or vegetate exposed surfaces. ■ Use sediment trapping measures such as hay bales and geo-textile filter fences and silt traps as required to prevent sediment laden runoff from entering the Inner Harbour. These measures would be maintained for the duration of construction activities and until such time as all ground disturbed by the works has been stabilised and rehabilitated. ■ Weekly and after rainfall inspections and reviews of erosion and sedimentation control measures. ■ Development of an emergency response plan to control spills. ■ Regular inspection of all machinery to identify leaks. In terms of dredging activities: ■ Turbidity curtains would be installed around the dredge areas and around the Outer Harbour reclamation site to confine any suspended fine sediments and minimise potential water quality impacts. ■ A Dredge Material Placement Management Plan would be developed as indicated in **Appendix B**.

Objective	Action
Heritage	
Ensure no Aboriginal sites or artefacts are disturbed without proper process	■ Although highly unlikely given the fact that the majority of the site is reclaimed land, if artefacts are discovered during any excavation works, all work would cease and the Department of Environment and Conservation (incorporating the former National Parks and Wildlife Service) would be contacted.
Social	
Minimise noise and dust from construction activities	■ Implement noise mitigation measures as outlined above. ■ Implement air quality mitigation measures outlined above.
Waste Management	
Minimise waste generated	■ A waste management plan would be prepared and implemented; ■ Procedures for waste management practices to be outlined to all employees including contractors; ■ Quantities of construction materials ordered would be carefully calculated to meet construction needs. ■ Excess construction materials would be sold back to the supplier or recycled; ■ Excess spoil generated during excavation activities would be re-used in landscaping if practicable; ■ Domestic recycling facilities would be provided. ■ All waste shall be stored and disposed of correctly including waste oils from the maintenance building/wash pad areas.
Energy	
Minimise energy wastage and the production of greenhouse gases	■ Design buildings to be energy efficient in terms of heating, cooling and lighting. ■ Design outdoor lighting in accordance with AS 42882-1997 Control of the Obtrusive Effects of Outdoor Lighting.

Mitigation measures that would be implemented during the operation of the proposed expanded general cargo handling facility have been summarised in **Table 5-2** overleaf.

Table 5-2: Statement of Commitments During Operation

Objective	Action
Traffic and Transportation	
Minimise the impact of traffic on the surrounding road network and adjoining residential areas	■ Prepare and implement an operational traffic management plan for the expanded site. ■ Utilise heavy vehicle freight routes (refer **Figure 4-3**) to reduce impact on surrounding local road network. ■ Utilise B-Double vehicles as much as possible and encourage backloading to minimise the number of truck movements. ■ Maximise the use of rail where practicable for the transport of cargo in order to minimise impacts on the road network.

Objective	Action
	■ Provide adequate space for reversing, manoeuvering and queuing. ■ Provide clearly identified traffic routes and loading/unloading bays on-site. ■ Install clear signage to demarcate all vehicle movements within the site. ■ Schedule trucks to arrive at regular intervals throughout the day where practicable. ■ Installation and maintenance of landscaping on the site so as not to affect driver sight distance for vehicles entering and exiting the site. ■ Clear demarcation of all visitor, disables, ambulance and service vehicle parking areas. ■ Liaise with government agencies, cargo owners and the facility operator to identify opportunities to increase the use of rail.
Air Quality	
Minimise dust and exhaust emissions from the site	■ Ensure that any hoppers at the berths are fitted with dust containment grates and dust extractors. ■ Clean up any spills of bulk cargo at the wharf and trafficked areas as soon as possible. ■ Cover all trucks entering and exiting the site that are transporting bulk cargo unless exempt from the DEC. ■ Ensure that all license terms with regard to dust emissions are adhered to. ■ Utilise B-Double vehicles as much as possible to minimise the number of truck movements. ■ Encourage backloading to reduce the number of vehicles on-site at any one time.
Noise	
Protect against adverse noise impacts to surrounding residents and adjacent land uses	■ Within 90 days of commencement of operation, undertake a program of noise monitoring to confirm the noise emission performance of the facility. ■ Utilise B-Double vehicles wherever possible to minimise the number of truck movements. ■ Encourage backloading to reduce the number of vehicles on-site. ■ Utilise rail as much as practicable for the delivery and distribution of containerised cargo so as to minimise the number of truck movements. ■ Ensure freight vehicles utilise the heavy vehicle freight routes as shown on **Figure 4-3** to minimise impacts to the local road network and residential areas. ■ Ensure the internal road system is maintained and is free of potholes. ■ Investigate the disabling of reversing alarms on trucks, forklifts and reach stackers and adopt a reversing light to be used during the night time period. Alternatively utilise “smart”

Objective	Action
	alarms that measure background noise levels. ■ Undertake periodic monitoring of noise levels to ensure that any vehicle movements undertaken during the night are managed consistent with good environmental practice and maintain amenity levels.
Water Quality	
No pollution of the Inner Harbour	■ Implement Stormwater Management Plan. ■ Regularly inspect stormwater pits and gross pollutant traps to ensure that they are operating efficiently. ■ As required, accumulated oils and grease are to be collected from the stormwater control devices by a licensed contractor and disposed of off site at a licensed landfill. ■ Ensure bunding around wash bay is in good condition. ■ Regularly inspect machinery to identify leaks. ■ All quarantine and machinery wash down waters and amenities wastewater would be directed to the sewer (subject to the approval by Sydney Water). ■ Ensure emergency procedures are in place and staff are trained for all types of emergency situations including potential fuel spills from vehicles or equipment.
Visual	
Minimise the visual impact of the expanded facility	■ Following construction undertake landscape treatments at strategic locations around the site with fast growing indigenous shrubs, small trees and groundcovers. ■ Regularly inspect and maintain site landscaping areas. ■ Preferable to utilise mobile harbour cranes instead of larger, rail mounted cranes. ■ Utilise subtle materials and colours for the terminal buildings and cargo storage sheds and equipment. ■ Utilise low intensity lighting around the site perimeter and direct floodlights into the terminal to minimise light spill in accordance with AS 42882-1997 Control of the Obtrusive Effects of Outdoor Lighting.
Hazards	
Minimise the risk of dangerous goods storage on the site	■ Reassess off-site hazards due to dangerous goods storage and transport when throughput reaches 25 000 TEU/year
Social/Community	
Avoid repeat complaints regarding air quality, noise etc	■ Maintain a complaints register for the site. ■ Investigate all complaints and resolve all issues promptly.
Waste Management	
Minimise waste generated on the site and maximise recycling opportunities	■ Implement Waste Management Plan. ■ Dedicated facilities to be provided for the storage of domestic waste such as glass, paper etc – these wastes would be collected on a regular basis and transported offsite to a recycling facility for disposal; ■ Wastewater generated from the maintenance building,

Objective	Action
	vehicle wash down areas and amenities would be directed to the sewer (subject to the approval by Sydney Water). ■ Waste accumulated within the stormwater pits/gross pollutants traps would be collected by a licensed waste contractor on a regular basis and transported offsite for disposal at a licensed facility.
Energy	
Minimise the production of greenhouse gases	■ Maintain all operating equipment so as to minimise the wastage of energy. ■ Switch off machinery when not in-use. ■ Fit energy intensive equipment with energy saving devices. ■ Minimise machinery idling time.

6. Conclusion

The proposed expansion of the General Cargo Handling Facility as outlined in this Environmental Assessment would result in an expanded general cargo handling operation that would extend to the north of Tom Thumb Road and encompass the construction and operation of MPB3 and EB4. The resultant cargo volumes, however, are not proposed to exceed the approved maximum capacity of the site of 2,770,000 tonnes per annum although the mix of cargo is proposed to change.

The expansion generally involves additional land for the operation of a vehicle processing precinct associated with the importation of motor vehicles through the site, the provision of additional berths for the receipt and dispatch of cargo from the site and additional land for the temporary storage of cargo prior to export or dispatch to local and regional markets. The additional area would increase the site of the total facility to an area of 45 hectares although a large proportion of this land would be used as cargo storage.

A vehicle processing precinct associated with the importation of motor vehicles through the site is proposed similar to the processing facilities presently located at Ingleburn. The new vehicle processing area would result in the majority of motor vehicles being processed and ready for delivery direct to car dealerships thereby negating the need to travel to a separate processing facility and then onto dealerships. This would result in a net reduction of truck movements on the local and regional road network.

The essence of the general cargo handling facility is to provide a modern intermodal facility which would secure and enhance the long term viability of the port of Port Kembla. The relocation of the motor vehicle importing operation from Glebe Island as well as general and containerised cargo from Darling Harbour East to Port Kembla sooner than outlined in the NSW Government's Ports Growth Plan would lead to many benefits including:

- Provision of direct and indirect job opportunities thereby providing a valuable contribution to the local and regional economy.
- Diversification and increase of Port Kembla's trade base while also significantly contributing to the local and regional economy.
- Extending the life of public infrastructure in Sydney.
- Utilisation of existing road and rail infrastructure.
- Reducing heavy vehicle movements and associated congestion in the inner areas of Sydney, particularly Balmain.
- Ability to operate 24 hours a day without causing adverse impacts to the residential areas to the north and north-west of the site.

The potential environmental impacts of the proposed expansion have been examined and detailed in this report. The potential environmental impacts of the proposed dredging and reclamation activities have also been assessed (refer **Appendix** B). The levels of impact identified have been assessed as not significant and do not significantly alter the impacts associated with the approved development (DA 105-5-2004-i and MOD 64-4-2004-i). The implementation of mitigation measures and safeguards would reduce the impacts identified and protect the surrounding environment and community amenity.

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