# 5.0 Concept Plan

## 5.1 Introduction

The development of the Outer Harbour is intended to make best use of available land area and to provide a maximum number of berths suitable for container handling, bulk trades and general cargo. As such, the development must be staged appropriately to meet the needs of prospective customers, to cater for growing port needs and regional development, and to increase the needs of new industry for a period of 30 years into the future.

To create the best potential to attract new industry and new customers, it is critical to design the facilities for the Outer Harbour with as much operational flexibility as possible. Flexibility of end use would ensure that any increase or change in demand, and change of mix of prospective trades, could be handled with minimal disruption or cost. However, development of a berth and infrastructure suitable for use with every trade is unlikely to be cost effective, and some targeting of use is required.

PKPC envisages the Outer Harbour would cater for a number of new trades already under consideration, future opportunistic trades, and possibly overflow from the existing trades in the Inner Harbour. Targeted trades have been summarised by PKPC for trade forecasting purposes into three general categories:

- Containers
- Dry bulk
- Break bulk and general cargo

The Concept Plan for the Outer Harbour is consistent with the strategic direction for NSW Ports. Under the State Government's NSW Ports Growth Plan a proportion of shipping and cargo previously handled through Port Jackson was transferred to Port Kembla Inner Harbour in 2008. This equated to up to an additional 400 ship visits, 240,000 motor vehicles and 120,000 tonnes of break bulk cargo (timber, machinery, steel, paper, etc.) to Port Kembla each year. Port Kembla Inner Harbour became the State's major centre for the importation of cars once the Glebe Island operation in Sydney Harbour ceased in 2008.

The increases in the trades listed above were accommodated within the confines of the Inner Harbour. This growth combined with existing activities including the BlueScope steel precinct and the grain and coal exporting facilities meant that there is very little available land in the Inner Harbour to accommodate future growth. Consequently, if the port is to continue to attract new trades as well as increasing the volume of existing cargoes, additional landside facilities would need to be provided in the coming decades. This is the primary driver in the proposed Outer Harbour development.

## 5.2 Concept Plan Framework

Concept Plan Approval is being sought for the total development which would be carried out in three discrete stages, anticipated to be completed by 2037.

The Concept Plan framework for the Outer Harbour development is presented in **Figure 5-1**.

**Figure 5-1: Concept Plan Framework**

- Reclamation and Dredging for total Concept Plan
- Demolition of existing No. 3 Jetty and No. 4 Jetty
- Demolition or refurbishment of No. 6 Jetty (Port Kembla Gateway)
- Construction and Operation of three (3) Multi-purpose Terminals and Berths
- Construction and Operation of four (4) Container Terminals and Berths
- Construction/Upgrade of Road and Rail infrastructure
- Extension of Salty Creek and Darcy Road Drain under reclamation footprint

## Stage 1 Project Application

### Stage 1a

**2010 - 2014**

- Reclamation for the central portion of the multi-purpose terminals and associated dredging
- Civil works for construction of terminal facilities including services
- Relocation of sulphuric acid pipeline to central multi-purpose berth
- Operation of central multi-purpose berth
- Road and rail infrastructure upgrades

### Stage 1b

**2010 – 2015**

- Demolition of No.3 Jetty
- Reclamation for the western container facility and associated dredging
- Wharf construction for the first container berth

### Stage 1c

**2014 – 2018**

- Demolition of No.4 Jetty
- Reclamation for the eastern container facility and associated dredging
- Reclamation of the southern portion of the multi-purpose terminals and associated dredging
- Extension of Salty Creek and Darcy Road Drain
- Road upgrades

## Stage 2

**2014 – 2025**

- New road links
- Land reclamation for the northern area of the multi-purpose terminals
- Construction and operation of second multi-purpose terminals
- Operation of first container berth
- Construction and operation of second container berth
- Rail infrastructure upgrades

## Stage 3

**2026 – 2037**

- Reclamation and dredging for northern portion of the multi-purpose terminals and berth
- Dredging to widen swing basin in northern Outer Harbour
- Land reclamation for the northern area multi-purpose terminals
- Land reclamation for eastern container terminals
- Construction and operation of the second and third multi-purpose berth and terminal
- Construction and operation of the eastern container terminals
- Construction of the container terminal northern piled structure

Concept Plan Approval for the total development would allow PKPC a level of certainty in defining the key components of the full development, while allowing flexibility to refine discrete stages in parallel with port growth. The Concept Plan outlines the project scope and staging for the total development and identifies the broad mitigation and management measures to address these impacts.

Major Project Approval is being sought to construct and operate Stage 1 of the Concept Plan. The Major Project application sits within, and is part of, the overarching Concept Plan. The Major Project application provides a comprehensive and quantified assessment of the first stage of the project, including the impacts and mitigation and management measures (refer **Section 6** for a description). Planning approval to construct and operate Stages 2 and 3 of the Concept Plan would be subject to separate Project applications.

## 5.3 Concept Plan Description

The Concept Plan provides a framework for the progressive completion of the Outer Harbour development and comprises creation of land dedicated to port activity. The reclaimed land would be divided into two main areas, one devoted to the import and export of dry bulk, break bulk and bulk liquid cargoes (multi-purpose terminals) and one devoted to container trade (container terminals).

A total of seven new berths would be accommodated within the total development, three berths for the multi-purpose terminals and four new berths for the container terminals. The existing oil and flammable liquids berth (Berths 206) located on the northern breakwater would be retained as part of the Concept Plan.

PKPC is seeking Concept Plan Approval for the total development of the Outer Harbour with the understanding that separate applications would be made for approval to construct and operate specific terminal facilities on the site. PKPC would construct the reclamation, road and rail infrastructure and basic services for the site as a whole. Development of specific facilities may be undertaken by PKPC or third party operators who would lease part of the site from PKPC for a specific purpose.

It is intended that the first stage of the multi-purpose terminals, including utilities and amenities, would be developed, operated and maintained by PKPC as a common user facility.

Preliminary designs and modelling prepared for the Master Plan would guide each of the three key stages of the Concept Plan. Subsequent applications for Project Approval would provide the necessary detail for assessment of each stage of the development, within the overall port context and Concept Plan.

An artist's impression of the Concept Plan and its components in illustrated in **Figure 5-2**. The multi-purpose terminals are located on the western side of the development and the container terminals are located on the eastern side of the development. The yellow dotted line represents the existing mean high water mark.

**Figure 5-2: Concept Plan - Artists' Impression**

The total development is anticipated to be completed by 2037. Once completed the reclamation footprint of the development would extend from the existing Port Kembla Gateway Jetty in the north to Foreshore Road in the south, the boat harbour to the east and existing rail sidings to the west (refer **Figure 5-3**).

A total of 5,300,00$m^3$ of fill would be required for the Concept Plan reclamation area. The fill would comprise of dredged material (rock and soft sediment) from the Outer Harbour with the balance imported from external sources. The majority of the dredging and reclamation work (approx. 4,628,049$m^3$) would be completed as part of Stage 1 of the Concept Plan and the balance (approx. 671,951$m^3$) would be reclaimed as part of Stages 2 and 3.

Development associated with the Concept Plan outside the reclamation footprint would comprise rail infrastructure upgrade in the South Yard, a new road link connecting Christy Drive to the multi-purpose terminals and Foreshore Road, a new road link connecting Darcy Road to the boat harbour, and an extension of existing rail sidings to connect with the container terminals.

**Figure 5-3: Concept Plan Inclusive of Land Based Activities**

## 5.4 Operational Scenario

Once fully operational in 2037, the Concept Plan would comprise two new areas of reclaimed land, one multi-purpose terminal area dedicated to handling dry bulk, break bulk and general cargo, and the other terminal area dedicated to handling containers.

A schematic depicting an operational scenario for the Concept Plan is illustrated in **Figure 5-4**.

### 5.4.1 Multi-purpose terminals

The multi-purpose terminals would be divided into separate parcels of land that would be divided by security mesh fencing. The central portion would be constructed and operational as part of Stage 1 (subject of concurrent Major Project application). PKPC would maintain and operate this area for common users. Other areas of the multi-purpose terminals would be divided into parcels of land that would be leased to customers and dedicated to specific port uses.

Utilities would be installed in a dedicated services corridor to facilitate the operation of the central portion of the multi-purpose. Services would include water, power, telecommunications and sewer.

Ships berthing at the multi-purpose terminals would be loaded and unloaded by either ship or land based cranes or by specialist loader/ unloader plant established on the wharf. Dry bulk would be moved via conveyor to stockpiles or vice versa. Loaders would be used to transport the dry bulk to and from trucks or trains. Break bulk would be transferred to and from ships using cranes and would be temporarily stored in cargo sheds located adjacent to the new road link from Christy Drive or on the terminal if non-weather sensitive.

A cement facility would be constructed on the western side of the central portion of the multi-purpose terminals. The cement facility would receive dry bulk direct from ship via a conveyor or vacuum system. The cement facility would lease a portion of the multi-purpose terminal area from PKPC. Planning approval to construct and operate the cement facility is not part of the Concept Plan application and a separate application for approval would need to be made by the cement facility operator.

### 5.4.2 Container terminals

The container terminals would be constructed and commence operation progressively over Stages 2 and 3 of the Concept Plan. As such it is likely that the container terminals would be split into two separate facilities, the eastern and western facilities. Each of the facilities would accommodate two berths.

Containers would be loaded and unloaded via rail-mounted quayside cranes, four for each facility (initially purpose built mobile harbour cranes might be utilised). Containers would be stacked up to eight containers high along the length of the container terminals. Up to 30 shuttle carriers would transfer containers between the unloading point and the container stacks. Up to ten rail mounted gantries would be positioned above the container stacks to reposition containers as required and load/ unload trains. Forklifts or reach stackers would move between the container stacks and a truck loading point to the south of the container stacks, within the Concept Plan footprint.

The majority of containers would be transported from the Outer Harbour by rail to markets in Sydney and interstate. A small proportion of containers and cargo within containers would be transported by road. It is possible that containers may be transported to an ‘inland Port’, such as an intermodal terminal, prior to being distributed to their ultimate destinations in Sydney and other markets.

In 2006 PKPC signed a Memorandum of Understanding with Wingecarribee Shire Council for strategic cooperation to promote the Southern Highlands intermodal project. Should the proposed Inland Port come to fruition, containers would be railed to the Southern Highlands Intermodal facility to then be distributed into Sydney and other markets.

### 5.4.3 Rail and road infrastructure

Trains and trucks would transport dry bulk, break bulk and cargo, and containers both to and from the port. Existing rail infrastructure within the Outer Harbour is not adequate to service the increase in cargo handling volumes that are envisaged at the Port and would be upgraded as part of the Concept Plan.

The rail infrastructure upgrade for Stage 1 would comprise an extension of an existing rail siding in the South Yard by approximately 120m. Additional rail infrastructure upgrade works would be required to service the development for Stages 2 and 3. The requisite upgrade work for Stages 2 and 3 would be determined following preparation of a rail master plan for the Outer Harbour that is planned for 2010 and as part of the detailed planning and design for these stages of work.

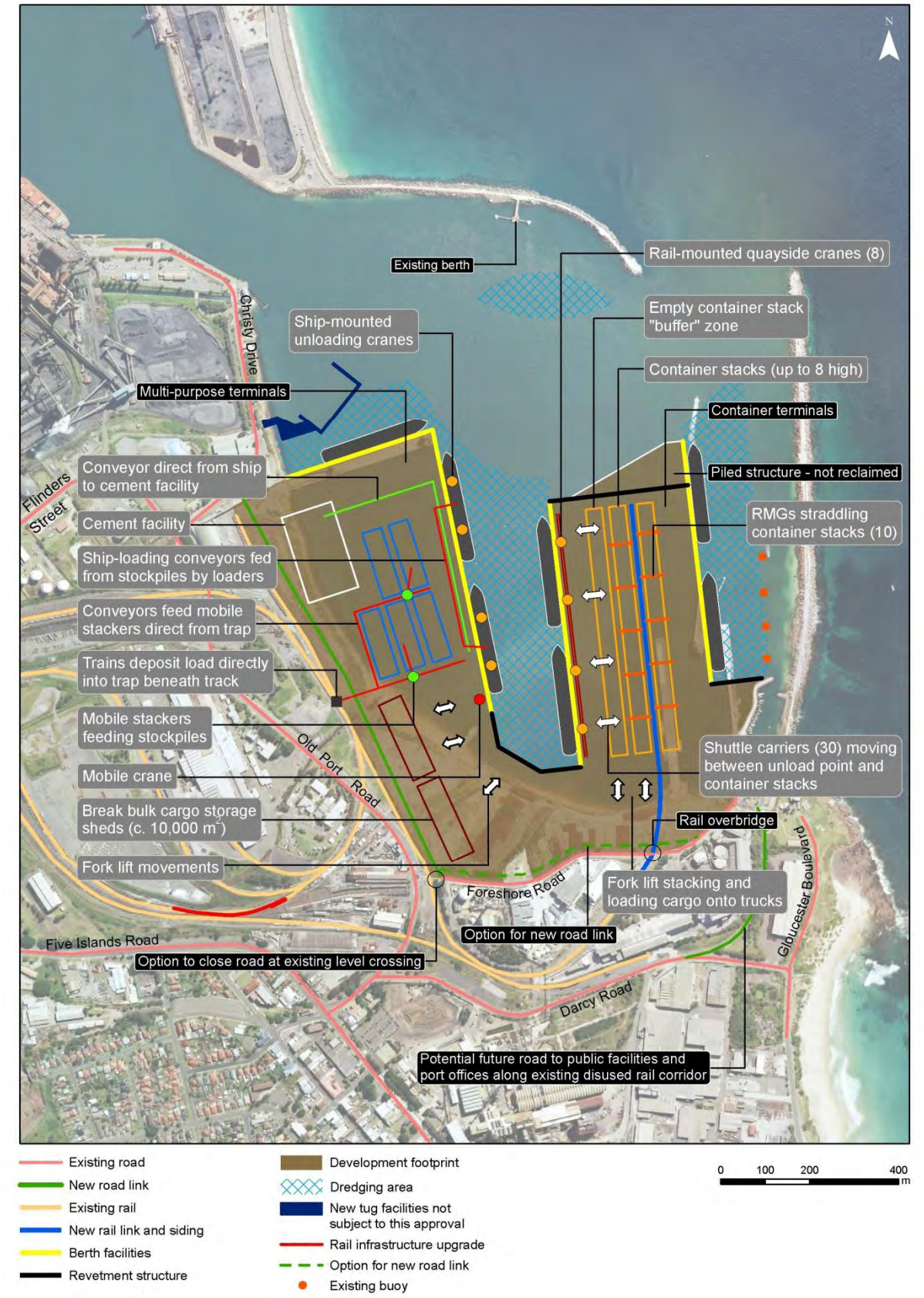
In addition, new rail sidings would be constructed along the length of the container terminals that would service both the eastern and western container berths. The rail sidings would connect to an existing rail siding located between Foreshore Road and Darcy Road.

A new road would be constructed to link Christy Drive to the central portion of the multi-purpose terminals as part of Stage 1. The road would be extended to the south east during Stage 2 to connect with Foreshore Road and the existing junction of Foreshore Road and Old Port Road would be closed including the adjacent level crossing. Alternatively a new road would e constructed adjacent to the existing Foreshore Road.

The decision whether or not to close Foreshore Road to the public would be subject to further discussion with Wollongong City Council and affected land owners as part of a project application made for Stage 2. Either way, the new road link or closure of Foreshore Road would enable a dedicated road link within the Outer Harbour to service port traffic.

A new road linking Darcy Road with the boat harbour would be constructed along a disused rail corridor. The road link would enable a dedicated access route direct to public facilities including Heritage Park, Battery Museum and the boat harbour. The public access route would enable port related traffic and public access traffic to be separated thereby increasing safety and security within the Outer Harbour for both port visitors, workers and the public.

**Figure 5-4: Concept Plan Operational Scenario**



## 5.5 Concept Plan Activities

A list of construction and operation activities that would be undertaken as part of the Concept Plan is presented in **Table 5-1**. The Concept Plan activities have been grouped by broad activity i.e. reclamation, dredging etc, and presented for each of the three stages of the development.

Major Project Approval is being sought for Stage 1 of the Concept Plan. A description of activities to be undertaken as part of the Major Project is presented in **Section 6**.

**Table 5-1: Activities to be Undertaken as Part of the Concept Plan**

| Approval type and stage of works | Activity to be undertaken |
|---|---|
| Stage 1 (Concurrent Major Project Application) | **Demolition** |
| | Demolition of No. 3 Jetty (currently used to accommodate tug boats) and No. 4 Jetty (currently used for import and export of non flammable liquids including sulphuric acid). |
| | **General Construction** |
| | Erection of site compound approximately 100m south east of Salty Creek outlet. |
| | Delineation of a temporary stockpiling/surcharge area south of the proposed dry bulk/multi-purpose terminals, capable of storing up to 100,000$m^3$ of material at any one time. |
| | New access road from Christy Drive to the multi-purpose terminals. |
| | Temporary construction access road from Foreshore Road to the container terminals to be utilised for reclamation and dredging activities. |
| | Extension of Darcy Road Drain through the reclamation area. Drain to remain an open drain, u-shaped, with wing walls at the harbour entrance. |
| | Redirection of Salty Creek from the foreshore, through the reclamation area, to the harbour. Salty Creek to remain an open channel through the reclamation area. |
| | Relocation of utilities for import of sulphuric acid (currently at Berth 206) to the operational central area of the dry bulk/multi-purpose terminal, including a dedicated pipeline/services corridor. |
| | Installation of utilities to service the central (operational) portion of the multi-purpose terminals (i.e. water, hydrant mains, power 240V and 415V, telecommunications, and sewer). |
| | **Dredging and Reclamation** |
| | Dredging of the following:<br>• All container berth boxes and approach channels.<br>• Approach channel and berth boxes for the first multi-purpose terminals berth.<br>• Basins between multi-purpose terminal and container terminal.<br>• Basin east of the container terminal. |
| | Land reclamation for central and southern areas of the multi-purpose and container terminals. |
| | Construction of the following:<br>• Temporary revetment structures.<br>• A series of discrete bunded fill areas, to be constructed within the reclamation footprint, for encapsulation of contaminated dredged material. Bund size and location would reflect dredging phases.<br>• Permanent revetment structures along the northern edge of the container terminals and reclaimed area between container terminals and multi-purpose terminals. |

| Approval type and stage of works | Activity to be undertaken |
|---|---|
| | **Terminal and Berth Construction and Operation** |
| | Construction of the following:<br>• Terminal and berth construction of one new multi-purpose berth.<br>• The central part of the dry bulk/multi-purpose terminal, partly paved for common users, including drainage systems<br>• Construction of first container berth with permanent edge structure (western container facility). Berth not operational. |
| | Operation of the following:<br>• The central part of the multi-purpose terminal<br>• One new multi-purpose berth. |
| | **Rail infrastructure Upgrade** |
| | Rail infrastructure upgrade in the South Yard, including extension of No. 13 siding. |
| **Stage 2** | **General Construction** |
| | Salty Creek open channel through multi-purpose terminals to be enclosed under hardstand for operational movement in this area. |
| | An extended new road link to connect the new container terminals with Christy Drive. |
| | Closure of the road at the existing level crossing between Old Port Road and Foreshore Road or alternatively creation of a new road parallel to Foreshore Road. |
| | Potential for a new road link along an existing disused rail corridor off Darcy Road to service the PKPC office and public access area, including Heritage Park and the boat harbour, and to separate this traffic from Port traffic. |
| | **Reclamation** |
| | Commence land reclamation for the northern area of the multi-purpose terminals. |
| | **Terminal and Berth Construction and Operation** |
| | Construction of the following:<br>• Second multi-purpose berth and terminal facilities.<br>• Second container berth (western container facility).<br>• Pavements for northern and southern portions of multi-purpose terminals and western container facility. |
| | Operation of the following:<br>• First container berth (western container facility).<br>• Second container berth (western container facility). |
| | **Rail Infrastructure Upgrade** |
| | A new rail overbridge to on Foreshore Road to provide grade separation between the rail and road traffic servicing the container terminals. |
| | Rail link to the container terminals and new rail sidings on the terminal area. |

| Approval type and stage of works | Activity to be undertaken |
|---|---|
| **Stage 3** | **Demolition** |
| | Demolition or refurbishment of No. 6 Jetty (Port Kembla Gateway). |
| | **Dredging and Reclamation** |
| | Dredging of the following:<br>• Berth box for northern portion of the area multi-purpose berth boxes terminals.<br>• Basin for northern portion of the multi-purpose terminal terminals.<br>• In northern portion of Outer Harbour to accommodate altered vessel turning circle. |
| | Complete land reclamation for the northern area of the multi-purpose terminals. |
| | Complete land reclamation for container terminals (eastern container facility). |
| | **Terminal and Berth Construction and Operation** |
| | Construction of the following:<br>• Second and third multi-purpose berths and terminal (third being located on the northern edge of the terminals formerly Port Kembla Gateway).<br>• Third and fourth container berth (eastern container facility).<br>• Northern portion of the container terminal terminals (piled structure).<br>• Pavement material between extent of reclamation and boundary of development (i.e. landside area to the rail line along the south western edge of the Outer Harbour, and to Foreshore Road in the south). |
| | Operation of the following:<br>• Third and fourth container berth (eastern container facility).<br>• Northern portion of the container terminal terminals (piled structure). |

## 5.6 Concept Plan Staging

Project timing for all development activities associated with the Concept Plan has been determined based on current trade projections outlined in the Master Plan and are anticipated to be completed by 2037. The Concept Plan would be progressively developed, each stage of development being driven by market demand and subject to individual approvals. A program illustrating the staging for the Concept Plan is presented as **Table 5-2**.

Subject to approval, construction of Stage 1 of the Concept Plan would commence in 2010 and be completed in 2018. At the completed of Stage 1 the first multi-purpose berth would be operational and the majority of dredging and reclamation works would be completed.

Stage 2 would commence in parallel with completion of Stage 1 and would be constructed between 2014 and 2025. At the completion of Stage 2, the western container facility (container berths 1 and 2) and the second multi-purpose berth would be operational.

Stage 3 would commence at the completion of Stage 2 and would be constructed between 2026 and 2037. The eastern container facility (container berths 3 and 4) and the third multi-purpose berth would be operational as part of Stage 3.

The indicative program outlined in **Table 5-2** represents the timeframe and sequence of reclamation, dredging and construction activities to be undertaken as part of the Concept Plan. Reclamation and dredging campaigns would follow a logical sequence allowing for all dredged material to be encapsulated and confined within a series of bunds to be located under the reclamation footprint. The precise timing of each reclamation and dredging campaign would be subject to availability of reclamation material.

Each of the stages of the Concept Plan would comprise a suite of sub-stages. The sub-stages within Stage 1 are discussed in detail in **Section 6.4**. Successful contractors would develop detailed construction programs for each stage of work under the Concept Plan, subject to approval. It should be noted that there would be some overlap between the construction stages and some sub-stages would be constructed in parallel.

**Table 5-2: Concept Plan Program**

| Stage | Activity | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Reclamation and dredging, road and rail infrastructure | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Multi-purpose terminal (berth 1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Western container terminal (berth 1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Western container terminal (berth 2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Multi-purpose terminal (berth 2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Multi-purpose terminal (berth 3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Eastern container terminal (berth 1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Eastern container terminal (berth 2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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## 5.7 Construction Staging – Stage 1

### 5.7.1 Overview

All components of Stage 1 are part of a concurrent Major Project application. A detailed description of activities within the Sub-Stages 1a, 1b, and 1c under Concept Plan Stage 1 activities is provided in **Section 6**.

Construction of Stage 1 would comprise the following:

- Demolition.
- Reclamation.
- Dredging.
- Terminal and berth construction.
- Road and rail infrastructure upgrades.
- General construction activities.

At the completion of Stage 1 the visual landscape of the Outer Harbour would comprise approximately 35 hectares of reclaimed land, nine hectares of pavement for the central portion of multi-purpose terminals, one operational multi-purpose berth, berthing facilities for the first container berth, new rail and road infrastructure (refer **Figure 5-5**). Services reticulation and infrastructure would be installed to service the operational central portion of the multi-purpose terminals.

Construction activities for Stage 1 would be undertaken by a construction contractor awarded the contract via a competitive tender process and managed by PKPC. Sequential construction staging for Stage 1 would be undertaken as outlined below.

### 5.7.2 Establish construction work areas

- Prior to the commencement of any construction works, an area for a site compound would be demarcated approximately 100m south east of the Salty Creek outlet.
- A temporary stockpiling/surcharge area south of the proposed multi-purpose terminals would be demarcated, capable of handling up to 100,000$m^3$ of fill material at any one time.
- A temporary construction access road would be constructed from Foreshore Road to the shoreline of the container terminal footprint to be utilised for reclamation and dredging activities.

### 5.7.3 Demolition

- Demolition of No. 3 Jetty currently used to accommodate tug boats and No. 4 Jetty (Berth 206) currently used for import and export of non flammable liquids including sulphuric acid would be carried out. The demolition would be phased according to reclamation staging.

### 5.7.4 Dredging

- Dredging would be completed over a series of dredging campaigns for:
  - basins between multi-purpose terminals and container terminals
  - basin east of the container terminals
  - all container berth boxes and approach channels

### 5.7.5 Reclamation

- Land reclamation for the central and southern portions of the multi-purpose terminals would be carried outand reclamation for the container terminals area. The northern portion of the multi-purpose terminals would not be reclaimed until the lease on Port Kembla Gateway expires in 2022 (Stage 3).
- Construction of permanent revetment structures along the northern edge of the area dedicated for container terminals and reclaimed area between container terminals and multi-purpose terminals and construction of temporary revetment structures surrounding the remainder of the reclamation footprint.
- A series of discrete bunded fill areas, would be constructed within the reclamation footprint, for encapsulation of contaminated dredged material. Bund size and location would reflect dredging phases.
- The surface of the reclaimed areas not to be paved as part of Stage 1 would be graded to ensure surface water runoff is directed toward a central area that would act as a sediment basin prior to infiltration.

### 5.7.6 Drainage

- Alterations to the local hydrological regime would be required to allow existing creeks/drains to flow through the reclamation footprint to the Outer Harbour. Construction activities relating to Salty Creek and Darcy Road Drain include:
  - Extension of Darcy Road Drain through the reclamation to the harbour. The drain would remain an open drain, u-shaped, with wing walls and an energy dissipater at the harbour entrance.
  - Redirection of Salty Creek from the foreshore, through the reclamation area to the harbour. Salty Creek would remain an open channel through the reclamation area.

### 5.7.7 Road and Rail Infrastructure

- Extension of rail siding No. 13 and turnout installation and removal in the South Yard to service first multi-purpose berth.
- New access road from Christy Drive to service the first multi-purpose berth.
- A temporary construction access road to link Foreshore Road with the container terminals reclamation.

### 5.7.8 Berth and Terminal Construction

- Construction of the central portion of the multi-purpose terminals including the first berth, pavements, utilities and stormwater drainage.
- Construction of the first container berth with permanent edge structure (western container facility).
- A services corridor for the central operational portion of the multi-purpose terminals would run along the southern edge of the paved area. Utilities required for operation of the first multi-purpose berth include water, power 240V and 415V, telecommunications, and sewer. A high voltage substation would also be constructed.
- Installation of sulphuric acid pipeline (relocated from Berth 206) to extend from the multi-purpose berth south to Foreshore Road and then to existing aboveground storage tanks at the Orica facility.

**Figure 5-5: Stage 1 Activities**

## 5.8 Construction Staging – Stage 2

### 5.8.1 Overview

Construction activities for Stage 2 of the Concept Plan would commence prior to completion of Stage 1. Stage 2 construction activities would commence in 2014 and be completed by 2025.

Construction for Stage 2 would comprise:

- Reclamation.
- Terminal and berth construction.
- Road and rail infrastructure upgrade.
- General construction activities.

Upon completion of Stage 2 a second multi-purpose berth would be operational and two container berths would be operational on the western container facility. Road and rail infrastructure would be in place to support the operation of these additional terminal areas. Public access would be permanently restricted to an area in the vicinity of Heritage Park and the boat harbour, enabling more secure and safe port operations within a dedicated area. Stage 2 is illustrated in **Figure 5-6**.

Following completion of Stage 2 construction, the visual landscape of the Outer Harbour would include reclamation and pavement of the northern and southern portion of multi-purpose terminals, and pavement for the container terminals and southern portion of multi-purpose terminals.

Construction activities for Stage 2 would be undertaken by construction contractors awarded the contracts via a competitive tender process and managed by PKPC. Sequential construction staging for Stage 2 would be undertaken as outlined below.

### 5.8.2 Construction Work Areas

- Construction work areas established as part of Stage 1 would remain in place and be utilised for Stage 2 activities.

### 5.8.3 Reclamation

- Land reclamation for the northern portion of the multi-purpose terminals would be completed with the exception of an area within a distance of approximately 50m from the existing Port Kembla Gateway Jetty, to enable the jetty to be demolished or refurbished as part of Stage 3.

### 5.8.4 Drainage

- Construction activities relating to watercourses include the decking/enclosure of both Salty Creek and Darcy Road Drain under the permanent hardstand of the multi-purpose terminals and container terminals respectively.

### 5.8.5 Berth and Terminal Construction

- A second container berth and operational facilities on the western container facility would be constructed.

### 5.8.6 Road and Rail Infrastructure

- The road link off Christy Drive constructed as part of Stage 1 would be extended east during Stage 2 and either a new road would be constructed adjacent to the existing Foreshore Road, or the junction of Foreshore Road and Old Port Road would be closed including the adjacent level crossing.
- An existing rail siding between Darcy Road and Foreshore Road would be extended along the length of the container terminals.
- A new rail overbridge would be constructed to provide grade separation of rail and road traffic between Foreshore Road and the new rail siding which will service the container terminals.
- A new road link along an existing disused rail corridor off Darcy Road would be constructed to service the PKPC office and public access area (boat harbour and heritage precinct) and to separate this traffic from port related traffic.

As part of Stage 2, the junction between Foreshore Road and Old Port Road, as well as the adjacent level crossing may be closed or a new road constructed adjacent to Foreshore Road to service the western container terminals. A road closure would remove all public access to the recreational boat harbour. To compensate, a new road is proposed to be constructed along a disused rail corridor at the southern end of the eastern breakwater. The road would join Darcy Road and would be operational prior to the road closure at Foreshore Road. The proposed public access road would be designed to allow safe egress for the public to the PKPC offices, boat harbour and heritage precinct, by separating this traffic from the port traffic.

If Foreshore Road is closed at the existing level crossing between Old Port Road and Foreshore Road, public access to properties along Foreshore Road would be restricted. At the time of writing, properties that would be affected by the road closure include cement, chemical and building product manufacturers. A traffic assessment to be undertaken as part of a project application for Stage 2 would consider the impact on premises to the south of Foreshore Road that would be affected by such a road closure including the feasibility of alternative access arrangements.

Prior to making a decision on the closure of Foreshore Road or to construct a new parallel road to Foreshore Road, all potentially affected parties would be consulted including land owners/occupiers and Wollongong City Council to settle on the most appropriate arrangement.

**Figure 5-6: Stage 2 Activities**

## 5.9 Construction Staging – Stage 3

### 5.9.1 Overview

Stage 3 activities conclude the Concept Plan and facilitate the realisation of the total Outer Harbour development.

Construction of Stage 3 would comprise:

- Reclamation
- Dredging
- Terminal and berth construction
- General construction activities
- Construction of a piled structure adjoining the northern perimeter of the container terminals

At completion of Stage 3 the visual landscape of the Outer Harbour would resemble the artist's impression (**Figure 5-2**). The total development would comprise 40 hectares of paved reclaimed land, two dedicated port terminal areas, three multi-purpose berths and four container berths.

Construction activities for Stage 3 would be undertaken by construction contractors awarded the contracts via a competitive tender process and managed by PKPC. Sequential construction staging for Stage 3 would be undertaken as outlined below (refer **Figure 5-7**).

### 5.9.2 Construction work areas

- Construction work areas established as part of Stages 1 and 2 would remain in place until the landside areas of the development are paved. A small construction compound would remain until the full development has been completed

### 5.9.3 Demolition/Refurbishment

- No. 6 Jetty (currently identified as Port Kembla Gateway) would be demolished

### 5.9.4 Reclamation

- A relatively small (50m wide) area adjacent to Port Kembla Gateway would be reclaimed which would complete the reclamation for the Concept Plan footprint

### 5.9.5 Dredging

- Dredging would be undertaken in the vicinity of the existing swing basin to accommodate an altered turning circle required for ships berthing at eastern container facility
- Dredging of berth boxes and basins would be undertaken for the northern portion of the multi-purpose terminals (north of Port Kembla Gateway Jetty)

### 5.9.6 Berth and Terminal Construction

- All activities associated with the construction of the northern multi-purpose terminals
- The third multi-purpose berth and terminal facilities would be constructed
- A concrete wharf deck on piles would be constructed to adjoin the northern face of the container terminals.
- The eastern container facility would be constructed, including the third and fourth container berths
- Landside pavements between the extent of the reclaimed land and the site boundary with Foreshore Road to the site boundary with the south and the existing rail sidings to the west would be constructed

**Figure 5-7: Stage 3 Activities**

## 5.10 Dredging Methodology

### 5.10.1 Overview

The Concept Plan includes dredging activities associated with all basins and berth boxes proximal to the multi-purpose terminals and container terminals, and widening of the existing shipping swing basin located to the south of the northern breakwater (**Figure 5-3**). Dredging would be undertaken using a combination of dredging types including cutter suction and grab dredging/backhoe dredging. Some rock blasting would also be required.

Dredging campaigns for the Concept Plan would be similar to previous dredging activities undertaken within Port Kembla Harbour that utilised a combination of techniques and equipment. Plant and equipment for dredging activities would include the following:

- Small cutter suction dredger
- Backhoe dredger
- Grab dredger
- Self propelled barges
- Workboat
- Survey/crew boat
- Flat top barge
- Auxiliary equipment e.g. spreader/diffuser pontoon, pipeline (floating), excavators, wheel loader, articulated dump trucks
- Silt curtains and booms

### 5.10.2 Depth of Dredging

The final dredging depth for multi-purpose and container berth basins and boxes would be determined by the type of ships that visit the Outer Harbour, and their required draft, and would be between -15m and -16.5m.

Assessments for traffic and transport, rail, air quality and noise have been undertaken to address the worst case scenario for transportation of fill material needed to complete the reclamation. That is, if the actual and final depth of dredging is -15m there would be less material available for reclamation and more fill material would need to be imported from external sources. Conversely, if the actual dredging depth is -16.5m there would be more material available for reclamation and less fill material would need to be imported from external sources.

The assessments that have been prepared have assumed that the depth would be -15m which is the worst case scenario with respect to assessing the numbers of truck and rail movements required to import external sources of fill to the development site.

Similarly, the sediment investigation assessment has been prepared to assess the worst case scenario of dredging to -16.5m rather than -15m.

### 5.10.3 Swing Basin Dredging

There is an existing swing or turn basin to the south of the northern breakwater that vessels use either to manoeuvre into the Outer Harbour berthing basins, or to turn and head into the Inner Harbour. The diameter and location of the existing swing basin was considered during development of the Master Plan and preferred layout for the Outer Harbour development. The Concept Plan would ensure the swing basin would retain a minimum diameter of 450m and comply with PIANC guidelines for the maximum design vessel, which has an overall length of 300m.

Operation of the multi-purpose berths and container berths on the western side of the container terminals would not require any alteration to the extent and depth of the existing swing basin. However, for vessels proceeding to the berths on the eastern container facility in the Outer Harbour, the existing swing basin would need to be extended in area and depth (refer **Figure 5-7**). Swing basin dredging has been programmed to occur prior to operation of the eastern container facility during Stage 3.

To ensure a diameter of 450m as a minimum for the ship turning circle, a relatively minor amount of dredging (maximum volume 50,000 $m^3$) is required to -15m depth for the swing basin area. The dredged spoil would be accommodated within the reclamation area for the third multi-purpose berth (in the vicinity of the existing Port Kembla Gateway). As the indicative Concept Plan program provides for these works to occur between 2026 and 2036, Stage 3 detailed design would take into consideration the location of the swing basin based upon type and range of vessels operational at the time.

The navigation channel for vessels entering the port and proceeding to the berths in the Inner Harbour remains unchanged by the Concept Plan.

## 5.11 Project Cost Estimate

A preliminary cost estimate for the Concept Plan is in the order of $700 million (in 2008 Australian dollars). Quantities were calculated for the major cost items based on the investigations and drawings developed during preparation of the Master Plan. The cost estimate is indicative only at this stage and would be refined during development of the design.

The indicative cost estimate was developed by the then Maunsell │ AECOM and PKPC and includes reclamation and associated basin and berth box dredging, construction of the terminals, rail extensions, new roads, and services.

Indicative project cost for the Concept Plan is outlined in **Table 5-3**.

**Table 5-3: Indicative Project Cost for Concept Plan**

| Concept Plan | Cost |
|---|---|
| Multi-Purpose Terminals | $129,400,000 |
| Container Terminals | $278,900,000 |
| Dredging | $189,900,000 |
| Reclamation | $87,400,000 |
| Roads (new road link off Christy Drive to multi-purpose terminals and new road to container terminals) | $2,000,000 |
| Rail (extension of siding in South Yard and rail extension to container terminals) | $8,000,000 |
| Services (for operational portion of multi-purpose terminals) | $4,000,000 |
| Back up Land | $400,000 |
| **Total Cost** | **$700,000,000** |

## 5.12 Capacity

The Master Plan assessed the potential throughput of cargo from PKPC trade forecasts to determine the required capacity to service likely demand into the future. Berth requirements have been prepared based on berth throughput assumptions. Throughputs have been estimated to represent best practice using current technology.

The capacity required for the proposed activities to be undertaken as part of the Concept Plan is shown in **Table 5-4**.

**Table 5-4: Preferred option capacity for Concept Plan**

| Multi-purpose Terminals | | Container Terminals | | Total number of berths in Outer Harbour |
|---|---|---|---|---|
| **No. of operational Berths** | **Capacity (Mtpa)** | **No. of operational Berths** | **Capacity ('000 TEU)** | |
| 3* | 6.25 | 4 | 1,200 | 8 (seven new berths plus retained oil and flammable liquids berth) |

*Includes three multi-purpose berths

### 5.12.1 Capacity Assumptions

Concept Plan capacity has been calculated using the following assumptions.

**Dry bulk products (1 berth) assumed at 4.25 Mtpa per berth.**

The capacity of a bulk loading berth depends on a number of factors including:

- Storage capacity servicing the berth
- Type and variety of products
- Maximum vessel capacity
- Average cargo exchange
- Loading equipment

The terminal is intended to be a multi user facility handling a variety of products potentially including clinker, granulated slag, sand, woodchips, coal and coke. Most of these products are relatively low density which requires greater storage area for a given tonnage. Lower loading rates are expected for these products compared to high density products such as metal ores etc. Combined, these factors limit the capacity to maximise berth utilisation. Based on these factors the following assumptions are concluded:

- Berth utilisation 50%
- Loading rate 1000 tph.

On this basis the capacity of the dry bulk berth is 4.25 mtpa calculated as follows:

*Average 1000 tph x 24 hrs x 350 (days/yr) x 0.5 (utilisation) = 4.2 mtpa*

**General cargo (2 berths) assumed at 1 Mtpa per berth.**

The capacity of general cargo berths depends on factors similar to those of the dry bulk products berth outlined above. The type and variety of products is of particular importance. The storage requirements and handling rates for unitised cargoes are very different to those for loose cargoes. The following assumptions are made:

- Unitised cargo (50% of throughput) 220t/hr/crane
- Loose cargo (50% of throughput) 20t/hr/crane
- Average three cranes

The general cargo berths have an assumed capacity of 1 mtpa calculated as follows:

*Average 360t/hr x 24 hrs x 350 (days/yr) x 0.33 (net utilisation) = 1.0mtpa.*

**Containers (4 berths) assumed at 300,000 TEU pa per berth.**

Four container terminals would be operational upon completion of the Concept Plan. The capacity of a container berth depends on a number of factors including cranes:

- Maximum vessel capacity
- Average container exchange
- Average container size
- Number and capacity of quay cranes
- Yard operating equipment type and capacity
- Yard storage capacity
- Trade characteristics
- Road and rail intermodal capacity

The following assumptions are made:

- 50% 40 foot containers, 50% 20 foot containers
- Crane rate 25 lifts/hr
- Average 3 cranes per berth, 75% availability

*Average 3 x 75 x 25 x 1.5TEU/lift x24x350 x 42% (net utilisation) = 300,000TEU/yr.*

Based on this the container berths have an assumed capacity of 300,000TEU/berth per annum calculated as follows. Based on the above the total berth capacity for the Container Terminals is estimated to be 1.2 MTEU per annum.

## 5.13 Current Operations

### 5.13.1 Recreational Boat Harbour

There is an existing recreational boat harbour located on the eastern perimeter of the Outer Harbour (**Plate 5-1**). The channel to and from the boat harbour is demarcated by buoys to separate the recreational area from the port activity and operation of the existing jetties. The recreational boat harbour would remain operational throughout all stages of the Concept Plan.

Road access to the boat harbour is via Foreshore Road which would not change as part of Stage 1. Access to the boat harbour would be via a new road link off Darcy Road once new port road access arrangements are finalised should Foreshore Road be closed to public access as part of Stage 2.

Marine access to the boat harbour would be maintained and unaffected throughout the construction and operation of the Concept Plan. During the reclamation and dredging activities, additional buoys and marine markers would be placed to clearly demarcate the boat harbour approach channel from active construction areas.

**Plate 5-1: Recreational Boat Harbour**

### 5.13.2 Tug Facility

The tug boats used within the Port are currently moored at No. 3 Jetty, which is to be demolished as part of Stage 1 of the Concept Plan. A new tug facility would be constructed to replace the existing facility and investigations regarding the design and location of the new facility have commenced. The new tug facility would be constructed prior to demolition of No. 3 Jetty and the preferred location of the new facility is immediately north of Port Kembla Gateway. Planning approval for the new tug facility is being sought separately and is not part of the Concept Plan for the Outer Harbour development.

### 5.13.3 Liquid Bulk

Liquid bulk (oil and flammable liquids), is currently handled at Berth 201 in the Outer Harbour adjacent to the northern breakwater, and the facility would be retained as part of the Concept Plan. This liquid bulk is predicted to remain at current throughput levels and would not require expansion of the existing facilities.

### 5.13.4 Port Kembla Gateway Jetty

A lease exists between PKPC and Port Kembla Gateway for utilisation of No. 6 Jetty. The lease period terminates in April 2012 with two five year option periods. Upon completion of the option terms (2022), negotiations would be carried out between PKPC and Port Kembla Gateway to relocate operations currently utilising the jetty under a new lease.

Dredging and reclamation associated with the northern area of the multi-purpose terminals would commence in Stage 2 upon completion of the option terms of the PKPC and Port Kembla Gateway lease. Construction of the northern portion of the multi-purpose terminals would be subject to separate approvals and be completed in Stage 3.

### 5.13.5 Shipping Traffic

At present the Port has approximately 900 vessel visits per year in an average year. This comprises approximately 800 vessel visits to the Inner Harbour and up to 100 vessel visits to the Outer Harbour. This equates on average to approximately 2.5 ship visits per day.

With long term growth in visits to the terminals in the Inner Harbour, it is possible that the Inner Harbour vessel visits could increase from 800 visits to 1100 visits per year.

The proposed development (comprising three multi-purpose berths and four container berths) could generate up to 1,500 vessel visits per year in the Outer Harbour once fully operational. With long term growth, projected total vessel visits per year for the Inner and Outer Harbours combined could be up to 2,600, which equates to seven vessel visits per day on average. Vessel transit time in the main channel to the Outer Harbour would be approximately one hour while vessel time to the Inner Harbour is approximately one and a half hours.

The projected increase in vessel visits over the development timeframe (20-30 years) is comparable with other ports in Australia. Several ports in Australia are approaching 2,000 vessel visits per year at present while the largest number of vessel arrivals in one port is approaching 4,000.

The operation of additional berths as part of the Concept Plan would significantly increase the number of vessel visits per year. As trade increases, PKPC would review resources to service the additional vessel movements and introduce measures, such as additional tug and pilotage resources, over time as required.

Berth design was a critical factor in the development of the Master Plan for the Outer Harbour. The preferred development option was selected as it has a number of advantages over the other options such as: efficient arrangement of container berths and efficient operating systems, berth alignment and improved navigation. Such a design is expected to increase operating efficiencies at the berths and reduce congestion. This, in turn, would have a significant beneficial impact for vessel movement in and out of the Port.

### 5.13.6 Capacity within the Port

The majority of berths within the Port service dedicated terminals and have limited opportunity to attract a new range of customers. Typical examples of this include the coal berths servicing the coal export industry, BlueScope berths servicing the steel industry, the grain berth servicing the grain industry and AAT berths servicing the car industry.

Other berths, such as AAT Berth 103, have a limited amount of backup land to support trade that needs to establish facilities within the Port. That is, with the expansion of the coal export trade, the introduction of the biodiesel facility (National Biodiesel Group), and existing GrainCorp operations, berth demand will increase.

The proposed Outer Harbour development would offer significant backup land and deep water access for a more diverse range of trades.

# 6.0 Major Project

## 6.1 Introduction

In consideration of the need for a staged development, and in accordance with advice provided by the DoP, PKPC is seeking concurrent Concept Plan and Major Project approval.

As discussed in **Section 5.2** Major Project approval is being sought to construct and operate Stage 1 of the Concept Plan. Construction of the Major Project would be divided into three sub-stages, identified as Stage 1a, Stage 1b and Stage 1c.

## 6.2 Major Project Application

### 6.2.1 Overview

Construction elements of Stage 1 comprise demolition of No.3 and No.4 Jetties, and reclamation and dredging for the footprint of the total development, with the following exceptions:

- An area in the vicinity of the Port Kembla Gateway; and
- Expansion of the current swing basin area (ship turning circle).

These dredging works would be undertaken as part of Stage 3.

At the completion of Stage 1, the central portion of the multi-purpose terminals would be operational. Road and rail infrastructure to support the first berth would also be constructed (refer **Figure 6-1**).

**Figure 6-1: Major Project**

The location of the first operational multi-purpose berth was selected to minimise the overall volume of material to be dredged as part of Stage 1a of the Major Project.

The activities to be undertaken as part of the Major Project (Stages 1a, 1b and 1c), include the following.

### 6.2.2 General construction and demolition

Construction and demolition works would include:

- Delineation of a temporary stockpiling/surcharge area south of the proposed multi-purpose terminals, capable of handling up to 100,000$m^3$ of material at any one time.
- Temporary construction of an access road from Foreshore Road to the proposed container terminal area to be utilised for reclamation and dredging activities.
- Erection of site compound of 1ha approximately 100 m south east of Salty Creek.
- Demolition of No. 3 Jetty currently used to accommodate tug boats, and No. 4 Jetty (including Berth 206) currently used for import and export of non flammable liquids including sulphuric acid, to facilitate reclamation for the proposed container terminals. Demolition would be phased according to reclamation staging.
- Redirection of Salty Creek from the foreshore, through the reclamation are to the harbour. Salty Creek would remain an open channel through the reclamation area.
- Extension of Darcy Road Drain, through the reclamation to the harbour. The drain would remain as an open u-shaped culvert, with wing walls and an energy dissipater at the harbour entrance.

### 6.2.3 Dredging

Dredging would be completed over a series of dredging campaigns for:

- The basin between the multi-purpose terminals and container terminals.
- The basin east of the container terminal.
- All container berth boxes.
- Approach channels.

### 6.2.4 Reclamation

Reclamation activities would include:

- Land reclamation for the central and southern areas of the multi-purpose terminals and the total reclamation footprint of the container terminal.
- Construction of permanent revetment structures along the northern perimeter of the container terminal area and the perimeter of reclaimed area between container terminals and multi-purpose terminals.
- Construction of temporary revetment structures along the perimeter of the remainder of the reclamation footprint apart from areas where two berths are constructed.
- A series of containment structures (discrete bunded fill areas) to be constructed within the reclamation footprint for encapsulation of contaminated dredged material (refer **Figure 6-8** for detail). Bund size and location would reflect dredging phases.
- Reclamation edge structures (temporary and permanent) would incorporate geotextile sediment filtration, mitigating effects of wave actions and any significant hydraulic gradient between the sediment and the Outer Harbour which could result in leaching of contaminants.
- Temporary sediment basins on unsealed reclamation areas to channel surface water flow including stormwater.

### 6.2.5 Terminal, wharf and berth facilities

Works to enable construction and operation of the first stage of the multi-purpose and container terminals would include:

- Construction and operation of the central portion of the multi-purpose terminals including the first multi-purpose berth.
- Construction of first container berth with permanent edge structure (western container facility). Berth not operational.
- Pavement for central operational portion of multi-purpose terminals, extending west from the harbour to the existing rail sidings.
- A services corridor for the central operational portion of the multi-purpose terminals running along the southern edge of the hardstand area. Utilities required for operation of the first multi-purpose berth include:
  - Water
  - Power (240V and 415V) including a high voltage substation
  - Telecommunications
  - Sewer
  - Stormwater drainage
- Relocation of utilities for import of sulphuric acid (currently at Berth 206) to the central operational portion of the multi-purpose terminals, including developing a dedicated pipeline/services corridor running south from the multi-purpose terminal and across Foreshore Road to the Orica site.

### 6.2.6 Road and Rail Infrastructure

Transport infrastructure would include:

- New access road from Christy Drive running south east to the multi-purpose terminals.
- Extension of rail siding No. 13 in the South Yard by 120m to service the multi-purpose terminals.

## 6.3 Construction Elements

### 6.3.1 Design and Construction Timing

Detailed design for reclamation and construction of operational facilities for the central portion of the multi-purpose terminals is expected to commence in early 2010 with construction works to commence later in 2010 and be finalised early 2012.

Reclamation works for the container terminals and the southern portion of the multi-purpose terminals would commence upon finalisation of Stage 1a. Detailed design for the balance of dredging and reclamation activities under the Major Project (i.e. Stages 1b and 1c), is expected to occur from July to December 2013, with construction scheduled between June 2015 and February 2018 (refer **Section 6.4** for additional detail).

The timing for reclamation and dredging activities would be programmed to minimise impact on existing ship movements and navigation within both the Outer Harbour and Inner Harbour.

### 6.3.2 Construction Site Facilities

A site compound, approximately 1 ha in size, would be located on port land on the southern edge of the Outer Harbour for use during the construction period. The compound would provide storage area for construction materials, heavy machinery and site offices. Appropriate signage would direct workers to relevant sections of the construction works and restrict public access.

Site offices and staff amenities would be established within the site compound as temporary structures during construction. Portable office buildings and amenities established at the commencement of construction would be removed from site upon completion of the construction works.

Site parking would be available within the site compound and would be designed to cater for the construction workforce. The parking facility would be levelled and compacted, with a pavement material placed on top, such as road base. The exact size and parking requirements would be determined during detailed design prior to construction.

If counterfort structures are selected for the wharf structures they would be erected on land adjacent to the Port and transported on barges to their destination. If a piled structure is required the piles would be delivered by barge to the workface.

### 6.3.3 Stockpile of Reclamation Fill

A temporary stockpiling/surcharge area south of the proposed multi-purpose terminals would be demarcated, capable of handling up to 100,000m$^3$ of fill material at any one time. The approximate size and location of this area is illustrated on **Figure 6-1**.

### 6.3.4 Demolition Materials

Material arising from demolition (e.g. jetty demolition) would be transported off-site for disposal.

### 6.3.5 Access

Access to the construction site compound and staff parking facilities would be via Foreshore Road.

Construction access for new road infrastructure supporting the multi-purpose terminals and reclamation of the container terminals would be from Christy Drive and Foreshore Road respectively.

### 6.3.6 Service Infrastructure

Temporary utilities such as lighting and power would be hired, or connected to existing mains to service the compound yard and construction activities.

### 6.3.7 Construction Hours and Workforce

Construction activities, with the exception of dredging, would be scheduled between the hours of 7 am and 6 pm Monday to Friday, and 8 am and 1 pm on Saturday. Where necessary, work may be permitted out-of-hours providing that the impacts associated with such work and appropriate mitigation measures are adequately addressed in the CEMP.

Dredging pumps and plant may be operational 24 hours a day, 7 days a week for the duration of dredging activities.

Construction, dredging and reclamation activities would require a specialist workforce. Indicative full-time equivalent jobs created during construction are outlined in **Table 6-1**.

**Table 6-1: Indicative construction workforce**

| Construction Activity | Full time equivalent jobs (FTE) |
|---|---|
| Berth construction | 50 on site |
| Reclamation works | 15 on site |
| Dredging works | 25 on site |

### 6.3.8 Construction Equipment

Construction equipment anticipated to be required for the Major Project (Stage 1) is listed in **Table 6-2** below.

**Table 6-2: Major Construction Equipment for Stage 1**

| Stage 1 Activity | Equipment | Task |
|---|---|---|
| Demolition of Jetties No.3 and No.4 (12 months) | Cranes, barges, boats | Moving structural timber, timber fenders, and decking from jetty structure |
| | Excavator | Dismantle jetties |
| | Wheeled loader | Moving demolished material around the active construction work area |
| | Tip truck | Transporting demolished material to salvage yard or landfill |
| Dredging and | Trucks | Delivery of fill material |

| Stage 1 Activity | Equipment | Task |
|---|---|---|
| reclamation (18 months) | Trains | Delivery of fill material |
| | Vibratory roller and compactors | Compaction of fill |
| | Graders | Grading final surface of fill |
| | Excavator and long reach excavator | Trenching/placing material for Salty Creek diversion and Darcy Road Drain extension.<br>Placing rock material for rock revetments. |
| | Front end loaders | Moving rock material for revetments |
| | Bulldozers | Levelling reclamation |
| | Grab/ backhoe dredgers | Dredge sediments and rock |
| | Cutter suction dredger | Dredge contaminated sediments |
| | Barges | Storage of dredged sediment and rock material before placing in reclamation |
| | Tugs and small craft | Tow barges laden with sediments |
| | Water carts | Dust suppression |
| General construction such as access roads, stockpile area, construction compound<br>(6-12 months) | Excavator | Minor excavation of existing surface |
| | Grader | Levelling surface |
| | Roller | Compaction of surface |
| | Asphalt paver | Laying asphalt |
| | Bitumen spray truck | To seal surface of road |
| Terminal and berth construction including multi-purpose berth, container berth, and utilities installation<br>(18 months per berth) | Cranes and piling cranes | Position pre-fabricated materials and heavy loads |
| | Excavator | Foundations for amenities |
| | Asphalt paver | Laying asphalt |
| | Rotary bore piling rig | Install piles for quay walls |
| | Backhoe | Excavation for services and relocation of sulphuric acid pipeline |
| | Front end loader | Stockpiling material behind quay walls |
| | Grader | Grading and levelling surface |
| | Roller | Compaction and completion of surface |
| Rail infrastructure upgrade in South Yard<br>(6 weeks) | Excavator | Excavate area for new turnout and rail siding |
| | Dump truck | Transport of spoil and ballast around site. |
| | D9 bulldozer | Levelling area |
| | Rail ballast tamper | Adjust ballast once track is laid |
| | Mobile crane | Move rail infrastructure into place and remove turnout |
| | Demolition saw | To aid turnout removal |

### 6.3.9 Dredging Requirements

**Berth Clearance**

Material would be dredged to sufficient depth alongside quay walls to facilitate the docking of vessels for both the multi-purpose and container terminals. The majority of dredging required for the total development would be undertaken as part of Stage 1. The exception to this is an area north of Port Kembla Gateway which would remain operational until the existing lease arrangements for the jetty ceases before dredging works are undertaken, as well as dredging for the purposes of extending the existing swing basin in an area to the south of the northern breakwater.

The location of dredging for Stage 1 is illustrated as blue hatching on **Figure 6-10**. The staging of the dredging campaigns would be aligned with the reclamation activity. The sequence of the dredging for berth basins, berth boxes and approach channels is also illustrated in **Figure 6-10**.

The first multi-purpose berth is designed for an along-side depth of -15 m PKHD. Based on a review of available bathymetry and survey data, the level of sediment along the edge of the proposed berth varies between -4 and -10m PKHD and bedrock varies from -11 m to -15 m PKHD. Therefore dredging of the in-situ soft bed material would be required together with excavation of some rock in the vicinity of the berth facility.

The container berths are required to accommodate vessels of 14 m draft. Sediment levels along the edge of the proposed berths vary between -10 m and -15 m PKHD. From available survey data the bedrock appears to be at around -15 m PKHD. Therefore dredging of the in-situ soft sediment material would be required to the bedrock depth.

**Shipping Channel and Swing Basin**

The diameter of the existing swing basin is sufficient for vessels proceeding to the first multi-purpose berth as part of Stage 1.

**Reclamation and Dredging Volumes**

Reclamation and dredging volumes have been estimated based on preliminary designs, and provide approximate volumes for programming of dredging and reclamation and the sourcing of requisite fill material. A total of 4,628,049 $m^3$ of fill would be required for the Stage 1 reclamation. Part of the fill would be sourced from dredging material within the Outer Harbour (383,575 $m^3$ rock, and 833,675 $m^3$ soft sediments) while the balance (3,410,799 $m^3$) would be imported from external sources.

The following **Table 6-3** should be read in conjunction with **Figure 6-10**.

**Table 6-3: Reclamation and Dredging Volumes for Stage 1**

| Sub-Stage | Reclamation Area Volume ($m^3$) | Dredging Area | | Balance of fill required to be sourced and transported from external locations ($m^3$) |
|---|---|---|---|---|
| | | Volume of rock to be dredged ($m^3$) | Volume of soft sediments to be dredged ($m^3$) | |
| 1a | 798,398<br>Areas 1 & 2 | 89,225*<br>Area 3 | 293,150*<br>Area 3 | 798,398<br>(blast furnace slag and coal wash) |
| 1b | 2,016,000<br>Area 5 | 0<br>Area 6 | 60,000<br>Area 6 | 1,573,625 |
| 1c | 1,813,651<br>Area 9 | 294,350<br>Area 8 | 480,525<br>Area 8 | 1,038,776 |
| **Totals** | **4,628,049** | **383,575** | **833,675** | **3,410,799** |

*Dredged material will be used in the Stage 1b reclamation area

### 6.3.10 Dredging Methodology

**Dredging Techniques and Equipment**

A combination of dredging types would be employed for the dredging campaigns for Stage 1, similar to previous dredging campaigns undertaken within the Inner Harbour. Dredging campaigns for Stage 1 would include cutter suction, backhoe dredging and/or grab dredging of the soft sediment materials. The hard rock material would be drilled, blasted and excavated using a grab dredge. The location for each type of dredging would be confirmed during detailed design and following a review of geotechnical testing results.

Silt curtains would be used during all dredging activities to contain plume dispersion.

Plant and equipment that would be utilised for the dredging campaigns would include the following:

- Small cutter suction dredger
- Backhoe dredger
- Grab dredger
- Self propelled barges
- Workboat
- Survey/crew boat
- Flat top barge
- Auxiliary equipment e.g. spreader/diffuser pontoon, pipeline (floating), excavators, wheel loader, articulated dump trucks.

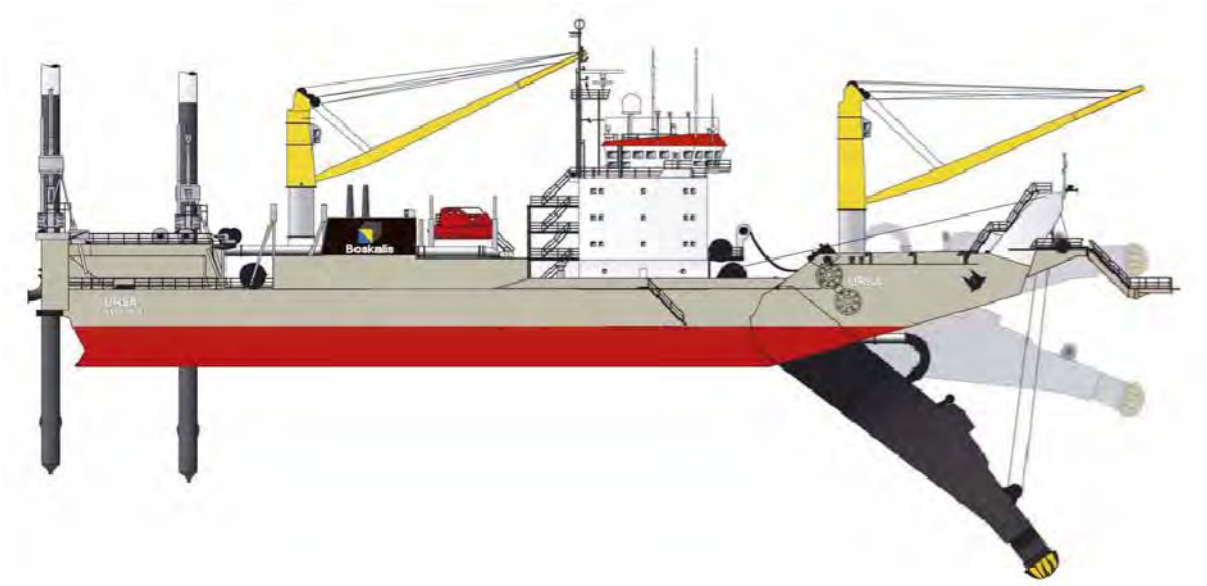
The proposed dredging types and methodologies are described below.

**Cutter Suction Dredging**

The Cutter Suction Dredger (CSD refer **Figure 6-2**) is a stationary dredger equipped with a rotating cutter head used to cut away the sediments, and centrifugal pumps which pump up a mixture of water and sediments through a pipeline to the disposal site. This pumped spoil would be released via a spreader/ diffuser chamber at depth to control turbidity and allow strategic placement of spoil across the site.

The CSD sails, or is towed, to the dredging location and is then stabilised into position using spuds. The CSD swings around the main spud during dredging activities and, depending on the size of the CSD, can cover a cut of 5m to 120m wide.

**Figure 6-2: Typical Cutter Suction Dredger**



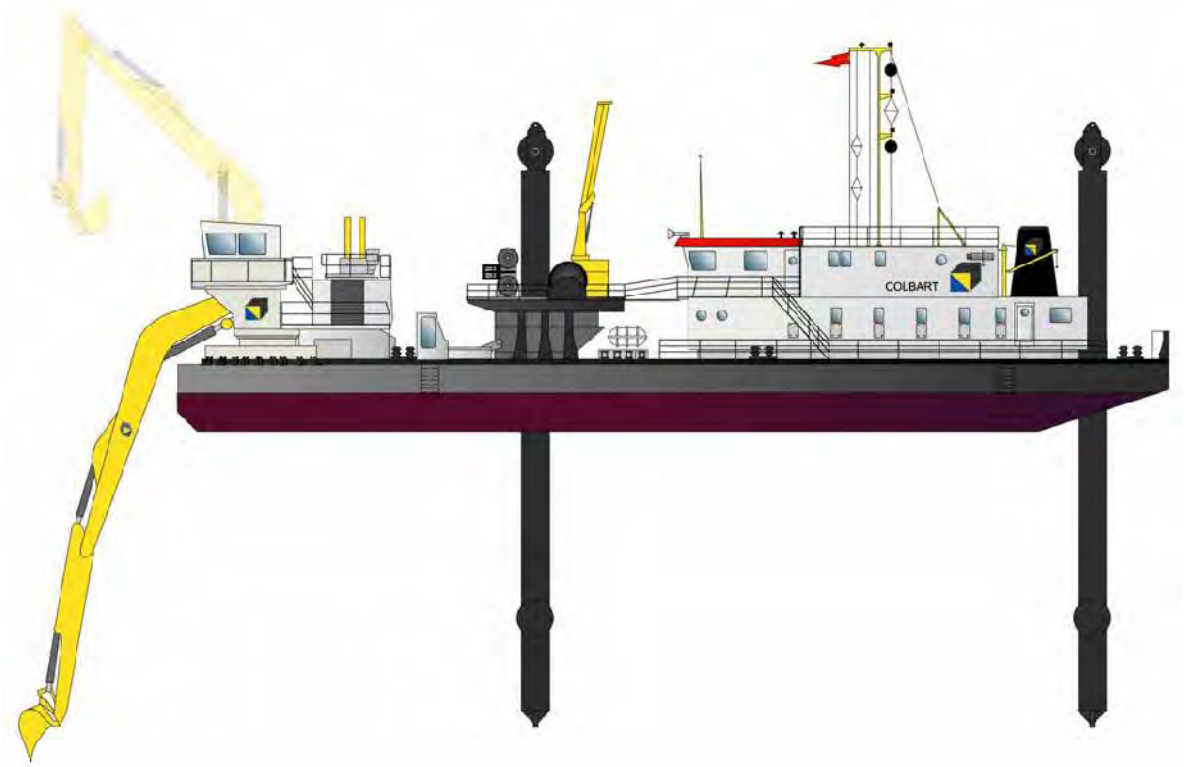

Source: Royal Boskalis Westminster nv www.boskalis.com

### Backhoe Dredging

A Backhoe Dredger (BHD refer **Figure 6-3**) is a stationary dredger, with an excavator mounted on a turntable at the front of the pontoon. The barge is held in accurate position by locating spud columns pushed into the seabed. The BHD is suitable for dredging a wide range of materials, from soft material (such as soft silt) to hard material (such as blasted or weathered rock and stiff boulder clay), and is capable of achieving depths up to 20m. The lack of anchor winches makes it a limited obstacle to shipping traffic and is suitable for working in narrow areas and in the near presence of obstacles like jetties.

A BHD operates by a cycle of operations which comprise the excavation of sediments into a bucket, the bucket is lifted and swung above the discharge area and the dredged material loaded into a barge.

**Figure 6-3: Typical Backhoe Dredger**




Source: Royal Boskalis Westminster nv www.boskalis.com

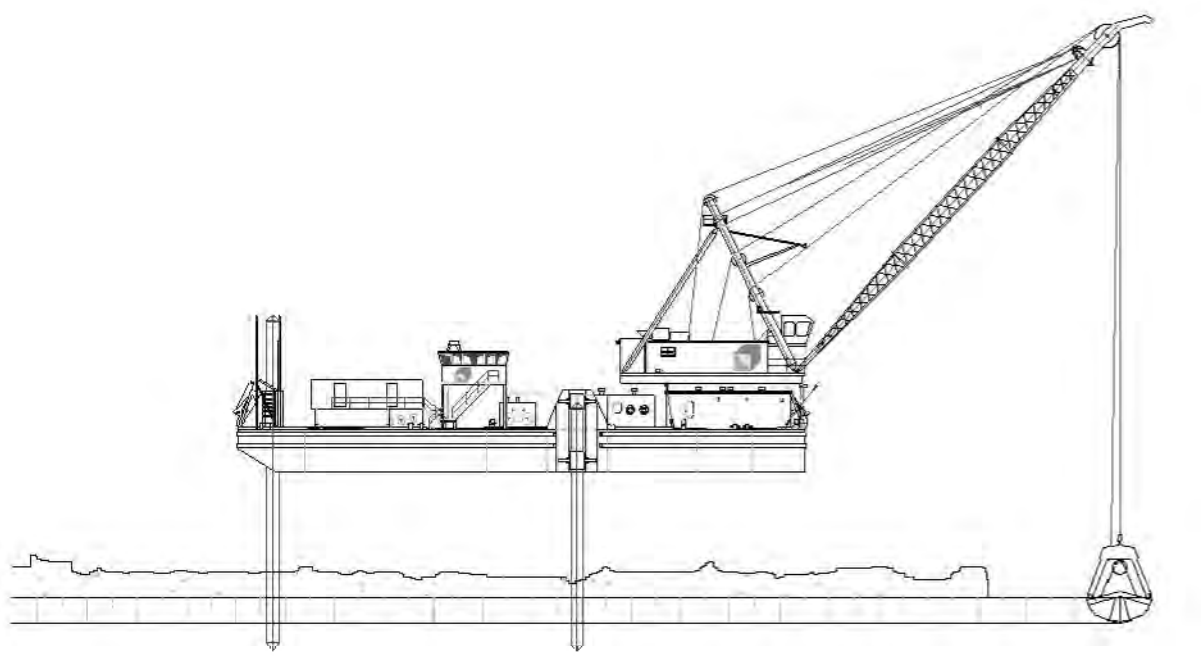
### Grab Dredger

A Grab Dredger (GD refer **Figure 6-4**)) is a pontoon fitted with a mooring system and crane capable of dredging various soil types in water depths of 40m or more. The grab is operated by crane wires and accurately positioned by the aid of an on board positioning system. The barge can be fixed in accurate position by locating spud columns pushed into the seabed. The actual pontoon and grab position is determined by a positioning system and the results are presented on navigational displays. Sensors on the boom and wires determine the actual vertical and horizontal offset of the grab as compared to the target dredge position.

A GD operates by lowering the grab to be placed on the sea bed. The grab digs into the sea bed and is then closed to capture the sediments. Dredged rock material is loaded onto split hopper barges which are then transported to the reclamation area.

The dredging activities would be undertaken in specific sequence to ensure that the various material types are deposited in the correct location. Proposed activities to be considered for each dredging campaign are outlined in the following section, and would be included in the Dredging Environmental Management Plan (DEMP). It should be noted that some of these activities could occur concurrently.

**Figure 6-4: Typical Grab Dredger**

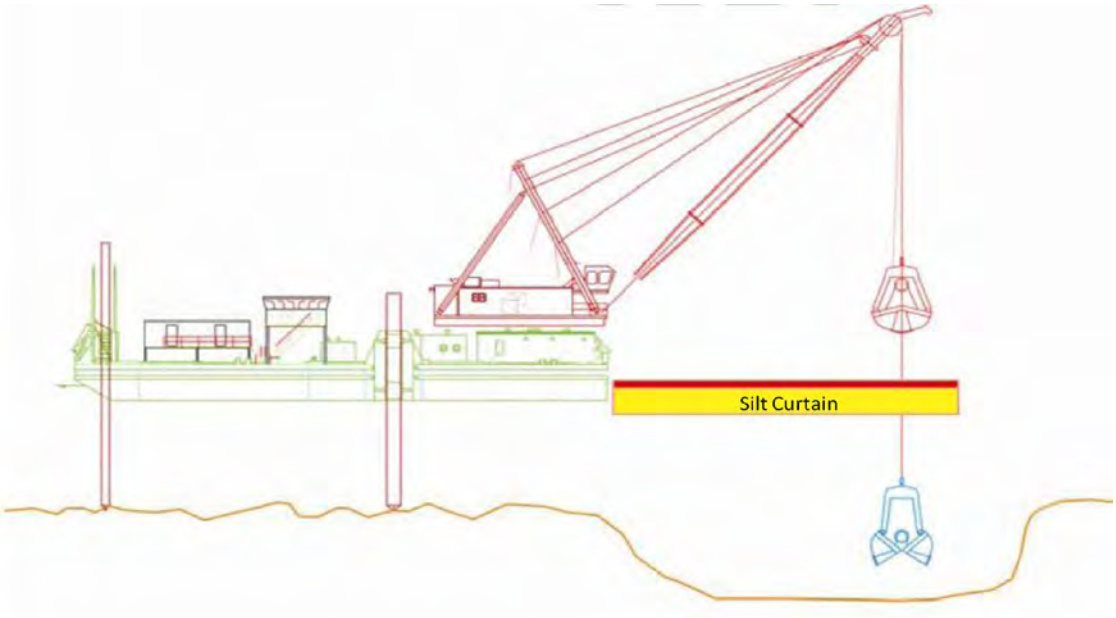


Source: Royal Boskalis Westminster nv www.boskalis.com

**Silt Curtains**

Dredging and dumping operations would require the installation of silt curtains around the dredging area directly in front of the grab/backhoe dredge (refer **Figure 6-5**). Silt curtains utilised during the dredging activities would be woven geotextile or other similar suitable material with a pore size of approximately 0.425 mm and a curtain drop that is determined to be suitable for each stage of works dependent on the bathymetry.

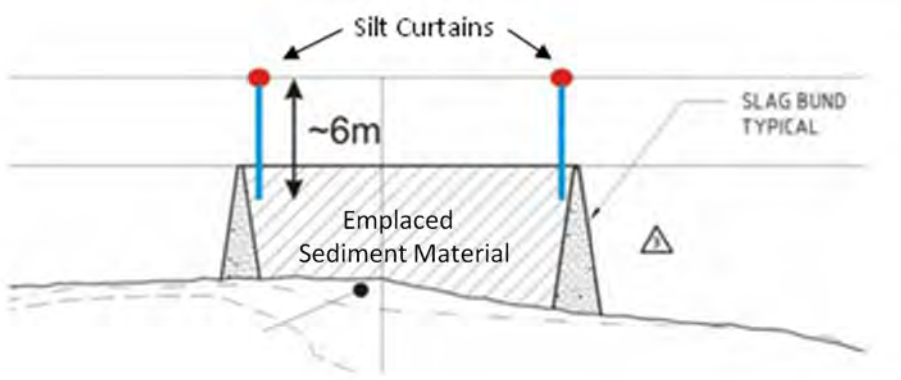
**Figure 6-5: Typical Silt Curtain**




Source: Royal Boskalis Westminster nv www.boskalis.com

In addition to the silt curtain for dredging operations, silt curtains would be used within each of the active reclamation areas. These silt curtains would have a 6m drop and would be positioned inside the walls of the underwater bund as shown in **Figure 6-6**. A silt curtain would also be positioned to surround the active work zone when constructing the underwater bunds.

**Figure 6-6: Silt Curtain Proposed for Reclamation Side of Underwater Bunds**




Source: Inner Harbour Dredging Environmental Management Plan

**Existing Soil Emplacement Area**

During the 1990's PKPC defined a spoil emplacement area in the Outer Harbour and commenced a program that involved placing material along and out from the south western foreshore area utilising material dredged from Inner Harbour development projects (refer **Figure 6-7**).

Since that time there have been five dredge spoil disposal campaigns where a total of 460,000m$^3$ of slag and dredge spoil was deposited in the spoil emplacement ground. A comparison of hydrographic surveys from 1985 and 2008, following the last campaign, shows that in some areas of the proposed shipping basin, dredged spoil is in excess of seven to eight metres thick.

This area is bounded, in part, by underwater bunds constructed from slag material. These bunds were constructed to a similar design to that provided in **Figure 6-9**. Dredge spoil from the more recent Inner Harbour developments, some of which is contaminated, has been deposited within the bunds and the present level of the surface of the reclamation area is approximately -4 m PKHD.

The existing spoil emplacement area overlaps with the proposed berth basin between the multi-purpose and container terminals. Some of the previously deposited material would require extraction during the dredging operations for construction of both permanent and temporary edge structures and to provide adequate vessel keel clearance for the multi-purpose and container berths.

The material to be extracted/ dredged is proposed to be incorporated within the reclamation footprint for the proposed development and would be transferred to a series of bunded enclosures to serve as a longer term consolidating material. Relocation of this dredged material within the bunds would occur during Stage 1a and Stage 1c construction activities. The proposed methodology to relocate these contaminated sediments to bunds within the reclamation footprint includes the following:

- Construction of bunds within the reclamation footprint of the container terminals. Bunds would have a crest up to a level that would contain the dredge spoil until it is encapsulated within the reclamation proper. The bunds would be constructed using uncrushed blast furnace slag, interburden rock or other suitable material.
- Material from the existing spoil emplacement area which overlaps with the proposed berth basin location would then be dredged using one of the proposed dredging methods. Original bund walls would remain intact during this process.
- Dredged material would be deposited into one of a series of newly constructed containment structures (bunds) positioned within the container terminals reclamation footprint for permanent encapsulation.

- New bund walls would be constructed within the footprint of the proposed multi-purpose terminals to permanently encapsulate the remaining portion of spoil emplacement area materials.
- To ensure the stability of the remaining spoil within the emplacement area, slag or rock would be used to line the exposed face of the spoil.
- Slag material from the bund walls of the emplacement area would also be deposited within the container terminals reclamation area.

The relocated spoil would be excavated using the same method of dredging as in the basin area and with a suite of environmental controls as outlined in a DEMP. There would be no remediation of sediments prior to being deposited as reclamation fill.

**Figure 6-7: Stage 1 Footprint and Spoil Emplacement Area in Outer Harbour**

**Dredging Environmental Management Plan**

To avoid sediment plumes, minimise the spread of contaminants in the Outer Harbour and prevent sedimentation of the shipping channel, a DEMP would be developed.

The DEMP would:

- Map dredged areas;
- Map disposal areas;
- Outline proposed dredging methods;
- Set out turbidity controls (eg. Silt curtains) to be employed during operations;
- Provide information on erosion and sediment control measures; and
- Map water quality monitoring locations (refer **Section 14**).

### 6.3.11 Reclamation Methodology

**Construction of Bunds**

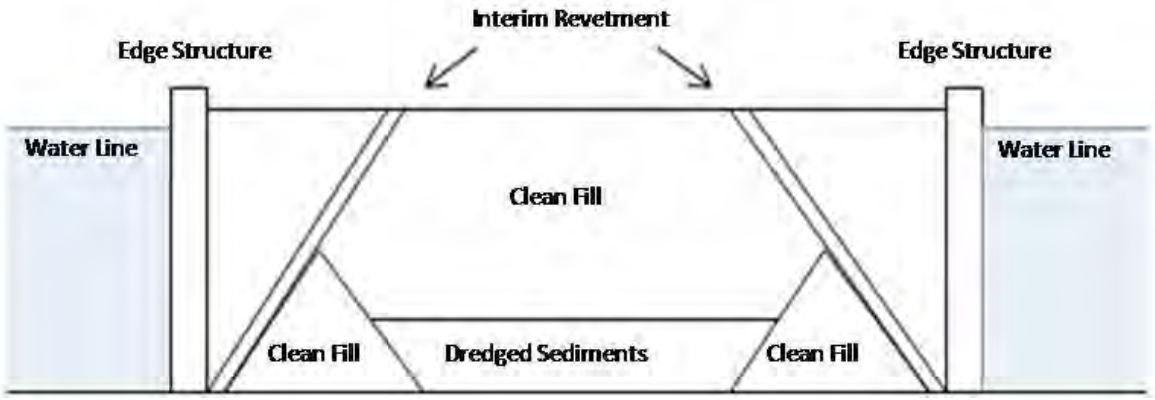
Environmental testing of sediments undertaken for this impact assessment found the sediments were contaminated with heavy metals, PAHs and Tri butyal tin (TBT) (detailed results are discussed in **Section 10**).

Contaminated sediments that are dredged from the Stage 1 dredging locations would be encapsulated and confined within a series of engineered containment structures, or bunds. The containment structures (refer **Figure 6-8**) would be constructed within the reclamation footprint and below the water line. The size and locations of the containment structures within the reclamation footprint would be determined as dredging and reclamation design activities progress and would be detailed in a DEMP.

Revetments (perimeter bunds) would encapsulate the reclamation materials. The perimeter bunds would be designed and constructed to a level sufficient to contain the dredged sediment. The bunds would be constructed using either interburden rock, uncrushed blast furnace slag or other suitable, coarse fill material. Interburden rock sourced from local hard rock quarries would be particularly suitable as this rock has a high specific gravity and good interlocking properties that would make it appropriate for use as a perimeter bund construction material.

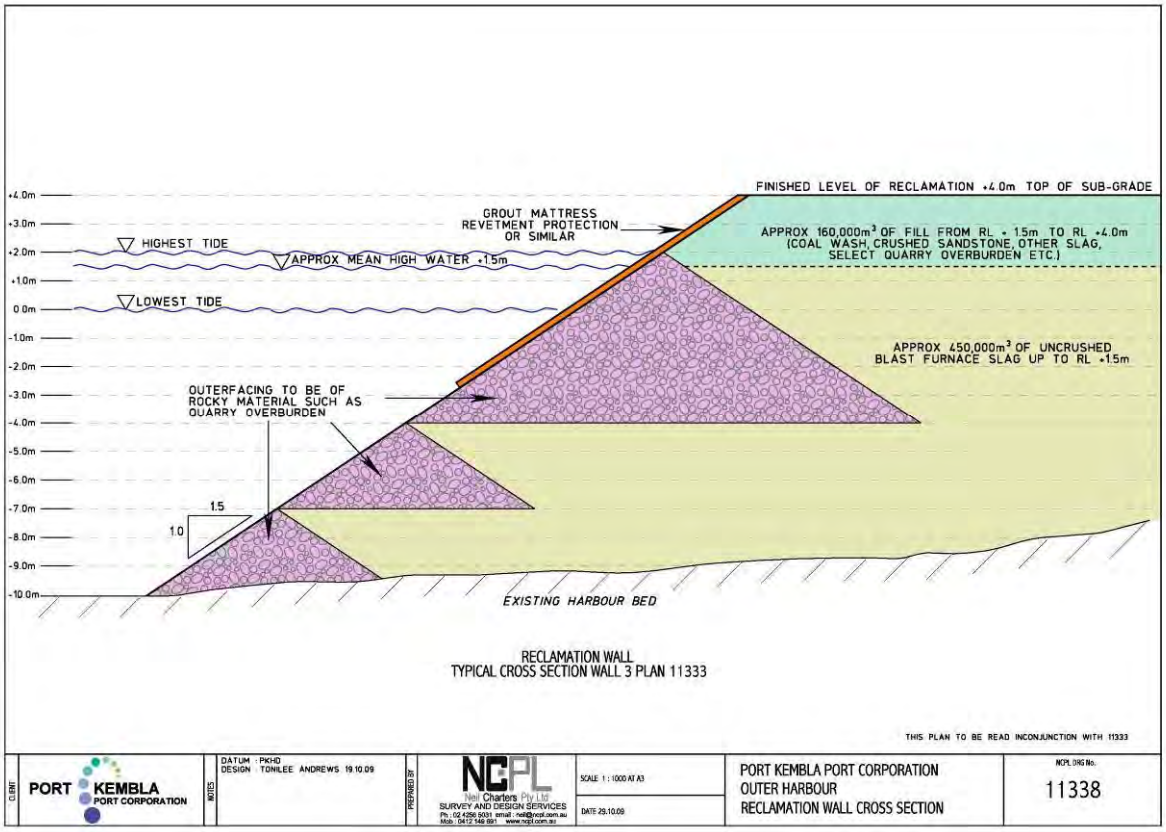
A schematic cross section of a bund wall design that has been included in recent tender documentation released PKPC for Stage 1 is presented as **Figure 6-9**. This suggested method of bund design aims to minimise the amount of rock material required for the outer facing wall. The final method of bund construction would be determined during detailed design.

**Figure 6-8: Typical Cross-section of Sediment Containment Structure**




** Not to scale

**Figure 6-9: Suggested Perimeter Bund Design**




Source: PKPC, 2009

### Construction of Rock Revetment

The construction of the rock revetments at the outer edge of the sediment containment structure would involve work from both the shore side and the harbour side. The basic construction method would be as follows:

- Creation of a suitable slope (as per design requirements) during dredging and land based earth moving operations.
- Placement of protective geo textiles with the assistance of divers on the reclamation side of the revetments to reduce sedimentation.
- Placement of rock protection below waterline by using front end loaders to push rock material through chutes located on barges or by large dragline plant.
- Placement of rock protection above water line using land based earth moving equipment.
- Survey and diver inspection.

### Consolidation of Fill Material

Soft dredged spoils within the reclamation would require consolidation. A range of treatment options are available for consolidating fill material. Selection of the preferred option would follow consideration of environmental factors and economic considerations as well as the time required to consolidate the soft material. Options include:

- Leave the materials untreated and allow them to consolidate with time under their own weight and the weight of additional overlying fill. This may sterilise the area for many years from commercial use, and would only be appropriate for areas not required for development until well into the future (i.e. those activities to be undertaken as part of Stages 2 and 3 of the Concept Plan).
- Accelerate the consolidation settlement by application of surcharge and installation of drainage (e.g. vertical wick drains) if required. The reclamation may be suitable for higher value commercial use after such treatment.

- Strengthen materials through inclusions such as piles, stone columns, cement deep mixing and other similar techniques. The reclamation may be able to sustain even higher loadings after such treatment.
- Excavate the soft materials and replace or modify them as appropriate. Excavation options requiring consideration include the viability of mud-waving and a suitable location to treat the soft materials. Treatment could comprise mixing with materials such as cements, sands gravels or slag and replacement.
- In-situ treatment methods, such as vibro-compaction and dynamic consolidation where granular fill materials are utilised to improve the reclamation.
- Treatment with materials that can compact quickly under their own weight (e.g. coarser, graded sands and gravels) or that set on placement (slag, self cementing materials).

## 6.4 Construction Staging

Activities for Stage 1 are programmed to commence in 2010, subject to approval. **Table 6-4** and **Figure 6-10** provide an indicative timeframe and sequencing for Stage 1 reclamation, dredging and construction works.

The programmed staging of reclamation and construction activities is indicative only, being driven by market demand and availability of reclamation materials.

**Table 6-4: Major Project (Stage 1) Indicative Program**

| Stage | Task Name | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1a | Multi-purpose terminals reclamation construction | | | | | | | | | |
| | Multi-purpose terminals civil works and services construction | | | | | | | | | |
| | Multi-purpose berth dredging | | | | | | | | | |
| | Multi-purpose berth wharf construction | | | | | | | | | |
| 1b | Container terminals reclamation construction | | | | | | | | | |
| | Container berth dredging | | | | | | | | | |
| | Container berth wharf construction | | | | | | | | | |
| 1c | Dredging for basin between southern portion multi-purpose terminals and western container berths | | | | | | | | | |
| | Reclamation of remainder of container terminal and multi-purpose terminals | | | | | | | | | |
| | Extension of Salty Creek and Darcy Road Drain through reclamation to harbour | | | | | | | | | |

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**Figure 6-10: Major Project Construction Staging**

### 6.4.1 Stage 1a

Stage 1a would commence in 2010 and be completed in early 2014. Key activities within Stage 1a include reclamation for the central portion of the multi-purpose terminals and associated dredging, and civil works for construction of terminal facilities including services. The first multi-purpose berth would be operational at the completion of Stage 1a works in 2014.

**Multi-purpose Terminal Reclamation, Civil Works and Installation of Services**

Land reclamation would be conducted under one continuous program of works for the central portion of the multi-purpose terminals, indicatively due to commence in mid 2010 and be finalised for operational use by mid 2013. Reclamation volumes required for Stage 1a would be approximately 798,398 $m^3$. A source of blast furnace slag, approximately within 3.5km from the Outer Harbour, has been agreed for the total reclamation footprint of Stage 1a. The volume of slag material will be sufficient to bring the level of the reclamation up to approximately tidal level and other select fill material will then be used to raise the reclamation up to RL +4.0m PKHD. This select material may consist of coal wash or quarry overburden (see **Section 6.4.4**). As such no dredged material would be required for the Stage 1a reclamation footprint.

Edge structures around this reclamation would include a permanent wharf and berth facilities on the eastern edge, and temporary revetment structures surrounding the northern and southern edges of the reclamation.

A construction site compound would be erected approximately 100 m south of the Salty Creek Outlet. A temporary stockpiling/surcharge area would be delineated south of the proposed multi-purpose terminal. This stockpile area would be designed to be capable of handling up to 100,000 $m^3$ of material at any one time. The site compound and stockpile/surcharge area would remain in place for the duration of all reclamation and construction activities under the Major Project.

Upon completion of Stage 1a construction activities the reclaimed area would facilitate an operational multi-purpose terminal. Construction activities under Stage 1a include:

- Construction of a permanent hardstand, of suitable pavement material, extending between the eastern edge of the reclamation to the existing rail sidings west of the proposed multi-purpose terminals.
- Construction of a new access road from Christie Drive to the multi-purpose terminals.
- Provision of surface and subsurface drainage.
- Installation of a 20 m wide services easement to house utilities servicing the operational area (i.e. water, power 240V and 415V, telecommunications, and sewer). A high voltage substation would also be constructed.

Berth 206 (No.4 Jetty) is currently used for the import and export of non flammable liquids including sulphuric acid, and runs at a low 3% berth capacity. The sulphuric acid pipeline that connects to the Orica site on the south side of Foreshore Road would be relocated in Stage 1a in anticipation of the demolition of No.4 Jetty in Stage 1c.

The sulphuric acid pipeline would be located within a dedicated services corridor linking the terminal to the three existing above ground storage tanks at the Orica site. This corridor would be approximately 4 m wide and would run from the multi-purpose berth west to the proposed new road, then south to Foreshore Road, crossing under Foreshore Road to run east to the existing sulphuric acid aboveground storage tanks at the Orica site. Upon completion of the first multi-purpose terminal, all import and export of sulphuric acid would occur from this berth.

**Multi-purpose Berth Dredging**

Dredging of the berth box, basin, and the approach channel for the operation of the first multi-purpose berth would be undertaken as part of Stage 1a. The quantity of rock volume to be dredged would total 89,225 $m^3$ and soft sediments to be dredged would total 293,150 $m^3$. Dredged material would be deposited within a series of bunds to be constructed as part of the reclamation footprint of the western container terminals as part of Stage 1b (**Figure 6-10**).

Dredged materials within Stage 1a would include a small area of existing contaminated spoil located in an emplacement area. This spoil was dredged during previous Inner Harbour developments (**Figure 6-7**).

### 6.4.2 Stage 1b

Stage 1b works would commence in mid 2010 and be completed by the end of 2015. Key activities within Stage 1b include reclamation for the western container facility, dredging and wharf construction for the first container berth.

**Container Terminal Reclamation**

The volume of fill material to enable the reclamation of the western part of the container facilities is estimated to total 2,016,000 $m^3$. Reclamation fill would continue to be enclosed within a series of bunds, under the reclamation footprint of the container terminals.

Initial reclamation fill would be sourced from the dredging campaigns for the first multi-purpose berth and western container berth (**Figure 6-10**) which are anticipated to provide 89,225 $m^3$ of rock and 353,150 $m^3$ of soft sediments. As such, a balance of 1,573,625 $m^3$ of fill would need to be sourced and imported from external locations (see **Section 6.4.4**).

No. 3 Jetty, currently used to moor tugs, would be demolished prior to commencement of reclamation activities for the western container terminal facility. A new tug facility, currently subject to a separate approvals process independent of this EA, would be provided in the area north of the proposed multi-purpose terminals.

Both temporary and permanent edge structures would be constructed along the perimeter of the Stage 1b western container terminal facility. Permanent revetment structures would be constructed along the northern edge of the container terminals facility. Temporary revetment structures would be constructed along the south-western and eastern edges of the container terminal reclamation area. The first container berth would be constructed for the western container terminal, however it would not be operational as part of the Major Project.

Access for reclamation and construction activities would be provided via the proposed construction access road from Foreshore Road to the container terminal. Site compound areas and stockpile/surcharge area would be retained from the Stage 1a construction phase.

**Dredging for First Container Berth**

Dredging for a berth box and approach channel to the first container terminal is programmed to be conducted during Stage 1b works, indicatively commencing mid 2012 to mid 2013. The volume of soft sediments in this area is estimated at 60,000 $m^3$, with no rock anticipated to be dredged. Dredged material would be placed into bunds within the reclamation footprint of the container terminals.

### 6.4.3 Stage 1c

Stage 1c works are programmed to commence in mid 2014 and be completed by mid 2018. Key activities include reclamation and associated dredging for the eastern container facility and for the southern portion of the multi-purpose terminals.

**Dredging for Southern Portion of Multi-purpose Terminals and Eastern Container Facilities**

The rock volume to be dredged is approximately 294,350 $m^3$ and soft sediments 480,525 $m^3$. The dredged material would be incorporated into the reclamation footprint for the eastern container terminals, indicatively programmed to occur in 2016.

The final series of bunds would be constructed during Stage 1c works within the reclamation footprint of the southern multi-purpose terminals and the eastern container terminals. Bunds would be constructed to a size designed to incorporate material from each dredging campaign during Stage 1c.

Dredged materials within the Stage 1c dredging area would include a portion of contaminated spoil previously dredged during Inner Harbour developments and deposited in the Outer Harbour. Provisions outlined in **Section 10** would be followed when relocating these sediments.

**Reclamation of Eastern Container Terminals and Southern Portion of Multi-purpose Terminals**

As part of Stage 1c works reclamation for the eastern container facility and the southern portion of the multi-purpose terminals west to Darcy Road Drain would incorporate dredged material from dredging works east of the container facility and between the multi-purpose and container terminals (refer **Figure 6-10**). Reclamation volumes for Stage 1c total 1,813,651 $m^3$. A total 294,350 $m^3$ of rock and 480,525 $m^3$ of soft sediments would be dredged. The balance of fill material totalling 1,038,776 $m^3$ would need to be sourced and imported to site from external locations (see **Section 6.4.4**).

Site compound areas and stockpile/surcharge area would again be reinstated from the Stage 1a construction phase.

The Stage 1 works would result in alterations to the local hydrological regime to allow drainage flow through the reclamation footprint. Design and construction activities to be conducted during Stage 1c include the extension of Darcy Road Drain to the edge of the reclamation, and the redirection of Salty Creek from the foreshore, through the reclamation area, to the Harbour.

Both the Darcy Road Drain and Salty Creek would remain an open u-shaped channel through the reclamation area during Stage 1. Darcy Road Drain would have an energy dissipater installed at the discharge point to the harbour. Permanent box culverts or pipes, designed to be no smaller than those existing along each water course, would be installed to maintain existing flows to and from the harbour.

### 6.4.4 Potential Sources of Reclamation Fill

There is an existing commercial agreement between PKPC and Australian Steel Mill Services (ASMS) Pty Ltd for the supply of up to one million tonnes (approximately 650,000$m^3$) of uncrushed blast furnace slag. The slag is currently stockpiled at “Mt Prosser”, a large slag stockpile located within the ASMS site approximately 3.5km north west of the Outer Harbour at a site off Springhill Road. The slag would be sourced for Stage 1a reclamation and trucked from Mt Prosser directly to the development site at a rate of between 3,000 to 5,000 tonnes per day.

The mix of material sizes within the stockpile is illustrated in **Plates 6-1 and 6-2**. The size of the available slag material is not uniform and contains a mix of materials ranging from fine (less than 1 cm) to large coarse material (approximately 30 cm in diameter).

Previously PKPC has sourced only the larger material for direct placement within reclamations in the Inner Harbour and below a depth of -4.0m PKHD in the Outer Harbour and the material has remained stable under waves and vessel wash. It is considered that there is insufficient larger slag material remaining in the stockpile to make it economically feasible to screen all slag to win the larger material only. All available slag material would be used and contained by bund walls.

The balance of fill required for Stage 1a (approximately 150,000 $m^3$) would comprise coal wash sourced locally from BlueScope Steel or from West Cliff Colliery on Appin Road approximately 30km north west of the Outer Harbour. The coal wash would be placed at a depth no lower than +1m PKHD.

**Plate 6-1: Blast Furnace Slag Material**

**Plate 6-2: Blast furnace slag – close view**

Source: PKPC, 2009

Stage 1b and Stage 1c reclamation areas would incorporate dredged material from the Outer Harbour, totalling 383,575$m^3$ rock, and 833,675$m^3$ soft sediments.

The source of the balance of fill (2,612,401$m^3$) has not been confirmed. However, a potential 1,000,000$m^3$ may come from large infrastructure projects that are in progress, such as the Metropolitan Transport Plan's light rail extensions in Sydney, and be transported by barge or train to Port Kembla. There is also potential to take advantage of additional volumes of coal wash.

PKPC would continue to track fill sources from within the Sydney Metropolitan Area, Illawarra and Shoalhaven region over the next 30 years to source the remaining fill. Potential sources of fill include:

- Continued negotiations with ASMS to provide additional slag materials.
- Major tunnel projects in the Sydney Metropolitan area, typically the South West Metro rail projects and the M4 East road tunnel. These projects are planned, but are not likely to commence construction for a few years.
- Tunnel projects in the Illawarra Region (e.g. Maldon-Dombarton Rail). Spoil from tunnels is produced relatively slowly and is likely to be moved by truck if suitable space for stockpiling is not available at the source.
- Mine spoil and coal wash waste. PKPC is currently pursuing a Resource Recovery Levy Exemption to be able to utilise local mines spoil and coal wash waste.
- Major civil and road works projects in the Illawarra and southern Sydney region.
- Large building projects involving ground excavation.
- Dredging projects in the Sydney and Illawarra regions.
- Surplus suitable overburden and interburden rock from local quarries.

Despite this uncertainty of fill source and location, a likely scenario of transportation of fill to the development site has been adopted (i.e. assumed modal split between truck, rail and barge) to form the basis of the impact assessments outlined in **Sections 18, 19, 21** and **22** of this EA.

## 6.5 Preliminary Design Elements

### 6.5.1 Berth Construction Considerations

The Master Plan outlines a port development based on projected trade growth to 2030. The Plan accommodates container ships in the range 3,000 to 5,000 TEU, with lengths in the range 230m to 300 m, and bulk carriers of Panamax size around 70,000 dead weight tonnes (dwt) and length of approximately 230m.

The berthing arrangement at the completion of the proposed development is shown in **Figure 5-3**. Edge structures for the reclamation that are proposed to be undertaken as part of the Major Project include both permanent edge structures, suitable for vessel berthing, and temporary edge structures. Some of the temporary edge structures would become redundant as the port development is progressed. The construction of subsequent stages of the development (Stages 2 and 3) would be subject to additional project applications made at a later date.

### 6.5.2 Edge Structures

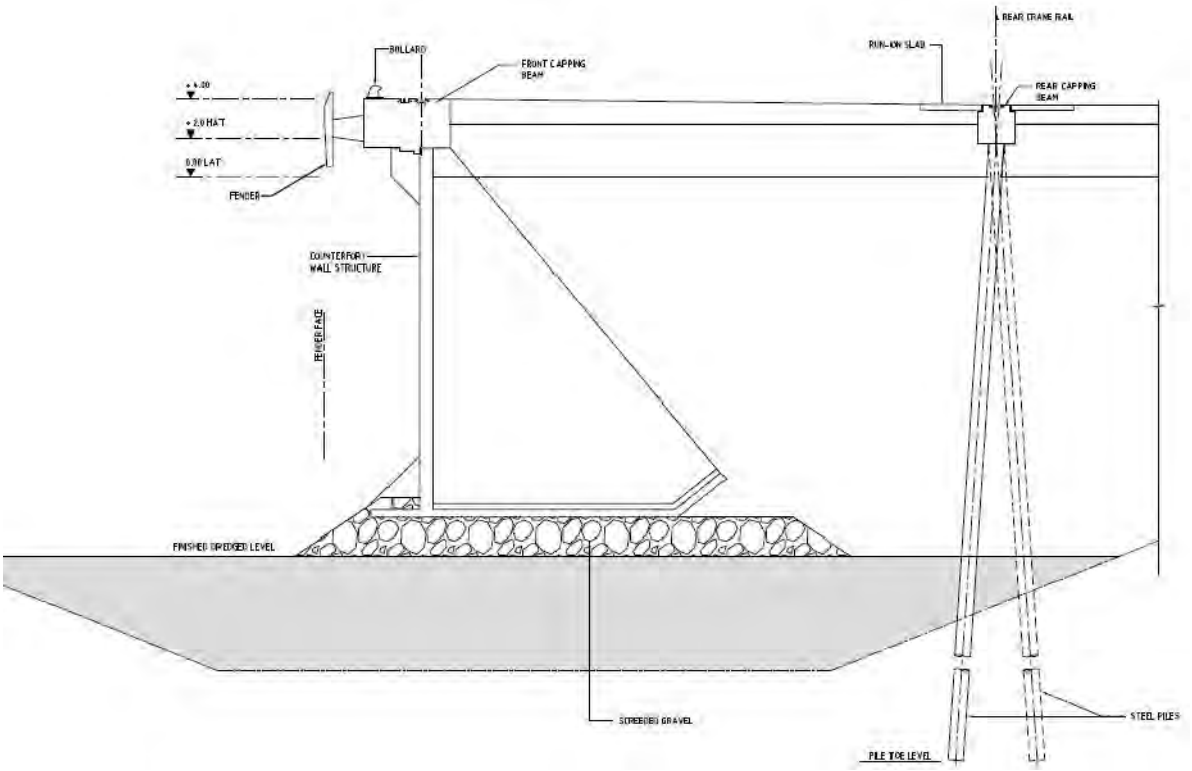
The relatively shallow depths to bedrock are a constraint on the type of wharf structure that can be developed economically. The hard bedrock makes the use of piled wharves and anchored sheet piled walls difficult and uneconomical as developing the requisite tension capacity in piling would require drilling and grouting anchor bars onto the hard bedrock.

As a consequence, land reclamation with permanent edge structures comprising mass gravity structures such as precast counterfort units (as shown in **Figure 6-12)**, circular cell cofferdam units or caisson units has been considered at the proposed vessel berthing locations. A gravity type wharf structure is more attractive if more than one berth is built at a time. Other structures may be more appropriate (e.g. a steel pile and concrete deck structure) if only one berth is built. A final decision on berth structures would be considered and confirmed during detailed design.

Rubble mound revetment structures would be used for all temporary edge structures along the perimeter of the reclamation until permanent edge structures are required. The rubble mound revetment structures would be formed on a bund perimeter at a slope of between 1:1.5 and 1:2.5 (subject to detailed design) and consist of rock armour with geotextile liner as shown in the typical detail in **Figure 6-13**.

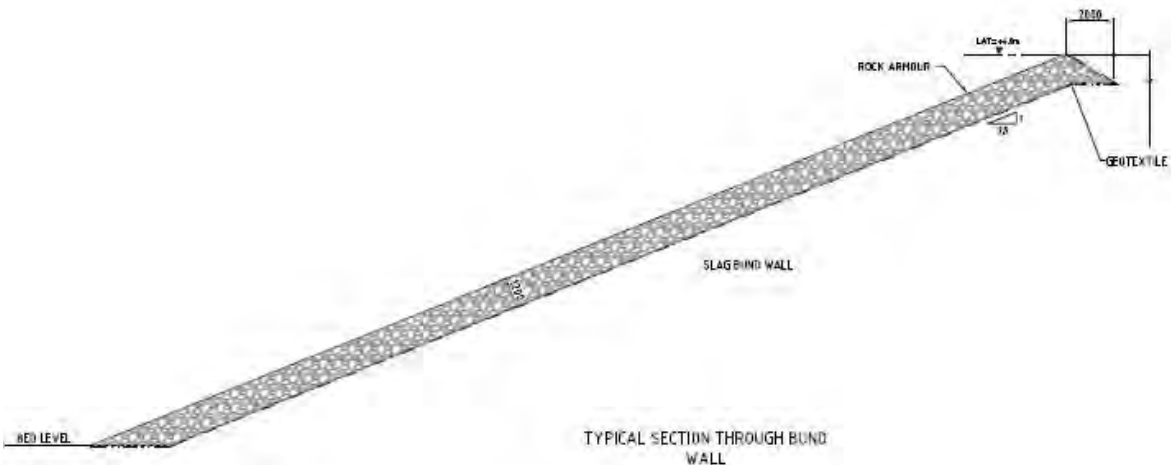
If gravity counterfort units or caisson wall units are used they would be founded on a gravel bed, as shown in the typical detail in **Figure 6-12**.

**Figure 6-11: Typical Detail of Counterfort Wall (vessel berth edge structures)**




Source: AECOM, 2009

**Figure 6-12: Typical Rubble Mound Revetment (temporary or permanent edge structures)**




Source: AECOM, 2009

### 6.5.3 Salty Creek and Darcy Road Drain

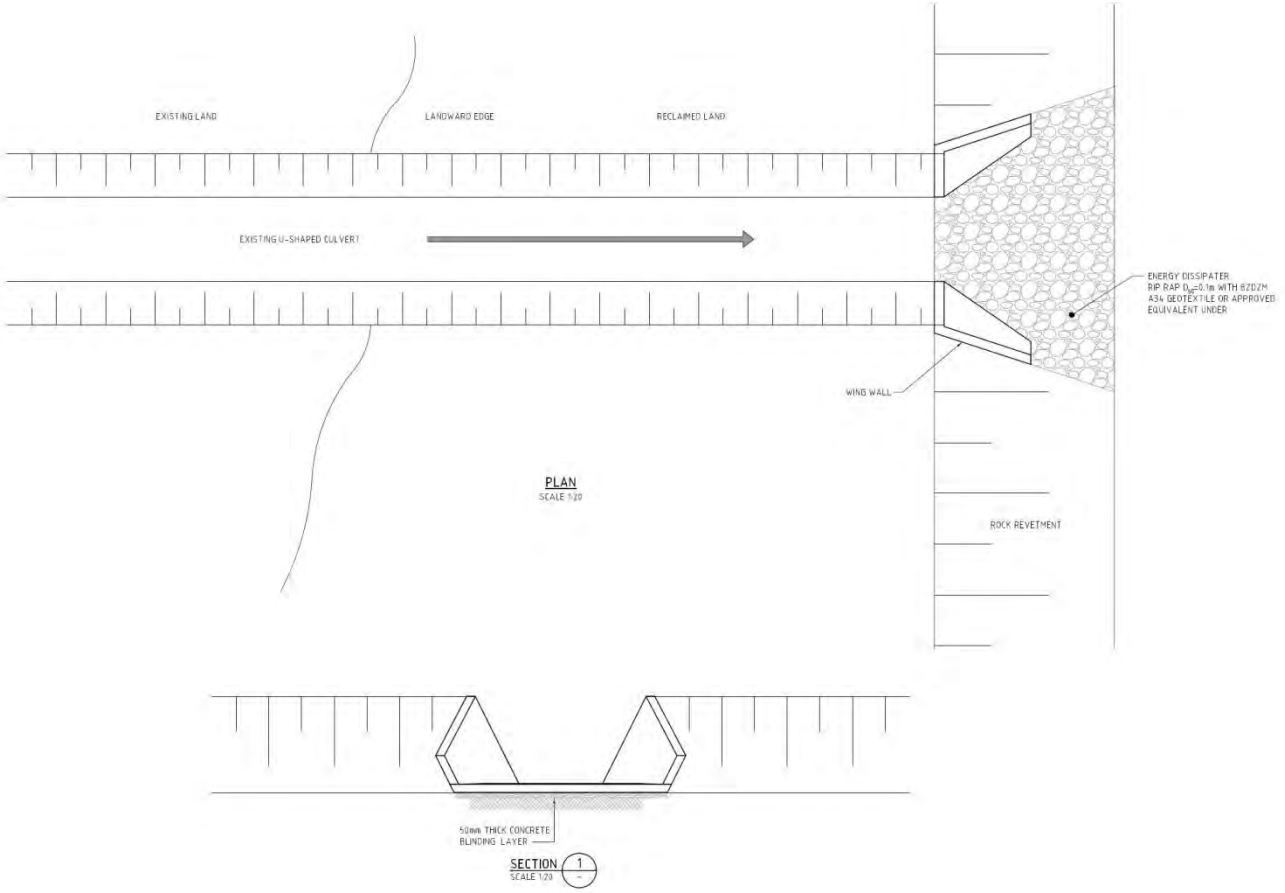
The proposed reclamation activities have the potential to inhibit, or block, the flow of both Salty Creek and Darcy Road Drain. Reclamation and construction activities for Stage 1a and Stage 1b would not inhibit the flow of either watercourse. However, for Stage 1c works which are scheduled to commence in 2014, the reclamation would significantly impact on the existing discharge points for Darcy Road Drain and Salty Creek.

Preliminary designs for the Darcy Road Drain extension include an open u-shaped culvert through the reclamation area at ground level, of similar size and appearance to the existing channel. Wing walls would be constructed between the culvert and the reclamation edge, and an energy dissipater placed at the harbour entrance. A schematic of the indicative design is illustrated in **Figure 6-14**.

The hydrology of Salty Creek is of an intermittently closed system, periodically experiencing sand drift across Red Beach to close the channel entrance to the Outer Harbour. During periods of closure a freshwater system is effectively created.

Preliminary designs for the redirection of Salty Creek include a permanent open box culvert or pipe through the reclamation footprint to the Outer Harbour. This structure would transform the hydrology of Salty Creek from an intermittently freshwater system to a permanent saline environment and the potential impacts associated with this are discussed in **Sections 14** and **17** of this EA. Detailed design of the culvert or pipe would ensure existing and future flow rates are not restricted, and the culvert or pipe size would be no smaller than the existing pipe within Salty Creek that is situated under the rail crossing.

**Figure 6-13: Preliminary Design of Darcy Road Drain Extension and Outlet (shown in plan and cross section views)**



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### 6.5.4 Drainage

Formal drainage exists along the internal and public roads on, and proximal to, the site. Surface water follows natural drainage lines and surface gradients between these roads and the mean high water mark. Local topography and anecdotal evidence suggests these natural surface gradients segregate the flow into three small catchments around the Outer Harbour foreshore, flowing to the harbour from the north-west, south-west and south-east.

During the detailed design phase of the Major Project (Stage 1), surface and sub-surface drainage would be developed both for individual phases of construction and reclamation, and for operational use of Stage 1. A formal surface water management system would be designed and installed for the area of paved hardstand, including appropriately designed pollution control devices.

Unpaved reclaimed surfaces would be profiled to form temporary sedimentation basins (refer **Figure 6-1**). These basins would be designed to capture and filter sediment-laden runoff from unpaved areas, which would percolate into the reclamation material.

### 6.5.5 Pavements

Pavement works undertaken as part of Stage 1 works would cover the central operating portion of the multi-purpose terminals. The terminal area would be paved with heavy duty asphalt approximately 1.2 m thick including base and sub base layers.

## 6.6 Operational Elements

### 6.6.1 Capacity

The Master Plan assessed the potential throughput of cargo from PKPC trade forecasts to determine the required capacity of the Outer Harbour to service likely demand into the future.

The capacity required for the proposed activities to be undertaken as part of the Major Project Application is shown in **Table 6-5** below.

**Table 6-5: Preferred option capacity for Major Project**

| Multi-purpose Terminals | | Container Terminals | | Total number of berths in Outer Harbour |
|---|---|---|---|---|
| No. of operational Berths | Capacity (Mtpa) | No. of operational Berths | Capacity ('000 TEU) | |
| 1 | 4.25 | 0 | 0 | 4 (one new berth plus three existing berths; two at Port Kembla Gateway and one oil and flammable liquids berth) |

Project capacity has been calculated using the following throughputs:

- Dry bulk products assumed at 4.25 Mtpa per berth.

### 6.6.2 Market Destination

The majority (approximately 80%) of dry bulk goods import from the first multi-purpose berth would be destined for the Sydney metropolitan market, with the remainder distributed to various locations across southern and south western NSW. Imports would be distributed via road directly from the multi-purpose terminal.

Exports destined for interstate and international markets would arrive via road and rail from the Lithgow area and southern NSW, with the majority (approximately 90%) transported via rail.

### 6.6.3 Shipping Traffic

At present the Port has approximately 900 vessel visits per year in an average year. This comprises approximately 800 vessel visits to the Inner Harbour and up to 100 vessel visits to the Outer Harbour. This equates to approximately 2.5 ship visits per day.

There would be one multi-purpose berth operational as part of Stage 1, servicing normally 100 ship visits per year (or 0.25 ships per day).

The additional ship movements would be accommodated within the existing pilotage, navigation, security and quality management systems provided by PKPC.

### 6.6.4 Internal Roads

As part of Stage 1 new road infrastructure would be required within the Outer Harbour to access the central operating portion of the multi-purpose terminals. The primary site access road would run from Christy Drive south and parallel with existing rail sidings to the west, before turning east to the terminal.

Terminal roads would be contained within a 15 m road corridor to facilitate vehicle movements between the berth, storage sheds, operational amenities, and site access roads.

### 6.6.5 Rail

Trains transporting goods to the port for export will load dry-bulk goods into a trap beneath the tracks, which would then be transferred by conveyor to stockpiles before being loaded onto waiting ships.

Conveyors would unload dry-bulk from ships to stockpiles. Other conveyors would then load dry-bulk materials from stockpiles onto trains.

For break bulk, cranes and forklifts would be used to move bulk goods across the terminal and onto trains.

### 6.6.6 Security

The operational areas of the central portion of the multi-purpose terminals would be fenced and have restricted site access along the proposed internal access road. Once constructed and operational, the central portion of the multi-purpose terminals would be located within an area identified as a Maritime Security Zone.

### 6.6.7 Division of Lease Areas

Leased areas of the central portion of the multi-purpose terminals would be divided by security fencing. All internal line markings and site layouts on longer term leased areas would be confirmed through lessees' site designs and subject to separate approvals processes.

Line markings would divide the common area into stacking areas. Delineation of stacking areas and internal pathways would be determined during the detailed design phase.

### 6.6.8 Services and Utilities

A utilities easement, approximately 20 m wide, has been delineated across the central operating portion of the multi-purpose terminal to house water, power 240V and 415V, telecommunications, and sewer conduits and pipelines (refer **Figure 6-1**).

Integral Energy has advised that a new 33/11kV indoor zone substation would need to be constructed to make power supply available for the Concept Plan (including Stage 1).

Two new 33kV underground feeders would be required to the zone substation from Integral Energy's Outer Harbour Transmission Station (located on Old Port Road, Port Kembla). The 33kV feeders would be located within the new road link corridor for access to the multi-purpose terminals. Feeders that are not located within a road easement would be installed in a 5 m wide easement linking the transmission station with the road corridor. Power to the central operational portion of the multi-purpose terminals would be supplied by an 11kV/433V underground distribution network.

It is estimated that a power supply of 13MVA would be required to service Stage 1. Integral Energy has advised that there is capacity in the 11kV network in the Outer Harbour to make 1MVA available for construction activities. Further discussion with Integral Energy would be undertaken during detailed design to confirm power requirements for Stage 1. An Application for Connection of Load would be made to Integral Energy for approval for power supply for the Concept Plan (including Stage 1).

Sydney Water has been consulted regarding the capacity of the water supply and sewerage systems to accommodate Stage 1 works. Connection and discharge to Sydney Water potable water and sewer mains and the most suitable connection points would be investigated and confirmed during detailed design.

Existing No.4 Jetty (Berth 206) which is currently used for the transfer of sulphuric acid would be demolished as part of the Major Project and a new pipeline would be constructed to connect the first multi-purpose berth with the existing aboveground storage tanks on the south side of Foreshore Road. Acid transfers, from bulk tanker ships to the existing acid tanks, would be performed via the new pipeline.

### 6.6.9 Lighting

Flood lighting would be installed for the central portion (common area) of the multi-purpose terminals. Lighting would be designed during the detailed design phase to meet ASNZS 4282 – *Control of Obtrusive Effects of Outdoor Lighting.* Designs would ensure minimal light spill impacts from the site through the use of directional lighting and consideration of appropriate luminosity.

Road and rail lighting would be designed to meet the relevant standards for minor public roads and the requirements of rail organisations.

### 6.6.10 Fuel

A locomotive refuelling site is located in the Outer Harbour to the immediate east of the South Yard. Locomotives accessing the multi-purpose terminal would be refuelled at their respective bases or at the South Yard refuelling facility.

### 6.6.11 Operational Hours and Operational Workforce

Over 180 direct and indirect employment opportunities would be generated per year in the Illawarra Region and over 297 in NSW as a whole as a result of the activities to be undertaken as part of the Major Project. Increased trade flows through the new multi-purpose terminal would potentially generate 384 extra Full Time Equivalent (FTE) jobs in the Illawarra Region and 451 in NSW as a whole. Jobs would be created predominantly in the building and construction industry, trade, manufacturing, and finance and business sectors.

More discussion on total jobs generated for Illawarra Region and NSW as a result of the proposed development is presented in **Section 20**.

### 6.6.12 Plant and Equipment

The operation of Stage 1 (one berth servicing the central portion of the multi-purpose terminals) would require the plant and equipment listed in **Table 6-6.**

**Table 6-6: Major plant and equipment for operation of Stage 1**

| Stage 1 Activity | Equipment | Task |
|---|---|---|
| Central portion of multi-purpose terminal including one berth | Trucks and Front End Loaders | To load and unload dry bulk, break bulk and general cargo to be transported to and from the Port |
| | Trains | To load and unload dry bulk, break bulk and general cargo to be transported to and from the Port |
| | Stockpile feeders | Transport cargo to and from stockpiles |
| | Ship cranes | Cranes located on ships that load and unload cargo to and from ships |
| | Mobile quayside cranes and bulk unloader/loaders | Cranes located on shore that load and unload cargo to and from ships |
| | Conveyor and or vacuum piping | Transport of dry bulk material direct from ship to storage and processing location |
| | Fork lifts or reach stackers and trailers | To move break bulk around terminal area and load and unload trucks and trains |

### 6.6.13 Amenities

An amenities building would be designed and constructed in the common user area as part of Stage 1a works. The location and size of the building would be confirmed during the detailed design phase. The amenities building would be located adjacent to the western most edge of the multi-purpose terminal.

The amenities building would be designed to accommodate approximately 30 stevedores and would contain a canteen, toilets, showers, and two small offices. It is anticipated that the buildings would be of similar style to those located at the Inner Harbour AAT site, being of a demountable construction/modular design.

Part of the central portion of the multi-purpose terminals is proposed to be leased for a cement facility. The facility would include storage sheds, storage silos, grinding mills, and an office and amenities building. The design, construction and operation of these facilities are not part of the Major Project and would be subject to separate applications for approval made by the individual lessee.

### 6.6.14 Car parking

Car parking for the operational workforce would be designed to accommodate approximately 50 car spaces and located proximate to the amenities building. Final parking location and designs would comply with relevant standards and be finalised during the detailed design phase.

### 6.6.15 Public Recreation Areas and Boating Harbour

The proposed development would not affect public access to the foreshore. Public access is currently only permitted to the boat harbour and boat ramp, Heritage Park and Historic Military Museum. No public access is currently allowed to Red Beach or the jetties.

The existing public access arrangements would be retained as part of the Major Project. No alterations to the boat ramp and harbour are proposed as part of Stage 1 or the Concept Plan.

Access in and out of the boat harbour and to other sites of interest would be maintained throughout the duration of the construction activities, reclamation and dredging. Buoys currently located in the Outer Harbour, used to delineate the recreational fishing passage to the boating area, would be retained as a marked separation between the dredging area and the recreational boating area and augmented if necessary.

The existing safety signage for use of and around the boat harbour would be retained and additional signage would be erected at and around the recreational boating harbour during construction of Stage 1.

## 6.7 Project Cost Estimate

A preliminary cost estimate for construction of Stage 1 is in the order of $313 million (in 2008 Australian dollars) and has been derived from the Master Plan.

The cost estimate is indicative only at this stage and would be refined during development of the detailed design. Indicative costing for Stage 1 activities is provided in **Table 6-7**.

**Table 6-7: Major Project Indicative Cost**

| Major Project Activity | Cost |
|---|---|
| Reclamation and construction of facilities for multi-purpose terminals (central portion operational, first berth operational) | $59,694,180 |
| Reclamation and construction of first berth for western container terminals (first berth, non-operational) | $167,214,610 |
| Dredging | $80,947,750 |
| Roads (new road link off Christy Drive to multi-purpose terminals and temporary construction road to container terminals) | $2,000,000 |
| Utilities installation (for operational portion of multi-purpose terminals) | $4,000,000 |
| **Stage 1 - Total Cost** | **$313,856,540** |

# 7.0 Statutory Controls and Approvals

This section describes the approval process and relevant statutory control considerations for the proposed Outer Harbour development. Where different planning and environmental approvals apply for Concept Plan and Major Project they have been discussed separately.

## 7.1 Commonwealth Environmental Assessment Process

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) requires the approval of the Commonwealth Minister for the Environment, Heritage and the Arts for actions that may have a significant impact on matters of National Environmental Significance (NES). Approval from the Commonwealth is in addition to any approvals under NSW legislation. *The EPBC Act* is administered by the Commonwealth Department of Environment Water, Heritage and the Arts (DEWHA).

As of 1 January 2004, the *EPBC Act* also provides for the identification, conservation and protection of places of national heritage significance and provides for the management of Commonwealth heritage places. The Australian Heritage Council was established in 2004 to advise the Australian Government on heritage matters.

The *EPBC Act* lists seven matters of NES which must be addressed when assessing the impacts of a proposal, including:

- Nationally threatened species and ecological communities.
- Australia's World Heritage properties.
- Ramsar wetlands of international importance.
- Migratory species listed under the *EPBC Act* (species protected under international agreements).
- Commonwealth marine areas.
- Nuclear actions, including uranium mining.
- National heritage.

The detailed assessment undertaken for this EA (**Sections 9** to **28**) has concluded that the proposed Concept Plan and Major Project (Stage 1 of the Concept Plan) would not have an impact on the matters of NES. Referral of the project to the DEWHA in accordance with the *EPBC Act* would not be required.

## 7.2 NSW Environmental Legislation and Assessment Process

### 7.2.1 Environmental Planning and Assessment Act, 1979

The *EP&A Act* and the *Environmental Planning and Assessment Regulation, 2000 (EP&A Regulation)* provides the framework for environmental planning in NSW and includes provisions to ensure that proposals which have the potential to impact the environment are subject to detailed assessment.

The objectives of the *EP&A Act* are:

*(a) to encourage:*

*(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*

*(ii) the promotion and co-ordination of the orderly and economic use and development of land,*

*(iii) the protection, provision and co-ordination of communication and utility services,*

*(iv) the provision of land for public purposes,*

*(v) the provision and co-ordination of community services and facilities, and*

*(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*

*(vii) ecologically sustainable development, and*

*(viii) the provision and maintenance of affordable housing, and*

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

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

The proposed Outer Harbour development falls under the provisions of Part 3A of the *EP&A Act*. Part 3A applies to development that is declared by the Minister to be a 'Major Project'. Under Part 3A, a proponent can seek a Major Project Approval and/or a Concept Plan approval. In accordance with the provisions of Part 3A of the *EP&A Act*, PKPC is seeking concurrent Concept Plan and Major Project Approval for the development. The Concept Plan would comprise components for the full development, while the Major Project would comprise components for Stage 1 of the development.

This EA has considered the impacts of all elements of the project and provides broad details for components associated with the Concept Plan and more comprehensive details for Major Project to enable commencement of all components forming part of Stage 1 of the development.

### 7.2.2 Protection of the Environment Operations Act, 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) is the main legislation in NSW that regulates pollution control and waste management. The POEO Act also establishes licensing of certain activities, which are listed in Schedule 1 of the Act. An activity listed in Schedule 1 is called a 'scheduled activity'.

Clause 47 of the Act specifies that an Environment Protection Licence (EPL) is required for development of premises for the purpose of scheduled activities.

A review of Schedule 1 of the POEO Act has been undertaken to identify activities of the proposed development which may require an EPL. Activities that fall within the scope of either the Concept Plan or Major Project (Stage 1) that are likely to trigger the need for an EPL application include:

- Storage of raw materials for cement and processing of cement.
- Dredging of soft sediments and rock.
- Shipping of dry bulk goods.
- Installation of new railway infrastructure, upgrading existing railway infrastructure as well as the operation of rolling stock.
- Sorting and separation of rock material for bund and revetment structures.
- Importation of large quantities of blast furnace slag and coal wash for reclamation purposes.

EPLs will also be obtained in accordance with section 43(d) of the POEO Act "*to control the carrying out of non-scheduled activities for the purpose of regulating water pollution resulting from any such activity*". Activities of this type for which EPLs will be obtained include:

- Reclamation.
- Berth construction.
- Construction of revetments.
- Construction of the piled deck at the northern end of the container terminal.
- Modifications to Salty Creek and Darcy Road Drain.

Applications for relevant EPL's would be made by the appropriate proponent of the trigger activity (PKPC, contractor, lessee) and obtained from the NSW Environment Protection Authority of the DECCW, prior to the carrying out of any scheduled activities. Variations to the EPLs would be applied for as the development progresses and changes to the activities are required.

Details of the potential scheduled activities for the proposed development are included in **Table 7-1** below. Whether the identified scheduled activities would be undertaken as part of the Concept Plan or Major Project (Stage 1), or both, has been indicated.

**Table 7-1: Scheduled Activities Likely to Require an EPL as Part of the Proposed Development**

| Scheduled Activity | Criteria | Proposed Activity | Concept Plan | Major Project |
|---|---|---|---|---|
| ***6* - Cement or lime works.**<br>***Cement or lime handling***, meaning the handling of cement, fly ash, powdered lime (other than agricultural lime) or any other similar dry cement products. | Capacity to handle more than 150 tonnes of cement or lime per day or 30,000 tonnes of cement or lime per year | A portion of the multi-purpose terminals would be leased from PKPC by a cement facility operator. The facility would comprise storage sheds, storage silos, grinding mills, and office/amenities buildings.<br>Although the cement facility would be constructed and become operational during Stage 1 of the proposed development, approval for the design, construction and operation of this facility is not part of the Major Project Application. Planning approval for the facility would be the responsibility of the cement facility operator and would be part of a separate approval process.<br>The cement facility operator would be responsible for making an EPL application to DECCW for this scheduled activity. | **No** | **No** |
| **16 - Crushing, grinding or separating,** meaning the processing of materials (including sand, gravel, rock or minerals, but not including waste of any description) by crushing, grinding or separating them into different sizes. | Capacity to process more than 150 tonnes of materials per day or 30,000 tonnes of materials per year. | Rock material used in the reclamation process, primarily for the construction of revetments, may need to be sorted and separated on site. Any EPL obtained for this purpose would only be for a relatively short period to support construction activities. | **Yes** | **Yes** |

| Scheduled Activity | Criteria | Proposed Activity | Concept Plan | Major Project |
|---|---|---|---|---|
| **19 - Extractive activities:**<br>***Land-based extractive activity***, meaning the extraction, processing or storage of extractive materials, either for sale or re-use, by means of excavation, blasting, tunnelling, quarrying or other such land-based methods.<br>***Water-based extractive activity***, meaning the extraction of extractive materials, either for sale or re-use, by means of dredging or other such water-based methods. | Land-based extractive activity, involves the extraction, processing or storage of more than 30,000 tonnes per year of extractive materials<br>Water-based extractive activity, involves the extraction of more than 30,000 cubic metres per year of extractive materials | A total of 4,628,049m$^3$ of fill would be required for the entire Stage 1 reclamation. Part of the fill would be sourced from dredging material within the outer harbour (383,575m$^3$ rock, and 833,675m$^3$ soft sediments), which would be considered a **water-based extractive activity**. The balance (3,410,799m$^3$) as well as the remaining fill required for Stages 2 and 3 would need to be imported from external sources.<br>PKPC has in place a commercial agreement with Australian Steel Mill Services Pty Ltd (ASMS) for the supply of up to one million tonnes (approx 650,000m$^3$) of uncrushed blast furnace slag currently stockpiled at "Mt Prosser", the large slag stockpile located within the ASMS site approximately 3.5km north west of the Outer Harbour. This slag would be sourced for Stage 1 reclamation and trucked from Mt Prosser directly to the development site at a rate of between 3,000 to 5,000 tonnes per day. This material, in addition to other sources of material yet to be acquired, may need to be stockpiled (stored) on site temporarily before being placed into the reclamation fill, which would be considered a **land-based extractive activity**. A 100 000m$^3$ stockpile area has been allowed for in the site development plan for this purpose.<br>Any EPLs obtained for extractive activities would only be for a relatively short period to support dredging and reclamation works. | **Yes** | **Yes** |
| **37 - Shipping in bulk**, meaning the operation of wharves and associated facilities for the bulk loading or unloading of agricultural crop products, rock, ores, minerals or chemicals into or from vessels (except where they are contained in shipping containers). | • Capacity to handle:<br>• more than 500 tonnes of agricultural crop products, rock, ores, minerals or chemicals per day, or<br>• more than 50,000 tonnes of agricultural crop products, rock, ores, minerals or chemicals per year. | The multi-purpose berths would have the capacity to load and unload up to 4.25 million tonnes per annum (mtpa) for Stage 1 (Major Project) and up to 6.25 mtpa for Stages 2 and 3. | **Yes** | **Yes** |

| Scheduled Activity | Criteria | Proposed Activity | Concept Plan | Major Project |
|---|---|---|---|---|
| **42 - Waste storage**, meaning the receiving from off site and storing (including storage for transfer) of waste. | • More than 2,500 tonnes or 2,500 cubic metres, whichever is the lesser, of waste is stored on the premises at any time; or<br>• More than 30,000 tonnes of waste is received per year from off site.<br>• The above refers to waste not considered to be hazardous waste, restricted solid waste, liquid waste, clinical or related waste, asbestos waste or waste tyres. | Up to one million tonnes (approx 650,000$m^3$) of uncrushed blast furnace and up to 1,000,000$m^3$ of coal wash, both obtained from local sources, would be used for the reclamation activities during Stage 1. This material may need to be stockpiled (stored) on site temporarily before being placed. A 100,000$m^3$ stockpile area has been allowed for in the site development plan and would be used for this purpose. | **No*** | **No*** |

*PKPC has applied for a resource recovery exemption for the use of both blast furnace slag and coal wash. These exemptions are likely to be approved prior to the commencement of construction. On receipt of these exemptions, PKPC would not be required to obtain an EPL for these activities.

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### 7.2.3 Fisheries Management Act 1994

The NSW *Fisheries Management Act 1994* (FM Act) aims to conserve, develop and share the fishery resources of the State for the benefit of present and future generations and applies in relation to all waters that are within the limits of the State.

The FM Act provides for the protection of certain aquatic habitats and species, the preparation of recovery plans and threat abatement plans and the regulation of certain activities that have the potential to impact aquatic habitats. Under the FM Act, approval is required from NSW Department of Primary Industries (DPI) - Fisheries for activities involving dredging and reclamation, blockage of fish passage and development of certain waterfront land.

These relevant approvals under sections 201, 205 and 219 of the *FM Act* are not required for projects considered under Part 3A of the *EP&A Act*. However, the potential impacts associated with dredging, reclamation and potential impacts on aquatic ecology must still be considered and are assessed in detail in later Sections of this EA.

### 7.2.4 Contaminated Lands Management Act 1997

The *Contaminated Land Management Act 1997* (the CLM Act) establishes a legal framework that enables the EPA to regulate the assessment and remediation of contamination that poses, or is likely to pose, a risk of harm to human health or the environment. In broad terms, the CLM Act specifies who is responsible for investigating and remediating the contamination, gives the EPA a range of duties and powers to ensure that the contamination is addressed, and establishes a scheme to ensure that the public has appropriate information about it.

The *Contaminated Land Management Amendment Act 2008* (the amending Act) received assent on 10 December 2008, following an extensive period of consultation and review of the CLM Act. The majority of the provisions in the amending Act commenced on proclamation on 1 July 2009. The purpose of the amendments is to allow contaminated sites to be cleaned up more efficiently while reinforcing the "polluter pays" principle. The amending Act has removed the concept of 'significant risk of harm' and provided a more objective basis for the duty to notify DECCW of contaminated land based on criteria referred to as 'trigger values', which are provided in '*Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997'* prepared by the former DECC.

Combined, the CLM Act and the amending Act set out criteria for determining whether contamination is considered significant enough to warrant regulation (SEWR) and gives the EPA (part of DECCW) the power to:

- Order certain persons to conduct a preliminary investigation to identify and investigate the nature and extent of potential contaminants at a specified site.
- Declare land to be "significantly contaminated land" if it has reason to believe that land is contaminated and the contamination is significant enough to warrant regulation.
- Issue management orders (for further investigation and/or remediation) to any one or more persons who are responsible for the contamination of land.
- Agree to a voluntary management proposal to investigate and/or remediate a site.
- Issue a management (investigation and/or remediation) order or to withdraw its approval of a voluntary management proposal that has not delivered a satisfactory outcome in managing contamination.
- Recover certain administrative costs associated with preliminary investigation orders and voluntary management proposals.
- Require land owners and persons carrying out certain activities to notify DECCW of contamination when it becomes aware, or ought reasonably to have become aware, of that contamination.
- Disclose site audit statements and reports that relate to statutory site audits.
- Work alongside the Minister to enter into offset arrangements where the person responsible for the contamination can mitigate the impact of contamination if remediation is not feasible within a reasonable time (for example, provision of community services or the establishment of environmental or resource projects) where, in the opinion of the Minister, it is in the public interest and it would not be practicable to remediate the contamination within a reasonable time).
- Impose penalties for providing false and misleading information to DECCW (for example, the maximum penalties for failure to comply with a management order or duty to notify are $165,000 plus daily penalties of $77,000 for non-compliance).

DECCW may decide that the contamination risks can be addressed through the planning process, in which case regulation under the *CLM Act* may not be required.

The *CLM Act* also allows DECCW to accredit suitably experienced and qualified individuals as site auditors to review work conducted by contaminated site consultants. The services of a site auditor can be used by anyone who needs an independent and authoritative review of information relating to possible or actual contamination of a site.

The proposed project would be subject to the *CLM Act* and the amending Act and sites would be investigated or remediated as necessary, if DECCW deems that the contamination present on the site is significant enough to warrant regulation (SEWR). The contamination of land and sediments within the project area is considered in **Sections 10, 11** and **12.**

### 7.2.5 National Parks and Wildlife Act, 1974

The *National Parks and Wildlife Act 1974* (*NP&W Act*) governs the establishment, preservation and management of national parks, historic sites and certain other areas, and the protection of certain fauna, native plants and Aboriginal relics.

The *NP&W Act* is relevant to the protection of Aboriginal artefacts and the protection of native flora and fauna. Section 86 of the *NP&W Act* identifies offences relating to Aboriginal objects, including disturbing land to discover an artefact. Section 87(1) of the *NP&W Act* provides for the issue of a permit to remove any artefacts, while section 90 (2) of the *NP&W Act* requires consent from the Director-General of DECCW to knowingly destroy, deface or damage an Aboriginal object or Aboriginal place.

The project area is highly disturbed and therefore it is considered unlikely that the development would have a significant impact on recorded Aboriginal sites. Once the proposal is approved under Part 3A of the *EP&A* Act, it would be exempt from the need for a section 87 permit or section 90 consent.

Potential impacts of the project on heritage have been assessed and findings presented in **Section 24**. The assessment uncovered no evidence that recorded or unrecorded Aboriginal sites would be impacted by the proposed development. All previously recorded Aboriginal sites are located well outside the impact area, and there is considered to be little or no likelihood that any intact or undisturbed subsurface Aboriginal heritage material remains *in situ* within the study area.

There will be no significant impact on listed heritage items within the Outer Harbour area. Existing jetty structures have been assessed as being of local significance and archival recording will be undertaken prior to their demolition.

### 7.2.6 Threatened Species Conservation Act, 1995

The *Threatened Species Conservation Act 1995* (*TSC Act*) provides for the conservation of threatened species, populations and ecological communities of animals and plants. This is achieved by the following:

- Conserving biological diversity and promoting ecologically sustainable development.
- Preventing extinction and promoting the recovery of threatened species, populations and ecological communities.
- Protecting critical habitat of threatened species, populations and ecological communities.
- Eliminating or managing certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities.
- Encouraging the conservation of threatened species, populations and ecological communities by the adoption of measures involving co-operative management.

The *TSC Act* provides a framework to ensure that the impact of any action affecting threatened species is assessed. Schedule 1 of the *TSC Act* lists endangered species, populations and ecological communities, Schedule 2 lists vulnerable species and Schedule 3 lists key threatening processes. Part 3 of the *TSC Act* defines critical habitat.

The proposed Outer Harbour development will require the removal of a limited amount of native vegetation associated with the construction of road and rail infrastructure. Vegetation to be removed has been assessed as being of low ecological value and works will have no impact on protected vegetation species.

One species of threatened fauna and flora is known to occur proximal to the area of development. The Green and Golden Bell Frog *Litoria aurea* (GGBF) is known to occur near the project site, with three populations having been identified by Gaia Research (2008) within "greened" areas to the south of Foreshore Road (refer **Section 17**).

Small fragmented patches of Coastal Saltmarsh were observed along Salty Creek between Old Port Road and the railway line east of Old Port Road. Coastal Saltmarsh is listed as an Endangered Ecological Community (EEC) under the *TSC Act 1995*.

A detailed assessment of the potential impacts of the proposed development on the GGBF and its habitat, as well as on the fragmented patches of Coastal Saltmarsh, is provided in **Section 17**.

## 7.3 State Environmental Planning Policies and State Strategies

### 7.3.1 State Environmental Planning Policy (Major Development) 2005

**Aims**

The aims of *State Environmental Planning Policy (Major Development) 2005*, Major Development SEPP are:

> *"(a) to identify development to which the development assessment and approval process under Part 3A of the Act applies.*
>
> *(b) to identify any such development that is a critical infrastructure project for the purposes of Part 3A of the Act.*
>
> *(c) to facilitate the development, redevelopment or protection of important urban, coastal and regional sites of economic, environmental or social significance to the State so as to facilitate the orderly use, development or conservation of those State significant sites for the benefit of the State.*
>
> *(d) to facilitate service delivery outcomes for a range of public services and to provide for the development of major sites for a public purpose or redevelopment of major sites no longer appropriate or suitable for public purposes.*
>
> *(e) to rationalise and clarify the provisions making the Minister the approval authority for development and sites of State significance, and to keep those provisions under review so that the approval process is devolved to councils when State planning objectives have been achieved".*

**Permissibility**

Part 20 of Schedule 3 of the Major Development SEPP lists the Three Ports Site as a State Significant Site and establishes an approvals framework for development that in the event of any inconsistency prevails over other environmental planning instruments. The Three Ports Site includes the area of Port Kembla, as illustrated by *Port Kembla Site, Land Application Map* (referred to as the 'land application map') and the proposed works are within this area. Additionally, Clause 7(1) states that *"Schedule 3 describes State significant sites, including development on those sites that is a project to which part 3A of the Act applies"*.

Under the land zoning map the area of proposed works is located predominantly within the SP1 (Special Activities) zone, with a small site where the proposed rail siding extension would occur in the Pacific National Southern Yard located within the IN3 (Heavy Industrial) zone. Under Clause 10 (IN3 zone) and Clause 11 (SP1 zone), of Part 20, 'port facilities' are permitted with development consent.

The proposed works fall within the definition of 'port facilities' under Clause 2(1) of Part 20, Schedule 3, which comprises the following activities at or in the vicinity of a port:

> *"(a) facilities for the embarkation or disembarkation of passengers onto or from any vessels, including public ferry wharves,*
>
> *(b) facilities for the loading or unloading of freight onto or from vessels and associated receival, land transport and storage facilities,*
>
> *(c) wharves for commercial fishing operations,*
>
> *(d) refuelling, launching, berthing, mooring, storage or maintenance facilities for any vessel,*
>
> *(e) sea walls or training walls,*

*(f) administration buildings, communication, security and power supply facilities, roads, rail lines, pipelines, fencing, lighting or car parks".*

**Declaration as a Part 3A project**

Under Clause 6 of the Major Development SEPP, development that, in the opinion of the Minister is of a kind that is described in Schedule 1 or 2, or is *"described in Schedule 3 as a project to which Part 3A of the Act applies"* is declared to be a project to which Part 3A of the Act applies.

Port and wharf facilities are listed at Clause 22, Group 8, in Schedule 1 of the Major Development SEPP. Clause 22 lists the following type of development:

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

The proposed Concept Plan constitutes development for the purpose of shipping berths and wharf-side facilities, and has a capital investment of approximately $700 million the cost estimate for construction of the Major Project (Stage 1) is $314 million.

On 10 October 2008 the Director General of the DoP, as delegate of the Minister for Planning under delegation executed on 26 February 2007, formed the opinion that the proposed Outer Harbour development is a development of a kind that is described in Clause 22, Group 8 of Schedule 1 of the Major Development SEPP. The Director General therefore declared the Outer Harbour development to be a project to which Part 3A of the *EP&A Act* applies for the purpose of section 75B of the Act.

Consequently, the proposed works are permitted with consent in the SP1 and IN3 zones and the Director General has declared the proposed development to be a project to which Part 3A of the *EP&A Act* applies.

On the 7th January 2009, the Minster for Planning authorised the lodgement of a Concept Plan for the project. Therefore Concept Plan and Major Project approval will be required from the Minister for Planning under Part 3A of the *EP&A Act*.

**Heritage Provisions**

Subject to Clause 21(1), of Part 20, Schedule 3 development consent is required for any of the following:

- Demolishing or moving a heritage item.
- Altering a heritage item that is a building by making structural changes to its interior.
- Erecting a building on land on which a heritage item is located.

The Heritage Assessment for this application (see **Section 24** of this report) identified heritage items that may be directly and indirectly affected by the proposed works.

Development consent would normally be required for the demolition or alteration, or the erecting of a building on land which a heritage item is located, however, Part 3A does not require development approval to be sought therefore, the project will not require consent in relation to the Heritage Provisions.

### 7.3.2 State Environmental Planning Policy (Infrastructure) 2007

The Infrastructure SEPP which commenced operation on 2 January 2008 aims to facilitate the effective delivery of infrastructure across the State by:

- Improving regulatory certainty and efficiency through a consistent planning regime for infrastructure and the provision of services.
- Providing greater flexibility in the location of infrastructure and service facilities.
- Allowing for the efficient development, redevelopment or disposal of surplus government owned land.
- Identifying the environmental assessment category into which different types of infrastructure and services development fall (including identifying certain development of minimal environmental impact as exempt development).
- Identifying matters to be considered in the assessment of development adjacent to particular types of infrastructure development.
- Providing for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing.

The SEPP in effect enables Port Corporations to develop appropriate facilities in port areas without consent. These may include facilities for commercial purposes provided the facilities are on land within the Port. Due to the level of capital investment associated with the Outer Harbour, development mentioned in **Section 5.6** of the Infrastructure SEPP does not apply, however it may apply for future developments undertaken as part of the Concept Plan.

### 7.3.3 State Environmental Planning Policy 33 - Hazardous and Offensive Development

The aims of SEPP 33 include the amendment of definitions of hazardous and offensive industries used in environmental planning instruments and to require development consent for hazardous and offensive development.

The document, *Applying SEPP 33 – Consultation Draft July 2008 (DoP 2008) Hazardous and Offensive Development Application Guidelines* provides assistance primarily to councils (but also to industry, consultants and other government agencies) in implementing SEPP 33. The Guidelines recommend a 'risk screening' method for determining whether a proposal is hazardous and provide guidance on assessing potentially offensive development proposals. The screening process considers the class and volume of waste materials to be stored on the subject site and the distance of the storage area to the nearest site boundary.

A review of the Dangerous Goods which could be potentially stored and handled at the Outer Harbour indicated that a Preliminary Hazard Analysis (PHA) of the proposed development would be required under the provisions of SEPP 33. The PHA utilised the methodology recommended in the DoP guidelines *Multi Level Risk Assessment* (DUAP, 1997a) and a range of Hazardous Industry Planning Advisory Papers *(HIPAPs)* including *HIPAP No.6 Guidelines for Hazard Analysis* (DUAP, 1997b) (HIPAP No. 6). A summary of the PHA undertaken in respect of the proposal is included in **Section 13** of this EA.

The PHA concluded that the risk criteria during Stage 1 (Major Project) and for the full development (Concept Plan) is not exceeded and the Outer Harbour development can be categorised as 'potentially hazardous'. As such, it is permissible within the current land zoning, provided mitigation measures outlined in **Section 13** are implemented.

### 7.3.4 State Environmental Planning Policy No.71 – Coastal Protection

*State Environmental Planning Policy No 71 – Coastal Protection (SEPP 71)* has an aim of ensuring there is a consistent and strategic approach to coastal planning and management. Relevant matters for consideration are listed in Clause 8 of *SEPP 71*. The applicability of *SEPP 71* and matters of consideration are addressed in **Table 7-2** below:

**Table 7-2: SEPP 71 Matters for Consideration**

| Clause 8 Matters for Consideration | Comment or Reference in EA |
|---|---|
| • aims of this Policy set out in clause 2: | |
| *(a) to protect and manage the natural, cultural, recreational and economic attributes of the New South Wales coast, and* | The proposed development would enhance the economic attributes of the Port, Port Kembla, and the Illawarra region. The natural attributes of the site and surrounding areas have been assessed from various perspectives in **Sections 9** to **28** and appropriate mitigation provided. Where loss of natural attributes is unavoidable, such as the reclamation of seabed, offsets have been considered. |
| *(b) to protect and improve existing public access to and along coastal foreshores to the extent that this is compatible with the natural attributes of the coastal foreshore, and* | No detrimental impact on the amenity of the coastal foreshore is envisaged. This stretch of coastal foreshore has limited public access to areas such as the recreational boat harbour and heritage port which would be retained. Public access would not be appropriate within the custom controlled port area. |
| *(c) to ensure that new opportunities for public access to and along coastal foreshores are identified and realised to the extent that this is compatible with the natural attributes of the coastal foreshore, and* | The nature of the port area and surrounding industrial development means that there are no new public access opportunities that would be affected by the proposed development. |
| *(d) to protect and preserve Aboriginal cultural heritage, and Aboriginal places, values, customs, beliefs and traditional knowledge, and* | The assessment uncovered no evidence that recorded or unrecorded Aboriginal sites would be impacted by the proposed development. All previously recorded Aboriginal sites are located well outside the impact area, and there is considered to be little or no likelihood that any intact or undisturbed subsurface Aboriginal heritage material remains *in situ* within the study area. The potential impacts of the proposed development upon Aboriginal cultural heritage are discussed further in **Section 24** of this EA. |
| *(e) to ensure that the visual amenity of the coast is protected, and* | The potential impacts of the proposed development upon visual amenity are minimal and discussed in **Section 23** of this EA. |
| *(f) to protect and preserve beach environments and beach amenity, and* | The proposed development does not impact upon beach environments, other than Red Beach, which is degraded as a result of historical port and industrial development and not used by the general public. |
| *(g) to protect and preserve native coastal vegetation, and* | The potential ecological impacts of the proposed development are discussed in detail in **Sections 16** and **17** of this report. |
| *(h) to protect and preserve the marine environment of New South Wales, and* | Aquatic Ecology and potential impacts on the aquatic environment are discussed in **Section 16**. |

| Clause 8 Matters for Consideration | Comment or Reference in EA |
|---|---|
| *(i) to protect and preserve rock platforms, and* | The proposed development would not impact upon rock platforms. |
| *(j) to manage the coastal zone in accordance with the principles of ecologically sustainable development (within the meaning of section 6 (2) of the Protection of the Environment Administration Act 1991), and* | The proposed development has been considered against the principles of ESD (refer to **Section 25**) and has been found to be generally consistent with these principles. |
| *(k) to ensure that the type, bulk, scale and size of development is appropriate for the location and protects and improves the natural scenic quality of the surrounding area, and* | The proposed development would have minimal impact on the scenic qualities of this section of the coast which is visually dominated by the surrounding port and industrial activities (existing and proposed). The potential visual impacts of the proposed development are low to moderate depending on the location of view as discussed in **Section 23**. |
| *(l) to encourage a strategic approach to coastal management* | The strategic context of the proposed development is considered in **Section 3** of this EA. |
| *a. existing public access to and along the coastal foreshore for pedestrians or persons with a disability should be retained and, where possible, public access to and along the coastal foreshore for pedestrians or persons with a disability should be improved* | The proposed development would not affect public access to the foreshore. Public access to the majority of active port areas is currently restricted. Public access is limited to the boat harbour and boat ramp, Heritage Park and Battery Museum only. The existing public access would be retained as part of the development. |
| *b. opportunities to provide new public access to and along the coastal foreshore for pedestrians or persons with a disability* | The nature of the port area and surrounding industrial development means that there are no new public access opportunities that would be affected by the proposed development. |
| *c. the suitability of development given its type, location and design and its relationship with the surrounding area* | **Section 2.3** of this EA addresses the relationship of the proposed development with surrounding land uses. The proposed development is entirely suitable for the proposed location within an existing port and industrial related environment. |
| *d. any detrimental impact that development may have on the amenity of the coastal foreshore, including any significant overshadowing of the coastal foreshore and any significant loss of views from a public place to the coastal foreshore* | No detrimental impact on the amenity of the coastal foreshore is envisaged. This stretch of coastal foreshore has limited public access and has been highly modified and significantly impacted by surrounding port and industrial activities. |
| *e. the scenic qualities of the New South Wales coast, and means to protect and improve these qualities* | The potential impacts of the proposed development upon the scenic quality of the landscape are discussed in **Section 23** of this EA. |
| *f. measures to conserve animals (within the meaning of the Threatened Species Conservation Act 1995) and plants (within the meaning of that Act), and their habitats* | An assessment of the potential impacts of the proposed development upon native flora and fauna is detailed in **Section 16**. |

| Clause 8 Matters for Consideration | Comment or Reference in EA |
|---|---|
| *g. measures to conserve fish (within the meaning of Part 7A of the Fisheries Management Act 1994) and marine vegetation (within the meaning of that Part), and their habitats* | An assessment of the potential impacts of the proposed development on aquatic flora and fauna are discussed in **Section 16**. |
| *h. existing wildlife corridors and the impact of development on these corridors* | No existing wildlife corridors would be affected. The potential ecological impacts of the proposed development are discussed in **Sections 16** and **17**. |
| *i. the likely impact of coastal processes and coastal hazards on development and any likely impacts of development on coastal processes and coastal hazards* | The impact of the proposed development on coastal processes and coastal hazards is addressed in **Section 15**. The proposed Outer Harbour development layout was selected from a range of layout options to minimise impacts from coastal processes which is also discussed in **Section 4.** |
| *j. measures to reduce the potential for conflict between land-based and water-based coastal activities* | The proposed development creates compatibility between land and marine based activities in the Outer Harbour and surrounding industry and road and rail infrastructure. Mitigation measures have been proposed to reduce potential conflict between port related activities and public recreational activities both land and water based. |
| *k. measures to protect the cultural places, values, customs, beliefs and traditional knowledge of Aboriginals* | The potential impacts of the proposed development upon Aboriginal cultural heritage are discussed in **Section 24** of this EA. |
| *l. likely impacts of development on the water quality of coastal waterbodies* | The potential impacts of the proposed development upon water quality are discussed in **Section 14** of this EA. |
| *m. the conservation and preservation of items of heritage, archaeological or historic significance* | The potential impacts of the proposed development upon items of heritage, archaeological or historic significance are discussed in **Section 24** of this EA. |
| *n. only in cases in which a development application in relation to proposed development is determined:*<br>• *the cumulative impacts of the proposed development on the environment, and*<br>• *measures to ensure that water and energy usage by the proposed development is efficient.* | The cumulative impacts of the proposed development are discussed in **Section 28** of this EA.<br>The use of water and energy by the proposed development is detailed in **Section 25** of the EA. |

## 7.4 Regional Environmental Plans and Strategies

As of 1 July 2009, regional environmental plans, referred to generally as REPs, are no longer part of the hierarchy of environmental planning instruments in NSW. This process is described through *State Environmental Planning Policy (Repeal of REP Provisions) 2009 (SEPP)*, also see DoP Planning Circular PS 09-014. Accordingly, Illawarra REP described in the following section is deemed to be a SEPP under the new Division 2, Part 3 of the *EP&A Act.*

### 7.4.1 Illawarra Regional Environmental Plan

The aim of the *Illawarra Regional Environmental Plan* (REP) is to maximise the opportunities for the people of the region and the State to meet their individual and community economic and social needs. Part 10 of the REP has specific provision related to *Ports and Harbours*. Specifically part 10 has an objective:

> *to strengthen and expand the existing economic and functional roles of the port of Port Kembla.*

Part 10 of the REP also has specific principles of relevance to the Outer Harbour, including:

> *A strategy plan for the utilization of the port of Port Kembla, including the Outer Harbour, should be developed as a matter of priority.*

Since the gazettal of the REP in the 1990's, strategic planning has continued with the ongoing inclusion of the Outer Harbour as an identified future development need. The Illawarra Regional Strategy 2006 - 2031 and the Port Kembla Land Use Review Strategy (finalised in 2007) discussed below are two key examples of this continued strategic support for the development of the Outer Harbour.

The proposed Outer Harbour development is consistent with the need identified by the REP and ongoing strategic planning. The proposed project would enable PKPC to continue to strengthen the economic and functional roles of the Port.

### 7.4.2 Illawarra Regional Strategy 2006 - 2031

The *Illawarra Regional Strategy* 2006 – 2031 released in January 2007 represents an agreed NSW Government position on the future of the Illawarra region in terms of infrastructure investment, settlement and environmental outcomes.

The *Illawarra Regional Strategy* 2006 – 2031 identified the Port Kembla Precinct (including the Outer Harbour) as regionally significant employment lands and recognised that the growth of port activities will be an important source of employment and economic activity.

The proposed Outer Harbour development aims to contribute to the continued growth of the Port to provide a significant contribution to the economy of the region.

### 7.4.3 Port Kembla Land Use Review Strategy

The *Port Kembla Land Use Review Strategy* that was finalised in 2007 was a collaborative strategy prepared by SKM on behalf of PKPC, Wollongong City Council (WCC) and the DoP. The strategy provides:

> *a planning and policy framework to capitalise on the opportunities presented by the Port of Port Kembla in terms of contributing to the economic sustainability of Wollongong and the Illawarra/South Coast Region.*

The strategy refers to the strategic planning context of all aspects of the Port including the Outer Harbour which is seen as an area of high potential for future growth in trade through wharf and terminal infrastructure upgrades. A specific objective for the Outer Harbour is:

> *To develop the Outer Harbour as a major new wharf and terminal complex utilising existing assets and infrastructure, and through the reclamation project, to handle a diversity of cargo types.*

## 7.5 Local Environmental Plans

### 7.5.1 Wollongong Local Environmental Plan 1990

The proposed development would be carried out on land that is part zoned 5 (a) Special Uses - Port and 'unzoned' (the Harbour waters) under *Wollongong LEP 1990* (LEP 1990).

Development for the purpose of a port is permissible with development consent in zone 5 (a) Special Uses - Port. In relation to unzoned land, Part 3, Clause 10(1)(e) of LEP 1990 states that:

> "*development of land not identified as being within a particular zone…may be carried out only with development consent".*

Accordingly, the proposed Outer Harbour development is permissible with development consent from Wollongong Council.

However, since the project is declared to be a project to which Part 3A applies, SEPP (Major Development) overrides the Wollongong LEP and project approval (for both Concept Plan and Major Project) will be required from the Minister for Planning.

## 7.6 Development Control Plans

There are no relevant development control plans that apply to the Outer Harbour area of the Port.

# 8.0 Consultation and Identification of Issues

## 8.1 Consultation Approach

The community and stakeholder engagement for the proposed Outer Harbour development is designed to build effective and sustainable relationships between PKPC and the project stakeholders, including the community.

The community and stakeholder consultation strategy was designed to be undertaken in two phases of engagement. In summary, phase one informed and engaged targeted community representatives and stakeholders. Information was provided on the Master Plan and project scope and approval process including outlining the opportunities to provide feedback during public exhibition of the EA. Additionally, phase one engagement sought feedback for consideration in the development of the EA.

Phase two seeks community and stakeholder feedback upon public exhibition of the completed EA. This phase includes the provision of information, and opportunities for community and stakeholders to engage with project team members and provide feedback.

### 8.1.1 Phase One Engagement

Phase one engagement presented information, in the form of a Planning Focus Meeting, an industry forum and a briefing, to stakeholders and the community regarding:

- Project definition and objectives.
- Brief summary of the Master Plan features and the staged approval process.
- The Part 3A approval process – including opportunities for community and stakeholder input into the EA.
- Preliminary EA findings / base data.
- Relationship between Concept Plan and Major Project applications.

Phase one engagement sought targeted community and stakeholder feedback on:

- Master Plan features / Concept Plan / Major Project.
- Considerations and opportunities.
- Potential impacts and impact mitigation strategies.

### 8.1.2 Phase Two Engagement

Phase two engagement will use a range of methods to encourage consultation with the community and stakeholders, including a community information session and newsletters. Phase two engagement will present the EA for public exhibition providing information on:

- Master Plan features / Concept Plan / Major Project.
- EA process.
- EA investigation findings.
- Impact mitigation strategies.
- Next steps.

Phase two engagement will seek community and stakeholder feedback on:

- Proposed development.
- EA outcomes.
- Impact mitigation.

### 8.1.3 Consultation Objectives

The community and stakeholder participation aims to:

- Progress dialogue with the community and key stakeholders regarding the features and benefits of the proposed development, potential impacts and impact mitigation strategies, opportunities and considerations.
- Continue the project's emphasis on two-way communication providing accurate information and gathering feedback from stakeholders and the community.
- Contribute to a robust Part 3A assessment which demonstrates transparent and meaningful consideration of feedback gained during community and stakeholder consultation, both during preparation of the Part 3A application and the public exhibition.

### 8.1.4 Stakeholder Groups

Four categories of stakeholders have been identified for consultation engagement:

- Government agencies and authorities.
- Interest groups.
- Local industry and business.
- Residents located adjacent to the development (properties located south of Five Islands Road) and all residents in Port Kembla.

The engagement undertaken to date with specific representatives for each of these stakeholder groups is outlined in **Table 8-1.**

**Table 8-1: Engagement to Date with Key Stakeholders**

| Category | Group | Attended Planning Focus Meeting | Consulted in relation to DGR's | Attended PKPC Industry Forum | Invited to August 6 2009 Briefing | Attended August 6 2009 Briefing | Target for Phase Two Consultation |
|---|---|---|---|---|---|---|---|
| Government Agencies and Authorities | Department of Environment, Climate Change and Water (formerly Department of Environment and Climate Change) | ■ | ■ | | ■ | ■ | ■ |
| | Australian Quarantine and Inspection Service | | | ■ | ■ | | ■ |
| | Australian Customs Service | | | ■ | ■ | | ■ |
| | Wollongong City Council | ■ | | ■ | ■ | ■ | ■ |
| | Department of Primary Industries Fisheries | ■ | ■ | | ■ | | ■ |
| | NSW Maritime | ■ | | ■ | ■ | | ■ |
| | Roads and Traffic Authority | ■ | ■ | ■ | ■ | | ■ |
| | Department of Planning | ■ | ■ | | ■ | | ■ |
| | RailCorp | ■ | ■ | | ■ | | ■ |
| | Australian Rail Track Corporation | | ■ | ■ | ■ | | ■ |
| | Port Kembla Water Police | | | ■ | | | |
| | Regional Development Australia | | | ■ | | | |

| Category | Group | Attended Planning Focus Meeting | Consulted in relation to DGR's | Attended PKPC Industry Forum | Invited to August 6 2009 Briefing | Attended August 6 2009 Briefing | Target for Phase Two Consultation |
|---|---|---|---|---|---|---|---|
| | Wingecarribee Shire Council | | | ■ | | | |
| | Minister for Ports and Waterways | | | ■ | | | ■ |
| | Sydney Water | | ■ | | | | ■ |
| | Integral Energy | | ■ | | | | ■ |
| Interest Groups | Port Kembla Harbour Environment Group (PKHEG) | | | ■ | ■ | ■ | ■ |
| | Port Kembla Pollution Meeting (PKPM) | | | ■ | ■ | ■ | ■ |
| | Illawarra Residents Against Toxic Environments (IRATE) | | | | ■ | | ■ |
| | Port Kembla Heritage Park | | | ■ | ■ | | ■ |
| | Port Kembla Community Project | | | | ■ | | ■ |
| | Port Kembla Surf Life Saving Club | | | | ■ | | ■ |
| | Southern Ocean Seabird Association | | | | ■ | | ■ |
| | Breakwater Battery Military Museum | | | | ■ | | ■ |

| Category | Group | Attended Planning Focus Meeting | Consulted in relation to DGR's | Attended PKPC Industry Forum | Invited to August 6 2009 Briefing | Attended August 6 2009 Briefing | Target for Phase Two Consultation |
|---|---|---|---|---|---|---|---|
| | The Mission to Seafarers | | | | ■ | | ■ |
| | Wollongong Transport Coalition | | | | ■ | ■ | ■ |
| | Conservation Volunteers Australia | | | | ■ | | ■ |
| Industry and Business | Metal Manufacturers Ltd | | | | ■ | | ■ |
| | Orrcon Operations | | | | ■ | ■ | ■ |
| | Morgan Cement | | | | ■ | | ■ |
| | Brick and Block | | | | ■ | | ■ |
| | Pacific National | | | ■ | ■ | | ■ |
| | BHP Billiton CRM | | | ■ | ■ | ■ | ■ |
| | CMA Recycling | | | | ■ | ■ | ■ |
| | Brailey's Transport | | | | ■ | ■ | ■ |
| | Bulktrans | | | | ■ | | ■ |
| | Mannway Transport and Distribution | | | | ■ | | ■ |
| | Murrells Transport | | | | ■ | | ■ |
| | Manilda Park Petroleum | | | | ■ | | ■ |
| | Nationwide Transport Ltd | | | | ■ | | ■ |
| | Brambles | | | | ■ | | ■ |
| | Heggies Bulkhaul | | | | ■ | | ■ |

| Category | Group | Attended Planning Focus Meeting | Consulted in relation to DGR's | Attended PKPC Industry Forum | Invited to August 6 2009 Briefing | Attended August 6 2009 Briefing | Target for Phase Two Consultation |
|---|---|---|---|---|---|---|---|
| | Orica Chemnet | | | | ■ | | ■ |
| | Port Kembla Chamber of Commerce | | | | ■ | | ■ |
| | BlueScope Steel | | | ■ | ■ | ■ | ■ |
| | Port Kembla Coal Terminal | | | ■ | ■ | ■ | ■ |
| | GrainCorp Operations Ltd | | | | ■ | | ■ |
| | Port Kembla Gateway | | | ■ | ■ | ■ | ■ |
| | Australian Steel Mill Services | | | | ■ | | ■ |
| | Svitzer Australia | | | ■ | ■ | | ■ |
| | P & O Stevedoring | | | | ■ | | ■ |
| | Patrick Stevedoring | | | ■ | ■ | | ■ |
| | Ralyn Shipping Pty Ltd | | | | ■ | | ■ |
| | Inchcape Shipping Services | | | | ■ | | ■ |
| | Wilhelmsen Ship Services | | | | ■ | | ■ |
| | Hetherington Kingsbury Shipping Agency | | | | ■ | | ■ |
| | Swire | | | ■ | ■ | ■ | ■ |
| | South Coast Labour Council | | | | ■ | | |
| | Illawarra Business Chamber | | | | ■ | | ■ |
| | Australian Amalgamated Terminals | | | | ■ | | ■ |
| | Illawarra Stevedores Pty | | | | ■ | | ■ |

| Category | Group | Attended Planning Focus Meeting | Consulted in relation to DGR's | Attended PKPC Industry Forum | Invited to August 6 2009 Briefing | Attended August 6 2009 Briefing | Target for Phase Two Consultation |
|---|---|---|---|---|---|---|---|
| | BIS Industrial Logistics | | | | ■ | ■ | |
| | PrixCar Services | | | ■ | | | |
| | Shipping Australia | | | ■ | | | |
| | Eastern Iron Ltd | | | ■ | | | |
| | Federal Chamber of Automotive Industries (FCAI) | | | ■ | | | |
| | Port Kembla Copper | | | | ■ | ■ | |
| | FALCON | | | ■ | | | |
| | Oceanlinx Ltd | | | ■ | | | |
| | John Holland Rail | | | ■ | | | |
| | Wallenius Wilhelmsen Logistics | | | ■ | | | |
| | Wallarah Minerals Pty Ltd | | | ■ | | | |
| | Australia Amalgamated Terminals | | | ■ | | | |
| | Coalworks | | | ■ | | | |
| | Australian Industry Group | | | ■ | | | |
| | Asiaworld Shipping Services | | | ■ | | | |
| | Peabody | | | ■ | | | |
| | Cement Australia | | | ■ | | | |

| Category | Group | Attended Planning Focus Meeting | Consulted in relation to DGR's | Attended PKPC Industry Forum | Invited to August 6 2009 Briefing | Attended August 6 2009 Briefing | Target for Phase Two Consultation |
|---|---|---|---|---|---|---|---|
| | Seaway | | | ■ | | | |
| | Gulf Agency Company | | | ■ | | | |
| | Independent Print Media Group | | | ■ | | | |
| | K Line Australia | | | ■ | | | |
| | Centennial Coal | | | ■ | | | |
| | Sutherlands Transport | | | ■ | | | |
| | Graincorp | | | ■ | | | |
| | Wollongong Game Fishing Club | | | | | | ■ |
| | Wollongong Sports Fishing club | | | | | | ■ |
| Local Residents located south of Five Islands Road | | | | | | | ■ |
| All residents in Port Kembla post code (2505) | | | | | | | ■ |

## 8.2 Government Agency Consultation

### 8.2.1 Government Agency Consultation - General Consultation

Government agency consultation for this project commenced with a Planning Focus Meeting on 27th November 2008. Agencies represented included DPI - Fisheries, NSW Maritime, the then DECC (now DECCW), RTA, DoP, RailCorp and WCC.

Subsequent meetings were held with various departments from March through November 2009. **Appendix A** provides a summary of meeting minutes. Issues identified through Government agency consultation have been included in the Key Issues table (**Table 8-2**) which also provides direction to relevant sections of the EA where each issue is addressed.

## 8.3 Community and Stakeholder Consultation

A detailed description of the communications and consultation tools used to inform and engage the stakeholders and community during the project is outlined below.

**Project Information Line**

A community information line is operated from PKPC's offices, staffed weekdays from 9am to 5pm for telephone enquiries or comments on the proposed development. The phone number is included in printed materials relating to the proposed development.

**Email Enquiries**

An email address for project enquiries or comments has been established and is included in printed materials relating to the proposed development.

**Project Website**

Information regarding the proposed development is posted on the PKPC website. It displays relevant and regularly updated project information.

**Phase One Engagement - PKPC Industry Forum**

PKPC hosted an Industry Forum on Friday 27 March 2009 bringing together 53 attendees comprised of port users, community representatives and stakeholders (**Table 8-1**). The aim of the forum was to look at ways in which PKPC can work in collaboration and cooperation with customers, stakeholders and the community for the future growth and development of the Port.

A number of presentations were given to address topic areas and issues as identified in a customer survey. Working group sessions were undertaken in order to initiate discussion and gain valuable feedback regarding whole of port issues. Details of the meeting including a summary of the workshops and general comments from participants are presented as **Appendix A**.

Issues identified through the PKPC Industry Forum have been included in the Key Issues table (**Table 8-2**) which also provides direction to relevant sections of the EA where each issue is addressed.

**Phase One Engagement - Stakeholder and Community Project Briefing**

On Thursday August 6 2009 a briefing was held at the Port Kembla Training and Conference Centre on Foreshore Road, Port Kembla. Fifty eight stakeholders and community representatives were invited to attend, as outlined in **Table 8-1**. The meeting was attended by 19 respondents comprising 12 local businesses, representatives from WCC, DECCW and three individuals representing individual community interest groups.

Project team members presented an overview of the Master Plan, described the EA process and outlined the key studies that are being conducted. The attendees were asked to provide their feedback on potential environmental impacts and mitigations in preparation for the EA. A discussion period followed the presentation and a feedback form was provided to all attendees.

Briefing attendees were encouraged to provide their views by participating in the post-briefing discussion or by returning the feedback form to the project team. Nine completed feedback forms were returned.

Issues identified through the Stakeholder and Community Project Briefing have been included in the Key Issues table (**Table 8-2**) which also provides direction to relevant sections of the EA where each issue is addressed.

**Phase Two Engagement – Public Exhibition of EA**

The next phase of consultation will commence with the public exhibition of the EA. It will include the provision of information, engagement with project team members and opportunities for community and stakeholders to provide feedback. In addition, this phase will include the preparation of a submissions report which will accurately collate submissions received during the exhibition period by identifying key issues and trends and providing co-ordinated responses to these issues.

The range of activities for the display and consultation during the public exhibition of the EA include:

- Advertisements – placed in local papers will advise stakeholders and community members of the EA display and encourage participation.
- Staffed community information session – will provide community members with the opportunity to interact with the project team and to discuss issues and provide feedback.
- Feedback form – a structured form to capture issues and feedback will be made available to the community and stakeholders.
- Community information sheet – will be distributed to the neighbouring community advising of the EA exhibition and encouraging participation.
- Media release – will be developed for the local media outlets.
- Updates to the website – will include details of the EA display and feedback mechanisms.

## 8.4 Key Issues Summary

A summary of the key issues raised during the community and stakeholder consultation undertaken to date for the Outer Harbour development is provided in **Table 8-2** below.

**Table 8-2: Key Issues Summary**

| Category | Issues Summary | EA Reference |
|---|---|---|
| **Functional** | | |
| **Traffic and Transport** | Impact on arterial road usage during construction, due to transportation of fill materials, and post development as containers will be transported via road versus rail | Potential impacts on arterial road usage during construction and operation are summarised in **Section18** Traffic and Transport and detailed in **Appendix I**. |
| | Road safety and large vehicle access may be further compromised at Downie's Bridge located on old Port Road. | Refer to **Section 8** below- Consultation and Identification of Issues<br>Construction and operational traffic would be directed away from Downie's Bridge as discussed in **Section 18** Traffic and Transport |
| | Traffic diversion during construction along Flinders Street, a two-way road, rather than Five Islands Road | Traffic during construction is summarised in **Section 18** Traffic and Transport |
| | Ensure rail capacity is sufficient to meet future port capacity. Detailed rail network modelling required. Modal split could be considered. Assessment for Outer Harbour development should include growth in Inner Harbour over the next decade. Forecast to be 20-27 mtpa. | Rail network modelling results are discussed in **Section 19** Rail |
| | Potential to maximise utilisation of rail transport over road transport | Rail transport utilisation is summarised in **Section 18** Traffic and Transport and **Section 19** Rail |

| Category | Issues Summary | EA Reference |
|---|---|---|
| | Importance to community of completion of the Maldon Dombarton rail link in conjunction with the development | Maldon Dombarton rail link is discussed in **Section 19** Rail |
| | Potential disruption to existing rail siding at Port Kembla Gateway Jetty during construction | Potential for impact and mitigation measures associated with the new rail siding is summarised in **Section 19** Rail |
| **Port Operations** | Impact on Port tenants from reclamation activities | Potential impacts on Port tenants from reclamation would be addressed during consultation and is discussed in **Section 8** Consultation and Identification of Issues |
| | Impact of reclamation on restricting ship navigation | There would be no reclamation activities undertaken within the Port turning circle and the location of all dredging plant and equipment would be limited to the active dredging area. The timing of reclamation activities is discussed in **Section 5.6** Concept Plan Staging and **Section 6.4** Major Project Construction Staging |
| | Will the proposed berths compete against existing berths in the harbour e.g. bulk discharge and break-bulk facilities such as Berth 103 that are under utilised | Competition within the Port is addressed in **Section 5.13.6** Capacity within the Port |
| | Increase in ship traffic and risk of port blockage | Ship traffic is discussed in **Section 5.11.5** Shipping Traffic |
| | Construction timing and staging<br>Impact of development on Berth 201 | Staged development and timing is summarised in **Section 6.4** Major Project Construction Staging |
| **Utilities** | The power consumption and loading of the project need to be suitably estimated to ensure appropriate planning for future power requirements. | |
| **Environment** | | |
| **Contamination – Soils and Sediment** | Sediments within the Outer Harbour need to be characterised to appreciate the vertical and horizontal contamination. | Results of sediment and soil investigations are analysed in **Appendix B** and **Appendix C** and discussed in **Section 10** Contamination -Sediment and **Section 11** Contamination - Land Based |
| | Potential to use cutter suction dredging where contaminated sediments are transported via pipe to reclaimed areas without impacting human health or | Impacts of dredging contaminated sediments is discussed in **Section 10** Contamination -Sediment |

| Category | Issues Summary | EA Reference |
|---|---|---|
| | ecology. | |
| | Contamination study should demonstrate a review of previous studies. | Previous investigations are discussed in **Section 10** Contamination – Sediment and **Section 11** Contamination – Land Based |
| | Potential for re-contamination of sea bed during dredging. Requirement for management of emplacement area | Mitigation measures to minimise impact on the receiving environment of the Outer Harbour are addressed in **Section 10** Contamination -Sediment |
| | Extent and depth of dredging | Dredging is discussed in further detail in Section 6 Major Project, **Section 10** Contamination -Sediment and **Section 5.8** Dredging Overview |
| | Disposal of sediment, mud, rocks, spoil etc from reclamation | Disposal techniques are discussed in the mitigation measures in **Section 6** Major Project and **Section 10** Contamination - Sediment |
| | Management of acid sulfate soils and minimisation of oxidation | Potential for impact and mitigation measures associated with Potential ASS and Actual ASS are discussed in **Section 10** Contamination -Sediment and **Section 11** Contamination – Land Based |
| | Sediment plume control | Sediment and plume control is discussed in further detail in **Section 9** Topography, Geology, Soils and **Section 10** Contamination -Sediment summary and **Section 16** Aquatic Ecology |
| | Fill management – quality and quantities of fill material and containment of fill material including coal wash and slag. | Fill management is discussed in **Section 5** Concept Plan and **Section 6** Major Project |
| | Record keeping - Placement of fill material should be accurately recorded. Material safety datasheets to be provided as part of DECCW levy exemption application. | Documentation and record s pertaining to the use of imported fill material is discussed in **Section 10** Contamination – Land Based |
| | Project should identify how contaminants of potential concern are derived. Contaminants of concern include PAHs in emplacement area and metals in the general Outer Harbour area. Project should consider elutriate testing during dredging. | Sediment investigations and elutriate test results are discussed in the **Section 10** Contamination -Sediment and in **Appendix B**. |

| Category | Issues Summary | EA Reference |
|---|---|---|
| **Water Quality** | Impact on flood levels at Salty Creek | Potential for impacts on Salty Creek are discussed in **Section 14.5** Hydrology and Water Quality |
| | Potential impacts on aquatic ecology and water quality due to run-off, drainage and ballast water exchange. Potential to capture and reuse storm water runoff | Potential for impacts on water quality are discussed in **Section 14** Hydrology and Water Quality. Potential for impacts on aquatic ecology are discussed in **Section 16** Aquatic Ecology and detailed in **Appendix G**. |
| **Aquatic Ecology and Terrestrial Ecology** | Impact on existing aquatic habitat and species (such as sea horse and black cod) with provision for compensatory habitat or financial compensation if suitable compensatory habitat cannot be identified. | Impacts on aquatic habitat and species are discussed in **Section 16** Aquatic Ecology and detailed in **Appendix G**. |
| | Green and Golden Bell Frogs present in the area. Survey/study can be based on assumptions drawn from work already completed to help develop management protocols. | The potential impacts on the Green and Golden Bell Frogs (GGBF) are summarised in **Section 17** Terrestrial Ecology and a more detailed Species Assessment and GGBF Management Plan are provided in **Appendix H**. |
| **Hydrology** | Sea level rise and berth levels | Potential for impact associated with sea level rise is summarised in **Section 15.3** Coastal Hydrodynamic Processes and detailed in **Appendix F**. |
| | Effect of waves and swell in the Outer Harbour after the construction of the new berths | Potential for impact associated with wave climate within the Outer Harbour is summarised in **Section 15** Coastal Hydrodynamic Processes and detailed in **Appendix F**. |
| | Potential for tidal or wave energy | Potential to harness tidal or wave energy as part of this project is addressed in **Section 25** Sustainability |
| | Plan for deflecting North easterly swells to protect existing berths | Wave modelling results and mitigation measures are summarised in **Section 15** Coastal Hydrodynamic Processes and detailed in **Appendix F**. |
| | Effect of dredging and staged dredging on Outer Harbour hydrology and flushing | Potential for impact on flushing and tidal discharge with the Port associated with the Outer Harbour development is summarised in **Section 15** Coastal Hydrodynamic Processes and detailed in **Appendix F**. |

| Category | Issues Summary | EA Reference |
|---|---|---|
| **Sustainability** | | |
| **Climate and Air Quality** | Potential increase in CO2 emissions due to transport required during construction and operation | Emission reduction measures are discussed in **Section 22** Air Quality |
| | Effects of climate change in reference to sea levels and height of the break water, and terminal design | Potential for impacts associated with climate change are discussed in **Section 25** Sustainability and **Section 15** Coastal Hydrodynamic Processes |
| | Need for EA to include a qualitative assessment of emissions | A qualitative air quality assessment is presented as **Section 22** Air Quality. |
| | Need for dust control measures during construction | Mitigation measures for dust control are summarised in **Section 22** Air Quality |
| | Potential impacts of providing fill for the reclamation on energy use, GHG emissions and external costs (e.g. transport) | Potential for impacts on energy use and GHG emissions is summarised in **Section 25** Sustainability. |
| **Waste Management** | Waste management will increase and require additional resources on a regular basis | Waste management is summarised in **Section 27** Waste Management |
| **Social Impact** | | |
| Land Use and Social Impact | Concern that the perimeters of development are in close proximity to a residential area and could encroach on commercial and residential sections (e.g. Military Rd) | A visual impact assessment is included in **Section 23** Landscape and Visual Amenity and detailed in **Appendix L**. |
| | Status of NSW Maritime's transfer of land ownership to PKPC | The transfer of land ownership is addressed in **Section 2.4** |
| Noise and Vibration | Potential impact on local community for increased noise and vibration particularly if rock blasting is required. Rock blasting should be included in the noise assessment. | Potential impacts for increased noise and vibration and the issue of rock blasting is summarised in **Section 21** Noise and Vibration and detailed in **Appendix J**. |
| | Ships idling at berths should be included in the assessment. | Potential impacts from increased noise and vibration is summarised in **Section 21** Noise and Vibration and detailed in **Appendix J**. |
| | Rail noise associated with operation of trains in the vicinity of the Outer Harbour should be included in the assessment. | Potential impacts from increased noise and vibration is summarised in **Section 21** Noise and Vibration and detailed in **Appendix J.** |
| **Landscape and Visual Amenity** | Landscape and visual amenity will be changed by development | Potential impacts on landscape and visual amenity associated with the Outer Harbour development is summarised in **Section 23** Landscape and Visual Amenity |

| Category | Issues Summary | EA Reference |
|---|---|---|
| | Recreational fishing and boating – maintaining existing access and facilities and reviewing opportunity for improvements such as providing a dry boat storage. | Potential impacts associated with maintaining existing recreational facilities is discussed in **Section 20** Socio-Economic and **Section 6.6.15** Public recreation areas and boating harbour. |
| **Approval Process** | Length and timing of EA exhibit period should allow for appropriate community engagement by not being scheduled over holiday breaks. Request that the public exhibition period be extended to 60 days. | This would be discussed with DoP. Refer to **Section 8.2.1** Government and Agency Consultation. |
| | Maintain ongoing communications and engagement with community and stakeholders regarding developments | This would be undertaken as part of the Community and Stakeholder Consultation (refer **Section 8.3** for discussion). |

## 8.5 Key Issues Themes

The following provides a synopsis of themes raised during phase one of the community and stakeholder consultation. Key issues have been grouped into the areas of:

- Functional.
- Environment.
- Sustainability.
- Social impact.

**Functional**

Functional issues raised in the consultation process included a focus on issues pertaining to road and rail transport and traffic management, as well as Port operations.

Comments regarding traffic and transport focused on the current and future capacity of the local and regional roads and rail infrastructure. In particular, the impact on arterial road usage during and after construction was noted as a potential concern as was the need to ensure rail capacity is sufficient to meet future port capacity and is preferably utilised over road transport.

Road safety concerns included large vehicle access at Downie's Bridge on Old Port Road during construction and the proposed diversion of traffic along Flinders Street versus Five Islands Road.

Regarding ship traffic in the port, the impact of the reclamation on restricting ship navigation was mentioned as was the risk of port blockages due to increased ship traffic.

Concerns regarding Port operations included questions about the impacts of reclamation on tenants' occupancy during activities to be undertaken as part of the Major Project and restriction of ship navigation. Questions were also raised regarding the type and function of new berths and the risk of port blockage caused by increasing ship traffic.

Local utility providers' concerns included the need to estimate power consumption and loading and water requirements for the total project early in project planning to gain an appreciation of likely future services requirements. It was noted that planning for new infrastructure early in project planning will enable adequate time to install new infrastructure, if required, prior to the commencement of operations.

Another concern was that the utilities estimates are well defined and as accurate as possible to ensure new infrastructure will adequately meet the future need and does not fall short or conversely greatly exceed the actual demand.

**Environment**

Key environmental themes raised during consultation questioned the project's ability to manage potential impacts and mitigation of contamination, water quality, aquatic and terrestrial ecology and hydrology.

The potential for re-contamination of the sea bed as a result of dredging was raised and questions were posed regarding the appropriate dredging methodology including the extent, staging, and depth of dredging. Stakeholders requested details of the proposed disposal of sediment, mud, rocks etc. from the reclamation as well as the measures to be taken during dredging to control sediment in the Outer Harbour.

Contaminants of concern included PAHs in the emplacement area and metals in the wider Outer Harbour area. Stakeholders expressed interest in understanding the project's approach to the management and containment of fill and spoil.

The potential impacts due to run-off, drainage and ballast water exchange were raised along with concerns regarding the impact on and compensatory provisions for existing aquatic habitats and species.

The effect of dredging on the Outer Harbour hydrology was raised as were concerns regarding wave action and swells during the reclamation and post construction period.

**Sustainability**

Consultation identified stakeholders' interest in the project's sustainability performance, including its response to climate change, air quality, energy use and waste management.

Stakeholders discussed the project's footprint questioning the amount and type of fill required for reclamation and potential impacts of providing fill on energy use, greenhouse gas (GHG) emissions, and external costs – e.g. transport. Waste management was viewed as an area requiring adequate resourcing.

Some stakeholders also questioned the potential for the project to result in an increase in emissions during construction and operation. The opportunity for the EA to include a qualitative assessment of emissions was suggested.

Discussions regarding the potential for construction to decrease air quality led to suggestions that dust control measures be applied, particularly along Port Kembla Gateway rail siding.

The broader issue of climate change was also discussed by some stakeholders who raised concerns regarding the project's consideration of potential rising sea levels and height of the breakwaters.

**Social**

Social issues discussed in consultation included land use, noise and vibration, landscape and visual amenity and an expectation for ongoing consultation during the approval process.

Participants voiced concern that the perimeters of development are in close proximity to a residential area and could encroach on landscape and visual amenity. Additionally noise and vibration impacts are perceived to have the potential to impact on existing commercial and residential areas and their amenity. This is due to works such as rock blasting during construction and noise of port operations and increased traffic post development.

Social impacts and their effective management are a high priority for the local community. Participants in consultation to date have requested ongoing communication and provision for meaningful and timely engagement through a robust public exhibition phase.

## 8.6 Conclusions

Early targeted stakeholder consultation has contributed to the development of this EA. Community and stakeholder feedback on functional, environment, sustainability and social issues have been addressed in the EA as shown in **Table 8-2**.

The next phase of community consultation will continue to support and encourage public participation in the project's environmental assessment process. Phase two communication and consultation tools during and post the public exhibition of the EA will inform members of the community and stakeholders about the project's scope and impacts and impact mitigation strategies. Phase two will provide direct contact with the project team and encourage feedback and submissions.