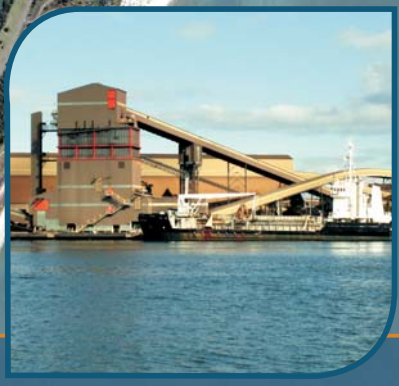
Newcastle Port Corporation



Capital Strategic Dredging Project, South Arm, Hunter River

Environmental Impact Statement

Volume 1

March 2013

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Glossary

Term	Definition
Acid Sulfate Soils	Soils and sediments containing iron sulfides, the most common being pyrite. When exposed to air due to drainage or disturbance, these soils can oxidise to produce sulfuric acid, often stripping out toxic quantities of iron, aluminium and heavy metals from the host sediment.
Advection-diffusion relationship	Relationship between the two main transport methods within fluids (for parameters such as salinity) due to the motion and concentration gradients of the fluid.
Ancillary dredging	Associated dredging undertaken to widen the shipping channel between the proposed berth sites and the existing shipping channel.
Anoxia	A total decrease in the level of oxygen.
Aquatic	Living in or on water, or concerning water.
Aquifer	An aquifer is a wet underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, or silt).
Arbitrary conservative constituent	A theoretical pollutant used to model dispersal.
Arterial Roads	Main (heavily used) roads used to travel between key centres.
Astronomical tide	The tidal levels and character which would result from gravitational effects, e.g. of the Earth, Sun and Moon, without any atmospheric influences.
Attenuation	Refers to the reduction in strength of something (such as noise, light, concentrations of metals).
Auxiliary spud	A component of a dredge ship lowered to the sea floor and used to manoeuvre the ship to a new starting position.
Ballast	Any solid or liquid that is brought on board a vessel to regulate the stability of the vessel.
Barge	A long, usually large, flat-bottomed boat that will be used to transport spoil for offshore dumping.
Bathymetric surveys	A survey that measures the depth of a water body from the water surface to river bed level, at various locations. A profile of the bed levels can be created from a bathymetric survey.
Batters	A slope of soil or rock fill (such as on either side of a road or rail embankment).
Batter failure	Instability of an embankment leading to deterioration or potential collapse of the batter slope. Most bearing capacity failures occur under stress and lead to tilting and sudden catastrophic type movement.

Term	Definition
B-Double routes	A B-Double is a type of haulage truck, B-Double routes are the approved routes these vehicles take during transport of material.
Beach renourishment	A method of replacing sand lost from beaches due to erosion and longshore drift.
Beam	The beam is a nautical term which refers to the point that is at the widest part of the ship. It is also referred to the point midway between the bow and the stern.
Benthic organisms	Living organisms such as crabs, worms, corals, sponges and snails that live, in this case, on the sea floor.
Benthic zone	The ecological region at the lowest level of a water body (such as ocean, lake).
Berth	A place assigned to a ship at mooring.
Bioavailability	The proportion of a nutrient or substance that can be taken up by an organism in a biologically effective form. For example, some soils high in phosphorus have a low level of phosphorus availability because the pH of the soil renders much of the phosphorus insoluble.
Biofuels	Any fuel made from recently living organisms or their by-products (such as oils from plants, manure from cows). It is a renewable energy source.
Bulk Cargo	Transport of large quantities of goods.
Bulk Liquids	Transport of large volumes of liquids.
Bunds	Containment built around liquid storage areas.
Carriageway	A roadway with a number of lanes of traffic, within a road corridor.
Channel bathymetry	The measurement of the depth of bodies of water.
Chlorophyll-a	Chlorophyll is made up of a group of pigments found in plants. Different forms of chlorophyll are distinguished by their chemical structure and bind to the light-absorbing proteins specific to plants, algae or bacteria. Chlorophyll-a is a blue-black plant pigment and is found in most forms of plants and algae.
Cohesion	The force that holds together the atoms or molecules in a solid or liquid.
Concept plan	Initial functional plan of a concept, to provide a level of understanding to later establish detailed design parameters.
Constraints	Limitation or restriction.
Construction Environmental Management Plan	A document setting out the management, control and monitoring measures to be implemented during construction of a development, to avoid or minimise the potential environmental impacts identified during an environmental impact assessment process.

Term	Definition
Cores	A sample of earth, mineral, or rock extracted from the ground.
Critical Habitat	Areas of habitat that are crucial to the survival of a species and essential for its conservation.
Cumulative impact	The sum on the environment resulting from the successive effects of several different impacts.
Cutter head	A rotary digging device which dislodges and feeds alluvial sand or gravel to the intake of a suction dredge.
Deposition	Geological process by which material is added to a landform or land mass. Fluids such as wind and water, as well as sediment flowing via gravity, transport previously eroded sediment.
Dewatering	The removal of water from an area by means such as pumping, evaporation or draining. Commonly used to extract groundwater or surface water from construction sites and mine shafts.
Director Generals Environmental Assessment Requirements	Requirements for an environmental assessment issued by the Director General of the NSW Department of Planning in accordance with the Environmental Planning and Assessment Act 1979.
Dispersion	Mixture in which fine particles of one substance are scattered throughout another substance (such as soil in water).
Dissolved oxygen	A relative measure of the amount of oxygen that is dissolved or carried in a given medium (usually water).
Draghead	The draghead is a steel structure that is connected to the dredge vessel by a suction pipe or drag arm. The dredge drag head agitates material and the suction pipe sucks a hydraulic mixture of water and sand from the sea floor.
Dredge	A vessel or barge fitted with machines (bucket ladder, grab or suction dredging machinery) for underwater excavation.
Dyke	An embankment or wall built to confine a river to a particular course.
Ecological communities	A group of actually (or potentially) interacting species living in the same place. A community is bound together by the network of influences that species have on one another.
Ecologically Sustainable Development	Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.
Ecosystem	An interacting system of animals, plants, other organisms and nonliving parts of the environment.
Ecotoxicity	Study of toxic effects, caused by natural or synthetic pollutants, on biological organisms, especially at the population, community, ecosystem level.

Term	Definition
EIS	Environmental impact statement. An environmental impact assessment document prepared in accordance with the requirements of the *Environmental Planning and Assessment Regulation 2000*. An EIS is a requirement of the NSW state significant assessment system.
Elutriate testing	Samples are submitted for elutriate testing to assess potential impacts to water quality due to the presence of elevated concentrations of metals in sediment.
Endangered	A population of organisms which is at risk of becoming extinct because it is either few in numbers, or threatened by changing environmental or predation parameters.
Erosion	A natural process where wind or water detaches a soil particle and provides energy to move the particle.
Estuarine	Growing in, inhabiting, or found in an estuary.
Estuary	A partly enclosed coastal body of water with one or more rivers or streams flowing into it, and with a free connection to the open sea.
Extractive Activities	Activities concerned with the removal of natural resources.
Fauna	The animals of a given region or period, taken collectively.
Fill	Earth used to construct an embankment.
Flood	The inundation of land that is normally dry through the overflowing of a body of water (such as a river).
Flora	Plants of a particular region which make up the vegetation of the site.
Fluidised	The process through which solid particles are changed to a fluid-like state, and behave as a fluid.
Geochemical	Study of the chemical composition of the earth.
Geometric	Consisting of, formed by, or characterised by points, lines, curves, or surfaces.
Geomorphology	Study of landforms and the processes that shape them, and more broadly, the evolution of processes controlling the topography of the planet.
Geotechnical	A discipline of engineering associated with studying the ground/ subsurface condition and its suitability for the proposed work.
Greenhouse gases	Gases with potential to cause climate change (methane, carbon dioxide and non-methane volatile organic compounds). Usually expressed in terms of global warming potential carbon dioxide equivalent.
Groundwater	Subsurface water stored in pores of soil or rocks.

Term	Definition
Groundwater equilibrium	Where levels of groundwater are maintained through a balance of recharge and discharge.
Heat flux	The amount of heat transferred across a surface of unit area in a unit time.
Heritage	Covers all that we, as a society, value today and wish to pass on to future generations It includes language, customs, places and moveable collections).
Hopper dredge	A hopper dredge is a propelled floating vessel (ship) which is capable of dredging material, storing it on board, transporting it to a disposal area, and placing the material.
Hydraulic ram	A steel piston that pushes against a spud to move the cutter suction dredge forward. It is driven by a hydraulic fluid coupled to a pump via hoses.
Hydraulic slurry	A mixture of removed material and seawater.
Hydrocarbons	Any of numerous organic compounds, such as benzene and methane, that contain only carbon and hydrogen.
Hydrodynamics	The branch of science concerned with the movement of fluids, especially liquids.
Hydrogeology	The branch of geology that deals with the occurrence, distribution, and effect of ground water.
Hydrology	The study of rainfall and surface water run-off processes.
Impermeable	Not permitting water or other fluid to pass through. Also known as impervious.
Interface	A surface forming a common boundary between adjacent regions, bodies, materials, or phases.
Intermodal	Using different modes of transport in conjunction, such as ships, aircraft, road vehicles.
Intertidal zone	Region between the high tide mark and the low tide mark.
Isohalines	A line or surface drawn on a map or chart to indicate connecting points of equal salinity in the ocean.
Keel level	The principal structural member at the base of a ship, running lengthwise along the centre line from bow to stern, to which the frames are attached.
Key threatening process	A process specified in Schedule 3 of the Threatened Species Conservation Act 1995 that adversely affects threatened species, populations or ecological communities, or could cause those that are not threatened to become so.
Landside	Land within the Project area that borders the berths.
Leaching	The removal of soluble material from a substance, such as soil or rock, through the percolation of water. Organic matter is typically removed from a soil horizon and soluble metals or salts from a rock by leaching.

Term	Definition
Levee	Embankment built along a river to prevent flooding by high water.
Light attenuation	Light attenuation is the property of light that causes it to diminish in intensity with increasing distance from the source.
Longshore drift	Longshore drift consists of the transport of sediments (generally sand but may also consist of coarser sediments such as gravels) along a coast at an angle to the shoreline.
Macrofauna	Are benthic or soil organisms that are retained on a 0.5 mm sieve (animals visible to the naked eye).
Manifold	A chamber or pipe with a number of inlets or outlets used to collect or distribute a fluid.
Marine	A general term relating to the sea or ocean.
Mean	Another name for 'average'. The average is the result obtained by adding the numbers or quantities in a set and dividing the total by the number of members in the set.
Median	Median is a mathematical result that indicates that one half of the group is higher and one half lower. It is the middle number in a sorted list of numbers.
Meteorology	Scientific study of the atmosphere that focuses on weather processes and short term forecasting (such as temperature, air pressure, water vapour, and how they change in time).
Migratory species	The entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries.
Mitigation	Reduction in severity of potential adverse effects.
National heritage places	A place that is present on the National Heritage List. The Environment Minister (in consultation with the Australian Heritage Council) determines this list. The heritage values of each National Heritage place are protected (such as natural, indigenous or historic).
Noise affected level	The noise affected level represents the point above which there may be some community reaction to noise.
Nuclear actions	Activities which involve establishing or significantly modifying a nuclear installation, radioactive waste products, mining or milling uranium ores etc.
Oxidisation	To combine with oxygen (by adding oxygen to a compound with a loss of electrons).
pH	Is a measure of the acidity or basicity of an aqueous solution. Solutions with a pH less than 7 are said to be acidic and solutions with a pH greater than 7 are alkaline.

Term	Definition
pH_{FOX}	Refers to the pH of the soil sample after contact with hydrogen peroxide. Hydrogen peroxide oxidises or reacts with the iron pyrites in the soil to form sulphuric acid. Any pH drop shows the soil's potential to form sulfuric acid once disturbed and in contact with oxygen.
Port-side	On the waterfront of a port.
Prevailing wind	A wind that blows predominantly from a single direction.
Propeller wash	A rotating ship propeller generates a turbulent continuous stream of fast moving water (vessel-generated waves). This can disturb sediments, benthic vegetation and cause erosion.
Proponent	Newcastle Port Corporation (NPC).
Quadrant	A sampling unit (usually a square) used to collect comparable samples from areas of consistent size and shape. Quadrants are used to identify what kind of plants and animals are in a particular habitat.
Ramsar listed wetlands	Ramsar wetlands are those that are representative, rare or unique wetlands, or are important for conserving biological diversity. These are Wetlands of International Importance.
Rating Background Level (RBL)	The overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period (as opposed to over each 24 hour period used for the assessment background level). This is the level used for assessment purposes. It is defined as the median value of: ◗ All the day assessment background levels over the monitoring period for the day (7 am to 6 pm). ◗ All the evening assessment background levels over the monitoring period for the evening (6 pm to 10 pm). ◗ All the night assessment background levels over the monitoring period for the night (10 pm to 7 am).
Reclamation	The conversion of wasteland into land suitable for use of habitation or cultivation.
Remediation	The restoration of a landscape and especially the vegetation following its disturbance.
Revetment rock	A layer of stone, concrete, or other materials constructed on a sloping embankment or beach face to protect it against erosion caused by waves or currents.
Risk assessment matrix	Used in the Risk Assessment process; it allows the severity of the risk of an event occurring to be determined.
Saline intrusion	Movement of saline water into freshwater water. Most often, it is caused by ground-water pumping from coastal wells or from construction of navigation channels. It can also occur as a result of a storm surge.

Term	Definition
Salinity	The total content of dissolved solids in groundwater, commonly expressed as parts of dissolved solids per million parts of solution (ppm), or milligrams of dissolved solids per litre of solution (mg/L). The significance of salinity depends on its nature as well as the amount of the dissolved solids.
Scour	Seabed soil types and a combination of current, tidal and wave action combine to create an environment which leads to seabed sediment being lifted and transported. The result is the natural depletion of soil in one area and its accumulation in another. Scour can be exacerbated when relatively hard objects are placed on the seabed, such as pipelines, platforms, protection structures and cables.
Seaward	Directed or moving towards the sea.
Sediment	Material of varying sizes that has been or is being moved from its site of origin by the movement of wind, water or gravity.
Sedimentation	The act or process of depositing sediment.
Seismic	Subject to, or caused by an earthquake or earth vibration.
Sensitive receiver	An area or place potentially affected by noise or vibration which includes: ◗ A residential dwelling. ◗ An educational institution, library, childcare centre or kindergarten. ◗ A hospital, surgery or other medical institution. ◗ An active (sports field, golf course) or passive (e.g. national park) recreational area. ◗ Commercial or industrial premises.
Shallow-draft	Of vessels whose keel is not far below the waterline.
Sheet piled wall	Sheet pile walls are constructed by driving prefabricated sections into the ground. The full wall is formed by connecting the joints of adjacent sheet pile sections in sequential and continuous installation. Sheet pile walls provide structural resistance by utilising the full section.
Shoreward	Toward, to, or on the shore.
Side winches	A winch is a mechanical device that is used to pull in (wind up) or let out (wind out) or otherwise adjust the tension of a rope or wire rope.
Silt Curtain	Typically woven or non-woven polypropylene skirts with float and ballast assemblies used during the construction of wharf facilities and dredging operations to control sediments and minimise the potential for associated water quality impacts.
Simulations	The imitation of some real thing, state of affairs, or process. Simulation can be used to show the eventual real effects of alternative conditions and courses of action.

Term	Definition
Slag	An industrial by-product from the production of steel. Slag contains varying concentrations of heavy metals including lead, copper, zinc, arsenic, chromium and cadmium.
Sludge	Refers to the residual, semi-solid material left from industrial wastewater, or sewage treatment processes.
Spatial	Of, relating to, involving, or having the nature of space.
Spoil	Excess of earth materials resulting from excavation/ dredging activities.
Spring-neap cycle	A neap tide is a relatively low high tide, or a generally low tidal range between low and high tides. During the moon's first and fourth quarter, periods of neap tides are experienced, due to the way in which the sun and moon act on the Earth to create tides. The opposite of a neap tide is a spring tide, a strong tide which is extremely high or very low, creating a large tidal range.
Spuds	Large diameter piles that can be lowered or raised to hold a flooding vessel such as a dredge in position.
SSI	State Significant Infrastructure A specific assessment system under the *Environmental Planning and Assessment Act 1979* to make planning decisions on projects classed as State significant infrastructure (SSI). Major infrastructure proposals, in particular linear infrastructure such as roads, railway lines or pipes which often cross a number of council boundaries, will generally be considered as SSI. Development which doesn't require consent but which could have a significant environmental impact, such as a port facility or major water supply system, is also likely to be considered as SSI. A full list of SSI development types can be found in Schedule 3 of the *State and Regional Development SEPP*. SSI projects are assessed by the NSW Department of Planning and Infrastructure.
Stakeholder	Stakeholders are anyone who has an interest in the Project. Project stakeholders are individuals and organisations that are actively involved in the Project, or whose interests may be affected as a result of Project cancellation or completion.
Storm surge	A storm surge is a rise in water level at the coast associated with an on-shore wind and/or low pressure weather system. It refers to the rise of water associated with atmospheric affect, plus wind set-up.
Stratification	Where columns form in the water, based on density differences due to temperature and salinity.
Sub aerial	Situated, formed, or occurring on or immediately adjacent to the surface of the earth.
Sub arterial roads	A sub-arterial road is a road connecting arterial roads to areas of development, and carrying traffic directly from one part of a region to another.

Term	Definition
Suspension	A process by which eroded particles of rock or sediment are transported in a water body.
Threatened species, populations and ecological communities	Species, populations and ecological communities specified in Schedules 1, 1A and 2 of the Threatened Species Conservation Act 1995.
Throughput	The average quantity of cargo and passengers that can pass through a port on a daily basis. This can be from the arrival at the port to loading onto a ship, or from the discharge from a ship to the exit from the port.
Tidal flows	The water current caused by the tides.
Tidal planes	The various tidal water levels (such as low water, mean sea level, etc.) are known collectively as “tidal planes”. They are considered points on a continuous surface.
Tidal prism	Where the tide moves up and down the lower reaches of a river, a volume, known as the tidal prism, of fresh water is displaced each tidal cycle. This volume of water is equivalent to surface area of the water body, times the difference between high and low tide.
Toe wall	The base or bottom of a wall or embankment.
Topography	Graphic representation of the surface features of a place or region on a map, indicating their relative positions and elevations.
Total dissolved solids (TDS)	The concentration of common dissolved salts found in water and reported by volume (mg/L).
Total suspended solids (TSS)	The concentration of filterable particles in water (retained on a 0.45 μm filter) and reported by volume (mg/L).
Total phosphorus load	The sum of all phosphorus entering the estuary from the land.
Trailer-suction Hopper Dredge	The Trailer-suction Hopper Dredge lifts sand from the sea floor and deposits it into a hopper within the dredge. The sand is then transported within the hopper to a nominated Dredged Material Ground (DMG) where the sand is placed.
Tributary	A stream or river that flows into a main (or parent) river or a lake. A tributary does not flow directly into a sea or ocean.
Tug	A small powerful boat designed for towing or pushing larger vessels.
Turbidity	A measure of the cloudiness of water which is determined by the amount of light scattered by suspended particles.
Turbidity Curtain	Turbidity curtains contain the silt and sediments stirred by in-water or near-water construction activities such as dredging operations.
Vessel bow thrusters	A propulsion device built into the bow of a ship or vessel which makes it more maneuverable (makes berthing or departing easier).

Term	Definition
Vessel wake	The series of waves caused by the flow of water around a moving vessel.
Vibracore	Vibracore is a sampling device which enables the collection of undisturbed sediment cores to depths of up to ten metres below the seabed. Cores are generally 100 mm diameter.
Water column	A water column is a term used to define a conceptual body of water, from surface to bed level.
Waterside	Water within the Project area that borders the berth sites (such as the waterside of the berth rather than the landside).
Wells	A hole (or shaft) drilled or bored into the earth to obtain water, oil, gas, or sediment.
Wetlands	Wetlands are land areas either temporarily or permanently covered by water and can be either natural or artificial with water that is still or flowing, fresh, brackish (slightly salty) or salty.
Wind rose	A diagram summarising the frequencies of winds of different strengths and directions as measured at a specific point over an extended period of time.
Winter solstice	Solstice means the sun stands still. The winter solstice is the day when the midday sun is at its lowest point above the horizon. The winter solstice occurs about June 21, when the sun is over the Tropic of Cancer.
World heritage property	Property that has outstanding universal value in its natural and/or cultural heritage and is listed on the World Heritage List.

Abbreviations

Term	Definition
ABS	Australian Bureau of Statistics
AEP	Annual exceedance probability
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information System
AMMM	Additional Mitigation Measures Matrix
ANZECC	Australian and New Zealand Environment and Conservation Council
ASS	Acid Sulfate Soil
ASSMAC	Acid Sulfate Soil Management Advisory Council
ATOAC	Awabakal Traditional Owners Aboriginal Corporation
AVTG	Assessing Vibration a Technical Guideline, (NSW Office of Environment and Heritage)
BaP	Benzo(a)pyrene
BHP	The Broken Hill Proprietary Company Limited
BHPB site	The former BHP Steelworks site
BS	British Standards
BTEX	Benzene, toluene, ethyl benzene and total xylene
C	Carbon
C/N	Carbon/Nitrogen
CBD	Central Business District
CLM Act	*Contaminated Land Management Act, 1997*
CMA	Catchment Management Area
CO	Carbon monoxide
COPC	Contaminants of potential concern
CSIRO	The Commonwealth Scientific and Industrial Research Committee.
D3	Carrington Dyke Berth 3
dB	The unit of sound pressure level, calculated as a logarithm of the intensity of sound
dB(A)	Unit used to measure ‘A-weighted’ sound pressure levels. ‘A-weighted’ is applied to measured or predicted sound levels in order to compensate for the non-linearity of human hearing

Term	Definition
DEC	NSW Department of Environment and Conservation, now the Office of Environment and Heritage (OEH)
DECC	NSW Department of Climate Change, now the Office of Environment and Heritage (OEH)
DEWHA	Department of the Environment, Water, Heritage and the Arts
DGR's	Director Generals Requirements
DAE	Dilute acid extraction
DMP	Dredge Management Plan
DoPI	NSW Department of Planning and Infrastructure
DPI	NSW Department of Primary Industry
DPW	Department of Public Works NSW
DSEWPaC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities
EEC	Endangered Ecological Communities
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
ENM	Excavated Natural Materials
ENMM	Environmental Noise Management Manual
EP&A Act / EPA Act	*Environmental Planning and Assessment Act, 1979*
EPL	Environmental Protection Licence
ERA	Environmental Risk Analysis
F3	Sydney to Newcastle Freeway
FM Act	*The Fisheries Management Act, 1994*
ft	Feet/ foot
g/s	Gram per second
HHWSS	High High Water Solstices Springs
Hz	Hertz
I&I	Investment an Industry
ICL	Independent Cement and Lime
ICNG	Interim Construction Noise Guideline
Infrastructure SEPP	*The State Environmental Planning Policy (Infrastructure) 2007*
ISLW	Indian Springs Low Water

Term	Definition
kg/m3	Kilograms per cubic metre
km/hr	Kilometres per hour
KTPs	Key Threatening Processes
$\mathbf{L_{10}}$	Noise level exceeded for 10% of the measurement period. This represents the upper intrusive noise level and is often used to represent traffic/ music noise
L_{90}	Noise level exceeded for 90% of the measurement period. This represents the background noise level excluding nearby sources
LA90 (Time)	The A-weighted sound pressure level that is exceeded for 90 per cent of the time over which a given sound is measured. This is considered to represent the background noise e.g. $L_{A90\ (15\ min)}$
$L_{Aeq\ (day/evening/night)}$	The A-weighted long term average sound level as defined in ISO1996-2: 1987, determined over all of the (day, evening or night) periods of a year
LAeq (Time)	Equivalent sound pressure level: the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring
LGA	Local Government Area
LHCCREMS	Lower Hunter Central Coast Regional Environmental Management Strategy
LNG	Liquefied Natural Gas
M1, M2, M3, M4, M5, M6, M7	Identifies the Mayfield berth box number
m^3	Cubic metres
m^3/s	Cubic metres per second
Major Development SEPP	*The State Environment Planning Policy (Major Projects) 2005*
Marstel	Marstel Terminals Pty Ltd
mg/kg	Milligrams of a substance per kilogram of sampled material
ML/d	Mega litres per day
mm/s	Millimetres per second
mm/year	Millimetres per year
MNES	Matters of National Environmental Significance
N	Nitrogen
NAGD	National Assessment Guidelines for Dredging
NATA	National Association of Testing Authorities
NCIG	Newcastle Coal Infrastructure Group
NEPM	National Environmental Protection Measure

Term	Definition
NES	National Environmental Significance
NHTG	Newcastle Harbour Tide Gauge
NO	Nitrogen oxide
NO_2	Nitrogen dioxide
NOW	NSW Office of Water
NO_x	Nitrogen oxide (NO) and Nitrogen dioxide (NO_2)
NPC	Newcastle Port Corporation.
NPW Act	*National Parks and Wildlife Act, 1974*
NSW	New South Wales
NTU	Nephelometric Turbidity Units
O_3	Molecular formula for ozone
OCPs	Organochlorine pesticides
OEH	Office of Environment and Heritage
OPP	Organophosphorus pesticides
PAHs	Polycyclic aromatic hydrocarbon
PASS	Potential Acid Sulfate Soil
PBP	Patterson Britton and Partners
PCBs	Polychlorinated biphenyls
PEA	Preliminary Environmental Assessment
pH_F	Field pH
pH_{FOX}	pH field peroxide
PM_{10}	The fraction of suspended particles with an aerodynamic diameter less than 10 microns in size
POEO Act	*Protection of the Environment Operations Act, 1997*
PoN	Port of Newcastle
Ports Act	*Ports and Maritime Administration Act, 1995*
ppt	Parts per thousand
PPV	Peak Particle Velocity
PQL	Practical Quantitation Limit
PRZ	Primary Remediation Zone
Pty Ltd	Propriety limited

Term	Definition
PWCS	Port Waratah Coal Services Pty Ltd
PWD	Public Works Department
RAP	Remediation Action Plan
RBL	Rating Background Level
RMS	Roads and Maritime Services
RNP	The NSW OEH Road Noise Policy
RTA	Roads and Traffic Authority
SAP	Sample and Analytical Plan
SEPP	State Environmental Planning Policy
SO_2	Sulphur dioxide
SOC Act	*State-Owned Corporations Act, 1989*
Sp	Species
sPOCAS	Suspension Peroxide Oxidation Combined Activity
SQG	Sediment Quality Guidelines
SQHL	Sediment quality guideline low value
SQHV	Sediment quality guideline high value
SRZ	Secondary Remediation Zone
SSI	State Significant Infrastructure
SWMP	Soil and Water Management Plan
T4	Terminal 4
TAFE	Technical and Further Education
TBT	Tributyltin
TCA	Transport Construction Authority
The Estuary Management Plan	*Hunter Estuary Coastal Zone Management Plan 2009*
The Regional Strategy	The *NSW Government's Lower Hunter Regional Strategy 2006-2031*
The Sea Dumping Act	*Commonwealth Environment Protection 1981 (Sea Dumping Act)*
The State Plan	*NSW State Plan, 2010*
The Strategy	The Spoil Handling and Disposal Strategy
TOC	Total organic carbon
TPH	Total petroleum hydrocarbons

Term	Definition
TPH C_{10}-C_{36}	Total petroleum hydrocarbons (ten to 36 carbon fraction) - semi-volatiles
TPH C_6-C_9	Total petroleum hydrocarbons (six to nine carbon fraction) - volatiles
TSC Act	*Threatened Species Conservation Act, 1995*
TSP	Total suspended particulates
UCL	Upper confidence limit
$\mu g/m^3$	Micrograms per cubic metre
WARR Act	*Waste Avoidance and Resource Recovery Act, 2001*
WM Act	*Water Management Act, 2000*

Executive Summary

Newcastle Port Corporation (NPC) is seeking approval for the capital dredging of twelve berths, together with the construction of foreshore stability treatments, within the Port of Newcastle ("the Project"). The Project is located in the South Arm of the Hunter River, adjacent to vacant industrial land at Carrington, Mayfield and Walsh Point.

The Project is listed as a transitional project under Schedule 4, Part 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*, and is classified as State Significant Infrastructure (SSI). The requirements listed under Part 3 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* apply.

This Environmental Impact Statement (EIS) has been prepared in accordance with the Director General's Requirements (DGRs) issued by the Department of Planning and Infrastructure under Part 5.1 of the *NSW Environmental Planning and Assessment Act 1979*.

The DGRs identify key issues for assessment in the EIS. The EIS is required to justify the Project with regard to the biophysical, social, economic and ecologically sustainable development principles. This EIS has been undertaken by GHD Pty Ltd on behalf of NPC.

The EIS examines potential impacts from the Project and focuses on the potential impacts of key issues identified by the DGRs. The EIS also examines other issues identified during the EIS preparation. Where impacts have been identified, management measures are proposed to eliminate or minimise the potential severity of the impacts. Residual risks or impacts have been identified where they remain after the application of the management measures.

What is proposed?

NPC is seeking to develop 12 berths in the Port of Newcastle. Dredging these berths would assist to increase the port's capacity, diversify trade through the port and develop vacant industrial land.

Approximately 1,870,000 cubic metres of river sediment would be removed from the berths. This sediment would require disposal and a range of disposal methods have been assessed. The Project would also involve constructing sheet pile walls and other foreshore treatments works to stabilise the river banks adjacent to the berths.

Where is the Project?

The Project is located in the South Arm of the Hunter River, within the Port of Newcastle. There are seven berths proposed in the area of Mayfield, on the riverfront adjoining the former BHP Steelworks site. Four berths are proposed at Walsh Point, located at the eastern end of Kooragang Island. One berth is proposed at Dyke Point, adjacent to Carrington. Figure 1.1 shows the berths locations.

Why is the Project required?

The Project will assist to increase port capacity, diversify trade and meet the demand for non-coal exports. Approval of the Project will assist proponents who seek to develop adjoining industrial land, allowing access to shipping for imports and exports.

When is the Project proposed?

The timing of the dredging activities would be determined by factors such as market forces, detailed design and environmental approvals.

Given that a number of different proponents may develop the berths at different times, it is unlikely that dredging would be undertaken at all twelve berths simultaneously, but rather in a series of smaller work packages. The proponent at the time would determine the timing, scale and nature of the landside facilities and associated dredging activities.

In addition, dredging of some berths may be deferred until these berths are required to support the adjacent landside development. Consequently, the order in which the berths are to be dredged cannot be determined at this stage.

To support future development of the Port, this EIS is designed so the berths can be developed independently or collectively. Additional details outlining potential staging is summarised in Section 2.4.

What were the key issues identified in the DGRs?

The DGRs identified the following issues as key issues for the EIS:

Strategic and Project Justification (Chapter 6)	Sediment and Water Quality (Chapter 8)
Contamination (Chapter 9)	Hydrology (Chapter 10)
Noise and Vibration (Chapter 11)	Heritage (Chapter 12)
Spoil Handling and Disposal (Chapter 13)	Flora and Fauna (Chapter 15)

Benefits of the Project

The Project would produce positive economic and social benefits to Newcastle and the State. It would assist to diversify trade through the port, and improve non-coal related trade. The development of non-coal trade opportunities would produce flow-on economic benefits. The Project would assist the development of vacant and active port side industrial land.

The EIS has identified and assessed the Project's potential impacts. Impacts would be managed appropriately so that potential undesirable impacts to the community and the environment would be reduced or eliminated. The Project is an appropriate development for the sites and would produce net positive results.

How can I comment on this EIS?

The NSW Department of Planning and Infrastructure will publicly exhibit this EIS for a minimum period of 30 days. During this period, the EIS will be on display in Newcastle City Council's offices at King Street. Copies of the EIS will be available on the Newcastle Port Corporation website at www.newportcorp.com.au (click on the Port Development and Current Projects links) and on the NSW Department of Planning and Infrastructure website at **www.planning.nsw.gov.au.**

Any person may make a submission to the Director-General of the NSW Department of Planning and Infrastructure quoting Project MP 10_0203 during the exhibition period. Submissions must be received by the end of the public exhibition period.

Comments and submissions can be:

- *Lodged online at **http://majorprojects.planning.nsw.gov.au** (search for the Project using the address and/or reference number 10_0203). The direct link to the Capital Dredging Project is http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=4347.*
- *Emailed to plan_comment@planning.nsw.gov.au.*
- *Faxed to (02) 9228 6455 or*
- *Posted to Major Infrastructure Assessments, NSW Department of Planning and Infrastructure, GPO Box 39 SYDNEY NSW 2001.*

Your submission should contain the following information:

- *Your name and address.*
- *The application reference number (MP 10_0203).*
- *The name and location of the Project.*
- *A statement on whether you support or object to the Project.*
- *The reasons why you support or object to the Project.*

For more details go to *www.planning.nsw.gov.au*.

Next Steps

The Department of Planning and Infrastructure will exhibit the EIS for a minimum period of 30 days and assess submissions in the context of the EIS. At the conclusion of the assessment process, the Minister will provide a determination. If the Project is approved the Director-General will provide conditions of approval that must be met for the development to proceed.

Submission of an Environmental Impact Statement

Submission of an Environmental Impact Statement prepared as per the requirements for State Significant Infrastructure under Part 5.1 of the *NSW Environmental Planning and Assessment Act 1979*.

Environmental Impact Statement prepared by:

Name:	Chris Gilmore / Codie Craig
Qualifications:	Bachelor of Social Science / Bachelor of Environmental Science
Address:	GHD Level 3, 24 Honeysuckle Drive Newcastle NSW 2300

In respect of:

Project:	Capital Dredging South Arm, Hunter River
Applicant name:	Newcastle Port Corporation
Applicant address:	Corner of Scott and Newcomen Streets, Newcastle NSW 2300
Proposed development:	Approval is sought to dredge twelve berths in the south arm of the Hunter River
Land to be developed:	The berths are located in the areas of Walsh Point, Mayfield and Dyke Point as detailed in this Environmental Assessment.

Certification

I certify that I have prepared the contents of this Environmental Impact Statement in accordance with the Director General's Requirements dated 4 February 2011, and that to the best of my knowledge the information contained in the Environmental Impact Statement is neither false nor misleading.

Signature: 

Name: Codie Craig

Date: 12 March 2013

1. Introduction

Newcastle Port Corporation (NPC) is a State-Owned Corporation established under the *Ports and Maritime Administration Act 1995* (Ports Act), pursuant to the *State-Owned Corporations Act 1989*. NPC's primary role is to provide safe, effective and sustainable port operations, and to deliver efficient port development that enhances the economic growth of the Hunter Region and New South Wales.

NPC proposes to facilitate the development of additional berths within the South Arm of the Hunter River, in the Port of Newcastle (referred to herein as "the Project"). The development of additional berths would assist NPC in meeting its objectives of increasing port capacity and diversifying trade and development options within the Port. Figure 1.1 shows the location of the Project. Chapter 2 (Description of the Project) provides a detailed description of the Project.

The design for the Project has been developed to the concept level. Details and dimensions provided in design drawings are therefore indicative and would be subject to refinement at the detailed design stage. Any design refinements or substantial modifications to the Project would be considered during the detailed design stage and would be undertaken in accordance with applicable statutory planning requirements. Section 2.3 provides further information on the development of the Project's design.

LEGEND

- Berth Locations
- Study Area Locality
- Watercourse

1:75,000 (at A4)

0 250500 1,000 1,500 2,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

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NEWCASTLE PORT CORPORATION

Newcastle Port Corporation
Capital Strategic Dredging Project

Job Number 22-15683
Revision 0
Date 10 SEP 2012

Project Location

Figure 1.1

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com **W** www.ghd.com.au

G:\22\15683\GIS\Maps\Deliverables\Environmental Assessment\Introduction\2215683_I001_Locality_0.mxd

Data Source: LPMA: DTDB - 2007, Imagery - 2007. Created by: gmcdiarmid, fmackay, mabarnier

1.1 Purpose and Scope of the Environmental Impact Statement

This Environmental Impact Statement (EIS) has been prepared in response to the NSW Department of Planning and Infrastructure Director-General's Requirements (DGRs), which were issued on 4 February 2011. DGRs are provided in Appendix A. Table 1-1 describes where issues contained within the DGRs have been addressed in this EIS.

Table 1-1 Director-General's Requirements

DGRs	Where addressed in the EIS
Consultation	Chapter 4
Environmental Risk Analysis	Chapter 5
Strategic and Project Justification	Chapter 6
Statutory Framework	Chapter 7
Sediment and Water Quality	Chapter 8
Contamination	Chapter 9
Hydrology	Chapter 10
Noise and Vibration	Chapter 11
Heritage	Chapter 12
Spoil Handling and Disposal	Chapter 13
Traffic and Traffic	Chapter 14
Flora and Fauna	Chapter 15
General Environmental Impact Statement Requirement (non-key Issues)	Chapter 16
Statement of Commitments	Chapter 17

Table 1-2 describes the structure of the EIS, and provides a summary of the contents of each chapter.

Table 1-2 Structure of the Environmental Impact Statement

Title	Description
Executive Summary	Summarises the EIS
Introduction	Provides an overview of the location and key features of the Project, the approval process and the environmental impact statement requirements
Description of the Project	Provides a description of the Project including construction activities and operation
Consultation	Details the outcomes of community and statutory consultation for the Project
Environmental Risk Analysis	Details the environmental risk analysis undertaken for the Project
Strategic and Project Justification	Details the strategic assessment, the justification for the Project and the alternatives considered to the Project
Statutory Framework	Outlines the statutory framework for the Project, including details on the approval authority, the application process, environmental planning instruments and legislative requirements
Key Environment Impact Statement Requirements	Addresses the DGRs for key issues: ◗ Sediment and water quality. ◗ Contamination. ◗ Hydrology. ◗ Noise and vibration. ◗ Heritage. ◗ Spoil handling and disposal. ◗ Flora and fauna.
Other Environmental Impact Statement Requirements	Assesses other environmental issues: ◗ Social and economic. ◗ Air quality and climate. ◗ Energy and greenhouse. ◗ Risks and hazards. ◗ Visual.
Statement of Commitments	This chapter provides the statement of commitments, which includes details on mitigation measures, environmental management and monitoring for the Project.

Title	Description
Justification of the Project	Provides the Project justification including achieving objectives and principles of ecologically sustainable development and the consequences of not proceeding
Conclusion	Summarises and concludes the EIS
References	Provides the references used within the EIS

1.1.1 List of Appendices

Appendices are provided at the end of the EIS to supplement the main document. The appendices include additional technical information from the studies that have been undertaken. The appendices include:

- Director General's Requirements (Appendix A).
- Concept Design Drawings (Appendix B).
- Community Consultation (Appendix C).
- Sediment Geochemical Assessment Report and Preliminary SAP Summary (Appendix D).
- Spoil Handling and Disposal Strategy (Appendix E).
- Heritage Assessment (Appendix F).
- Flora and Fauna Database Search Results (Appendix G).
- Noise and Vibration Guide (Appendix H).
- Sea Dumping Licence - Crown Land (Appendix I).

1.1.2 Limitations

This Environmental Impact Statement:

- Has been prepared by GHD Pty Ltd (GHD) for Newcastle Port Corporation.
- May only be used and relied on by Newcastle Port Corporation for the purpose agreed between GHD and Newcastle Port Corporation or organisations authorised by Newcastle Port Corporation to do so.

This Environmental Impact Statement (EIS) was produced specifically for Newcastle Port Corporation for the purposes of this commission. No warranties, expressed or implied, are offered to any third parties and no liability will be accepted for use of this report by any third party.

The services undertaken by GHD in connection with preparing this EIS were limited to those specifically detailed within the EIS. GHD expressly disclaims responsibility for any error in, or omission from, this EIS arising from or in connection with any of the qualifications being correct. The work conducted by GHD under this commission has been to a standard that would normally be expected of a professional environmental consulting firm operating in the state of New South Wales. Although strenuous effort has been made to prepare the EIS in accordance with the brief issued by Newcastle Port Corporation and the Director General's Environmental Assessment Requirements issued by the NSW Department of Planning and Infrastructure, we cannot however guarantee that other issues outside of the scope of work undertaken by GHD do not remain.

The data and report relates only to the assessment of the project as described in the EIS, and must be reviewed by a competent and appropriate environmental scientist, planner of engineer experienced in environmental impact assessment before being used for any other purposes. GHD accepts no responsibility for use of this data.

GHD relied on third party information and site records in the preparation of this EIS, which may not have been independently verified. Where laboratory tests and similar work have been performed and recorded by others, the data is included and used in the form provided by others. The responsibility for the accuracy of such data remains with the issuing party, not with GHD.

The advice presented in this EIS is based on information obtained from sample collections at discrete locations across the project site and may not fully represent conditions that may be encountered across the site and at other locations. The characteristics of sub-surface and surface materials may vary significantly between adjacent sample points and intervals, and at locations other than where observations, tests and investigations have been made. Sub-surface conditions and contaminant concentrations can change in a limited time. This should be kept in mind when reviewing the data. Because of the inherent uncertainties in the sub-surface conditions, changed or unanticipated sub-surface conditions may occur that could affect the findings presented by GHD, which may need to be re-examined and changed. GHD does not accept responsibility for the consequences of significant variations in conditions.

An understanding of site conditions depends on the integration of many pieces of information, some regional, some site specific, some structure specific and some experienced based. This EIS must be read in full and should not be altered, amended, abbreviated, issued in part or issued incomplete in any way without prior checking and approval by GHD and Newcastle Port Corporation. Anyone using this document does so at their own risk and should satisfy themselves concerning its applicability and, where necessary, should seek professional advice I relation to using this report.

Subject to the limitations and scope of work described in this EIS, the opinions, conclusions and any recommendations in this EIS are based on conditions encountered and information reviewed at the time of preparation (March 2013). GHD expressly disclaims responsibility for any changes that may occur after this time.

2. Description of the Project

2.1 Introduction

NPC has identified a number of sites within the South Arm of the Hunter River that have the potential to be developed as berths. NPC seeks approval for the dredging of material from the identified sites and ancillary bank stabilisation works such as sheet pile walls. The Project would involve the dredging of an estimated 1,870,000 cubic metres of material from the twelve proposed berths.

The actual dredging works may be undertaken by third party proponents as part of the development of future port infrastructure projects. The approval to dredge material may be provided to these third party proponents as an early works package, whilst approval is being sought independently for the development of land-side port facilities. In this case, the third party proponents would be responsible for meeting all environmental management and approval requirements for these facilities, including material sea dumping permits if required.

2.2 Proposed location of the Project

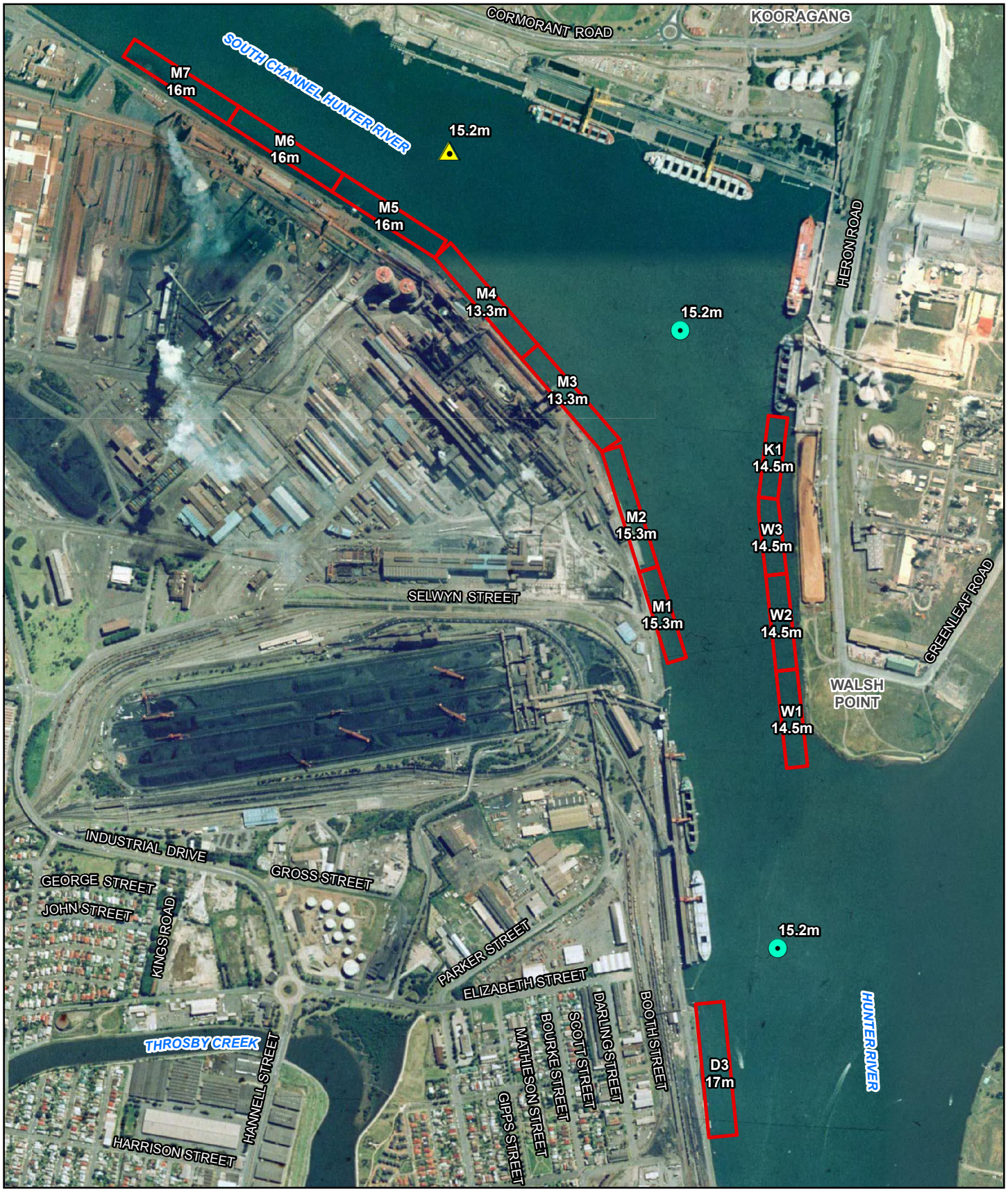
The berths are located at Mayfield, Carrington and Walsh Point within the Newcastle Local Government Area (LGA). NPC has identified twelve sites within the South Arm of the Hunter River that are suitable for development as berths. Table 2-1 describes the berths.

Table 2-1 Berth Descriptions

Berth Name	Description
Kooragang 1	Disused berth box on Kooragang Island
Walsh Point berth pocket (up to three berth boxes)	Vacant industrial land located at Walsh Point berth is likely to be developed as a berth pocket, which would account for three standard berth boxes
Mayfield 1 Mayfield 2 Mayfield berth pocket (comprising Mayfield 3 and 4 berths) Mayfield 5 Mayfield 6 Mayfield 7	Berths along the southern side of the existing shipping channel at Mayfield in the area of the former BHP Steelworks site
Dyke 3	Disused berth box at Dyke Point

The Project would also involve ancillary dredging to widen the channel between the proposed berths and the existing shipping channel.

Figure 2.1 shows the locations of these berths.



LEGEND

- Berth Locations
- Existing Channel 15.2m (NHTG)
- Approved Channel Depth 15.2m to be dredged by others

1:13,000 (at A4)

0 50 100 200 300 400

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

N

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Newcastle Port Corporation
Capital Strategic Dredging Project

Job Number 22-15683
Revision 0
Date 10 SEP 2012

Berth Locations

Figure 2.1

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

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Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by: gmcdiarmid, fmackay

2.3 Project Design

The Project's design has been developed to a concept level. The design utilised the concept engineering plans provided by Worley Parsons during the development of the preliminary environmental assessment. Detailed designs would be developed prior to construction when landside infrastructure requirements have been determined.

The design has considered a range of factors. Requirements such as depth and width were determined by examining the intended use for each site. This included assessing the likely vessel types that would use each berth. The type of vessel that would likely use each berth was considered so that adequate berth draught (depth) and beam (width) would be provided.

Depths shown in Table 2-2 include a 0.5 metre overdredge allowance. The 0.5 metre overdredge makes allowance for construction dredging tolerances and sedimentation of the berth over time between maintenance dredging periods so that the declared depth is not impacted. The proposed depths are shown in Table 2-2.

Table 2-2 provides details for the proposed berths and Figure 2.1 shows the depths of the proposed berths and the channel.

Table 2-2 Berth Details

Berth Name	Site ID	Designed Dredge Level (metres below Newcastle High Tide Gauge NHTG) [1]	Intended Usage	Design Vessel Class
Kooragang 1	K1	14.5	General cargo	Up to Panamax
Walsh Point berth pocket (up to three berth boxes)	Walsh Point berth pocket (W1, W2, W3)	14.5	General cargo to be developed as the Walsh Point Berth Pocket	Up to Panamax
Mayfield 1	M1 (NPC berth)	15.3	NPCs operations berth	Various
Mayfield 2	M2	15.3	Bulk and general cargo	Up to Panamax
Mayfield berth pocket (two berth boxes)	Mayfield berth pocket (M3 and M4)	13.3	Bulk and general cargo	Up to Panamax
Mayfield 5	M5	16	Container berth	Up to Panamax
Mayfield 6	M6	16	Container berth	Up to Panamax
Mayfield 7	M7	16	Bulk liquids	Up to Panamax
Dyke 3	D3	17	Deep draft standby berth	Cape

Note 1 – The designed dredge level includes an additional 0.5 metres for over-dredging to support the dredging tolerance during construction and the subsequent maintenance of the berth.

2.3.1 Geotechnical Analysis

The design had to consider the geochemical composition of the foreshore and the sediments to be dredged. A large body of information is available from previous geotechnical and geochemical investigations that have been undertaken in the South Arm of the Hunter River.

As part of this EIS, NPC undertook additional vibracoring sampling and testing to supplement previous investigations. **Figure 9.2** in Chapter 9 (Contamination) shows the location of the vibracoring sampling.

Vibracoring sampling confirmed site conditions for the proposed berths. The geotechnical analysis was used to understand constraints at the sites and assist in refining the design. These constraints include:

- Types and Volumes of material to be dredged.
- Suitability of the material for disposal.
- Likely dredging methods.
- Engineering treatments required to stabilise the foreshore at each site.

Chapter 8 (Sedimentation and Water Quality), Chapter 9 (Contamination) and Chapter 13 (Spoil Handling and Disposal) provide further description of the sediment conditions.

2.3.2 Geochemical Analysis and Suitability of Material for Disposal

A pilot study was undertaken in May 2011 to investigate the sediment within the Project area. Generally, it was found during this assessment that the material may be suitable for disposal at sea. The pilot study was undertaken in accordance with the requirements of SEWPaC, as NPC is seeking a Sea Dumping Permit (SDP) concurrently to this EIS. Subsequently, sediment sampling was conducted in accordance with a Commonwealth government (SEWPaC) approved Sampling and Analysis Plan (SAP).

The impacts associated with ocean disposal of the dredged material will be assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) by SEWPaC, and approval from SEWPaC is required prior to any disposal occurring.

This sediment sampling and analysis program is still underway at the time of writing this EIS. The preliminary findings from the SAP (for M3 and M4) are presented in Chapter 9 and Appendix D (Preliminary SAP Summary).

Typically, it was found that the riverbed consists of fine grained, soft silty clay sediments overlying sand. The sand contains some lenses of clay and overlies deeper layers of clay, soft rock and hard rock below the proposed dredge profile. The soft, silty clay sediment contains varying levels of contaminants that have washed into the sediment layers over an extended period from industrial developments in the region.

The physical properties of each of these materials considerably influence the method of dredging, excavation, reuse and disposal. Chapter 9 (Contamination) and Chapter 13 (Spoil Handling and Disposal) describe the relevant characteristics of the sediment handling processes.

2.3.3 Volumes

Volumes of dredging material at each berth were determined by examining the proposed levels for each berth, together with the physical composition and nature of the material.

Table 2-3 shows the approximate volumes of dredging material at each berth. The volumes reported for each berth include dredging of temporary batters between berths. These would be removed once all berths have been developed.

Table 2-3 Approximate Dredging Volumes

Berth	Approximate Volume in Cubic Metres
Dyke 3	300,000
Kooragang 1 and Walsh Point berth pocket	675,000
Mayfield 1 and 2	310,000
Mayfield berth pocket	65,000
Mayfield 5 to 7	520,000
TOTAL	**1,870,000**

2.3.4 Foreshore stability and batter design

The proposed batter designs considered the geotechnical characteristics of the materials that would form the channel batters, along with the geometric constraints of each berth.

The primary design philosophies for the berths and associated batters are:

- Achieve the designed dredge levels for each of the new berths including an over-dredging allowance of 0.5 metre at all proposed dredging areas. This allowance would provide a buffer against dredging tolerance and subsequent sedimentation that may occur between maintenance dredging programs.
- The batters are stable during construction until permanent batter protection occurs.
- To provide batter erosion protection to resist geotechnical bank failures and erosion from tidal flows, flood flows, vessel bow thrusters and propeller wash and vessel wake.
- Design submerged slopes to avoid excessive slump and/or create excessive maintenance dredging requirements.
- Limit the potential impacts on the current groundwater equilibrium on the sites.
- Limit potential contaminants leaching into the Hunter River.

The proposed batters have been designed for stability and would be further developed at the detailed design stage. The detailed batter design will incorporate margins of safety to account for possible slip circle and wedge type batter failures under normal conditions and seismic events.

The detailed design will also confirm the extent, size and grading of any revetment rock that may be required to provide protection against erosion from a two percent annual exceedance probability flood event (1 in 50 years) and from propeller wash and vessel motion. The detailed design would also confirm requirements for sheet pile wall designs and additional stability measures that may be required.

While new berth infrastructure and land-side development does not form part of the approval being sought by this EIS, factors influencing the general location and potential infrastructure arrangements have been considered in the development of the design. The design has aimed to minimise the encroachment of the berths on the existing shipping channel and adjacent port land. Table 2-4 provides a description of the proposed foreshore treatment measures at each berth.

Table 2-4 Foreshore Treatment Measures

Berth	Foreshore design
Kooragang 1	Option 1 - A full depth vertical retaining structure such as a sheet piled wall. Option 2 - A partial depth retaining wall structure incorporating an armoured batter at 1 in 2.5 seaward of the structure.
Walsh Point berth pocket (up to three berth boxes)	Option 1 - A full depth vertical retaining structure such as a sheet piled wall. Option 2 - A partial depth retaining wall structure incorporating an armoured batter at 1 in 2.5 seaward of the structure.
Mayfield 1	Excavation of fill material and the construction of a full depth vertical retaining structure such as a sheet piled wall.
Mayfield 2	Excavation of fill material and the construction of a full depth vertical retaining structure such as a sheetpiled wall.
Mayfield 3	A full depth vertical retaining structure such as a sheet piled wall
Mayfield 4	A full depth vertical retaining structure such as a sheet piled wall
Mayfield 5	Option 1 - A full depth vertical retaining structure such as a sheet piled wall. Option 2 - A partial depth retaining wall structure incorporating an armoured batter at 1 in 2.5 seaward of the structure.
Mayfield 6	Option 1 - A full depth vertical retaining structure such as a sheet piled wall. Option 2 - A partial depth retaining wall structure incorporating an armoured batter at 1 in 2.5 seaward of the structure.
Mayfield 7	A partial depth retaining wall structure incorporating an armoured batter at 1 in 2.5 seaward of the structure and additional stability measures such as a secondary sheetpile toe wall.
Dyke 3	A full depth vertical retaining structure such as a sheetpiled wall.

Appendix E (Spoil Handling and Disposal Strategy) provides further details on the Project's design.

2.4 Staging

A number of different proponents may develop the berths at different times. The proponent at the time would determine the timing, scale and nature of the landside facilities. This would affect the timing and scale of the dredging activities.

Dredging at some berths may be deferred until these berths are required to support the adjacent landside development. Consequently, the order in which the berths are to be dredged will depend on a number of factors such as market forces, detailed design and environmental approvals.

For completeness of the EIS however, the assessment of potential impacts was based on the scenario that all 12 sites are to be dredged during a single campaign. This has allowed for the range of impacts, and potentially cumulative impacts of the works, to be assessed holistically. This scenario is considered unlikely and the likely environmental impacts would be diminished if dredging activities were undertaken independently.

The berths would be dredged as required to support the trade requirements and landside activities.

2.5 Dredging Activities

Prior to dredging and excavation, it would be necessary to:

- Establish the contractor's designated work and storage areas on the site.
- Identify and decommission services.
- Identify and remove artificial obstructions from the site.
- Install additional stability measures adjacent to the existing permanent BHP sheet-piled wall at Mayfield 5, 6 and 7 such as a secondary steel sheet piled wall to provide additional toe support prior to dredging.

The general sequence of events for the dredging program would involve.

- Establish the site identify the installation of environmental control provisions.
- Install bank stability improvement measures.
- Remove and manage contaminated sediments.
- Excavate the shorelines using land based plant.
- Remove overlying marine silts and clays.
- Remove sand.
- Remove underlying stiff clays.
- Progressively place batter protection rock.

2.6 Dredging Methods

The following sections describe the dredging methods available for the construction of the Project. The dredge type to be used during construction would be confirmed at the time of dredging.

2.6.1 Backhoe Dredge Working in Conjunction with Barges

A backhoe dredge is an excavator mounted on a purpose-built barge. Three ‘spuds’ (large diameter piles that can be lowered or raised) would support the barge. The spuds can be lowered into the seabed and hold the position of the barge. The barge is not self-propelled and would be moved around the site by tugs when all the spuds have been raised.

The backhoe dredge would be fitted with a specially designed grab or bucket that minimises turbidity in the water column during dredging operations. The material would be raised slowly within a turbidity curtain prior to its placement in a hopper barge anchored adjacent to the backhoe dredge. The use of the specially designed grab or bucket would significantly reduce the amount of material put into suspension. It also has the advantage of minimising the water content of the material.

The excavator can be fitted with position-fixing equipment (both spatially and with depth). This would allow the operator to selectively remove material from the bed of the river and accurately control the operation. Where contaminated material is removed, such as the potential Walsh Point “hotspot”, shallow-draft, flat-topped barges incorporating an above-deck hopper could be used to transport the material. These craft are more easily unloaded at the temporary unloading wharf facilities.

Where the dredged material is suitable for offshore disposal, the two barges would be split hopper barges with a hopper capacity of around 750 cubic metres. These barges would be ocean-going vessels that could be self-propelled or supported by a tug. Figure 2.2 shows a typical backhoe dredge.

BHD Colbart

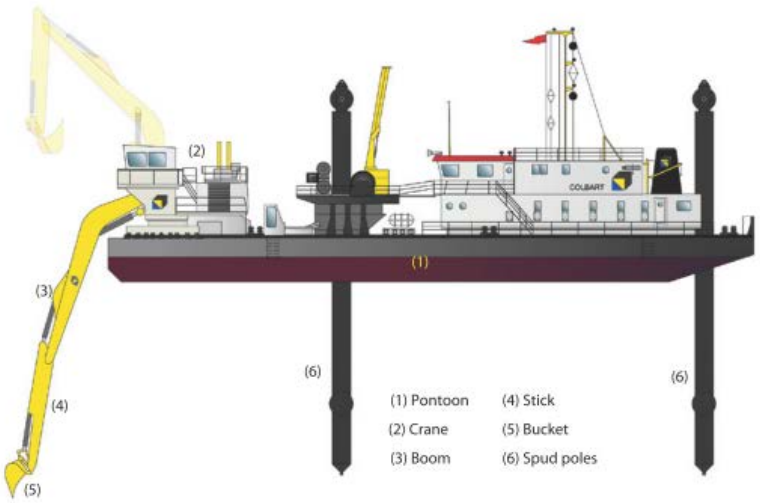

Figure 2.2 Typical Backhoe Dredge

Source: Royal Boskalis Westminster N.V.

2.6.2 Trailer Suction Hopper Dredges

A trailer suction hopper dredge is usually a self-propelled, ocean-going vessel with its own onboard hopper for carrying dredged sand or other materials that can be readily loosened and agitated from the harbour bed. A trailer suction hopper dredge with a typical hopper capacity of between 2,000 and 4,000 cubic metres could be used on this Project. The dredge would operate 24 hours per day, seven days per week, allowing for some delays due to equipment maintenance, refuelling and staff changes. The trailer suction hopper dredge would be supported by at least one tug boat.

During dredging operations, materials are removed by trailing a draghead along the seabed. The draghead agitates the seabed as the dredge pulls it along. Agitated material is transported up via suction pipes in the form of hydraulic slurry (a mixture of removed material and seawater) and into the hopper by large inboard pumps. Trailer dredges may be fitted with one or two suction pipes depending upon the size of the vessel.

In the hopper of the dredge, the sand (or coarser grained) particles settle out and the excess water and fine particles pass through a hopper overflow system back into the river through a discharge outlet normally located at the keel level of the vessel. This reduces the potential for disposal of fine grained sediments in the upper level of the water column encouraging sedimentation of suitable overflow sediments.

Once the dredge has loaded its hopper it ceases dredging by raising its dragheads off the seabed and travelling to the nominated disposal area. Discharge can be by one of three methods. The first of these is bottom dumping, a method in which the dredge hoppers split or the bottom doors open, allowing the material to fall to the sea floor. This would be the most likely method used to dispose of the materials offshore.

The second method, pumping ashore, would be carried out when material is fluidised in the hopper prior to it being pumped onshore through a discharge pump, outlet and pipeline. Typically, the solids concentration of the slurry would be 10 to 15 percent by volume. This would normally involve the dredge anchoring in a mooring area within the safe operational limits of the vessel and the coupling of its discharge outlet to the discharge pipeline intake manifold supported by a floating buoy anchored to the seabed. The intake manifold would be connected to a discharge pipeline, which would comprise sections that are floating, submerged and onshore. A discharge outlet would be located onshore, from which deposited material would be reworked by an onshore crew including bulldozers and front-end loaders. The onshore outlet can be moved by extending sections of pipeline.

The third method, ‘bow casting’, is similar to the pump-ashore method of discharge, except that, rather than coupling the pump ashore discharge outlet to the discharge pipeline, material is pumped out of the pump ashore outlet onto the water surface some 50 metres or so in front of the bow of the dredge. This may be used in beach replenishment for example. Figure 2.3 shows a typical trailer suction hopper dredge.

Figure 2.3 Typical Trailer Suction Hopper Dredge

Source: Royal Boskalis Westminster N.V.

2.6.3 Cutter Suction Dredge

Cutter suction dredges are designed to remove material ranging from silt to hard clays and soft rock. The ability to dredge harder materials is a function of the power of the cutter head, the power of the side winches and the physical construction of the dredge.

A cutter suction dredge is generally not self-propelled. It is a floating barge with a number of major elements that include a cutter, ladder, onboard pipework and pumps, an onboard power plant, control room and anchoring system (comprising spuds, swing wires and anchors).

During dredging operations the cutter, located at the end of a ladder, is lowered to the seabed. The cutter revolves through the bed material and in so doing loosens material. Agitated material in the form of a hydraulic slurry is sucked up into the pipe intake by onboard pumps. The pipe intake is located behind the cutter. Typically, the solids concentration of the hydraulic slurry would be 10 to 15 percent by volume. The slurry would then be pumped through a discharge pipeline to the nominated disposal area.

This type of dredge works in a controlled manner with the vessel's pontoon normally held in position at the stern by a spud, which is dropped into the seabed. The cutting action is then facilitated by swinging the forward end of the pontoon in an arc across the seabed between two anchors set in front and to the side of the dredge. The dredge works on a fixed centreline. The cutterhead is lowered to the required dredging depth. Once the dredge face is cut down to the required depth, the dredge (and hence the cutterhead) is advanced along the centreline by means of moving the carriage in which the spud is mounted. To move forward the dredge is pushed against the spud by a hydraulic ram at a predetermined step size.

At the completion of a step an auxiliary spud is lowered and the main spud raised and returned to its starting position. The main spud is dropped and the auxiliary spud is raised prior to the recommencement of dredging operations. Small cutter dredges may not be fitted with a spud carriage and often advance by 'stepping' through the alternating use of the main working spud and the auxiliary spud.

A large dredge would typically have a pump on its ladder and at least one additional inboard pump within the pump room. The discharge pipeline would include sections of floating and onshore pipeline. Typical in side dimensions of the onshore discharge pipeline would be approximately 450 – 800 millimetres.

Placement of the material from the discharge pipe on to the nominated onshore fill area is typically managed by controlling the direction of flow of the discharge water with conventional land-based plant and equipment such as bulldozers and front-end loaders. The material would be discharged into containment ponds. The containment ponds would incorporate dewatering provisions to collect and redirect water back to receiving waters. Figure 2.4 shows a typical cutter suction dredge.

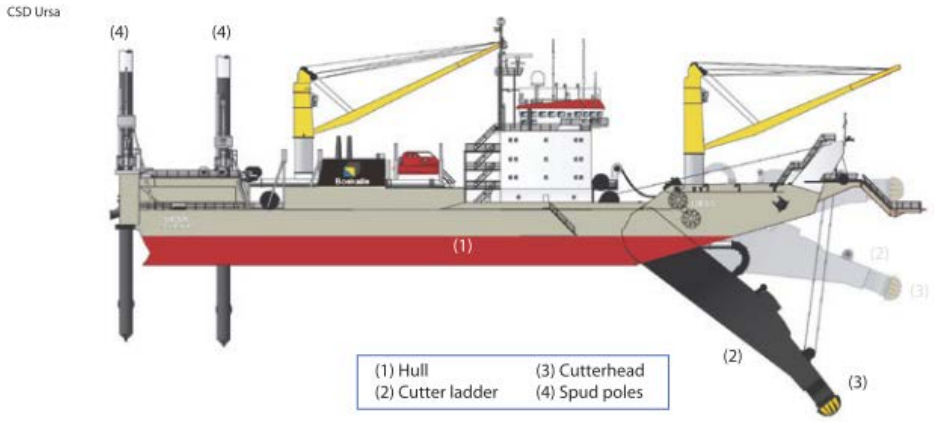

Figure 2.4 Typical Cutter Suction Dredge

Source: Royal Boskalis Westminster N.V.

2.7 Proposed Stockpile Areas

Excavated sediment that requires treatment due to contamination would be temporarily stockpiled and dewatered before it is transported. Two temporary stockpile areas may be required for the Project. Areas adjacent to dredging at Walsh Point and Mayfield are the likely locations.

Previous investigation identified an area in the vicinity of Walsh Point as a potential contamination ‘hotspot’. Vibracoring investigations undertaken for this EIS did not locate this ‘hotspot’ however despite core sampling in the same location. If contaminated sediment is identified in this area during dredging works,, a temporary spoil stockpile may be required in the Walsh Point area. An indicative location on the southwest corner of Walsh Point has been nominated for the EIS due to its close proximity to the proposed Walsh Point berth. This is further discussed and displayed in Section 16.2.

The excavation of existing industrial foreshore land at the proposed Mayfield 1 and 2 berths would require a temporary stockpile to manage potentially contaminated material.

It is estimated that approximately 1,870,000 cubic metres of material would be removed by dredging and land-based excavation to create the proposed berths. Of this amount, approximately 30,000 cubic metres (or around 1.6 percent of the total volume) has been identified as potentially contaminated material that may require some form of treatment before disposal or reuse.

An alternate location would be selected if these sites are found to be unsuitable. Any proposed stockpile areas would require the development of site-specific management plans.

3. Interaction with Adjoining Projects and Proposals

The DGRs state that an assessment of the Project's interaction with relevant proposals and approved projects in the area is required. This chapter outlines the Project's relevance to these proposals and approved projects, and outlines the Project's potential interaction with them. Figure 3.1 shows their locations relative to the Project. An assessment of potential cumulative impacts is provided in Section 16.7 at the end of the environmental impact statement chapters.

The area surrounding the Project is industrial in nature. No residential areas immediately adjoin the site and there are no proposed residential developments adjacent to the site. Proposals and approved projects that are adjacent to the site are industrial in nature on existing industrial land. No sensitive environmental areas would be impacted by the Project.

Ramsar listed wetlands are located on the North Arm of the Hunter River, covering an area on the northern side of Kooragang Island, Fullerton Cove and areas to the east of Tomago. *State Environmental Planning Policy No 14 – Coastal Wetlands* (SEPP 14) wetlands are also located in this area, and extend to the South Arm of the Hunter River to the west of the Tourle Street Bridge at Mayfield, approximately four kilometres upstream of the proposed Mayfield berths. Chapter 15 (Flora and Fauna) shows the locations of these wetlands, and describes the Project's potential impacts on these areas.

Land uses surrounding the Project are as follows:

Mayfield

Industrial land adjoins the proposed Mayfield berths. The Hunter River is to the east and north with Kooragang Island beyond. The closest residential areas are located in Mayfield North and Mayfield East over one kilometre to the south and west.

Dyke 3

The proposed Dyke 3 berth is adjacent to the suburb of Carrington, located approximately 270 metres to the west. Existing portside infrastructure, including rail sidings, warehouses and infrastructure associated with the Port Waratah Coal Services coal loader separate the berth from residential areas of Carrington. The Hunter River is located to the east, with the residential suburb Stockton located approximately 800 metres beyond.

Walsh Point

Walsh Point is located at the eastern end of Kooragang Island. Industrial developments occupy all of Walsh Point with the exception of vacant industrial land located at the southern tip of the Point. Stockton is the closest residential area, located approximately 850 metres to the east.

LEGEND

Adjoining Projects

- 1. Mayfield Concept Plan Site
- 1A. Marstel Concept Plan Site
- 1B. ICL Concept Plan Site
- 2. Intertrade
- 3. Hunter River Remediation Project
- 4. Extension of Shipping Channel
- 5. NCIG
- 6. PWCS T4
- 7. Swing Basin
- 8. Orica Expansion Site
- 9. Eastern Star Gas Development Site
- 10. K10

1:25,000 (at A4)

0 95 190 380 570 760

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

N

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Newcastle Port Corporation
Capital Strategic Dredging Project

Planning Approvals and Proposals

Job Number 22-15683
Revision 0
Date 10 Sep 2012

Figure 3.1

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 T 61 2 4979 9999 F 61 2 4979 9988 E ntlmail@ghd.com.au W www.ghd.com.au

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Data Source: LPMA: DTDB - 2007, Imagery - 2007. Created by: gmcdiarmid, fmackay, mbarnier

3.1 Mayfield Concept Plan (Port terminal facilities)

The proposed berths at Mayfield 1 to 7 that are the subject of this environmental assessment are located immediately to the north and east of the Mayfield Concept Plan site. The Project would assist in developing the waterside shipping infrastructure for the Mayfield Concept Plan site. Refer to Figure 3.2.

NPC's Mayfield Concept Plan is the proposal to develop a portion of the former BHP steelworks site at Mayfield. This was known as the BHP Closure Area. In this report, this portion of land is identified as the BHPB Site, which is approximately 90 hectares.

NPC developed the Mayfield Concept Plan in accordance with the *NSW Ports Growth Plan*. The vision for the site is to diversify cargo handling infrastructure for trade. The proposal includes the development of landside trade precincts with supporting infrastructure and transportation links. The Mayfield Concept Plan has now been approved by the NSW Department of Planning and Infrastructure. The proposed precincts include:

- Bulk liquids.
- Container terminal.
- General purpose.
- Bulk and general.
- NPC Operations.

3.2 Intertrade Industrial Park

The proposed berths at Mayfield 1 to 7 are to the north and east of the Intertrade site. The 62 hectare Intertrade site occupies the western portion of the BHPB Site and is bounded to the north and east by the NPC Mayfield Concept site. The proposal for the Intertrade site is to develop approximately 52 hectares of general industrial and commercial land, and approximately 10 hectares of land for an intermodal facility. Refer to Figure 3.2 for the location of the Intertrade site.

3.3 Marstel Terminals Bulk Liquids Storage Facility

Marstel Terminals Pty Ltd (Marstel) proposes to construct a bulk liquids storage facility to receive, store, blend and distribute fuels and biofuels to the Hunter Region. The Marstel proposal is located in the Bulk Liquid Precinct of the NPC Mayfield Concept site. The proposed berth at Mayfield 7 would provide access to the Bulk Liquid Precinct. Refer to Figure 3.2.

3.4 ICL Cement Terminal, Mayfield North

Independent Cement and Lime (ICL) propose to develop a cement terminal within the Bulk and General Precinct of the NPC Mayfield Concept site. Proposed berth Mayfield 2 would provide access to the Bulk and General Precinct. Refer to Figure 3.2.

LEGEND

- 1. Mayfield Concept Plan Site
- 1A. Marstel Concept Plan Site
- 1B. ICL Concept Plan Site
- 2. Intertrade

1:12,000 (at A4)

0 45 90 180 270 360

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

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Capital Strategic Dredging Project

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Date 10 Sep 2012

Mayfield Concept Plan, Marstel, ICL and Intertrade

Figure 3.2

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Data Source: LPMA: DTDB - 2007, Imagery - 2007. Created by: gmcdiarmid, fmackay, mbarnier

3.5 Extension of Shipping Channels

The NSW Maritime Authority holds a development consent (DA-134-3-2003-i) granted to it by the Minister for Planning on 9 August 2005 for the Extension of Shipping Channels within the Port of Newcastle. This approval includes dredging, excavation, treatment and disposal of sediments from the south arm of the Hunter River.

The Project is required to improve the shipping channel within the south arm of the Hunter River. The approved area for the channel deepening project covers the area to the west of the Kooragang 6 berth on the northern side of the river and the Mayfield 4 berth on the southern side of the river, and extends west to the Tourle Street Bridge. This area fronts the NCIG coal terminal and the proposed T4 terminal on Kooragang Island. Refer to Figure 3.3 for the location of the channel deepening area.

3.6 Hunter River Remediation Project

BHP Billiton undertook the Hunter River Remediation Project in the Hunter River at Mayfield, adjacent to the former BHPB site. The Hunter River Remediation Project was undertaken in the area of proposed berths Mayfield 5, 6 and 7. A sheet pile wall was constructed on the waterside of the BHPB site adjacent to Mayfield 5, 6 and 7 and a small extent on the One Steel lands immediately to the west. Refer to Figure 3.5.

The remediation project involved dredging and treating contaminated river sediments from the BHPB site. The treated soil was placed in purpose built cells at the Kooragang Waste Emplacement Facility on Kooragang Island.

3.7 Newcastle Coal Infrastructure Group Coal Terminal

The Newcastle Coal Infrastructure Group (NCIG) coal terminal would not directly interact with the Project. The NCIG coal terminal is located on the southern side of Kooragang Island, to the west of the Project area. Refer to Figure 3.3.

The NCIG terminal and the two Port Waratah Coal Service terminals at Carrington and Kooragang Island comprise the Port of Newcastle's current coal export shipping infrastructure. The NCIG terminal was approved by the NSW Government in April 2007. The approval for the NCIG project included the dredging of three berths. Dredged sand was used as preload and engineering fill for the construction of the land-side infrastructure.

3.8 Port Waratah Coal Services Terminal 4

The proposal for the development of the port's fourth coal terminal on Kooragang Island is known as the "T4" Project. Port Waratah Coal Services Pty Ltd (PWCS) has lodged an application under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* for the T4 Project.

The T4 site is located on the southern side of Kooragang Island to the west of the NCIG coal terminal. Refer to Figure 3.3. Both the proposed T4 terminal and the existing NCIG coal terminals are located to the west of the Project. Neither the T4 nor NCIG terminals would use the berths proposed under this Project.

3.9 Swing Basin

The NPC Swing Basin Project is located immediately to the west and north of the Project. Refer to Figure 3.3. NPC received approval in 2005 for the construction of a swing basin for navigational purposes in the South Arm of the Hunter River. In May 2011, NPC sought a modification to the swing basin approval under Section 75W of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

The Project involves the dredging, excavation and disposal of sediments in order to extend shipping channels. The Swing Basin Project modification would further assist the development of shipping infrastructure within the port and achieve NPC's objectives for the Port.

3.10 Orica – Kooragang Island Facility Expansion

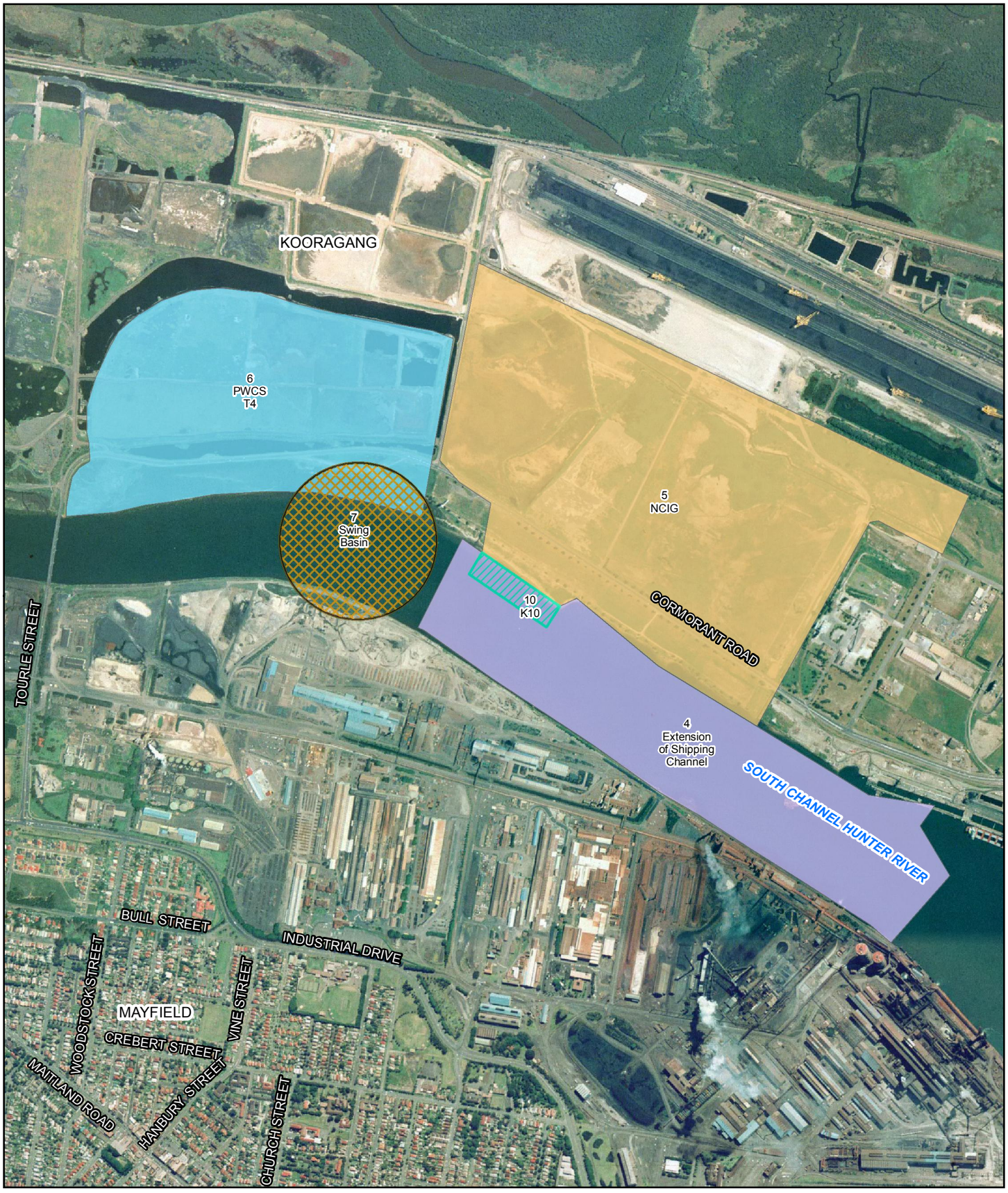
The Orica facility is located on Walsh Point at the eastern end of Kooragang Island. This site is immediately adjacent to the proposed Kooragang 1 berth and the proposed berth pocket at Walsh Point. This berth pocket would occupy the area of up to three berth boxes depending on vessel size. Refer to Figure 3.4.

Orica received approval in December 2009 for the expansion of the ammonium nitrate facility located on Kooragang Island. Orica has since lodged an application to amend the approved project under Section 75W of the EP&A Act. The primary amendments relate to the layout of the facility, and the equipment to be used.

3.11 Walsh Point – Santos

The Santos (formerly Eastern Star Gas) proposal is located to the north of the Orica facility on Walsh Point. The planning for the project is in the initial stages. Santos has not finalised arrangements for access to berths. Refer to Figure 3.4.

The Santos site is 24 hectares in area. Santos proposes to export liquefied natural gas (LNG) from the site. The plant would have the potential to export four million tonnes of LNG per year from the site.



LEGEND

- 4. Extension of Shipping Channel
- 5. NCIG
- 6. PWCS T4
- 7. Swing Basin
- 10. K10

1:18,000 (at A4)

0 70 140 280 420 560

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

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Newcastle Port Corporation
Capital Strategic Dredging Project

NCIG, T4, Swing Basin and Channel Deepening

Job Number	22-15683
Revision	0
Date	13 Sep 2012

Figure 3.3

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

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Data Source: LPMA: DTDB - 2007, Imagery - 2007. Created by: gmcdiarmid, fmackay, mbarnier

LEGEND

- 8. Orica Expansion Site
- 9. Eastern Star Gas Development Site

1:10,000 (at A4)

0 37.5 75 150 225 300

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

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Newcastle Port Corporation
Capital Strategic Dredging Project

Job Number 22-15683
Revision 0
Date 10 Sep 2012

Orica and Eastern Star

Figure 3.4

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Data Source: LPMA: DTDB - 2007, Imagery - 2007. Created by: gmcdiarmid, fmackay, mbarnier

LEGEND

3. Hunter River Remediation Project

1:5,000 (at A4)

0 15 30 60 90 120

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56

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CLIENTS | PEOPLE | PERFORMANCE

Newcastle Port Corporation
Capital Strategic Dredging Project

Hunter River
Remediation Project

Job Number 22-15683
Revision 0
Date 10 Sep 2012

Figure 3.5

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

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Data Source: LPMA: DTDB - 2007, Imagery - 2007. Created by: gmcdiarmid, fmackay, mbarnier

4. Consultation

4.1 Introduction

The DGRs state that an appropriate level of consultation should be undertaken during the preparation of the EIS. Table 4-1 details the DGRs for consultation.

Table 4-1 Consultation DGRs

Environmental Impact Assessment Requirements
You should undertake an appropriate level of consultation with relevant parties during the preparation of the EIS, including (but not limited to): ◗ Local, State or Commonwealth government authorities such as: - Department of Environment, Climate Change and Water (now Office of Environment and Heritage). - NSW Office of Water. - NSW Industry and Investment (now Department of Trade and Investment, Regional Infrastructure and Services). - NSW Maritime. - Roads and Traffic Authority (now Roads and Maritime Services) - Newcastle City Council. ◗ Specialist interest groups and the public, including adjoining and affected landowners. The EIS must describe the consultation process, document consultation undertaken and identify the issues raised (and where these have been addressed in the EIS).

4.2 Consultation Activities

NPC has undertaken a range of consultation activities during the preparation of the EIS. These consultation activities were documented in the Stakeholder Engagement Plan prepared for the EIS.

4.2.1 Objectives of the Stakeholder Engagement Plan

The objectives of the Stakeholder Engagement Plan are to:

- Identify the community and key stakeholders potentially affected by the Project.
- Provide relevant information about the Capital Strategic Dredging Project.
- Identify the nature and extent of stakeholder issues/concerns and relevant strategies to manage these proactively.
- Define key messages, and identifying the key communication tools and techniques to be used during the development and exhibition phases of the EIS.
- Disseminating information and providing opportunity for feedback.

- Documenting policies and procedures that will be implemented to record and respond to enquiries, complaints, issues and incidents.
- Identifying and allocating communication roles and responsibilities during the delivery of this plan.

4.3 Government Authorities

NPC has consulted with the government authorities listed in Table 4-2. Appendix C (Consultation) contains copies of correspondence with these authorities.

Table 4-2 Agency Consultations

Newcastle City Council
NSW Maritime
NSW Office of Environment and Heritage
NSW Trade and Investment
NSW Office of Water
NSW Roads and Maritime Services (formerly NSW Roads and Traffic Authority)
Commonwealth Department of Sustainability, Environment, Water, Population and Communities

NPC attended a meeting with the NSW Office of Environment and Heritage (OEH, Heritage Branch) on 3 April 2012 to discuss the outcomes of the adequacy review. A similar meeting was also conducted with the Environment Protection Authority on 26 April 2012, and Department of Planning and Infrastructure on 15 August 2012. Additional correspondence with the OEH Heritage Branch occurred during September and October 2012. A series of recommendations were discussed and agreed upon, and have been captured in Chapter 12 and Table 17-1 (Statement of Commitments).

As a result of these meetings, relevant comments that were identified during the adequacy review have been captured within the EIS.

4.4 Aboriginal Stakeholder Consultation

NPC has consulted with Aboriginal stakeholders in accordance with the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC, 2005) as required by the DGRs. Refer to Chapter 12 (Heritage) for details and results of the Aboriginal consultation program.

The NSW Office of Environment and Heritage provided a list of potential stakeholders to be consulted. Table 4-3 lists the Aboriginal stakeholder organisations that were consulted.

Table 4-3 Aboriginal Stakeholder Consultation

Awabakal Traditional Owners Aboriginal Corporation
Awabakal Descendants Traditional Owners Aboriginal Corporation
Awabakal Newcastle Aboriginal Co-op
Cacatua Cultural Consultants
Arwarbukarl Cultural Resource Association
Awabakal Local Aboriginal Land Council
Maaiangal Aboriginal Heritage
Mur-Roo-Ma Inc
Nu-Run-Gee Pty Ltd
Gidawaa Walang Cultural Heritage Consultancy
Garrigal Aboriginal Community Inc
Worimi Aboriginal Community Co-operative
Worimi Local Aboriginal Land Council
Worimi Knowledge Holders AC
Yarnteen Ltd
The City of Newcastle
Office of Environment & Heritage
Office of the Registrar (NSW Aboriginal Land Rights ACT 1983)
Do-Wa-Kee
Yamuloong Group Initiatives Ltd

A public notice was placed in the Newcastle Herald on 28 May 2011 calling for expressions of interest from Aboriginal stakeholders. The closing date for expressions of interest was 9 June 2011.

Responses to the public notice and letters were received from:

- Office of Environment and Heritage.
- Office of the Registrar Aboriginal Land Rights Act 1983.
- The City of Newcastle.
- Mur-roo-ma Inc.
- Awabakal Local Aboriginal Land Council.
- Cacatua Culture Consultants.
- Gidawaa Walang Cultural Heritage Consultancy.
- Awabakal Descendants Traditional Owners Aboriginal Corporation.
- Awabakal Traditional Owners Aboriginal Corporation (ATOAC).
- Nur-Run-Gee Pty Ltd.

A methodology was sent to all registered stakeholders on 11 July 2011. Responses were received from three stakeholders:

- Awabakal Traditional Owners Aboriginal Corporation.
- Awabakal Descendants Traditional Owners Aboriginal Corporation.
- Nur-Run-Gee Pty Ltd.

In response to concerns raised by Awabakal Traditional Owners Aboriginal Corporation and Awabakal Descendants Traditional Owners Aboriginal Corporation regarding the methodology, NPC convened a site inspection on 2 September 2011. Appendix C (Consultation) contains responses from the Aboriginal stakeholders consulted for the Project, together with a copy of the advertisement placed in the Newcastle Herald on 28 May 2011.

In November 2011, the Awabakal Traditional Owners Aboriginal Corporation and Awabakal Descendants Traditional Owners Aboriginal Corporation were notified by email of the proposed addition of Mayfield berths 3 and 4 to the Project. Responses were received from Awabakal Traditional Owners Aboriginal Corporation and from Awabakal Descendants Traditional Owners Aboriginal Corporation stating they had no objection to the addition of the two Mayfield berths.

Registered Aboriginal stakeholders were sent a draft copy of the EIS on 21 August 2012, and given 28 days to comment. Copies of these outgoing letters are provided in Appendix F. No responses had been received from the stakeholders by the closing date, or by the time of writing of this EIS.

4.5 Community Consultation

4.5.1 Newcastle Herald Advertisement

NPC placed an advertisement in the Newcastle Herald on Saturday November 19. The advertisement provided a description of what is proposed, and sought comment from members of the community. A request for written comments to be submitted by 12 December 2011 was included in the advertisement. A copy of the advertisement is contained within Appendix C Community Consultation. This same advertisement was also placed in the Stockton Messenger and The Post newspapers.

4.5.2 Community Project Flyers

NPC distributed community information flyers to residents in Stockton, Tighes Hill, Mayfield East, Maryville and Carrington during the week of 21 November 2011. The information flyers provided a description of the Project, and sought comments from members of the public. The flyer provided details of the planned community information sessions, and how residents could attend the sessions to be able to meet project staff.

4.5.3 Community Information Sessions

NPC hosted a number of following community information sessions. Sessions were held at:

- Mayfield Sports Club on Wednesday 30 November 2011 from 11 am to 7 pm
- Stockton RSL Club on Thursday 1 December 2011 from 11 am to 7 pm.

Community members were able to meet with the project team one-on-one and ask for more information.

Three people attended the community information session at Mayfield, and nine people attended the session at Stockton. Table 4-4 reflects the issues raised during these sessions.

Table 4-4 Issues Raised During Community Consultation

Subject	Comment	Where Addressed
Dyke 3	◗ Enquired on the proposed use of Dyke 3. ◗ Concerned if Dyke 3 cuts off public access.	◗ Section 2.3 (Project Design) ◗ Section 14 (Traffic and Transport and Section 16.1 (Social and Economic)
Walsh Point	◗ Enquired about the status of Walsh Point Berth. ◗ Concerns about the access to Walsh Point. ◗ Is K1 identical to Walsh Point berths?	◗ Section 2.3 (Project Design) ◗ Section 14 (Traffic and Transport ◗ Section 16.1 (Social and Economic)

Subject	Comment	Where Addressed
Community	◗ No information on cargos leaving wharves. ◗ No public meeting held at this stage. ◗ Community consultation is not successful because it is not good enough. Flyers should be sent to personal addresses. ◗ Confirmed comment process. ◗ Communication of information on dedicated website. ◗ Need EIS to be in general layman terms.	◗ This Chapter - Section 4 (Consultation) - Primarily Section 4.5 Community Consultation ◗ Executive Summary - *How can I comment on this EIS?* ◗ Glossary of Terms
Timing	◗ Will wharves be constructed first or dredging, and where will the fill go? ◗ What are the timeframes for the use/development of the berths. ◗ Enquiring about the timeframes of lodgement.	◗ Section 2.3 (Project Design) ◗ Section 2.4 (Staging) ◗ Executive Summary - *When is the Project proposed?* And *How can I comment on this EIS?*
Channel	◗ Are there any plans to change/dredge the main channel? ◗ Will the channel be widened and how noisy will it be? ◗ Concerned about the dredging changing river flows.	◗ Section 2.3 (Project Design) ◗ Section 2.5 (Dredging Activities) ◗ Section 8 (Sediment and Water Quality) ◗ Section 10 (Hydrology)
Cumulative	◗ Port values such as ecology, drainage, heritage, economic and other values are not being considered. ◗ Cumulative impacts of port dredging impacts will increase erosion on Stockton (previous studies undertaken by community have shown this). ◗ Concerned about cumulative impacts from other Port activities.	◗ Section 5 (Risk Analysis) ◗ Section 8 (Sediment and Water Quality) ◗ Section 12 (Heritage) ◗ Section 15 (Flora and Fauna) ◗ Section 16.1 (Social and Economic) ◗ Section 16.7 (Potential Cumulative Impacts)

Subject	Comment	Where Addressed
Dumping	◗ Dredge material will go out to sea. ◗ Sand reused on Stockton beach was a success. ◗ Environmental concerns regarding sea dumping. ◗ Sea dumping and monitoring (is it filling) of process. ◗ Will dredged material be trucked? ◗ Concerned about sea dumping (general). ◗ Does not want any sand on Stockton beach as residual contamination would harm others in the future. ◗ Sand dumping on Stockton beach has benefited beach erosion issues.	◗ Section 9 (Contamination) ◗ Section 13 (Spoil Handling and Disposal), and associated Strategy (Appendix E) ◗ Section 14 (Traffic and Transport
Contamination	◗ Concerned about soil contamination. ◗ Testing of soil regarding the contaminants in the river. ◗ Not convinced that the soil testing for the EIS showed no contaminants. ◗ Requested information on how contaminants will be managed if found during construction. ◗ Concerned about contaminants activated from dredging activities , in particular fish stocks.	◗ Section 9 (Contamination) ◗ Section 13 (Spoil Handling and Disposal) ◗ Section 15 (Flora and Fauna)

Subject	Comment	Where Addressed
General	◗ Enquired about the use of each berth. ◗ There will be a need to have maintenance dredging. ◗ Concerned that wharves are progressing without defined need or demand. ◗ Clarified depths in relation to each berth. ◗ How does the works fit in with the need for tourism and community access for public recreation? ◗ Where is the transport to support these developments? ◗ What will be the use of the wharves? ◗ Is there a change between the dredging plan and concept plan? ◗ Will sea level rise be considered? ◗ Will sea armour be trucked in? Prefer over water. ◗ Concerned about access for recreational fishing (no current access to Basin). ◗ Supports non-coal trade at Mayfield. ◗ Concerned about add more coal berths and coal dust.	◗ Section 2.3 (Project Design) ◗ Section 6 (Strategic and Project Justification) ◗ Section 13 (Spoil Handling and Disposal) ◗ Section 14 (Traffic and Transport ◗ Section 16.1 (Social and Economic) ◗ Section 16.3 (Energy and Greenhouse)

5. Environmental Risk Analysis

5.1 Introduction

The DGRs state that an environmental risk analysis (ERA) must be undertaken as part of the EIS. Table 5-1 outlines the DGRs requirements for the ERA.

The ERA is a process designed to analyse the Project's potential impacts and to identify risks and impacts previously not identified. The purpose of the risk assessment is to confirm the key issues from the DGRs, and determine if issues not contained within the DGRs require a greater level of assessment. This chapter details the methods used for the environmental risk analysis, the outcomes from the assessment and the management of issues identified.

Table 5-1 Environmental Risk Analysis DGRs

Environmental Impact Statement Requirements	Where Addressed
The DGRs for the EIS require than an environmental risk analysis be undertaken for the Project, The environmental risk analysis is a process designed to analyse the Project's impacts and to identify impacts that may not have previously been identified.	Chapter 5 (Environmental Risk Analysis)
The EIS must include a risk analysis to identify potential environmental impacts associated with the Project (construction and operation).	Chapter 5 (Environmental Risk Analysis)
The EIS must detail proposed mitigation and identify potentially significant residual environmental impacts after the application of the proposed mitigation measures.	Chapter 5 (Environmental Risk Analysis), Chapters 8 to 16 and Chapter 17 (Statement of Commitments)
Where additional key environmental impacts are identified through this environmental risk analysis, an appropriately detailed impact assessment of this additional key environmental impact must be included in this EIS.	Chapter 5 (Environmental Risk Analysis) and Chapter 16 (General Environmental Assessment Requirements)

5.2 Approach to Environmental Risk Analysis

The ERA is an important part of the EIS process. It provides a framework for identifying and analysing the potential environmental impacts of the Project. It allows the design to be refined to minimise potential impacts.

The objectives of the risk assessment are to:

- Identify and confirm key environmental impacts of the Project that require detailed investigation and summarise the risk assessment findings, identifying any significant residual risks.
- Identify areas of knowledge gaps or uncertainty.

- Facilitate a consistent approach to risk assessment across the various environmental issues. The approach is applied conservatively where there is an uncertainty or knowledge gap.
- Inform the design and construction processes.
- Provide a clear process to develop management measures to mitigate the risk.
- The level of investigation is to align with the level of risk to humans and the environment.

The ERA approach is widely recognised and used for environmental impact assessments. It assesses the overall risk by examining the likelihood and the consequence of a risk occurring. Figure 5.1 shows the processes of the ERA.

Figure 5.1 ERA Process

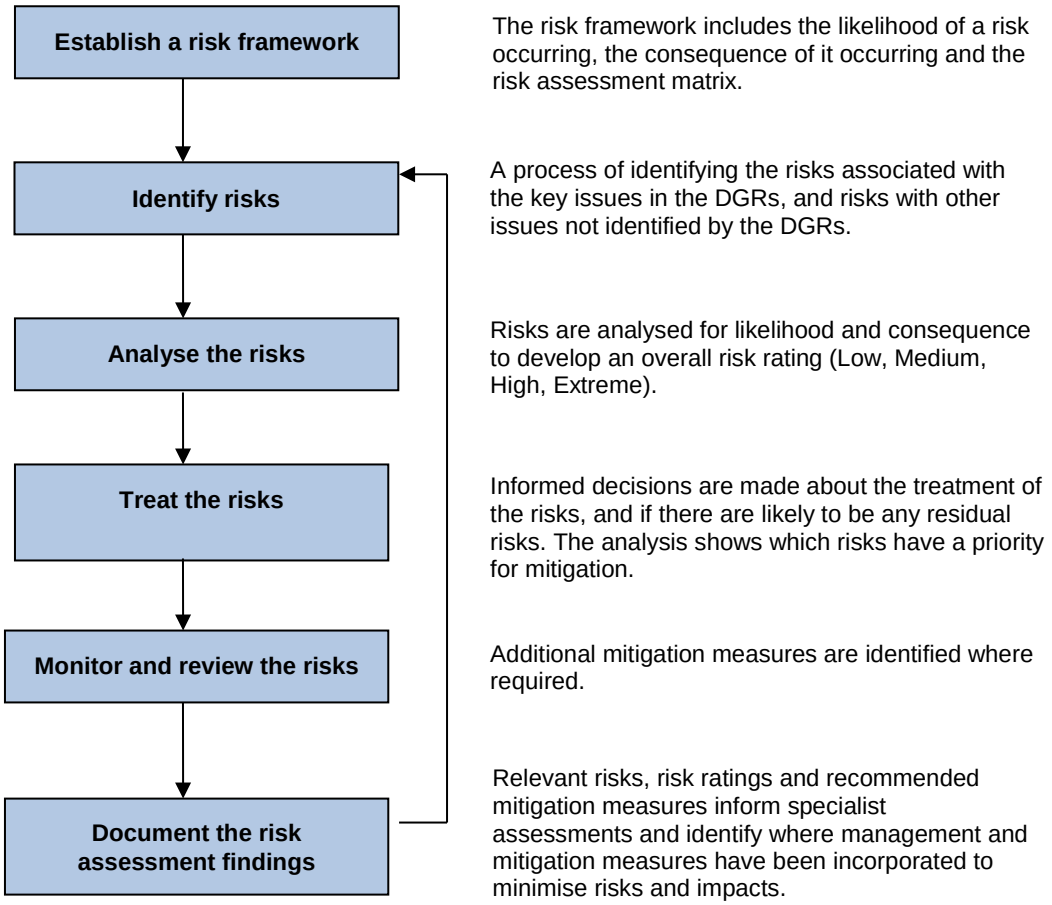

Table 5-2 shows the risk matrix, and the intersections of the assessment of likelihood and consequence. Table 5-3 shows the risk ratings used in the ERA.

Table 5-2 Risk Matrix

Likelihood Level	Consequence Level				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Low	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Negligible	Low	Medium	High	High
Unlikely	Negligible	Low	Medium	Medium	High
Rare	Negligible	Negligible	Low	Medium	Medium

Table 5-3 Risk Ratings

Insignificant	
Minor	
Moderate	
Major	
Catastrophic	

Almost certain	Event is expected to occur in most circumstances
Likely	Event will probably occur in most circumstances
Possible	Event could occur
Unlikely	Event could occur but not expected
Rare	Event occurs only in exceptional circumstances

This ranking approach utilised the five level scale, which is function of the risk matrix. It is an assessment of the likelihood and consequence as shown in Table 5-2.

An initial risk rating was assigned based on the risks identified and information available at the time of each workshop (program of workshops detailed below). Residual risks were assigned after the risks were analysed and treatments proposed.

For the purposes of the risk assessment workshop, any non-key issues that received a ranking 3 or higher would require additional detail within the EIS.

5.3 ERA Workshops

The following Sections outline a series of workshops that were undertaken as part of the ERA process.

5.3.1 Project Commencement

At the commencement of the Project, key Project team members analysed the DGRs to identify any risks associated with the key issues, and any issues that were not listed in the DGRs. This workshop reviewed the DGRs and relevant available literature. It confirmed the approach for the assessment of each issue in line with the level of risk identified.

Briefing sheets were distributed to specialists to provide a structured approach to the EIS. They identified the known issues and risks, relevant literature for review and any knowledge gaps.

5.3.2 Multi-disciplinary Risk Assessment Workshop

A workshop involving specialist teams for the EIS was held on 12 July 2011. This meeting further examined the DGRs and highlighted the objectives of the EIS.

Dredging methods and spoil handling and disposal options were identified as key factors for the Project. A range of methods and options were analysed. It was determined that appropriate management of these issues could significantly control potential environmental risks.

Risk identification, analysis, management and prioritisation confirmed the key risks to be addressed by the specialist assessments.

5.3.3 Risk Assessment Review Workshop

The second multi-disciplinary risk assessment workshop was undertaken on 26 August 2011 to review the assessment and treatment of previously identified risks, and determine if any new risks had emerged from the specialist studies. This workshop facilitated an environmental assessment and risk review with input from specialists, project management and design teams.

5.4 Key Environmental Impacts

The risk analysis workshops assessed the risks associated with the Project, management measures required to manage the risks, and any residual risks. Table 5-4 provides a summary of potential risks, risk categories, impacts and proposed management measures.

It incorporates the findings from the Project commencement, multi-disciplinary and risk assessment review workshops. Key issues from the DGRs were analysed for any new risks. Issues not identified by the DGRs were analysed to determine if potential risks would warrant a greater level of assessment in the EIS.

Table 5-4 Summary of the ERA

Issue	Identified risks	Initial risk	Risk treatment	Residual risk
	Key Issues			
Noise and Vibration	• Impacts of noise and vibration due to construction activities. • Potential cumulative impacts – dependent on timing and how many berths are developed concurrently. • Consideration of external cumulative impacts with other adjoining projects. Assessment of impacts at sensitive receivers should consider other projects that may occur simultaneously. • Dredging can potentially occur over a 24-hour period, therefore risk of night time noise. • Potential vibration impacts on infrastructure. Assess the impacts on existing infrastructure from available construction techniques. • Potential complaints - difficult to predict. • Traffic assumptions associated with the stockpile locations at Walsh Point. Disposal by road for land fill for contaminated spoil. • Existing sheet pile wall at Mayfield and landside contamination would affect the level of potentially contaminated material to be disturbed, and require transport by road. • There will be no blasting required during dredging, however piling will be necessary, therefore a risk of some noise remains.	High	• Full detail of noise and vibration mitigation measures are provided in Section 11.5 of this report. • Dredging would be relatively quiet, however sensitive noise receivers at Carrington need to be considered during piling. These would be buffered by the existing port infrastructure such as rail sidings and warehouses. • Noise outside of standard construction hours would be restricted to that produced by the operation of the barge. This would be no louder than existing night-time harbour traffic. • Dilapidation surveys would be conducted for structures within the distances specified in relevant guidelines. • Standard procedures would include an initial letterbox drop and monitoring. • Refinement of the design to eliminate the need to disturb contaminated material behind Mayfield 1 and 2, therefore reducing the potential for noise/vibration associated with its removal.	Low

Issue	Identified risks	Initial risk	Risk treatment	Residual risk
Contamination	**Land** • Potential contamination under former BHP Steelworks site (Mayfield berths 1 and 2). There is a high potential for the land adjacent to these berths to be contaminated. • Previous studies identified a contamination hotspot near Walsh Point Berth Pocket. • Mayfield berths 5-7 - the existing sheet pile wall in front of this area is not deep enough. This wall has the potential to become unstable. Given the instability of the bank and the high potential for contamination, land based excavation should be avoided at this site. • Potential land requirements for a 1:4 batter option. • Contaminated material stockpiling and treatment options. This will depend on the level of contamination (not suitable to dump this material offshore). • Traffic and transport implications for Mayfield berths 1 and 2 – removal of material. **Sediment** • Unknown parameters associated with previously identified Walsh Point contamination hotspot. • Groundwater at Walsh Point should not be significantly impacted – low risk. • No real issues associated with Acid Sulfate Soils (ASS), turbidity or Total Suspended Solids (TSS) – low risk.	High	• Contamination mitigation measures are provided in Section 9.6 of this report. • The conservative approach would be to treat and dispose of the material onto land (not off-shore). • Validation sampling would be done at the time of construction. • A management plan would be developed to reduce impacts from contaminated materials. • Transportation of contaminated material to landfill. • Treatment of the contaminated material would be required. Preferably treat the material onsite to stabilise it (mixing with concrete), and then transport to Kemps Creek, Sydney for disposal. • Statement of Commitments should note that further testing would be done at this location prior to dredging. • The design of Mayfield berths 1 and 2 would be refined to minimise potential disturbance of this land. • Mayfield berths 5-7 will require another sheet pile wall in front of the existing wall, together with rock stabilisation.	Medium

Issue	Identified risks	Initial risk	Risk treatment	Residual risk
	• Metals in sediments have a significant water quality risk, but with adequate management measures will not be a significant issue during dredging. Must be considered as part of the water quality assessment. Minimal chance of metal mobilisation - low risk during disposal.			
Sediment and Water Quality	• Acid Sulfate Soils – no significant elevated levels identified, plus it would be buffered by the saline water and unlikely to oxidise. • Sediment dispersion and suspension are a relatively low risk. • Must consider the implications of the existing sheet pile wall between Mayfield berths 5-7. Potential for erosion and mobilisation of contaminants. • Potential contamination issues. • Potential water quality impacts up-stream are considered low risk due to limited mobilisation of sediments. • Impacts of actual dredging as well as disposal options.	High	• Sediment and Water Quality mitigation measures are provided in Section 8.4 of this report. • Refined the design to minimise excavation and the potential impacts on water quality. • A new sheet pile wall seaward of this existing wall would limit the potential for the erosion and sedimentation together with the mobilisation of contaminants. • Use standard procedures/mitigation measures for dredging as those used in regular maintenance dredging.	Medium

Issue	Identified risks	Initial risk	Risk treatment	Residual risk
Hydrology	• Modelling results will help address the flooding characteristics - the Project is unlikely to impact on the hydrology of the Hunter River. • Hunter Estuary Ramsar wetland – upstream of the Project, however, very low potential for impacts to this site. • The impacts of climate change, and in particular sea level rise – unlikely to have a significant impact. Sea level rise is unlikely to impact the hydrology of the river to any great extent, but impacts on the foreshore and design treatments will need to be addressed. • The most significant impact could be from turbidity. Tidal flow and velocity changes would occur as a result of the Project. • Scouring and erosion of river banks by natural forces as well as by passing vessels – this is an operational issue. Saline intrusion is expected to be minimal.	Medium	• A complete outline of hydrology mitigation measures are provided in Section 10.4 of this report.	Low
Heritage	• Aboriginal Heritage Groups – possible risks associated with the consultation process. Stakeholders could oppose the Project and object on the grounds of cultural significance. This has the potential to impact on the approval process. • Non-Indigenous – possible risks associated with the management of items (old boat rails from a ship construction yard 1914).	Medium	• Heritage mitigation measures are provided in Section 12.4 of this report. • NPC will facilitate a site visit (2 September 2011). Maximum of 12 people are able to attend. • Underwater video recording of some heritage items will be undertaken prior to their disturbance.	Low

Issue	Identified risks	Initial risk	Risk treatment	Residual risk
Spoil Handling and Disposal	• Potential traffic and transport risks associated with road haulage of material. • Currently basing the assessment on disposal at Kemps Creek (for Walsh Point material). • Potential for reuse - T4 project will need a large amount of fill, however it is difficult to predict when this project will commence. Reuse therefore unlikely but possible. • Air quality, there is a risk of odours associated with stockpiling. • Potential risks associated with the impacts of dredging - must account for the dredging methods and the disposal of the spoil. • Issues associated with nominated spoil management locations (due to the potentially long timeframes for commencement of dredging activities). • The outcomes from the Project start-up workshop identified spoil handling and disposal, and land-side impact assessment as key risks to consider.	High	• Spoil Handling and Disposal mitigation measures are provided in Section 13.4 of this report. • Land-side and contamination impacts are provided in Section 9.3 of this report.	Medium

Issue	Identified risks	Initial risk	Risk treatment	Residual risk
Ecology	• Hydrology modelling and water quality modelling (plumes) is key to assessing potential risks on aquatic ecology. Specifically the potential impacts of sediments settling on seagrass beds, and potential impacts upstream on sensitive areas such as the Ramsar wetlands. • Risk of turbidity and TSS impacting aquatic values – considered unlikely to pose a significant risk. • Walsh Point – there is possible bird foraging area. • Unlikely to be impacts at actual berth locations. • Offshore disposal would be assessed separately through Commonwealth approval process. • Implications of land-based assessment requirements for spoil management areas.	Medium	• Ecology mitigation measures are provided in Section 15.4 of this report.	Low
Non-Key Issues				
Social and Economic	• Potential impacts to nearby residential receivers. • Proposed dredging may have a minimal socio-economic impact on the community, but this would be a low risk to the Project. • The majority of social impacts would be related to issues such as noise and vibration caused by the operation of plant and equipment. • Water quality adjacent to the dredging may be affected. • Equipment may temporarily alter the visual amenity of the surrounding area.	Low	• Social and economic mitigation measures are provided in Section 16.1.4 of this report. • The Project would produce short-term disruptions but result in long-term benefit to the broader economy.	Negligible

Issue	Identified risks	Initial risk	Risk treatment	Residual risk
Air quality and climate	• Excavated sediment that is contaminated will be stockpiled. • Stockpiled sediments have the potential to create odour impacts. • Potential impacts to nearby residential receivers. • Risks associated with dust (or odour) plumes.	Medium	• Air quality and climate mitigation measures are provided in Section 16.2.4 of this report.	Low
Energy and greenhouse	• Emissions from construction activities (energy used on site, transportation of raw materials to site and waste from site, and methane generating activities).	Low	• Energy and greenhouse mitigation measures are provided in Section 16.3.4 of this report.	Negligible
Pollution and fuel spills	• Potential spillage from vehicles transporting material to and from the construction site. • Potential water quality impacts due to any accidental leaks or spills during construction. • Erosion and sedimentation hazards. • Risk of pollution from construction vehicle fuel spillages and dredging activities. • Risk of pollution from contaminants, such as heavy metals and petroleum based products, being discharged to receiving waterways.	Medium	• Pollution and fuel spill mitigation measures are provided in Section 16.4.2 of this report. • Avoidance and control of pollution associated with the construction and operation phases. • In the event of a spillage of materials from construction vehicles, spilled material would be removed as soon as practicable. • An appropriate spill kit would be kept on site at all times and any spillage would be immediately and appropriately cleaned up. In the event of a large or hazardous spill, the Fire Brigade, Police, Ambulance and the Office of Environment and Heritage would be contacted.	Low

Issue	Identified risks	Initial risk	Risk treatment	Residual risk
Visual	• Potential to affect the visual amenity and landscape features of the area through temporary construction activities. • Potential direct views of dredging of new berths and the disposal of spoil by truck. • Temporary stockpiling of spoil material, may be visible to some sensitive receivers. • Sedimentation of the water column may result from the dredging activities. Water adjacent to dredged berths would experience temporary cloudiness. • Excavation of the batter slopes at the Walsh Point and Kooragang 1 berth – possible minor visual impacts to sensitive receivers located in Stockton. • Potential impacts associated with the introduction of new built elements to the landscape.	Low	• Visual mitigation measures are provided in Section 16.5.4 of this report.	Negligible
Traffic and Transport	• Impacts to existing road networks, upgrades, and cumulative impacts. • The outcomes from the Project start-up workshop identified traffic and transport as a key risk to consider.	High	• Traffic and transport mitigation measures are provided in Section 14.4 of this report.	Low

Issue	Identified risks	Initial risk	Risk treatment	Residual risk
Cumulative Impacts	• There is potential for cumulative impacts arising from simultaneous dredging of all twelve berths, however impacts would diminish if dredging were not done all at once. • There is also potential for impacts from this Project to accumulate with impacts from other nearby projects.	Medium	• Cumulative mitigation measures are provided in Section 16.7 of this report. • It is highly unlikely that all twelve berths would be dredged simultaneously, therefore a negligible cumulative impact once combined with surrounding projects (such as the Mayfield Redevelopment, Orica and T4).	Low
Navigational Hazards	• This was added as a non-key issue, as it was identified as a risk during the ERA workshop. • Risks include potential collisions and damage to harbour vessels or structures, as well as environmental impacts associated with such hazards. • Some of the risks associated with this hazard were considered fatal and severe, however implementation of standard mitigation measures substantially reduced this risk rating.	High	• Full details of navigational hazard mitigation measures are provided in Section 16.4.2 of this report. • Mitigation measures will be standard Port practice, such as having all ships being under pilot control and guided by tug boat, the implementation of standard management practices, and daily checking of the location of environmental controls such as curtains.	Medium

5.5 Design Amendments

An additional berth pocket, comprising Mayfield 3 and 4 berths, was included during the development of the concept design. The Mayfield berth pocket is located along the southern side of the existing shipping channel between proposed Mayfield 2 and 5 berths. It is adjacent to the former BHP Steelworks site. Figure 2.1 shows the locations of these berths.

The designed dredge level of the Mayfield berth pocket (13.3 metres NHTG) is consistent with the existing berth at the Mayfield site. The approximate volume of dredging material at the Mayfield berth pocket would be 65,000 cubic metres.

The Mayfield berth pocket does not require the excavation of land side fill material, and is unlikely to introduce any unidentified or additional environmental impacts. No additional environmental risks were identified. The existing risks addressed during the ERA would be minimised through appropriate management measures outlined in the Statement of Commitments (Chapter 17).

5.6 Conclusion

5.6.1 Risk Analysis

The ERA did not identify any additional key issues to those identified in the PEA and the DGRs. Chapters 8 to 15 address the key issues from the DGRs.

The ERA identified a risk to navigation from the presence of the dredging barge within the port. However, through the application of existing port safety protocols used for regular maintenance dredging, the identified potential risks would be adequately addressed. Chapter 16 addresses other environmental issues identified in the ERA not listed as key issues in the DGRs.

The ERA demonstrated that a combination of standard and Project-specific management measures would adequately manage risks associated with key issues listed in the DGRs and other issues identified through the ERA process. Residual risks would be eliminated or minimised through management measures, and potential environmental risks associated with the Project could be adequately managed.

6. Strategic and Project Justification

The Project is an important element in NPCs strategy for the diversification and future development of the Port. The Project is aimed at achieving dredging approval for future berths that will assist in developing new and diversified trade opportunities. The approach identified will provide future developers of the landside infrastructure with surety in regards to the water side infrastructure and assist in early work progressing.

The DGRs identify a number of key issues to be addressed in relation to the Strategic Justification of the Project. Table 6-1 outlines where the issues relating to strategic and Project Justification have been addressed.

Table 6-1 DGRs for Strategic and Project Justification

Environmental Impact Statement Requirements	Where Addressed
A description of the strategic need, justification and objectives for the Project.	Section 6.1 describes the strategic need for the Project, and Section 6.4 provides a justification for the Project.
Identify alternatives to the proposed preferred project and justify the Project taking into consideration the objects of the *Environmental Planning and Assessment Act 1979*, and it consistency with the aims and objectives of relevant Commonwealth, State and local policies including the *National Ports Strategy,* the *NSW State Plan, NSW Ports Growth Plan,* the *Lower Hunter Regional Strategy, Hunter Estuary Coastal Zone Management Plan (Newcastle City Council, 2009)* and the Project objectives.	Section 6.4 provides a justification for the Project with consideration to the objects of the NSW *Environmental Planning and Assessment Act 1979*. Section 7.2.1 addresses the legislative context for the Project, including the objects of the NSW *Environmental Planning and Assessment Act 1979*. Section 6.2.1 discusses the Project's consistency with Commonwealth strategies and policies. Section 6.2.2 discusses the Project's consistency with State policies and strategies. Section 6.2.4 discusses the Project's consistency with regional and local strategies and policies. Section 6.3 discusses the alternatives considered, implications of doing nothing, and the preferred option.

6.1 Strategic Need and Objectives for the Project

6.1.1 Strategic Need

NPC was established in July 1995 under the *Ports and Maritime Administration Act 1995* (Ports Act) and the *State-Owned Corporations Act 1989* (SOC Act). The principal functions and objectives of NPC are defined under the Ports Act and the SOC Act. NPC's primary function is to provide safe, effective and sustainable port operations and to deliver efficient port development that enhances the economic growth of the Hunter Region and NSW.

Section 9 of the Ports Act and Section 20E of the SOC together state that the principal objectives of NPC are:

(a) To be a successful business and, to this end:

(i) to operate at least as efficiently as any comparable business

(ii) to maximise the net worth of the State's investment in the Port Corporation

(iii) to exhibit a sense of social responsibility having regard to the interests of the community in which it operates and by endeavouring to accommodate these when able to do so.

(b) promote and facilitate trade through its port facilities

(c) ensure that its port safety functions are carried out properly

(d) promote and facilitate a competitive commercial environment in port operations

(e) improve productivity and efficiency in it ports and the port-related supply chain

(f) where its activities affect the environment, conduct its operations in compliance with the principles of ecologically sustainable development contained in section 6(2) of the Protection of the Environment Administration Act 1991

(g) exhibit a sense of social responsibility towards regional development and decentralisation in the way in which it operates.

The Project would be consistent with NPC's principal functions as defined under the Ports Act and the SOC Act. The Project would also assist NPC to achieve these principle functions.

6.1.2 Project Objectives

NPC has identified the need and opportunity to develop additional berths within the port. The Project would assist NPC to achieve the broader strategic objectives for the port, which include expanding and diversifying trade options. The objectives for the Project are as follows:

- Promote the diversification of trade in the port.
- Ensure berth box dredging approvals are in place to assist proponents in the development of wharf and landside infrastructure.
- Promote a competitive commercial environment.
- Promote use of currently under-utilised state owned land.
- Provide surety to developers in regard to water side approvals.

6.1.3 Newcastle Port Corporation Strategies

As a state-owned corporation, NPC's role is to promote and facilitate trade and ensure safety in the Port of Newcastle. NPC's primary objectives are to provide safe, effective and sustainable port operations.

The Port of Newcastle plays a central role in the economies of the Hunter Region and the State of NSW.

NPC's role is to facilitate port development that enhances the economic growth of the Hunter Region and New South Wales. Trade through the Port in 2009-2010 was over 103 million tonnes and valued at over $13 billion. NPC's objectives for the port include encouraging the diversification of trade opportunities. The approval of the Project would assist NPC to achieve this strategic aim.

6.1.4 Mayfield Site Port-related Activities Concept Plan

The development of the former BHPB site at Mayfield has been a core focus for NPC since steelmaking operations ceased in 1999. The site has been earmarked for port related activity for a number of years and more specifically as the State's next container terminal. The Concept Plan establishes broad parameters and environmental performance criteria to guide future development.

In the broader context of the proposed redevelopment of the old BHPB site, the approval of the Project would improve certainty for proponents wishing to develop facilities at the proposed Mayfield 1 to 7 berths.

The Project's interaction with adjoining projects and proposals is discussed in Section 3.

6.2 Strategies and Policies

This section addresses the requirements of the DGRs to establish the context for the Project, and to demonstrate the Project's consistency with the aims and objectives of relevant Commonwealth, State and local policies.

6.2.1 Commonwealth Strategies and Policies

National Ports Strategy

In December 2010 the Commonwealth Government released the *National Ports Strategy – Infrastructure for an economically, socially and environmentally sustainable future*. The Strategy identifies the need for a nationally coordinated approach to the future development and planning of Australia's port and freight infrastructure. The Strategy identifies the critical role ports play in Australia's economy, its defence and its social well-being.

Four specific priorities have been identified as being central to the Strategy. These are:

1. Planning for relevant ports.
2. Ensuring plans can be executed.
3. Improving landside efficiency, reliability, security and safety of container ports.
4. Promoting clarity, transparency and accountability.

The overarching objective of the National Ports Strategy is to "*drive the development of efficient, sustainable ports and related freight logistics that together balance the needs of a growing Australian community and economy with the quality of life aspirations of the Australian people*".

The Project would meet the objectives of the National Ports Strategy by facilitating the efficient development of the Port of Newcastle, increasing trade diversity and in turn the diversity of the Port and surrounding economy.

6.2.2 State Strategies and Policies

NSW State Plan 2010

The NSW State Plan 2010 (the State Plan) was developed by the NSW Government to set priorities to guide Government decision making and resource allocation. From public consultation undertaken during the development of the State Plan, transport was identified consistently as the highest priority for NSW.

Chapter 1 of the State Plan *Better Transport and Liveable Cities* identifies the need for improved freight access. It also identifies that major upgrades to the capacity of the State's ports are a key to delivering improved freight outcomes.

The Project would facilitate the implementation of the State Plan by increasing the capacity of the Port of Newcastle, and facilitating the diversification of trade through the Port.

NSW Ports Growth Plan

The Ports Growth Plan was announced in 2003. The Plan established a framework for the State Government, industry and the community to work towards ensuring future growth and development of port capacity in NSW. The aim of the Ports Growth Plan was to distribute the benefits of port growth more equitably between Sydney, the Hunter and Illawarra regions, provide long term capacity for container, bulk goods and general cargo and enhance the economic efficiency of NSW. The Port Growth Plan also identified the former BHPB site at Mayfield as a suitable tract of land to support a container facility.

The Project would be consistent with the aims of the Port Growth Plan by facilitating the diversification of trade within the Port of Newcastle. The Project would allow for the development of land-based infrastructure that could accommodate growth of container, bulk liquid, general and bulk cargo movements through the Port.

6.2.3 Newcastle Port Environs – Concept Proposal

In March 2003, the Premier of NSW released the *Newcastle Port Environs – Concept Proposal* to provide for the sustainable growth of Newcastle Port and its environs. The port concept proposal provides a strategic overview of the likely future development of the Newcastle Port environs by identifying key developmental and environmental issues and categorising land areas for potential use.

The concept proposal aimed to facilitate and encourage:

- The use of port-front land for port-related industries.
- Land that is suitable for port-related industrial development being available for these uses.
- Opportunities to build upon the competitive advantages offered by the Port of Newcastle for economic growth, including deep-water access, proximity to a major airport and potential for infrastructure links.

The Project is consistent with the aims of the *Newcastle Port Environs – Concept Proposal.*

6.2.4 Regional Strategies and Plans

Lower Hunter Regional Strategy

The NSW Government's Lower Hunter Regional Strategy 2006-2031 (the Regional Strategy) is a planning strategy that compliments and informs other relevant State planning instruments. Its primary purpose is to ensure that adequate land is available and appropriately located to sustainably accommodate the projected housing and employment needs of the region over the next 25 years. It also aims to ensure associated support services and infrastructure is available and appropriately located.

The Regional Strategy plans for population growth of 160,000 people by the year 2031 and the creation of up to 66,000 new jobs over the same period. The Port of Newcastle is identified as a significant facilitator of national economic activity; accounting for 14 percent of Australia's total exports sent to international markets.

The Regional Strategy recognises the challenges for the Port to accommodate expanding export operations in both the Hunter and Sydney. It also recognises that actions and strategies to improve the efficiency of freight to the Port have also put added pressure on export operations to service international demand.

The Project would assist in facilitating the development of land-based port infrastructure to assist in increasing the Port's capacity to service the needs of the Hunter, and Australia's export market. The Project would also indirectly assist in achieving the Regional Strategy's aim of creating additional jobs through facilitating the future growth and diversity of port-side operations in Newcastle.

Hunter Estuary Coastal Zone Management Plan

The Hunter Estuary Coastal Zone Management Plan (the Estuary Management Plan) was adopted by Newcastle, Port Stephens and Maitland Councils in October 2009. The aim of the Estuary Management Plan is to provide guidance for achieving a sustainable estuary, giving consideration to environmental, social and economic demands on the river system and the extensive catchment area. The study area incorporated in the Estuary Management Plan includes the Hunter River and its tributaries, extending from the sea to the river's upper tidal limit at Oakhampton.

The Estuary Management Plan prioritises 25 key management objectives (1 being most important and 25 being least important). The most applicable objective to the Project, which was ranked 23, states:

'*To facilitate appropriate reuse of sediment dredged from the Port of Newcastle'*

To achieve the prioritised objectives, the Estuary Management Plan has adopted a list of management strategies. The Project would be subject to Management Strategy 23 which states:

'*Where appropriate, reuse sediment dredged from the Port of Newcastle*'

The actions suggested to implement Management Strategy 23 include consultation with relevant government agencies to discuss possible options for reuse of dredged materials, including the reuse of clean sand for nourishment of Stockton Beach.

The Project is estimated to extract in the order of 1,870,000 cubic metres of material from the proposed berths. Consultation has been undertaken with relevant government agencies listed in the DGRs and other focus groups and stakeholders. Details of the re-use options for the dredged materials are provided in Chapter 13 (Spoil Handling and Disposal).

6.3 Alternatives Considered

6.3.1 The Implications of Doing Nothing

In the event that no berth dredging was undertaken at Mayfield there would be no viable port related development or berths for shipping. There would be no berth boxes and consequently no trading vessels would be able to use the wharf. Similarly, ships would not be able to berth at a wharf structure at Walsh Point if berth pockets were not dredged.

Without new berths the diversification of trade in the port would not be improved. The existing berths are projected to approach operational capacity in the next five to ten years. This would limit the economic growth potential of Newcastle and NSW through the limited ability to provide growth in non-coal trade through the port of Newcastle.

Berth box dredging approvals would be incorporated into the overall development application for the new wharf. This may lead to delays in construction and decrease certainty for prospective proponents who wish to develop the site.

6.3.2 Alternatives Considered

The Project was conceived with the aim of increasing trade options within the Port of Newcastle. In order to increase trade options, and in particular facilitate trade diversification, new berths are required.

The location of new berths within the port is constrained by the supply of available and suitable land adjacent to the channel. Operational requirements, such as vessel interaction and safe manoeuvring within the port, are other constraints that were considered. For example, potential berths near the port entrance would not be viable given the lack of available land and the impacts of passing vessels on docked vessels.

The location and availability of suitable land adjacent to the channel was assessed. At these locations, a number of arrangements for the size of the berths, both in area and depth, were considered.

The area of each berth has been maximised to support the largest class of vessel that is likely to use the berth in the future. While a deeper berth could potentially support a larger vessel (maximum draught), the size of the vessel able to use the berth is constrained by the berth's length and beam.

The proposed depth of the berths has also been based on a review of berths at the ports of Brisbane, Sydney and Melbourne. This is in view of trade patterns where the same vessel may visit multiple ports in Australia during a single visit. Each berth has therefore been sized to accommodate the largest vessel likely to use each site and likely growth in particular trade vessels (such as containers). This would provide maximum flexibility to future users of the berth.

Given the operational constraints associated with dredging in a relatively small area of isolated sediments, a backhoe dredge or cutter suction dredge would be the most likely method used to undertake the works. Both of these would result in lower levels of suspended sediment concentrations than the trailer suction hopper dredge. Section 2.6 (Dredging Methods) provides additional details on the types of dredges available for use.

6.3.3 Preferred Option

The preferred option of the new berths, as described in this EIS, is the only viable option for NPC. This option will provide the best opportunity for NPC to promote diversity in trade, support the various port growth strategies and the Mayfield Site Development Concept Plan.

6.4 Project Justification

The DGRs require an assessment of how the EIS for the Project has considered the objects of the NSW EP&A Act, and a justification for the Project with consideration to the objects.

The objects 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,

(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,

(vii) Ecologically sustainable development,

(viii) The provision and maintenance of affordable housing,

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

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

The development of the Project to date has been undertaken with consideration of a number of factors. The factors that have shaped the development of the Project include, but are not limited to:

- Trade strategies for the Port.
- Port operation requirements.
- End user requirements.
- Existing landside infrastructure.
- Future landside infrastructure requirements.

The Project would be consistent with the objects of the EP&A Act. Table 6-2 outlines the Project's consistency with the objects of the EP&A Act.

Table 6-2 Objects of the EP&A Act

Object	The Project
(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.	The Project would contribute to the social and economic welfare of the community. The Project would assist to diversify trade opportunities through the Port and create economic opportunities. The landside infrastructure adjacent to the proposed berths is currently under-utilised industrial land. The Project would contribute to improved management of port resources and port-side land. The Project would not have significant environmental impacts.

Object	The Project
(ii) The promotion and co-ordination of the orderly and economic use and development of land.	The Project would contribute directly to the promotion and co-ordination of the orderly economic use and development of land. The Project would facilitate the development of new berths for shipping within the port. This would facilitate the diversity of trade within the Port and have direct economic benefits. The Project would also assist in facilitating the development of wharf-side industrial land that is currently under-utilised.
(iii) The protection, provision and co-ordination of communication and utility services.	The Project would not influence communication or utility service provision in the area.
(iv) The provision of land for public purposes.	The Project would not influence the provision of public land in the area.
(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.	The Project has the potential to produce negative environmental impacts in the absence of appropriate environmental management measures. With the application of the mitigation measures, negative environmental impacts would be minimised.
(vii) Ecologically sustainable development.	The Project would involve the facilitation of additional berth facilities in the Port of Newcastle. The location of the proposed berths is at existing industrial land surrounding the port. The existing channel and berth boxes undergo daily dredging as part of the maintenance of port operations. With the application of appropriate environmental management measures, the Project would not negatively affect the ecological sustainability of the port or surrounding areas.
(viii) The provision and maintenance of affordable housing.	The Project would not directly influence the provision of affordable housing in the area.

Object	The Project
(b) To promote the sharing of the responsibility for environmental planning between the different levels of government in the State.	The proponent for the Project is NPC, as State-owned corporation. The NSW Department of Planning and Infrastructure is the approval body for the Project. A number of NSW Government departments and agencies have supplied EIS requirements that have been included in the DGRs. The Commonwealth Department of Sustainability, Environment, Water, Population and Communities and the City of Newcastle have both been consulted during the development of this EIS. As such, the development of the Project has considered requirements from local, state and Commonwealth government departments and agencies.
(c) To provide increased opportunity for public involvement and participation in environmental planning and assessment.	The DGRs have established the minimum consultation requirements for the Project. The DGRs require *"an appropriate level of consultation with relevant parties during the preparation of the EIS."* NPC developed and implemented a stakeholder engagement strategy for the Project, and has consulted with: • Local, state and Commonwealth departments and agencies. • Stakeholder groups including community groups, Aboriginal stakeholders and adjoining residential areas. Consultation for the Project is detailed in Chapter 4 Consultation.

7. Statutory Framework

The DGRs require an assessment of how the EIS has considered the relevant planning, land use and development matters (including relevant strategic matters). This chapter outlines the statutory framework applicable to the Project at the state, Commonwealth, regional and local levels. It details the relevant legislation and planning policies that have been addressed in the preparation of this EIS.

7.1 Commonwealth Legislative Framework

7.1.1 *Environment Protection and Biodiversity Conservation Act 1999*

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Commonwealth Government's key piece of environmental legislation. The aims of the EPBC Act are to:

- Provide for the protection of the environment, especially matters of national environmental significance.
- Conserve Australian biodiversity.
- Provide a streamlined national environmental assessment and approvals process.
- Enhance the protection and management of important natural and cultural places.
- Control the international movement of plants and animals (wildlife), wildlife specimens and products made or derived from wildlife.
- Promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources.

The EPBC Act requires the Federal Environment Minister's approval for an action that will, or is likely to, have a detrimental or adverse impact on a matter of National Environmental Significance (NES) or on Commonwealth land, unless the action is exempt. Matters of NES include World Heritage properties, Ramsar wetlands, nationally threatened species and ecological communities, migratory species, Commonwealth marine areas, nuclear actions and national heritage places.

Under the EPBC Act, actions that are likely to have a significant impact on a matter of NES are classed as 'controlled actions' and are subject to a referral, assessment and approval process. An action includes a project, development, undertaking, activity or series of activities. The Project is unlikely to have a significant impact on any matter of NES, and therefore a referral under the EPBC Act has not been prepared. The assessment of flora and fauna impacts (Section 15.3) includes an assessment of the Project's potential to have a 'significant impact' on any relevant NES matters.

The EPBC Act interactive map tool identifies extra information that may be relevant to the site. Kooragang Nature Reserve is listed as a Nationally Important Wetland. This is further discussed in Section 15.2.13.

7.1.2 *Environment Protection (Sea Dumping) Act 1981*

The Commonwealth *Environment Protection (Sea Dumping Act) 1981* (Sea Dumping Act) aims to provide protection for the marine environment by regulating the dumping of material in marine areas. Material includes the spoil recovered from dredging activities. Proponents must obtain approval from the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) under Section 19 of the Sea Dumping Act prior to the disposal of material at sea.

NPC is preparing an application for a sea-dumping permit for the material to be dredged as a result of the Project. NPC has commenced discussions with the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) to discuss the requirements for the sea dumping permit.

The permit application will be prepared in accordance with SEWPaC requirements. The application would then be submitted to SEWPaC for approval when the programme for dredging works has been confirmed. Section 7.5.2 details the NSW Crown Lands licence to dispose of material at sea.

Chapter 13 provides details on the assessment undertaken to determine the suitability of the material for disposal at sea and also provides details on other spoil management options available for the Project.

7.2 State Legislative Framework

This section identifies the relevant NSW legislation applicable to the Project.

7.2.1 NSW *Environmental Planning and Assessment Act 1979*

Development within the state of NSW is governed by the provisions of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The EP&A Act is the core piece of legislation that provides the statutory framework in which development proposals and significant infrastructure activities are assessed. There are a number of key sections of the EP&A Act that govern the assessment of development proposals but Part 5.1 specifically applies to State Significant Infrastructure.

Confirmation of Part 5.1

The Project's status as a State significant infrastructure project to which Part 5.1 applies was confirmed by the Department of Planning and Infrastructure by letter dated 22 March 2012. This letter stated that the Director – Infrastructure Projects (as delegate for the Minister) has listed this project as a transitional project under Schedule 4, Part 1 of the State Environmental Planning Policy (State and Regional Development) 2011, As such, the project has been transitioned to State significant infrastructure, and is therefore to be assessed under Part 5.1 of the EP&A Act.

Section 115Y(2) of the EP&A Act stipulates that an environmental impact statement must be prepared and that the matters listed under Part 3 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* apply. These matters relate primarily to the form and content of an environmental impact statement.

This EIS has been prepared in a form and content consistent with the Regulations.

Application of other provisions of the EP&A Act

Section 115ZF of the EP&A Act outlines how other parts of the Act apply. It states:

"Part 4 and Part 5 do not, except as provided by this Part, apply to or in respect of State significant infrastructure (including the declaration of the infrastructure as State significant infrastructure and any approval or other requirement under this Part for the infrastructure).

Part 3 and environmental planning instruments do not apply to or in respect of State significant infrastructure, except that:

(a) they apply to the declaration of infrastructure as State significant infrastructure or as critical State significant infrastructure (and to the declaration of development that does not require consent), and

(b) they apply in so far as they relate to section 28, and for that purpose a reference in that section to enabling development to be carried out in accordance with an environmental planning instrument or in accordance with a consent granted under this Act is to be construed as a reference to enabling State significant infrastructure to be carried out in accordance with an approval granted under this Part.

(3) Divisions 6 and 6A of Part 4 apply to State significant infrastructure that is not carried out by or on behalf of a public authority (and to the giving of approval for the carrying out of any such infrastructure under this Part) in the same way as they apply to development and the granting of consent to the carrying out of development under Part 4, subject to any necessary modifications and any modifications prescribed by the regulations.

(4) Division 2A of Part 6 does not apply to critical State significant infrastructure.

(5) The regulations may make provision for or with respect to the application to State significant infrastructure of the provisions (with or without modification) of section 81A, section 109M or any other provision of this Act relating to the issue of subdivision certificates.

(6) Section 109R applies to approved State significant infrastructure."

No environmental planning instruments apply that suspend laws pursuant to Section 28 of the Act. The proponent is a public authority so Part 4 (Division 6 and 6A) does not apply. Part 6 relates to Orders and in this case, is not directly relevant. Subdivision certificates, building certification or occupation certificates would not be required in relation to this activity as neither subdivisions or buildings are involved.

Other approvals and legislation that does not apply

Section 115ZG of the EP&A Act outlines approvals and legislation that do not apply when a project is assessed under Part 5.1. These are:

- The following authorisations are not required for approved State significant infrastructure (and accordingly the provisions of any Act that prohibit an activity without such an authority do not apply):
  - *the concurrence under Part 3 of the Coastal Protection Act 1979 of the Minister administering that Part of that Act,*
  - *a permit under section 201, 205 or 219 of the Fisheries Management Act 1994,*
  - *an approval under Part 4, or an excavation permit under section 139, of the Heritage Act 1977,*
  - *an Aboriginal heritage impact permit under section 90 of the National Parks and Wildlife Act 1974,*
  - *an authorisation referred to in section 12 of the Native Vegetation Act 2003 (or under any Act repealed by that Act) to clear native vegetation or State protected land,*
  - *a bush fire safety authority under section 100B of the Rural Fires Act 1997,*
  - *a water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the Water Management Act 2000.*
  - *Division 8 of Part 6 of the Heritage Act 1977 does not apply to prevent or interfere with the carrying out of approved State significant infrastructure.*

These Acts are further addressed in Section 7.5.

Planning Focus Meeting

There was no Planning Focus Meeting convened by the NSW Department of Planning and Infrastructure for the Project. NPC met with the NSW Department of Planning and Infrastructure prior to lodging the preliminary environmental assessment and it was agreed that a Planning Focus Meeting was not required.

Objects of the Environmental Planning and Assessment Act 1979

The DGRs state that an assessment of how the Project has considered the objects of the NSW EP&A Act is required. The objects 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

(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

(vii) Ecologically sustainable development

(viii) The provision and maintenance of affordable housing.

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

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

Section 6.3 provides an assessment of the alternatives considered during the planning stages of the Project, and Section 6.4 provides a justification for the Project with consideration to the objects of the EP&A Act.

7.2.2 *Threatened Species Conservation Act 1995*

The *Threatened Species Conservation Act 1995* (TSC Act) lists threatened species, populations and ecological communities as well as critical habitat and key threatening processes. Pursuant to the EP&A Act an assessment of the Project's impacts on land that is critical habitat or is likely to significantly affect threatened species, populations or ecological communities, or their habitats listed under the TSC Act must be undertaken. This assessment of significance involves assessing the Project's potential impacts based on a set of seven criteria. The assessment is used to determine if the Project is likely to have a significant impact on identified threatened species or their habitat, or endangered ecological communities at the site and for those that have the potential to occur at the site.

Further details on the assessment of the Project's potential impact on TSC Act matters are provided in Chapter 15 (Flora and Fauna).

7.2.3 *Fisheries Management Act 1994*

The *Fisheries Management Act 1994* (FM Act) lists threatened species of fish and marine vegetation, including endangered populations, ecological communities and key threatening processes. If projects are likely to significantly impact threatened species, populations or ecological communities, a Species Impact Statement is required. As a SSI this activity is not required to gain a permit to dredge or reclaim land (section 201, FM Act), or a permit to harm marine plants (section 205, FM Act) or a permit to block fish passage (section 219, FM Act).

Section 220ZZ of the FM Act, as amended by the *Threatened Species Legislation Amendment Act 2004*, lists the factors to be addressed in the assessment of significance of impact on threatened species, populations, ecological communities of fish and marine vegetation. Further details on the assessment of the Project's potential impact on FM Act matters are provided in Chapter 15 (Flora and Fauna).

7.2.4 *Protection of the Environment Operations Act 1997*

The *Protection of the Environment Operation Act 1997* (POEO Act) is administered by the NSW Office of Environment and Heritage (OEH). OEH issues environment protection licences (EPL) to the owners or operators of various activities listed in the POEO Act. Licence conditions relate to pollution prevention and monitoring, and cleaner production through recycling and reuse and the implementation of best practice.

NPC holds an EPL (number 3373) for maintenance dredging within the port. The EPL is issued in accordance with Clause 19 of Schedule 1 of the POEO Act – Extractive Activities and covers maintenance dredging within the Port of Newcastle (water-based extractive activity) in the range of 100,000 to 500,000 cubic metres of material obtained or moved annually.

A variation to EPL 3373 would be required for the Project. The variation would be sought to accommodate the additional volume of material that would be dredged over and above the 100,000 to 500,000 cubic metres allowed annually, and would cover capital strategic dredging activities.

Details of the spoil disposal strategy are provided in Chapter 13 Spoil Handling and Disposal.

7.3 State Environmental Planning Policies

7.3.1 *State Environmental Planning Policy (State and Regional Development) 2011*

The *State Environmental Planning Policy (State and Regional Development) 2011* aims to identify development that is State significant development, State significant infrastructure and critical State significant infrastructure. It also aims to confer functions on joint regional planning panels to determine development applications.

Schedule 4, Part 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*, lists the Project as a transitional SSI project.

7.3.2 *State Environmental Planning Policy (Infrastructure) 2007*

The aim of *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP) is to facilitate the effective delivery of infrastructure across the State by:

> *(a) Improving regulatory certainty and efficiency through a consistent planning regime for infrastructure and the provision of services*
>
> *(b) Providing greater flexibility in the location of infrastructure and service facilities*
>
> *(c) Allowing for the efficient development, redevelopment or disposal of surplus government owned land*
>
> *(d) 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)*
>
> *(e) Identifying matters to be considered in the assessment of development adjacent to particular types of infrastructure development*
>
> *(f) Providing for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing.*

Under Division 13 of the Infrastructure SEPP the Project is defined as *port facilities.*

Clause 68(1) provides that the Port Corporation can undertake port facilities without consent on any land provided the development is directly related to the existing port facility. Clause 68(5) notes that port facilities includes dredging and land reclamation when undertaken in connection with such facilities.

Therefore, the Project is permissible without consent under clause 68 of the Infrastructure SEPP.

7.3.3 *State Environmental Planning Policy (Major Projects) Amendment (Three Ports) 2009*

The *State Environmental Planning Policy (Major Projects) Amendment (Three Ports) 2009* (Three Ports SEPP) contains specific provisions relevant to the Ports of Newcastle, Port Botany and Port Kembla. Clause 4 of Division 1, Part 20 of the Three Ports Amendment states that:

"The only environmental planning instruments that apply, according to their terms, to land within the Three Ports Site are this Policy and all other State Environmental Planning Polices, other than State Environmental Planning Policy No 1 – Development Standards".

Clause 4 of the Three Ports SEPP, therefore overrides the provisions of all other environmental planning instruments, with the exception of other relevant State Environmental Planning Policies.

7.3.4 *State Environmental Planning Policy 55 – Remediation of Land*

The object of *State Environmental Planning Policy No 55—Remediation of Land* (SEPP 55) is to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. Although section115 ZF of the EP&A Act states that this environmental planning instrument does not apply, these matters have been considered and are addressed throughout this EIS. Chapter 9 (Contamination) addresses potential contamination issues associated with the dredged material, and Chapter 13 (Spoil Handling and Disposal) details management measures to address contamination and the disposal of dredged material.

7.3.5 *State Environmental Planning Policy 14 – Coastal Wetlands*

The aim of *State Environmental Planning Policy No 14 – Coastal Wetlands* (SEPP 14) is to ensure that the coastal wetlands are preserved and protected in the environmental and economic interests of the State. Although section115 ZF of the EP&A Act states that this environmental planning instrument does not apply, these matters have been considered and are addressed throughout this EIS. Chapter 15 (Flora and Fauna) addresses the Project's potential impacts on coastal wetlands.

7.3.6 *State Environmental Planning Policy 71 - Coastal Protection*

State Environmental Planning Policy 71 – Coastal Protection (SEPP 71) aims to ensure that development in the NSW coastal zone is appropriate and suitably located, so that there is a consistent and strategic approach to coastal planning and management, and that there is a clear development assessment framework for the coastal zone.

Clause 4 stipulates land to which SEPP 71 applies, being land which is within the coastal zone. The Project is situated in the coastal zone, as defined under the NSW *Coastal Protection Act 1979*, Clause 8 of SEPP 71 states matters that are to be taken into consideration by a consent authority when determining a development application to carry out development on land to which SEPP 71 applies. Although section115 ZF of the EP&A Act states that this environmental planning instrument does not apply, these matters have been considered and are addressed throughout this EIS.

7.4 Regional and Local Legislative Framework

7.4.1 *Hunter Regional Environmental Plan (HREP) 1989*

The *Hunter Regional Environmental Plan 1989 (Heritage)* is a deemed SEPP. This SEPP does not apply to the Newcastle Local Government Area, and is therefore not applicable to the Project.

7.4.2 *Newcastle Local Environmental Plan 2003*

The site of the Project is excluded from the provisions of the *Newcastle Local Environmental Plan 2003* (LEP) with the adoption of the "Three Ports Amendment" to the Major Development SEPP.

7.4.3 *Draft Newcastle Local Environmental Plan 2011*

The site of the Project is excluded from the provisions of the *Newcastle LEP 2003* with the adoption of the Three Ports SEPP. This would also apply to the *Draft Newcastle LEP 2011*.

7.5 Other Legislation

This section identifies other legislation considered in the development of this EIS. Table 7-1 provides a summary of the relevant legislation and its relevance to the Project.

Table 7-1 Summary of other Relevant Legislation

Legislation	Key Requirements	Relevance to the Project
Contaminated Land Management Act 1997 (CLM Act)	The CLM Act requires that any contamination that poses a risk to human health or the environment be reported to the Office of Environment and Heritage.	Chapter 9 assess the presence of contaminants within the spoil, and the potential for significant risk or harm.

Legislation	Key Requirements	Relevance to the Project
Crown Lands Act 1999	The Crown Lands Act governs the use of Crown Land.	A licence would be required for dredging and placing dredged material on Crown Land. This would be sought as part of the application for the sea dumping permit.
Heritage Act 1977	Consent is required under Part 4 of the Heritage Act for projects that alter, move or damage any part of a heritage listed item.	Pursuant to Section 115ZG of the EP&A Act, an approval under Part 4 of the Heritage Act is not required for an approved Part 5.1 project. Regardless, an assessment of the Project's potential impact on heritage items is provided in Chapter 12 and Appendix F
*National Parks and Wildlife Act 1974 (*NPW Act)	Under Sections 87 and 90 of the NPW Act, a permit is required to disturb or move, destroy, deface or damage an Aboriginal object or Aboriginal place.	Pursuant to Section 115ZG of the EP&A Act, a permit is not required under Section 90 of the NPW Act for an approved Part 5.1 project. Regardless, an assessment of the Project's potential impact on Aboriginal heritage is provided in Chapter 12.
Fisheries Management Act 1994	Under sections 201, 205 and 219 a permit is required to dredge or reclaim land, harm marine plants or to block fish passage respectively.	Pursuant to Section 115ZG of the EP&A Act, a permit is not required under Section 201, 205, or 219 of the FM Act for an approved Part 5.1 project.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act)	The WARR Act establishes a hierarchy of waste management (avoid, recover, dispose) encouraging the efficient use of resources and minimising waste.	Waste generated during the course of the Project would be managed in accordance with the principles contained within the WARR Act. A waste management plan would be developed for the Project.

Legislation	Key Requirements	Relevance to the Project
Water Management Act 2000 (WM Act)	Section 91 of the WM Act relates to activity approvals and provides that certain types of development and activities that are carried out in or near a river, lake or estuary are "controlled activities" and require an activity approval. Section 91 also provides that aquifer interference activities require an aquifer interference approval, which is an activity approval.	Pursuant to Section 115ZG of the EP&A Act, activity approvals under the WM Act are not required for an approved Part 5.1 project.
Coastal Protection Act 1979	The Coastal Protection Act aims to provide for the protection of the coastal environment. The Coastal Protection Act specifies circumstances where a public authority requires concurrence from the Minister to undertake development within the coastal zone.	Pursuant to Section 115ZG of the EP&A Act, concurrence under Part 3 of the Coastal Protection Act is not required for an approved Part 5.1 project. However, concurrence from the NSW OEH will be required for sea disposal of dredged material. This concurrence would be sought when the Sea Dumping Permit is lodged with the Commonwealth DSEWPaC.

7.5.1 Landowner's Consent

NSW Maritime, as owner of the land within the Hunter River channel, has provided landowner's consent to enable NPC to lodge the application for Project approval.

7.5.2 Crown Lands Licence

NPC has an existing licence from Crown Lands in relation to the disposal of maintenance dredge material at sea. The licence also has provision permitting the placement of material on Stockton Beach. A copy of the Crown Lands licence is located in Appendix I. The existing licence has been extended until 30th November 2012 as an interim measure to cover the recently granted 10 year sea dumping permit for maintenance dredging from SEWPaC. It is envisaged that a new Crown Lands Licence covering the 10 year sea dumping permit will be issued in November 2012.

Prior to the commencement of the dredging under this consent, NPC will seek a licence (or modification to the existing licence) from Crown Lands for the proposed disposal of capital dredge material at sea. The licence will be subject to approval of a Sea Dumping Permit by SEWPaC.

7.6 Conclusion

Due to recent changes to the *NSW Environmental Planning and Assessment Act 1979 (*EP&A Act), an assessment of the Project's status as State Significant Infrastructure was undertaken. The assessment confirmed that the Project is to be assessed under Part 5.1 of the EP&A Act, and the Minister for Planning and Infrastructure will determine the application as the proponent is a public authority. Table 7-2 provides a summary of the approvals that must be obtained before construction works for the Project can commence.

Table 7-2 Summary of Approval Requirements

Act	Approval Authority / Administering Agency	Approval Requirement
NSW Environmental Planning and Assessment Act 1979	Minister for Planning and Infrastructure	State Significant Infrastructure Project Approval
NSW Protection of the Environment Operations Act 1997	NSW Office of Environment and Heritage	Variation to Environment Protection Licence 3373 to permit capital dredging and disposal of dredged material
Commonwealth *Environment Protection (Sea Dumping Act) 1981*	Commonwealth Department of Sustainability, Environment, Water, Population and Communities	Approval for sea-dumping of dredged material