

Environmental Impact Statement

Proposed Port Kembla Bulk Liquids
Terminal (SSD 7264)

TQ Reference: PJ-PK-0001-REPT-009

82015103001/Report 001 Ver 3



Prepared for
TQ Holdings Australia Pty Ltd

4 December 2015



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Declaration

Environmental Impact Statement prepared under Schedule 2, Part 3 of the *Environmental Planning and Assessment Regulation 2000*.

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Project to which the Environmental Impact Statement relates:

Project Description:	Proposed Port Kembla Bulk Liquids Terminal, Lot 301 DP 1148391, Lot 2 DP 1125445, Lot 11 DP 1182111, Lot 70 DP1182824, Tom Thumb Road, Port Kembla.
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Applicant's Name: TQ Holdings Australia Pty. Ltd.
Applicant's Address: Level 4, 71 Walker Street
North Sydney, NSW 2060

The contents of this Statement, as required by Clause 71 of the Environmental Planning and Assessment Regulation 2000, are set out in the accompanying pages.

Declaration:

The Statement has been prepared in accordance with Schedule 2, Part 3 of the *Environmental Planning and Assessment Regulation 2000*.

The Statement contains all available information that is relevant to the environmental assessment of the development to which this Statement applies. Furthermore, the information contained within this Statement is neither false nor misleading.

Signature:



On Behalf of Cardno NSW/ACT Pty Ltd

Date: 4 December 2015

Executive Summary

TQ Holdings Australia Pty Ltd (TQ) proposes to develop the Port Kembla Bulk Liquids Terminal (PK BLT) at Port Kembla, New South Wales, Australia. Within the PK BLT, TQ proposes to construct and operate a bulk liquids terminal for the importation by ship, storage on site and distribution of liquids by road which will operate 24 hours a day and seven days a week. The construction and operation of the PK BLT (the Proposal) requires development approval and is identified as State Significant Development (SSD) subject to Section 89C of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Consequently, the application is required to be supported by an Environmental Impact Statement (EIS) prepared in accordance with the requirements of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation).

The PK BLT is proposed to be located on NSW Ports land, with TQ holding a long term lease. The Site would comprise the following land parcels:

- > Lot 301 DP 1148391
- > Lot 2 DP 1125445
- > Lot 11 DP 1182111.

The site also includes a license to operate on Berth 104 (Lot 70 DP1182824).

The proposal includes the following works:

- > Establishment of infrastructure on Berth 104 to enable the unloading of bulk liquid tanker vessels
- > Construction of bulk liquids storage tanks on Site 1 and Site 2
- > Truck loading and unloading equipment on Site 2
- > Terminal Office and Operator Control Room, and utilities on Site 3; and
- > Operation of the Bulk Liquid Terminal.

To assess the environmental impacts arising from the worst case scenario (Stage 3 full development) a detailed environmental assessment and risk analysis informed by agency consultation and Secretaries Environmental Assessment Requirements (SEARs), was undertaken by Cardno NSW/ACT Pty Ltd (Cardno), with the subsections below summarising the key findings of the primary environmental assessments.

Hazard and Risk

Sherpa Consulting Pty Ltd prepared the Preliminary Hazard Analysis (PHA) which identified a number of risk based scenarios for the Proposal to identify potential hazards and allow mitigation measures to be developed. Due to fencing and natural barriers such as waterways, there will not be a constant human presence within these areas. The injury heat radiation contours do not extend 1,200m from the site boundary into the nearest residential and sensitive land use areas, therefore, HIPAP 4 injury risk criteria are met for the PK BLT site. The cumulative risk was qualitatively assessed and the assessment indicates that there is a low cumulative risk in the areas as the contours typically remain onsite for all developments.

The scenario consequences were combined with outputs from the frequency of occurrence analysis and risk analysis, with risk contours developed. The resulting risk contours identified that the 5×10^{-5} per year individual fatality risk contour extends outside the site boundary to the east of Site 2 by 20m and into the Gurungaty waterway. The affected area is a shallow waterway, which precludes ship or boat access, and is within the port area, which restricts public access. Hence it is unlikely people will be present in this area and exposed to the risk.

The 5×10^{-5} per property damage and accident propagation risk contour extends offsite to the north of Site 1 into neighbouring land by up to 5m. This land is zoned to accommodate potentially hazardous installation and it is noted there is currently no equipment, structures or dangerous goods located in the area the risk contour extends into. TQ has advised PKCT of the propagation of the resulting risk contours on to their land arising from the PHA in its current state and ongoing consultation will be undertaken to ensure risks are managed appropriately.

Air Quality

Pacific Environment prepared the Air Quality and Greenhouse Gas Assessment and Environmental Risk Sciences prepared the Human Health Risk Assessment for the Proposal.

The Air Quality Assessment was prepared to identify all sources of air emissions and emission rates for the PK BLT development. The assessment was conducted and assessed against Stage 3 of the proposal, at maximum throughput and with tank out breathing losses. Dispersion modelling was conducted to predict and determine compliance of the proposal against air and odour goals.

The Human Health Risk Assessment considered the acceptability of risks associated with the release of potential contaminants into the environment on human health. The assessment considered the Stage 3 operation and was undertaken in accordance with national and international guidelines. The Assessment reviewed inhalation exposures, the nature of pollutants and the release of chemicals against acute and chronic health risks from volatile chemicals derived from the storage of liquids.

The greatest source of emissions from the Proposal is expected to come from tank venting and breathing losses. Tanks holding finished fuel products have the potential to release various Volatile Organic Compounds (VOCs) and Polycyclic Aromatic Hydrocarbons (PAHs), several of which may be toxic at high concentrations. The most significant air quality emissions are expected to be from petroleum products and predicted concentrations were well below all relevant criteria at sensitive receptor locations. The impact of odour from the PK BLT at the nearest sensitive receptor locations is predicted to be negligible.

The Human Health Risk Assessment found that exposure to VOCs over a maximum short duration of approximately 1 hour were below the relevant peer reviewed health based guidelines with all concentrations in the air at a level well below the potential rate of exposure for adverse health effects in all members of the public for a short-duration.

An assessment of chronic health impacts found that concentrations of VOCs and Background Air Pollution (BaP) in surrounding air concentrations for the Proposal is below relevant long-term health based guidelines. Adverse impacts to human health are not expected. Consequently, the Proposal would not have acute or chronic impacts on the local community at the maximum level of operation (Stage 3).

Noise and Vibration

A Noise and Vibration Assessment was undertaken by Pacific Environment Limited to determine the level of impact of the Proposal. The Assessment included monitoring of the existing environment and modelling of the environment inclusive of the Proposal. The existing noise environment was influenced by industrial and traffic noise at each of the monitoring locations.

The construction noise and vibration assessment considered four scenarios including civil earthworks, establishment of foundations, assembly of plant infrastructure and work outside of standard hours. It is predicted that there will be no criteria exceedances for sensitive receivers, therefore the impacts are considered negligible.

The operational noise assessment did not identify any criteria exceedances or anticipated impacts on receivers from low frequency noise. The road traffic noise assessment indicated that the majority of project related traffic is expected on Springhill Road and Masters Road. The assessment indicated that increases in traffic noise would be below the traffic noise increase criteria of 2 decibels.

The cumulative noise impact resulting from existing industry around the proposed facility has been accounted for during criteria setting for amenity noise limits, with cumulative industrial noise impacts not anticipated.

Traffic

A Traffic Impact Assessment was undertaken by Cardno for the PK BLT. The capacity and performance of the existing road network was assessed to determine if there was sufficient capacity to support the Proposal, with traffic counts and modelling undertaken for the following intersections:

- > Masters Road / Springhill Road
- > Springhill Road / Tom Thumb Road
- > Tom Thumb Road / Yampi Way
- > Tom Thumb Road / Farrer Road
- > Tom Thumb Road Roundabout

A route selection assessment was subsequently carried out, which identified that the preferred route for outgoing products via Masters Road and Five Islands Road to the Princes Motorway was most appropriate.

The Assessment considered two scenarios being:

- > Stage 1 Operations and Stage 2 Construction phase
- > Stage 3 Operational phase.

These two scenarios were selected as they are considered to provide the worst case (greatest) level of traffic generation.

The Assessment identified that there are no critical capacity issues arising during the Stage 1 Operation /Stage 2 Construction scenario, with a number of generic mitigation and management measures identified to ensure construction and operational traffic is managed appropriately.

The traffic generated by the PK BLT during Stage 3 Operations (full development of site) scenario would result in a negligible increase in traffic generation as forecast to 2026.

Traffic modelling undertaken of future traffic scenario 2026 has identified that the intersection at Springhill Road and Masters Road would reach an unacceptable level of service by 2026 regardless of the traffic generated by the PK BLT at full operation. A suitable mitigation measure will be required to be developed by Roads and Maritime Services in the medium term to mitigate this impact which is independent to this development. Based on this result, the proposed additional traffic volume from PK BLT would not result in any additional cumulative impacts on the local road network requiring an upgrade of the road network.

Hydrology

A Surface Water Assessment for the PK BLT was undertaken by Cardno. The Assessment reviewed the impacts of the Proposal on hydrology, flooding, water quality, water supply and waste water in terms of existing conditions and conditions during the construction phase and operational phase of the development.

The Assessment concluded that the site is mostly free from constraints of flooding and stormwater. The Proposal is not likely to impact on the water quality of adjoining waterways, with wastewater suitably managed to reduce any potential adverse impacts.

The projected sea level rise due to climate change would not pose a risk to PK BLT due to site elevations. Where impacts of the Proposal, such as sub catchment flooding or potential malfunction of contamination containment systems have the potential to occur appropriate mitigation measures will be employed. It is considered that with application of the recommended mitigation measures and further detailed design of stormwater drainage systems in consultation with NSW Ports, the Proposal will have minimal impacts to flow regimes, flooding and water quality.

Greenhouse Gases and Climate Change

An Air Quality and Greenhouse Gas Assessment was undertaken by Pacific Environment. The Assessment considered Scope 1, 2 and 3 emissions associated with the Proposal. The potential impacts of climate

change have been assessed based on the assumptions that sea level along the NSW coast will rise relative to 1990 mean sea levels by 0.4m by 2050.

The Greenhouse Gas (GHG) Scope 1 annual emissions would be 0.2 ktpa CO₂-e and represent approximately 0.0001% of Australia's commitment under the Kyoto Protocol (591.5 Mtpa) carbon dioxide equivalent [CO₂-e].

The Assessment concluded that the proposed development would produce a very small portion of GHG, with the location of the site closer to several major supply regions in NSW reducing associated transport emissions resulting from the current transport of liquid fuels from Sydney.

The PK BLT design has been developed to address potential Climate Change impacts, with no adverse impacts anticipated.

Ecology

An Ecological Impact Assessment was undertaken by Cardno and Ecoplanning for the PK BLT. This assessment including field survey identified that the Green and Golden Bell Frog (*Litoria aurea*) was the only species listed as protected in either State or Commonwealth legislation to have either 'high' or 'moderate' potential to use the subject site.

In accordance with the SEARs and consultation with the Office of Environment and Heritage, an expert report was also developed by Ecoplanning to assess the proposed works under the *Framework for Biodiversity Assessment (FBA)*. This assessment determined that the Green and Golden Bell Frog should be removed as an impact for further consideration for the project as the proposed works was unlikely to:

- > cause the extinction of a species or population from an Interim Biogeographic Regionalisation for Australia subregion; or
- > significantly reduce the viability of a Green and Golden Bell Frog population.

In accordance with the FBA, the expert report has defined a species polygon for the purposes of quantifying impacts to Green and Golden Bell Frog which equated to 0.09ha in area. Preliminary calculations utilising the Major Projects module of the Biobanking Credit Calculator have identified that 1 species credit will need to be obtained to meet the offset obligations of the FBA for this species polygon. This process will be ongoing and undertaken in parallel to the State Significant Development Project Approval.

Visual Amenity

An assessment of Visual Amenity was undertaken by Cardno for the PK BLT. The Assessment was carried out to identify any potential visual impacts and mitigation measures required to reduce potential loss of amenity for surrounding areas. A preliminary viewshed analysis, site inspection, visualisation of the development, examination of surrounding development, lighting impact assessment were all carried out.

The Assessment found that the Proposal will have minimal visual impact and would not be substantially visible from the majority of locations in the surrounding area due to the surrounding development and topography.

Views of the development will likely be sheltered by existing industrial development such as Port Kembla Coal Terminal (PKCT), GrainCorp and the Quattro Grain Terminal and will only be visible from scattered locations from Coniston and the Wollongong CBD to the north. The Proposal is in keeping with the existing visual character of surrounding industry, which is identified to be of generally low visual quality.

Geotechnical and Soils

A review of the geotechnical and soils site context has been undertaken, comprising of a Soils and Groundwater Impact Assessment and a Geotechnical Investigation. The Assessments were undertaken to provide information on the subsurface conditions of the site to identify the potential for contaminants on site and to guide foundation design.

Port Kembla Harbour is a highly modified environment which has been developed through a number of dredging and emplacement processes resulting in its current landform. Due to this history of imported fill, soil quality and type was considered in the assessment.

The Assessment identified the potential for onsite soil erosion during construction resulting from earthworks. There is also the potential for Acid Sulfate Soils (ASS) to occur in material greater than 5m below the surface. However, excavation of material down to 5m depth is not likely as a result of the works. These potential impacts would be addressed through the mitigation measures identified within the Assessment. The Assessment did not identify contaminated soils and groundwater; however, there is a risk that previously unidentified contamination may be exposed during construction activities such as excavation. This low risk would be managed through further soil and groundwater testing and the implementation of an Unexpected Finds Protocol in the contractor's Construction Environmental Management Plan (CEMP).

Socio Economic

A Socio Economic Assessment has been undertaken by Cardno which identifies that the Proposal will not have any adverse impacts during construction and operation. The Proposal is considered to have positive benefits on the social and economic environment of the Region and surrounding suburbs by providing increased direct and indirect employment creation. Similarly, at a national scale, the PK BLT will continue to support the future energy security of Australia, with increased competition in this sector likely to ensure lower costs for the general public.

Cumulative Impacts

A Cumulative Impact Assessment has been undertaken that considers the potentially compounding effects of both the environmental impacts within the site, as well as those from the site and surrounding development.

The Assessment demonstrated that the Proposal, in conjunction with existing and known future developments, would not have a significant level of impact.

Summary

The proposed Site is located within an existing port area, comprising port and industrial land uses to the north, south, east and west. The TQ Site and proposed PK BLT are located approximately 1,200 m from any potentially sensitive residential receivers and there are no heritage impacts expected.

The location of the PK BLT on existing port land, adjacent to existing terminal facilities ensures that a new incompatible use is not being introduced to the area. Furthermore, the Proposal would not create any environmental impacts that cannot be appropriately managed through mitigation measures.

The Proposal represents opportunities to reduce transport emissions as the site is located in proximity to existing construction material suppliers and port facilities as well as an existing customer base in the Illawarra Region.

The sites that TQ propose to utilise for the PK BLT are underutilised special activities zoned lots well separated from residential areas or environmental constraints. They have good access for the import and distribution of bulk liquid products and would provide local employment opportunities.

In summary, the benefit would comprise of improving the local fuel import capacity and storage contributing to the transport energy needs of NSW. The proposed development would utilise an existing underutilised site, creating employment without affecting the environment and amenity of the surrounding area.

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Glossary of Terms

The table below provides a glossary of key terms and acronyms used within this document

Term or Acronym	Definition
AAT	Australian Amalgamated Terminals
ABS	Australian Bureau of Statistics
AESS	Automatic engine shut down/start up systems
AHIMS	Aboriginal Heritage Information Systems
ANZECC	Australian and New Zealand Environment Conservation Council
ARI	Average Recurrence Interval
ASW	Automatic Weather Station
BaP	Background Air Pollution
BoM	Bureau of Meteorology
BTEX	Benzene, toluene, ethylbenzene, and xylenes
BTS	Bureau of Transport Statistics
CCTV	Closed Circuit Television
CEMP	Construction Environmental Management Plan
CLM Act	Contaminated Land Management Act 1997
Combustible Fuel	Any liquid, other than a flammable liquid, that has a flash point, and has a fire point that is less than its boiling point. For the purpose of this Standard, combustible liquids are divided into two classes as follows: <ul style="list-style-type: none"> > Class C1—A combustible liquid that has a flash point of 150°C or less. > Class C2—A combustible liquid that has a flash point of greater than 150°C.
CORTN	Calculation of Road Traffic Noise
DoE	Department of the Environment (Commonwealth)
DOI	Department of Primary Industries
DP&E	Department of Planning and Environment
DPF	Diesel Particulate Filters
DPI	NSW Department of Primary Industries (Fisheries)
DWT	Deadweight Tonnage
E10	Unleaded Fuel containing up to 10% ethanol
EIS	Environmental Impact Statement
enHealth	Environmental Health Standing Committee
ENM	Excavated Natural Material
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPA	Environment Protection Agency (NSW)
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth)
EPL	Environment Protection Licence
ERA	Environmental Risk Assessment
ESA	Environmental Scoping Assessment
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically Sustainable Development

Term or Acronym	Definition
ESL	Ecological Screening Level
FERP	Flood Emergency Response Plan
FIAB	Freight Infrastructure Advisory Board
Flammable Fuel	<p>Fuels which give off a flammable vapour at temperatures of not more than 60.5°C or not more than 65.6°C, open cup test, normally referred to as the flash point. e.g unleaded petrol.</p> <p>Class 3 flammable fuels are divided into 3 Packing Groups:</p> <ul style="list-style-type: none"> > PG I—high danger; initial boiling point $\leq 35^{\circ}\text{C}$. > PG II— medium danger; flash point (closed cup) $< 23^{\circ}\text{C}$; initial boiling point $> 35^{\circ}\text{C}$. > PG III—low danger; flash point (closed cup) $\geq 23^{\circ}\text{C}$–$\leq 60.5^{\circ}\text{C}$; initial boiling point $> 35^{\circ}\text{C}$.
FM Act	Fisheries Management Act 1994
GGBF	Green and Golden Bell Frog
GHG	Greenhouse Gas
HAZID	Hazard Identification
HAZOP	Hazard and Operability Study
HDDV	Heavy Duty Diesel Vehicles
HHRA	Human Health Risk Assessment
HMI	Human Machine Interface
HRA	Health Risk Assessment
HSL	Health Screening Level
ICNG	Interim Construction Noise Guideline
IFR	Internal Floating Roof
IMO	International Maritime Organisation
INP	Industrial Noise Policy
LGA	Local Government Area
LOR	Limit of reporting - Defined as the lowest concentration that can be reliably achieved as the laboratory within specified limits of precision and accuracy during routine laboratory operating condition.
LoS	Level of Service
LR1 Vessel	Long Range Vessel with DWT (55,000 to 79,999)
LR2 Vessel	Long Range Vessel with DWT (80,000 to 159,999)
Manifold	Piped network allowing multiple inlet pipelines to interconnect with multiple outlet pipelines through a valved connection.
mAHD	Metres Australian height datum
mBGL	Metres Below Ground Level
MLA	Marine Loading Arm
MNES	Matters of National Environmental Significance
MPa	Megapascal
MR Vessel	Medium Range Vessel
MSIC	Maritime Security Identification Card
NCA	Noise Catchment Area
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure

Term or Acronym	Definition
NGA	National Greenhouse Accounts
NML	Noise Management Level
NOW	NSW Office of Water
NP&W Act	<i>National Parks and Wildlife Act 1974</i>
OEH	Office of Environment and Heritage
OEHHA	Office of Environmental Health Hazard Assessment
OEMP	Operation Environmental Management Plan
OSD	On-site detention
PAC	Planning Assessment Commission
PAH	Polycyclic aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
PCBU	Person conducting a business or undertaking
PHA	Preliminary Hazard Analysis
PK BLT	The proposed Port Kembla Bulk Liquids Terminal
PKCT	Port Kembla Coal Terminal
PM	Particulate matter
PMF	Probable Maximum Flood level
POEO Act	Protection of the Environment Operations Act 1997
POL	Petroleum, oil and lubricants
PPE	Personal protective equipment
PUC	Port User Council
PULP95	Premium unleaded petrol (95 ron)
PULP98	Premium unleaded petrol (98 ron)
QRA	Quantitative Risk Assessment
RAP	Remediation Action Plan
RBL	Rating Background Level
RNP	Road Noise Policy
Roads and Maritime	Roads and Maritime Services
RON	Research octane number
SEAR's	Secretary's Environmental Assessment Requirements
SEPP 33	State Environmental Planning Policy No. 33- Hazardous and Offensive Development
SEPP 55	State Environmental Planning Policy No. 55 – Remediation of Land
Shore line	Shore line is the term used to refer to the shore pipelines from Berth 104 area to both Site 1 and Site 2. The three MLAs connect to three individual shore lines. Provision has been made for installation of a future fourth shore line between B104 and Site 2 in conjunction with a fourth MLA.
Shoreline	The line along which a large body of water meets the land.
SSD	State Significant Development
SVOCs	Semi-volatile organic compounds
SWL	Sound power level
SWMP	Soil and Water Management Plan
TIA	Traffic Impact Assessment
TPH	Total petroleum hydrocarbons

Term or Acronym	Definition
TQ	TQ Holdings Australia Pty Ltd
TLG	Truck Loading Gantry
TSC Act	Threatened Species Conservation Act 1995
TSP	Total suspended particulates
ULP	Unleaded petrol
ULSD	Ultra low sulfur diesel
Unloading Skid	Equipment package designed to connect to delivery trucks to safely control the delivery of the on board fluid.
UST	Underground storage tank
VENM	Virgin Excavated Natural Material
VMP	Vegetation management Plan
VOCs	Volatile organic compounds
VRU	Vapour Recovery Unit
WARR Strategy	<i>NSW Waste Avoidance and Resource Recovery Strategy 2014-2021</i>
WCC	Wollongong City Council
WLEP	Wollongong Local Environment Plan
WHS Act	Work Health and Safety Act 2011
WMS	Waste Management Strategy
WSUD	Water Sensitive Urban Design

1 Introduction

This section provides the background to the Proposal, nature of the proposed development and the purpose of the Environmental Impact Statement (EIS).

1.1 Overview of Proponent

The Proponent for the Proposal is TQ Holdings Australia Pty Ltd (TQ). TQ is comprised of Joint Venture partners with international experience in liquid fuel logistics and a strong commitment to operational excellence.

1.2 Capital Investment Value

The Capital Investment Value (CIV) for the Proposal, consistent with the definition provided in the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), is approximately \$172 million AUD (Excluding GST).

The CIV Report prepared by Dermot FitzGibbon, an experienced estimator of similar bulk liquid terminals at **Appendix B**, provides a detailed breakdown of associated cost items.

1.3 Background

In 2009, National Biodiesel Pty Ltd (National Biodiesel) proposed a Soybean Processing Plant and Biodiesel Production Facility at Port Kembla. National Biodiesel obtained Approval MP 08_0083 under Part 3A (now repealed) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for this Facility. Three modifications to MP 08_0083 were subsequently proposed and approved under Section 75W of the EP&A Act. For the purposes of this EIS this previous project is referred to as 'the Approved Project'.

National Biodiesel subsequently determined that the Approved Project, specifically the Processing aspect, would not be viable given current market conditions. However, the storage component of the Approved Project remains viable. The Approved Project rights were acquired by TQ, with TQ now proposing to establish the Port Kembla Bulk Liquids Terminal (PK BLT) at the same location in Port Kembla (the Site). The Proposed Project scope has recently been revised to comprise a bulk liquids terminal for the importation and distribution of finished fuel products.

TQ currently holds a long term lease from NSW Ports over three separate land allotments of undeveloped land within the Inner Harbour area of Port Kembla. TQ proposes to construct and operate a bulk liquids terminal on this land for the storage and distribution of liquids.

The site comprises the following land parcels:

- > Lot 301 DP 1148391
- > Lot 2 DP 1125445
- > Lot 11 DP 1182111.

The site also includes a license to operate on Berth 104 (Lot 70 DP1182824).

Specifically, this application relates to the following works:

- > Establishment of infrastructure on Berth 104 to enable the unloading of bulk liquid tanker vessels
- > Construction of bulk liquids storage tanks on Site 1 and Site 2
- > Truck loading and unloading equipment on Site 2
- > Terminal Office and Operator Control Room and utilities on Site 3
- > Operation of the Bulk Liquid Terminal.

Refer to **Figure 2-1** for the locality of the site within the surrounding context and **Figure 2-2** for a site analysis plan and **Appendix C** for the proposed development plans.

1.4 Purpose of Environmental Impact Statement

TQ propose to develop a bulk liquids terminal at Port Kembla, New South Wales, Australia. An EIS prepared under Part 4 of the EP&A Act is required to assess the proposed PK BLT due to the proposal being classified as State Significant Development (SSD) subject to Section 89C of the EP&A Act.

Further details of the SSD classification are provided in **Section 3** of this EIS. The classification of the proposal as SSD requires the issuing of Secretary's Environmental Assessment Requirements (SEARs) (refer to **Appendix A**) by the Department of Planning and Environment (DP&E), with assessment and determination undertaken by DP&E.

The purpose of this EIS is therefore to:

- > Describe and assess the environmental condition of the existing TQ site.
- > Identify environmental impacts from the proposed works during construction and operation and assess the impact on the site and locality.
- > Identify relevant measures to adequately mitigate environmental impacts.

TQ does not currently hold an Environmental Protection Licence (EPL) for this site or any operations. This EIS will also consider whether the proposed development will be likely to trigger the requirement for an EPL.

This EIS will provide DP&E and other stakeholders with a document, which details the existing environment and assesses the likely environmental impacts from the worst case scenario (Stage 3 full development). Specialist reports provide further detail on key environmental impacts. These reports are located in the Appendices to this document.

1.5 Scope of Environmental Impact Statement

The scope of this EIS is to discuss and assess the extent of environmental impacts from the proposed PK BLT relating to the environmental areas listed below. The SEARs, as outlined in **Section 1.6** provided the basis for the EIS scope, with points 1 to 10 below specifically noted. Points 11 to 15 are additional environmental issues, which are included in the scope as TQ identifies them as relevant to a full review and assessment of the Proposal.

The following environmental issues are addressed:

1. Hazard and Risk
2. Air quality
3. Noise and Vibration
4. Traffic & Transport
5. Soil and Water (including surface water, waste water, stormwater and contamination)
6. Waste Management
7. Greenhouse Gas
8. Visual Amenity
9. Biodiversity
10. Heritage
11. Cumulative
12. Utilities
13. Human Health Risks
14. Socio-economic
15. Ecologically Sustainable Development.

1.6 Secretary’s Environmental Assessment Requirements

On 8 September 2015, DP&E issued SEARs (SSD 7264) in response to a request by TQ as the proposal constitutes SSD, under Part 4, Clause 77A of the EP&A Act. Before release of the SEARs, DP&E consulted with the Office of Environment and Heritage (OEH).

Issues identified for consideration by OEH and DP&E are included within the SEARs in **Table 1-1** and associated agency comments are provided in **Appendix A**. These documents provide guidance as to the extent of the assessment required for the proposed bulk liquids terminal.

Table 1-1 Secretary’s Environmental Assessment Requirements (SSD 7264) (SEARs)

Secretary’s Environmental Assessment Requirement	Report Section
General Requirements	
<p>The EIS must meet the minimum form and content requirements in clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.</p> <p>Notwithstanding the key issues specified below, the EIS must include:</p> <ul style="list-style-type: none"> ▪ a detailed description of the development including: <ul style="list-style-type: none"> – need for the proposed development; – justification for the proposed development; – likely staging of the development during construction and operation; – likely interactions between the development and other existing, approved and proposed port and industrial operations in the vicinity of the site; and – plans of any proposed building works. 	<p>Clause 6 and 7 requirements are addressed throughout this EIS.</p> <p>Sections 1, 2.2, 3.1, 3.3 and Appendix C</p>
<ul style="list-style-type: none"> ▪ consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments; 	<p>Section 5</p>
<ul style="list-style-type: none"> ▪ risk assessment of the potential environmental impacts of the development; identifying key issues for further assessment; 	<p>Section 6, Section 7 and Appendix D</p>
<ul style="list-style-type: none"> ▪ a detailed assessment, where relevant, of the key issues below, and any other potential significant issues identified in the risk assessment. This must include: <ul style="list-style-type: none"> – a description of the existing environment, using adequate baseline data; – an assessment of the potential impacts of all stages of the proposed development, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes; and – a description of the measures that would be implemented to avoid, minimise and if necessary, offset the potential impacts of the proposed development, including proposals for adaptive management and/or contingency plans to manage any significant risks to the environment; and 	<p>Section 7</p>
<ul style="list-style-type: none"> ▪ a consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EIS. 	<p>Section 11.3</p>
<p>The EIS must also be accompanied by a report from a qualified quantity surveyor providing:</p> <ul style="list-style-type: none"> ▪ a detailed calculation of the capital investment value (as defined in clause 3 of the <i>Environmental Planning and Assessment Regulation 2000</i>) of the proposal, including details of all assumptions and components from which the CIV calculation is derived; ▪ an estimate of the jobs that will be created during the construction and operational phases of the proposed 	<p>Appendix B</p>

Secretary's Environmental Assessment Requirement	Report Section
<p>development; and</p> <ul style="list-style-type: none"> ▪ certification that the information provided is accurate at the date of preparation. 	

The Department understands that the development of the terminal is likely to be staged and a component may be constructed under an existing project approval. Notwithstanding, the Department would prefer the operation of the facility to operate under a single, modern development consent. Consequently, the Department encourages you to develop the proposal with this preference in mind, and to consider surrendering all existing planning consents for the site if the development application is approved.

Section 11

Key Issues

The EIS must address the following specific matters:

Hazards and Risks - including

- a summary of the results of a Preliminary Hazard Analysis (PHA) undertaken for the proposed development with consideration of the existing site. The PHA should be prepared in accordance with Hazardous Industry Planning Advisory Paper No.6 – Guidelines for Hazard Analysis. The PHA should:
 - identify the hazards associated with the existing site and proposed development, as well as any external hazards (i.e. natural hazards) to determine the potential for off-site impacts;
 - address all relevant recommendations arising from the Buncefield accident;
 - demonstrate that the proposed development complies with the criteria set out in Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning; and
 - estimate the cumulative impacts from the overall site and the surrounding potentially hazardous developments in the area (if any) and demonstrate that the proposed development does not increase the cumulative risk of the area to unacceptable levels; and
 - an evaluation of the impacts of the transport of Dangerous Goods to and from the site in the immediate vicinity.

Section 6, Section 7, Appendix D and Appendix B

Air Quality – Including:

- a description of all potential air emissions and odours and their sources, including construction, operational and transport sources;
- a quantitative assessment of all potential air quality impacts and odour impacts for the development, including cumulative, on surrounding land and sensitive receptors under the relevant Environmental Protection Authority (EPA) guidelines;
- details of any pollution control equipment and other impact mitigation measures for fugitive and point source emissions; and
- details of the proposed management and monitoring measures.

Section 7.4 and Appendix E

Secretary's Environmental Assessment Requirement	Report Section
<p>Noise and Vibration – including:</p> <ul style="list-style-type: none"> ▪ a description of all potential noise sources, including construction, operational and transport sources; ▪ a quantitative assessment of construction, operational and transport noise and vibration impacts to surrounding receivers from on site and off site activities (including shipping) in accordance with the relevant EPA guidelines; and ▪ details of the proposed management, mitigation and monitoring measures. 	<p>Section 7.5 and Appendix G</p>
<p>Traffic and Transport – Including:</p> <ul style="list-style-type: none"> ▪ details of traffic types and volumes likely to be generated during construction and operation of the development; ▪ details of the proposed transport routes, site access, internal roadways, parking and updates to road and shipping infrastructure; ▪ detailed plans of the proposed layout of the internal road network and parking on site in accordance with the relevant Australian standards; ▪ a detailed traffic impact study of the proposed development, with consideration of the predicted traffic impacts on the safety and capacity of the surrounding road network and the shipping capacity of Port Kembla and cumulative traffic impacts from other developments, using SIDRA or a similar traffic model; and ▪ a description of the measures that would be implemented to upgrade and/or maintain the surrounding road network and shipping infrastructure over time. 	<p>Section 7.6 and Appendix H</p>
<p>Soil and Water – including:</p> <ul style="list-style-type: none"> ▪ details of water supply including annual volumes of surface and groundwater required by the proposal and options for reuse of process water; ▪ a detailed consolidated site water balance ▪ proposed erosion and sediment controls (during construction) and the proposed stormwater management system (during operation); ▪ an assessment of the potential soil, groundwater and surface water impacts and the measures proposed to mitigate these impacts; ▪ an assessment of pollutant loads and concentrations, contaminated groundwater and soils, acid sulfate soils and proposed mitigation and management measures, particularly in the event of a product spill; and ▪ potential impacts of flooding, with consideration of climate change and projected sea level rises. 	<p>Section 7.7, Section 7.13, Appendix J and Appendix N</p>
<p>Waste Management – including:</p> <ul style="list-style-type: none"> ▪ details of all the quantities and classification of all waste streams to be generated on site; ▪ details of waste storage, handling and disposal and how slops will be managed; ▪ wastewater predictions and the measures that would be implemented to treat, reuse and/or dispose of this water; and ▪ the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the NSW Waste Avoidance and Resource Recovery Strategy 2007 and Draft NSW Waste Avoidance and Resource Recovery Strategy 2013-2021. 	<p>Section 7.7, Section 7.10 and Appendix J</p>

Secretary's Environmental Assessment Requirement	Report Section
<p>Greenhouse Gas – including:</p> <ul style="list-style-type: none"> an assessment of the potential greenhouse gas emissions of the proposed development 	Section 7.8 and Appendix E
<p>Visual Amenity - including:</p> <ul style="list-style-type: none"> an assessment of the potential visual impacts of the proposed development on the amenity of the surrounding area; and 	Section 7.11 and Appendix M
<p>Biodiversity – including:</p> <ul style="list-style-type: none"> an assessment of the potential impacts on critical habitats, threatened species (including <i>Litoria aurea</i>), populations or ecological communities and their habitats in accordance with the <i>Framework for Biodiversity Assessment</i> or relevant Office of Environment Guidelines. 	Section 7.9 and Appendix K
<p>Heritage - including:</p> <ul style="list-style-type: none"> Aboriginal and non-Aboriginal heritage items and values of the site and surrounding area, taking into account the <i>NSW Heritage Manual and Assessment Heritage Significance Guidelines</i>. 	Section 7.12
<p>Cumulative- including:</p> <ul style="list-style-type: none"> All industrial facilities in the area and other nearby approved and proposed development, particularly in relation to hazards and risk, air quality, noise and vibration, traffic and soil and water. 	Section 7.3, Section 7.4, Section 7.5, Section 7.6 and Section 7.7, Section 7.13 and Section 7.17
Plans and Documents	
<p>The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the <i>Environmental Planning and Assessment Regulation 2000</i>. These documents should be included as part of the EIS rather than as separate documents.</p>	Appendix C
Consultation	
<p>During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners.</p> <p>In particular you must consult with:</p> <ul style="list-style-type: none"> The City of Wollongong; Environment Protection Authority; Roads and Maritime Services; Office of Environment and Heritage; NSW Department of Primary Industries; NSW Ports; SafeWork NSW (formerly WorkCover NSW) The local community and stakeholders. 	Section 9
<p>The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.</p>	Section 9
Policies, Guidelines and Plans	
<p>Additional Policies, Guidelines and Plans – Provided as Attachment 1 of SEARs</p>	The relevant guidelines, policies and plans outlined in Attachment 1 of the SEARs have been considered throughout the preparation of this EIS and any supporting studies.
<p>Review of the DP&I EIS Guideline – Chemical Works is recommended</p>	A review of the Guideline has been undertaken. The Guideline states that early effective consultation is required with relevant government agencies, as has

Secretary's Environmental Assessment Requirement	Report Section
	occurred through the SEARs application process and a pre-lodgement meeting held with DP&E. The Guideline states that site evaluation is required, along with the consideration of key environmental factors. Traffic and air quality are highlighted. Comprehensive assessments have been undertaken relating to these aspects at Sections 6, 7, 8, 9 and 10 . This EIS addresses the proposed content and layout as detailed in the Guideline.

It is noted that additional requirements for this assessment were provided by Wollongong City Council in a letter dated 9 October 2015. The requirements have been addressed in **Section 5** and **Section 7**.

1.7 EIS Preparation Team

This document has been prepared by Cardno (NSW/ACT) Pty Ltd staff, comprising David Laing (Project Director/Senior Principal), Alex Larance (Project Manager/Senior Environmental Engineer), Daniel Thompson (Senior Environmental Planner), Cassy Baxter (Environmental Scientist), Lewis Westhoff (Environmental Planner), Robert McKinlay (Environmental Planner) and Loren Laughlan (GIS Analyst) with the ongoing support of TQ's engineering and project management team.

Specialist supporting studies have been prepared by Cardno NSW/ACT Pty Ltd, Sherpa Consulting Pty Ltd, Pacific Environment Pty Ltd, Ecoplanning Pty Ltd and Environmental Risk Sciences Pty Ltd (EnRisks).

1.8 Structure of this Environmental Assessment

This EIS has been prepared in accordance with the EP&A Act 1979 and the EP&A Regulation. It is set out as follows:

- > **The Glossary** provides terms and acronyms for reference
- > **The Executive Summary** provides an overview of the Proposal. This summarises the EIS and justifies the Proposal and key areas of environmental assessment.
- > **Section 1** explains the purposes, aims and scope of this EIS, as well as including background information on the development and its surrounding context. The SEARs are addressed to guide the assessment and outline the consultation requirements.
- > **Section 2** describes the existing site use.
- > **Section 3** details the Proposal, reviews the project need, and discusses alternatives to the Proposal, as well as the consequences of not proceeding.
- > **Section 4** provides a consolidated project justification.
- > **Section 5** assesses relevant Federal, State and Local legislation applicable to the Proposal
- > **Section 6** provides a project risk assessment.
- > **Section 7** assesses environmental impacts.
- > **Section 8** provides an outline of the *Construction Environmental Management Plan* (CEMP) and *Operations Environmental Management Plan* (OEMP) requirements.
- > **Section 9** provides an outline of the consultation undertaken to date and further commitments for ongoing consultation.
- > **Section 10** summarises the commitments made within each of the environmental assessments.
- > **Section 11** provides a conclusion to the report.
- > **Section 12** identifies reference material used for this report.

2 Site Description

2.1 Site Location

The site comprising four lots is located in the Inner Harbour of Port Kembla, within the Wollongong LGA. TQ has a long term lease over the land from NSW Ports, which includes the non-exclusive access and use of Berth 104. Refer to **Figure 2-1** for a locality plan.

The land allotments and zoning are shown in **Table 2-1**, with the site descriptions identified below.

Table 2-1 Site Allotments

Description	Part Lot No.	Deposited Plan (DP)	Zoning (Three Ports SEPP, 2013)	Approximate Area (ha)
Site 1	2	1125445	SP1 – Special Activities	1.8
Site 2	301	1148391	SP1 – Special Activities	4.139
Site 3	11	1182111	SP1 – Special Activities	0.367
Berth 104	70	1182824	SP1 – Special Activities	0.91

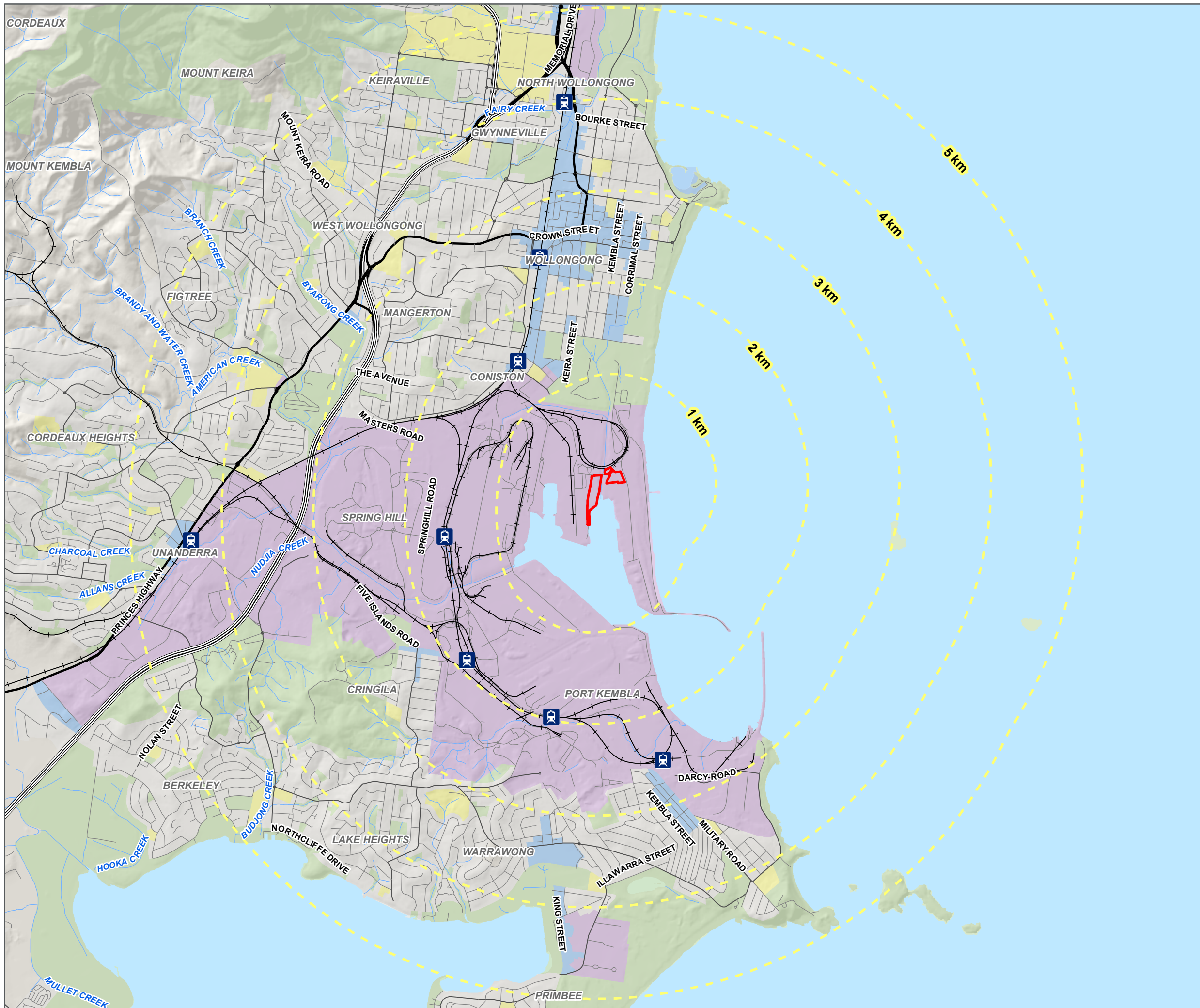
2.1.2 Lease Area

The land allotments are shown in **Figure 2-2**.

The typical land uses for the sites are summarised below. Additional details can be found in **Section 3**.

- > Site 1 – Combustible and flammable bulk liquids storage and pump bay.
- > Site 2 – Combustible and flammable bulk liquids, pump bay and truck loading facilities.
- > Site 3 – Site control room & office block, maintenance work shop and utilities.
- > B104 – Bulk liquids unloading facilities.

Refer to **Figure 2-2** for a site plan and **Figure 2-3** for a site analysis plan.



Location Plan

PORT KEMBLA

Legend

- Project Site
- Railway Stations
- Railway
- Motorway
- Primary Road
- Distributor Road
- Local Road
- Watercourses

Land Use (ABS, 2011)

- Commercial
- Education
- Industrial
- Parkland
- Residential
- Water

FIGURE 2-1

1:40,000 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
 Date: 2015-11-19
 Coordinate System: GDA 1994 MGA Zone 56
 Project: 82015103
 Map: 82015103-GS-014-LocationPlan.mxd 04
 All base data supplied by LPI unless otherwise stated.



Legend

- Project Site (7.22 ha)
- Cadastre (LPI, 2015)

Site #	Lot / DP	Area (ha)
Site 1	2 / 1125445	1.80
Site 2	301 / 1148391	4.14
Site 3	11 / 1182111	0.37
Berth 104	70 / 1182824	0.91
		7.22



FIGURE 2-2
1:2,500 Scale at A3

Metres

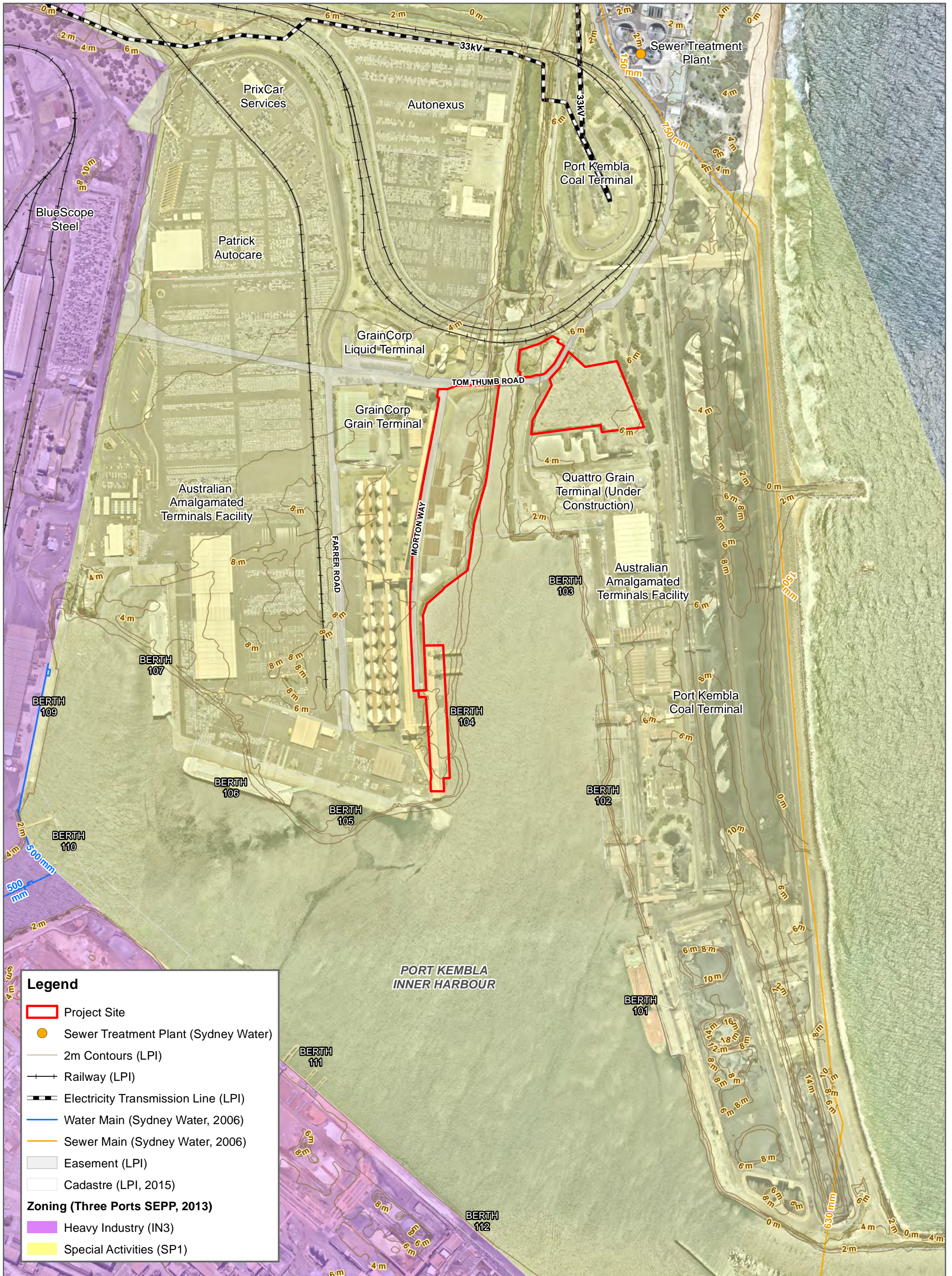
0 25 50 75 100

Site Plan
PORT KEMBLA



Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2015-11-19
Coordinate System: GDA 1994 MGA Zone 56
Project: 82015103-01
Map: 82015103-GS-001-SitePlan.mxd 09
Aerial imagery supplied by nearmap (January, 2015)



Legend

- Project Site
- Sewer Treatment Plant (Sydney Water)
- 2m Contours (LPI)
- Railway (LPI)
- Electricity Transmission Line (LPI)
- Water Main (Sydney Water, 2006)
- Sewer Main (Sydney Water, 2006)
- Easement (LPI)
- Cadastre (LPI, 2015)

Zoning (Three Ports SEPP, 2013)

- Heavy Industry (IN3)
- Special Activities (SP1)

FIGURE 2-3
 1:6,000 Scale at A3

Metres

0 50 100 150 200

Site Analysis Plan
 PORT KEMBLA



2.2 Existing Land Uses & Port Operations

2.2.1 Existing Land Uses

Sites 1, 2 and 3 are undeveloped, although earthworks comprising grading has been undertaken previously, which will minimise bulk earthworks required. The proposed development site is situated amongst a range of existing heavy industry, port and associated logistical operations.

The surrounding land uses include:

- > North of the Site – Wollongong Golf Club, Car Storage, Wollongong Sewerage Treatment Plant (operated by Sydney Water), Autonexus, Port Kembla Coal Terminal (PKCT) receival area and Greenhouse Park (Wollongong City Council [WCC])
- > South of the Site – BlueScope Steel and Quattro Grain Terminal
- > East of the Site – PKCT, Quattro Grain Terminal and Australian Amalgamated Terminals (AAT) multi-purpose berth; and
- > West of the Site – GrainCorp Grain Terminal, GrainCorp Liquid Terminals, Australian Amalgamated Terminals, PrixCar Services and Patrick Autocare.

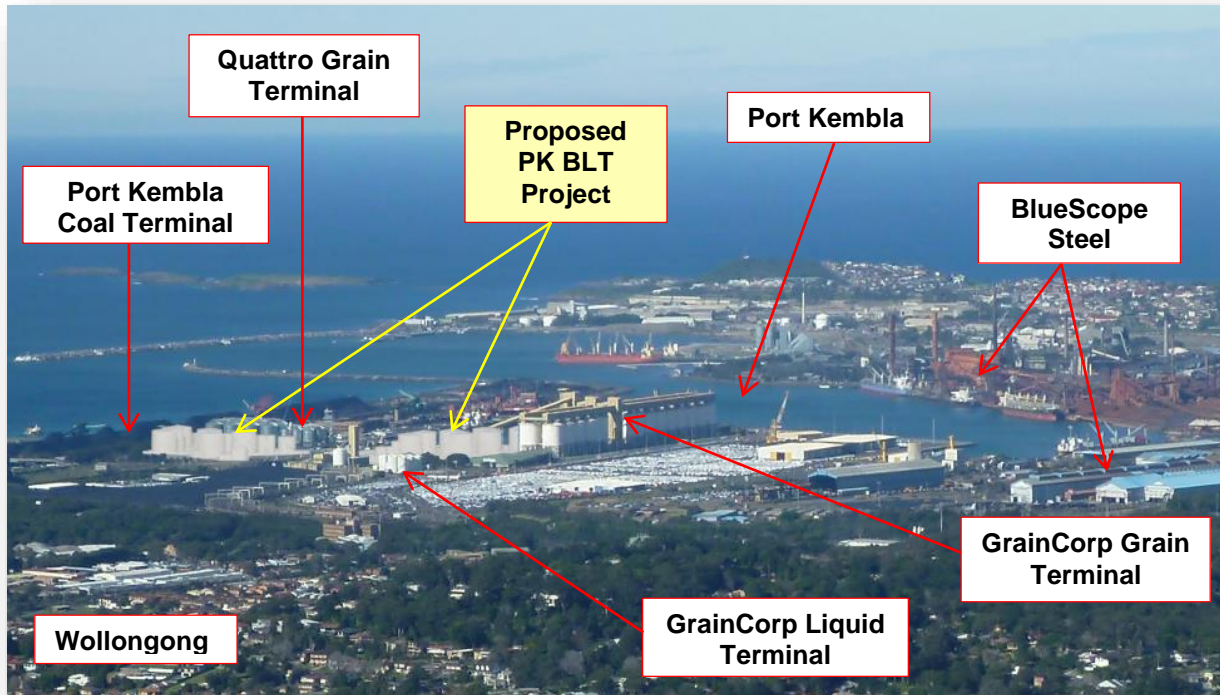
2.2.2 Existing Port Operations

The nearby berths and operations comprise:

- > Berth 104 that services the grain facilities and bulk liquids storage facilities owned and operated by GrainCorp
- > Berths 103, 105, 106 and 107 service AAT for the purposes of transferring motor vehicles, general cargo and containers. Post construction of the Quattro Grain Terminal Berth 103 will also be used for the out-loading of grain
- > Berths 101 and 102 service PKCT.

Refer to **Figure 2-4** for a visual representation of the Proposal in the existing port and heavy industrial context, as viewed from Mount Kiera lookout looking to the South East over Port Kembla. This image demonstrates the existing developed nature of the surrounding port operations. **Figure 2-5** identifies the surrounding development context.

Figure 2-4 Visualisation of Proposed Project Infrastructure for Scale and Context



Note: Artist's impression superimposed over photograph taken from Mount Kiera looking South East with a zoom lens.

Refer to **Figure 2-5** for a locality plan showing surrounding operations to the Proposal Site

2.2.3 Local Infrastructure Capability

Importation of bulk liquid products will be via Berth 104 which is an existing common user berth structure situated directly adjacent to the proposed PK BLT storage and distribution areas. TQ will have non-exclusive access and use of Berth 104 as part of their ongoing operations.

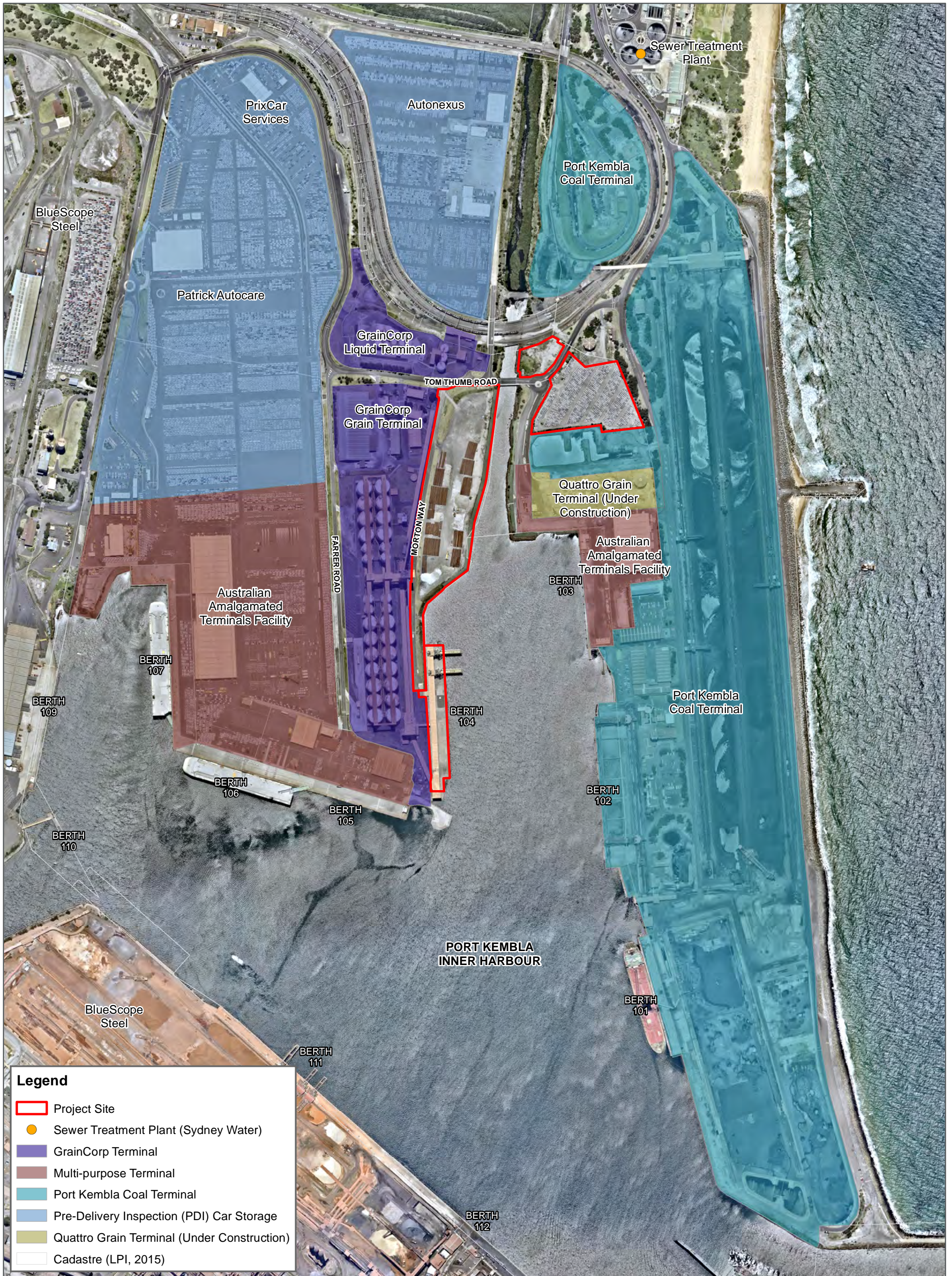
Tom Thumb Road is a private internal access road (owned and operated by NSW Ports within the Port Precinct) which provides site access via a single lane in each direction accessed via a secure gatehouse off Springhill Road. Springhill Road links to the regional road network and Southern Freeway and Princes Highway via Masters Road, Springhill Road and Five Islands Road.

The existing road network provides rapid access to the regional roads for delivery and distribution of fuel tankers by road. A rail siding is also located to the north of the site, although TQ are not proposing to utilise rail infrastructure at this time.

Refer to **Section 7.6** for a more detailed assessment of traffic and transport related aspects.

The site has adequate utility connections in the vicinity, with the existing high voltage power supply being extended from a nearby sub-station to feed into the site.

Refer to **Section 7.14** for a more detailed assessment of utility requirements.



Legend

- Project Site
- Sewer Treatment Plant (Sydney Water)
- GrainCorp Terminal
- Multi-purpose Terminal
- Port Kembla Coal Terminal
- Pre-Delivery Inspection (PDI) Car Storage
- Quattro Grain Terminal (Under Construction)
- Cadastre (LPI, 2015)

FIGURE 2-5
1:6,000 Scale at A3



Adjoining Developments Plan
PORT KEMBLA



3 Project Description

3.1 Justification and Need

TQ has determined that the approved development (MP 08_0083) is no longer viable having regard to the changing long term market conditions for soybean crushing and biodiesel production means that these aspects of the Project are no longer viable. The recent decline and cessation of all fuel refining in NSW and the ongoing need for the State to have a secure and diverse fuel supply network has created a strong market demand for fuel storage facilities for both conventional petroleum and renewable fuel products (URS 2014).

Australia as a member of the International Energy Agency (IEA) is required to maintain petroleum reserves equivalent to 90 days of the previous year's imports. Australia has not met this obligation for some time which has increased its vulnerability to oil supply shocks. The PK BLT will provide new petroleum storage capacity to assist Australia to help meet its international obligations.

The NSW government has developed a consistent set of strategic plans which support the development of the PK BLT at the proposed site. *The Illawarra Regional Strategy* (DoP, 2006) identifies that freight tasks are being relocated from Sydney to Port Kembla including card imports. The *NSW Freight and Ports Strategy* (TfNSW, 2013) identified that a number of long term fuel refineries and terminals based in Sydney were in the process of closing due to their age and international competition. The strategy also identified Port Kembla as the site of a future biodiesel terminal. The PK BLT proposal is consistent with the strategic importance of Port Kembla.

The PK BLT facility now proposed would allow TQ to contribute to meeting the growing demand for fuel products in the Illawarra, central and southern NSW. The TQ site is located in close proximity to port infrastructure and these growth areas, reducing truck journey lengths and associated costs, as well as the environmental impact of transporting fuel to end users. The existing road network provides for the rapid transfer of materials to and from the site and nearby port facilities, with minimal disruption to local roads.

The location of the PK BLT on portside land, adjacent to existing terminal facilities ensures that the proposal is compatible with other developments in the immediate area. The proposed development is also consistent with approved development in terms of the storage and handling of bulk quantities of flammable and combustible liquids (biodiesel, methanol, hexane, NM30), and the unloading of bulk liquids from berth 104 as previously approval was granted to bring in methanol and biodiesel via vessel. Furthermore, the process would not create any environmental impacts that cannot be appropriately managed through on site mitigation measures.

The land that TQ is proposing to use for the PK BLT is currently underutilised special activities zoned land allotments, which are well separated from residential areas or environmental constraints. The land has good access for the import and distribution of bulk liquids and would provide local employment opportunities.

In summary, the benefit would comprise the provision of bulk liquids import capacity and storage that contributes to meeting the growing energy needs of NSW. The facility would develop an underutilised site, creating employment without affecting the amenity of the surrounding area and enhancing the future energy security of both NSW and Australia.

The site is currently available to allow TQ to commence construction and operation immediately once approval is received. The ready access to a work force for both on-site and off-site delivery of construction and operational services, as well as the lack of environmental impacts associated with the site contributed to the decision by TQ to undertake the proposal at this location.

Further project justification is provided in **Section 4** and a further assessment of the strategic planning context is provided in **Section 5.6**.

3.2 Project Description

The proposed PK BLT comprises a number of storage tanks (including 23 product tanks, 13 slops tanks and 2 firewater tanks). All bulk liquid storage tanks and bunds would be designed and constructed in compliance to *AS1940 The storage and handling of flammable and combustible liquids* and *API650*. The tanks are expected to be constructed from carbon steel and will utilise fixed external roofs for all tanks, with an additional internal floating roof design to be utilised for flammable liquid storage to reduce air emissions.

The site will have a perimeter fence, security monitoring and access protocols. The site will be equipped with firefighting provisions as required by the relevant standards. Site entry gates will be set back from the roadways by a minimum of the longest vehicle proposed to access the site. This is required to maintain road safety in the port precinct. Site 1 will have a setback to accommodate a B-Double truck. Site 3 will not include an entry gate for and therefore no setback is required.

Figure 3-2 shows the proposed PK BLT site layout which has been developed by TQ. Further development plans are provided in **Appendix C** for reference.

Hazardous materials stored onsite comprises bulk petroleum fuel products (flammable and combustible) and ethanol. The total storage capacity of the site will be up to 288 ML of liquid products (excluding slops tanks).

The proposed site will be operational 24 hours day, 7 days per week, manned by onsite operations personnel during ship unloading and other critical activities. All terminal activities (controlling tank movements, product transfers, road tanker loading, Vapour Recovery Unit (VRU) monitoring, fire system control and alarms) can be coordinated by the Control Room Operator.

A central control room located on Site 3 will be used to monitor and control the status of all terminal operations, including tank levels, product receipts and transfers, and truck out loading operations.

3.2.1 Product Receipt & Storage

Bulk Liquids will be received by ship at Berth 104 using up to four Marine Loading Arms (MLAs) (**Figure 3-1**) and shore lines. The MLA allows products to be transferred from a ship into the shore pipeline (shore line) by solid piping rather than relying on large flexible hoses. The MLA is a large articulated piping system that allows movement of the ship in three planes while still maintaining a connection between the ship and shore line pipes. During a ship unloading operation, the MLA is manoeuvred into place and connected to the ship manifold piping. Once the MLA is fully connected the ships on board pumps are started to commence product transfer from the ship compartments, through the MLA to the shore lines. The shore line pipes then transfers the product to the terminal manifolds where valved connections are used to direct the product into the desired bulk storage tank. This entire line up of product flow and ship unloading operation is monitored by operators at the berth as well as at the terminal control room.

Product is transferred to the Site 2 manifold and then piped directly into the designated tanks by interconnections made at the transfer manifold. There is also capability for product from the ship to be pumped to Site 1 via the Site 2 manifold.

Renewable fuels can be received by either vessel or road tanker. For road tanker deliveries, vehicles will enter Site 2 via the access gates and proceed to the Truck Loading Gantry (TLG) for unloading (refer to **Section 3.2.2** for more details).

Dedicated unloading pumps will be used to transfer product to the appropriate tanks on Site 1 or Site 2.

Product can be transferred between tanks via the transfer pumps located on each site. The transfer pumps can also be used for recirculating the contents of any of tank as required for product quality purposes.

3.2.1.1 **Bulk Liquid Product Receipt**

Liquid product will be received at Berth 104 immediately south of Site 2 (refer to **Figure 2-2**). This berth is suitable for MR, LR1 and LR2 vessels up to 120,000 Deadweight Tonnage (DWT). Berth 104 is a common user berth and will be predominately utilised by both TQ and GrainCorp. GrainCorp currently export grain from Berth 104 by deploying two grain loaders, which are mounted on rail tracks that traverse the length of the berth for shipping operations. The operation of the existing ship loaders requires that the berth deck is

kept clear for safety purposes. GrainCorp Liquid Terminals also currently utilise Berth 104 to receive chemical tankers, which are unloaded using flexible hoses to connect the ship to their shore line.

The PK BLT will operate as an import terminal, from which finished fuel products will be received by ship and dispatched by road tankers (and potentially by rail into the future). TQ propose to locate all of their required fixed ship unloading equipment within the existing operating envelope of Berth 104. The new equipment items that will be situated on Berth 104 to facilitate the proposed ship unloading operations include:

- > MLA - rail mounted on trolley and wheels, similar to existing grain loaders. An example of a typical Marine Loading Arm is provided in **Figure 3-1**
- > Spill capture and pollution control measures – including integrated sump on the Marine Loading Arm trolley
- > Pig launchers - to clean out product lines
- > Shore line connecting pipework – to transfer product from ship to shore storage areas. Additional pipelines will branch off the shore line pipework to connect with other infrastructure such as tanks on each site.
- > Operator cabin and control room on the wharf
- > Fire monitors.

The proposed changes to Berth 104 infrastructure will allow efficient ship unloading operations to occur. The new rail mounted MLA equipment is planned to be parked at the northern end of the berth to allow the existing grain loaders to still cover the full length of a Panamax vessel as is required by the adjoining GrainCorp operations.

The operator cabin will be equipped with a remote access station to the main terminal control room, so that information such as tank levels can be monitored, as well as the MLA operation and emergency shut-down systems.

Figure 3-1 Typical Marine Loading Arm Proposed on Berth 104



3.2.1.2 Berth Security

The existing Berth 104 area is a secure area of the Port that requires a Maritime Security Identification Card (MSIC) for personnel access. The Berth 104 area is currently secured by a security fence, automatic

security gates and back to base Closed Circuit Television (CCTV) monitoring to the security officers patrolling and managing security within the Port Precinct.

TQ proposed berth operations will fit into the existing security arrangement without any modification to existing physical infrastructure.

A plan showing the proposed development across the entire site is provided below as **Figure 3-2**.

3.2.2 Product Distribution

Product distribution will be via single, rigid and B-double road tankers. Road tankers will enter Site 2 from the access gate at the southern end of Site 2, approach the truck loading gantry, park and commence bottom filling via dedicated loading arms. Trucks will be filled with a variety of liquids prior to road tanker export via Tom Thumb Road security gatehouse to the road network external to the port precinct.

There is a total of six road tanker loading bays proposed. The TLG is an equipment package designed to control the process of loading product into a road tanker. The system includes automated product isolation valves, filters, air elimination, flow control valves, flow meters and hoses with connection adaptors to suit the trucks being loaded. The connection is made at the base of the truck compartments (known as bottom loading). Another part of the TLG system is a vapour recovery connection and an earthing and overflow protection system. The earthing and overflow protection system monitors the truck compartment levels and will stop the loading operation if any of the safety checks are not met, eg. a compartment being too full. The earthing component ensures there are no static electricity issues while loading the truck. The TLG system controls flow rates into each truck compartment, starting slowly, then filling at higher rates and finishing slowly to ensure only the correct volume is loaded into each truck compartment. Trucks can be loaded with up to 55 m³ (B Double) depending on the truck size and loading operation. The TLG area will have drive-over bunding around the perimeter and be drained to the slops collection system to ensure potential spills are effectively contained and managed.

Slops are a generic term for waste products collected within the terminal during normal operations. The major source of slops is shore line flushing via pigging following a product change and at the commencement of vessel discharge operations. The flushed product is directed to a slops tank where it is then allowed to settle. Any water in the slops tank is then pumped to the Oily Water tank for offsite disposal. The slops can then be pumped and blended back into a bulk storage tank. Another source of slops is road tanker compartment draining prior to loading operations. This is only expected to generate a minor amount of slops and the slops would be returned to a bulk storage tanks in a similar way to slops from shore line flushing.

Further details on traffic routes for product distribution are detailed in **Section 7.6** and further details on slops and surface water management are provided in **Section 7.7**.

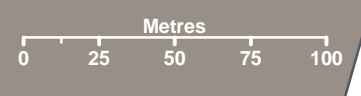
3.2.3 Interaction with Other Port Operations and Activities

The proposed PK BLT would not operate in isolation, with interactions occurring with the ongoing and proposed future activities being undertaken in and around the site. The environmental assessments that have been undertaken within this EIS have considered these interactions and the potential impacts. For example the traffic assessment has considered additional truck movements generated by the proposal as well as those generated by the existing processes on site around the Port precinct as well as in the broader connecting road network.

Details of potential interactions and cumulative impacts relating to traffic and operational transport aspects are discussed further in **Section 7.6**.



FIGURE 3-2
1:2,500 Scale at A3



Proposed Development Plan

PORT KEMBLA



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2015-12-03
Coordinate System: GDA 1994 MGA Zone 56
Project: 82015103-01
Map: 82015103-GS-015-DevelopmentPlan.mxd 09
Aerial imagery supplied by nearmap (January, 2015)

3.3 Development Stages

3.3.1 Stage 1A (Committed Development)

Prior to developing the overall PK BLT, TQ will commence construction of selected elements of the existing Major Project Approval (08_0083) and associated modification under S75W (by MOD 1, MOD 2 & MOD3). These works would be consistent with the environmental assessment, conditions of consent, statement of commitments (SoC) for this existing approval.

TQ subsequently obtained endorsement from DP&E on 21 January 2015 for a proposed Staging Plan prepared by URS 2014 (refer **Appendix A** for a copy of the letter from DP&E).

The infrastructure approved to be constructed as Stage 1A under Major Project Approval (08_0083) includes:

- > Bulk earthworks and retaining wall on Site 1
- > Three combustible liquid storage tanks on Site 1
- > Berth infrastructure and ship unloading equipment on Berth 104 consisting of:
 - Three shore lines from berth to Site 1
 - Three marine loading arms (with a capacity for a fourth to be developed as part of proposed "Stage 3" works)
 - Berth operator cabin required for unloading operations, and
 - Berth manifold to connect the shore lines to the marine unloading arms.

Refer to **Figure 3-3** for an overview of the Stage 1A preliminary works to be completed under the existing Major Project Approval (08_0083) as modified under S75W.

3.3.2 Stages 1B, 2 and 3 (Proposed Development)

The proposal consists of three main development stages of the PK BLT which have been separated to fast track the commencement of operations. The proposed project will be constructed in three stages on Sites 1, 2 and 3 which still require planning approval from DP&E. The new SSD planning application will cover all stages (including Stage 1A) of the proposed development. The stages of the Proposed Project have been identified as:

- > Stage 1A (existing approval 08_0083)
- > Stage 1B
- > Stage 2
- > Stage 3.

The proposed development strategy will utilise the Stage 1A (Committed Development), which will comprise the construction (refer to **Section 3.3.1** above) as the preliminary works. The remaining Stage 1B infrastructure (refer to **Section 3.3.2.1** below), will provide up to 133.5 ML of liquid fuel storage capacity primarily on Site 1, and construction of additional facilities necessary on Berth 104 and Sites 2 and 3 to allow operations to commence.

A Staging Plan has been provided as **Figure 3-3** to identify the key development aspects in each stage. Also refer to **Table 3-1** for a summary of the current approvals status for each project stage.

3.3.2.1 Stage 1B (Balance of Stage 1)

Stage 1B will form part of the new SSD approval from DP&E.

This stage of development is comprised of:

- > Five combustible liquid storage tanks on Site 1
- > Three flammable liquid storage tanks on Site 1

- > Two flammable liquid storage tanks on Site 2
- > Slops tanks on Site 1 – to collect any waste product or spills
- > Bund walls around Site 1 and the tanks constructed on Site 2
- > Truck loading bay structure and fit out of three truck loading bays on Site 2
- > Service bridge between Site 1 and Site 2
- > Pump bay and product piping to the truck loading bays from Site 1 to Site 2
- > Workshop and control room/office facilities on Site 3
- > Landscaping along sections of the perimeter of Site 3 including a suitable selection of native plants. Site 1 and Site 2 are not planned to include landscaping along the perimeter.
- > Fire system, utilities, stormwater and pavements for Site 1 and for the truck loading bay and ethanol storage tanks on Site 2.

The tanks are 10 – 29m in diameter and have heights ranging from 20 – 29m. The throughput after completion of Stage 1 is anticipated to be 720 mega litres per annum (MLpa) at commencement, increasing to 1,200 MLpa. Stage 1 works are anticipated to be completed to allow operation commencing in mid-2017. Refer to **Figure 3-3** for an overview of the Stage 1B infrastructure works.

3.3.2.2 Stage 2

Stage 2 will predominantly occur on Site 2 and will form part of the new SSD approval from DP&E.

This stage of development is comprised of:

- > Three flammable liquid storage tanks on Site 2
- > Two combustible liquid storage tanks on Site 2
- > Bunding around a reduced section on Site 2 to provide the necessary bund capacity for the largest storage tank and positioned in such a way as to allow future tanks construction to occur onsite during Stage 3
- > Fit out of one additional truck loading bay on Site 2
- > Pump bay and product piping to allow the transfer of product from Site 2 to Site 1
- > Fire system, utilities and stormwater for additional storage tanks on Site 2.

The capacities, diameters and heights of tanks will be as per Stage 1 dimensions. The additional capacity will allow throughput to increase to 2,000 MLpa. Stage 2 is anticipated to be completed by early 2018. Refer to **Figure 3-3** for an overview of the Stage 2 infrastructure works.

3.3.2.3 Stage 3

Stage 3 will predominantly occur on Site 2 and Berth 104, with the date for commencing Stage 3 construction determined by market demand. Stage 3 will form part of the new SSD approval from DP&E.

This stage of development is comprised of:

- > Two flammable liquid storage tanks on Site 2
- > Two combustible liquid storage tanks on Site 2
- > Bunding around additional tanks on Site 2, integrating with existing bunds constructed in Stage 2
- > An additional MLA on Berth 104
- > Fit out of two additional truck loading bays on Site 2
- > Fire system, utilities and stormwater, fencing and pavements for additional storage tanks on Site 2.

The additional capacity for Stage 3 will allow throughput to increase to approximately 2,900 MLpa. The completion date of Stage 3 will be determined by market factors. Refer to **Figure 3-3** for an overview of the Stage 3 infrastructure works.

3.3.3 Planning Approvals

The approvals required for each stage of the development are outlined in **Table 3-1** below.

Table 3-1 Summary of Current Approval Status for Project Stages

Project Stage	Planning Approval Status	Comment
Stage 1A (Committed Development) Construction	Already Approved Major Project (08_0083) and as modified under S75W (MOD1, MOD2 & MOD3) To be covered by new SSD Project Application to DP&E	Works will be in accordance with existing Conditions and SoCs provided with approval. EIS prepared in accordance with SEARs and will include the effects of the Committed Development and the Proposed Development
Stage 1B (Balance) Construction	To be covered by new SSD Project Application to DP&E	EIS prepared in accordance with SEARs.
Stage 1 Operations	To be covered by new SSD Project Application to DP&E	EIS prepared in accordance with SEARs
Stage 2 Construction	To be covered by new SSD Project Application to DP&E	EIS prepared in accordance with SEARs
Stage 2 Operations	To be covered by new SSD Project Application to DP&E	EIS prepared in accordance with SEARs
Stage 3 Construction	To be covered by new SSD Project Application to DP&E	EIS prepared in accordance with SEARs
Stage 3 Operations	To be covered by new SSD Project Application to DP&E	EIS prepared in accordance with SEARs

While the Stage 1A already has planning approval, the new SSD planning application will cover all stages, including Stage 1A, of the proposed development.

3.4 Proposed Site Construction

3.4.1 Proposed Construction Activities

The following is a summary of construction activities proposed:

- > Bulk earthworks across all sites.
- > Installation of drainage infrastructure.
- > Piling of pre-cast driven concrete piles for tanks.
- > Concrete foundations and roadway construction.
- > General construction and fabrication activities including installation of piping and tanks requiring use of cranes, welding, grinding, etc.

A bulk earthworks strategy has been developed for the proposed bulk earthworks. This strategy identified that all three sites to require net fill. A total of approximately 4,355m³ of suitable engineering fill is required to be imported on site as part of the proposed works.

3.4.2 Construction Staging

Construction of the project will be staged as outlined in **Figure 3-3**.

Construction activities associated with:

1. Stage 1 will occur on Sites 1, 2 and 3 and the Berth.
2. Stage 2 will predominantly occur on Site 2.
3. Stage 3 will predominantly occur on Site 2 and the Berth. (The date for commencing Stage 3 construction will be determined by market demand).

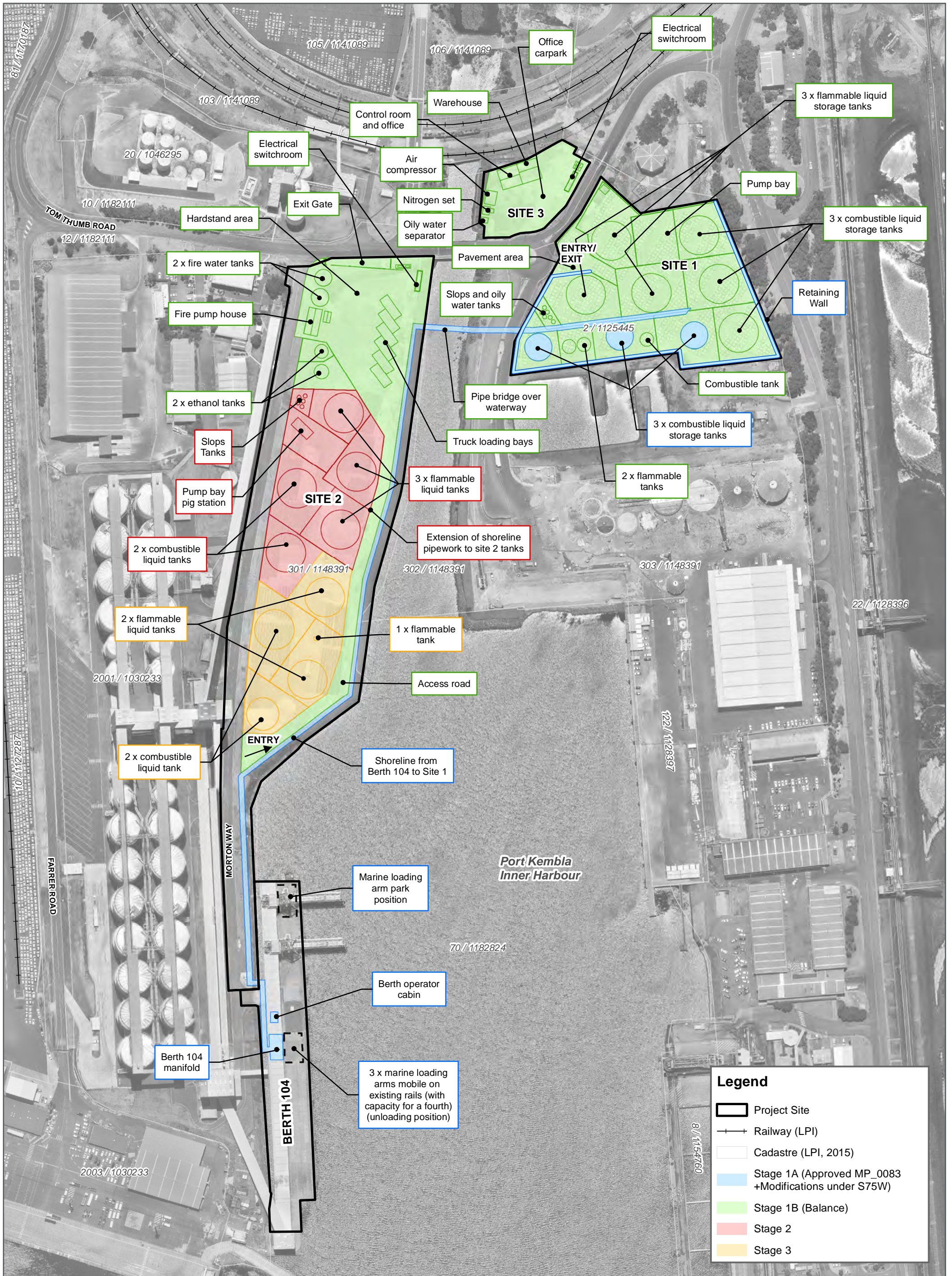
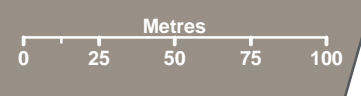


FIGURE 3-3
1:2,500 Scale at A3



Development Staging Plan

PORT KEMBLA



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2015-11-19
Coordinate System: GDA 1994 MGA Zone 56
Project: 82015103-01
Map: 82015103-GS-010-StagingPlan.mxd 09
Aerial imagery supplied by nearmap (January, 2015)

3.4.3 Hours of Construction

Normal hours of construction proposed are summarised below in **Table 3-2** which will be the normal construction hours for the Proposal. However, it is anticipated that additional works are likely to be required outside of normal hours during the construction phase for the following reasons:

- > Transport logistics
- > To ensure calm weather required during significant crane lifts
- > Safety reasons.

Table 3-2 Normal Hours of Construction

Day	Normal Hours of Construction	*Outside of Normal Hours of Construction
Monday - Friday	7:00am to 6:00pm	6:00pm to 7:00am (only if required)
Saturday	8:00am to 1:00pm	1:00pm to 8:00am (only if required)
Sunday and Public Holidays	Nil	Only if required.

*Note – The noise and vibration assessment has assessed and provided justification for construction works to occur outside of normal hours which is likely to be required due to weather conditions, road safety or other logistical aspects.

The Noise and Vibration Assessment (refer **Section 7.5**) has quantitatively modelled potential impacts from four construction scenarios including civil earthworks (scenario 1), establishment of foundations (scenario 2), assembly of plant infrastructure (scenario 3) and outside of standard hours works (scenario 4)

The modelling of scenario 4 identified that no significant impacts are anticipated that will prevent works outside of normal hours of construction. Further details are provided at **Section 7.5.4**.

3.4.4 Personnel and Employment

The overall number of personnel expected on site during the construction stages of the project, excluding truck drivers who pick up/deliver construction items, are summarised in the **Table 3-3**.

Table 3-3 Summary of Personnel

Stage	Construction (Personnel)	Operations (Personnel)	Total (Personnel)	Duration (months)
Stage 1A Construction	17 - 35	0	17 - 35	4
Stage 1 Balance Construction*	38 - 138	0	38 - 138	15
Stage 1 Operations & Stage 2 Construction	38 - 138	5 - 12	43 - 150	6
Stage 2 Operations	0	5 - 12	5 - 12	TBA
Stage 2 Operations & Stage 3 Construction	38 - 78	5 - 12	43 - 90	12
Stage 3 Operations	0	5 - 12	5 - 12	Ongoing

*Note: Stage 1 Balance Construction refers to stage 1 construction works which are not completed as part of Stage 1A

3.5 Proposed Site Operations

3.5.1 Hours of Operation

The proposed site will be operational 24 hours a day 7 days per week manned by onsite operations personnel during higher risk activities such as ship unloading or product transfer. All terminal activities (controlling tank movements, product transfers, road tanker loading, Vapour Recovery Unit monitoring, fire system control and alarms) will be coordinated by the Control Room Operator.

3.5.2 Proposed Throughput

Stages 1 and 2 are designed to accommodate flammable and combustible fuels. Stage 3 will be developed for additional flammable and combustible products as required by market demand. The forecast throughput levels are summarised in **Table 3-4**.

Table 3-4 Estimated Annual Throughputs for Petroleum Products

Fuel Type	Stage 1 (ML pa)	Stage 2 (ML pa)	Stage 3 (ML pa)
Combustibles	780	1,300	1,885
Flammables	420	700	1,015

A VRU will be sized to suit the above throughputs and truck loading rates to reduce air emissions.

The above forecast is based on the following estimated ship movements as provided by TQ:

- > Stage 1 – 22 vessels per year
- > Stage 2 – 25 vessels per year
- > Stage 3 – 32 vessels per year.

3.5.3 Maintenance and Other Minor Works

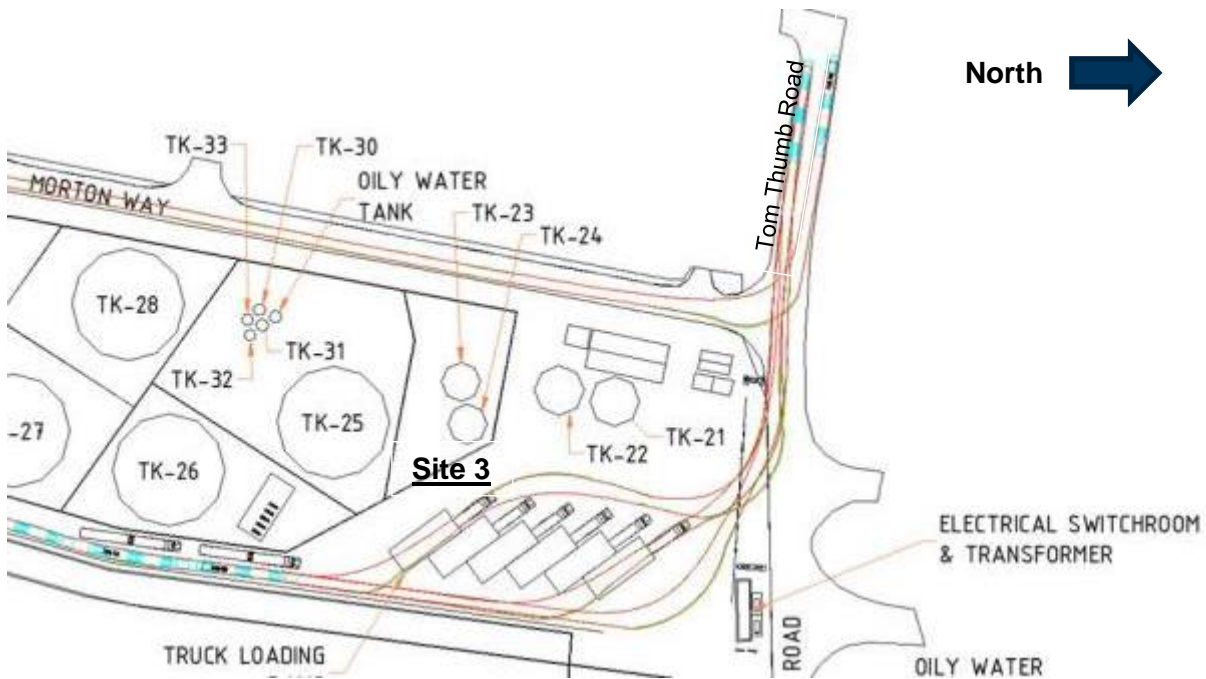
To support the daily functions of the PK BLT ongoing maintenance and other minor works may be undertaken during operation to ensure that operation occurs within the parameters as identified in this document. The works will ensure the function of the PK BLT occurs in a safe and secure manner through minimising any risks or environmental impacts on people or the environment. The works may include activities such as plant and equipment upgrades or replacement, installation of additional pollution control measures and hose/pipeline repairs.

3.6 Proposed Vehicle Access & Egress

The Proposal will be constructed and will operate within a working port area. Therefore the design of access and egress locations will consider the vehicle type, turning pathways and appropriate sight lines to ensure road safety and to minimise operational impacts to the greater port environment. Any modifications to existing roadways will be carried out in accordance with appropriate standards and in consultation with NSW Ports to ensure future operational performance and safety of port related transport activities.

The proposed road accesses and egresses have been assessed as part of the Traffic and Transport Impact Assessment in **Section 7.6** and **Appendix F** and will comprise of all construction and operational vehicles entering and exiting the Port precinct via Tom Thumb Road and the existing security gatehouse situated just off Spring Hill Road.

The heavy vehicle access to the Truck Loading Gantry on Site 3 is shown below as **Figure 3-4** which indicates that a potential conflict with vehicles turning from Tom Thumb Road into Morton Way and northbound traffic on Tom Thumb Road. This issue will be addressed in consultation with NSW Ports during the detailed design and future traffic management planning stages.

Figure 3-4 Vehicle Access Arrangement to Truck Loading Gantry on Site 3


3.6.2 Transport Schedule

A summary of vehicle movements for both the construction and operational stages is shown in **Table 3-5** below. It is assumed that site based personnel during construction and operations will drive light vehicles to site.

Table 3-5 Summary of Daily Vehicle Movements Expected During Construction and Operations

Stage	Construction (No. of Vehicles)		Operations (No. of Vehicles)		Total	Duration (months)
	Light Vehicles	Heavy Vehicles	Light Vehicles	Heavy Vehicles		
Stage 1A Construction	7 - 15	10 - 20	0	0	17 - 35	4
Stage 1 Balance Construction	7 - 15	8 - 16	0	0	15 - 31	15
Stage 1 Operations & Stage 2 Construction	38 - 138	5 - 10	5 - 12	53 - 105	131 - 265	6
Stage 2 Operations	0	0	5 - 12	84 - 174	89 - 186	TBA
Stage 2 Operations & Stage 3 Construction	38 - 78	5 - 10	5 - 12	84 - 174	132 - 274	12
Stage 3 Operations	0	0	5 - 12	140 - 261	145 - 273	Ongoing

3.6.3 Car Parking

Twenty parking spaces will be located at Site 3 near the control room, office block and maintenance workshop for operational staff. This 20 spaces exceed the 12 spaces projected to be required for operational staff. An additional 1-2 spaces will be provided on Sites 1 and 2 to allow maintenance vehicle parking as required. These maintenance spaces will be located to allow safe entry/exit to the site and so as not to impede operational activities.

3.7 On Site Product Storage & Loading Facilities

3.7.1 Bulk Liquid Storage Tank Design and Layout

All bulk liquid storage tanks and bunds will be designed, constructed and operated in accordance with *AS1940-2004 - The storage and handling of flammable and combustible liquids* and *API650*. The tanks are expected to be constructed from carbon steel and will utilise fixed external roofs for all tanks, with an additional internal floating roof on flammable bulk liquid storage tanks. The proposed dimensions and locations of the tanks are included in **Table 3-6**.

The following design guidelines for flammable and combustible storage tanks have been used by TQ as well as Qualitative Risk Assessment (QRA) outcomes (refer **Section 6**) in the development of the overall site layout:

- > All tanks shall be located within bunded areas in such a way that spills will not reach a protected works, watercourse or a property boundary
- > The ground around the tank should be kept clear of any combustible vegetation or refuse within 3m
- > Tank to tank distances will be designed in accordance with AS1940
- > Distances from tanks to onsite and offsite protected places will be designed in accordance with AS1940. Protected places can be described as a dwelling, public building or place where people may be accustomed to assemble
- > Distances from tanks to security fence will be design in accordance with AS1940; and
- > Power lines can present a particular hazard and so power lines must not be allowed within 5m of the tank.

The level of risks associated with the product types outlined in **Table 3-6** have been assessed in the PHA and therefore should TQ operational requirements need to change any liquid products to lower risk items then further approval should not be required. Further reviews of risk and additional approval requirements would be required if liquid products with higher levels of risk were proposed to be substituted in respective storage tanks.

3.7.2 Internal Floating Roof

An Internal Floating Roof (IFR) is a device used in the flammable liquid bulk storage tanks. The IFR floats on top of the liquid surface, in full contact with the liquid. The purpose of the IFR is to minimise the exposed liquid surface area within the tank. Any exposed liquid surface is a source of vapour generation due to evaporation of the flammable liquid. An IFR therefore significantly reduces the rates of evaporation of the liquid and consequently reduces hydrocarbon emissions from the tank. Refer to **Table 3-6** for a list of the storage tanks which will incorporate IFRs.

Table 3-6 Storage Tank Contents and Capacities

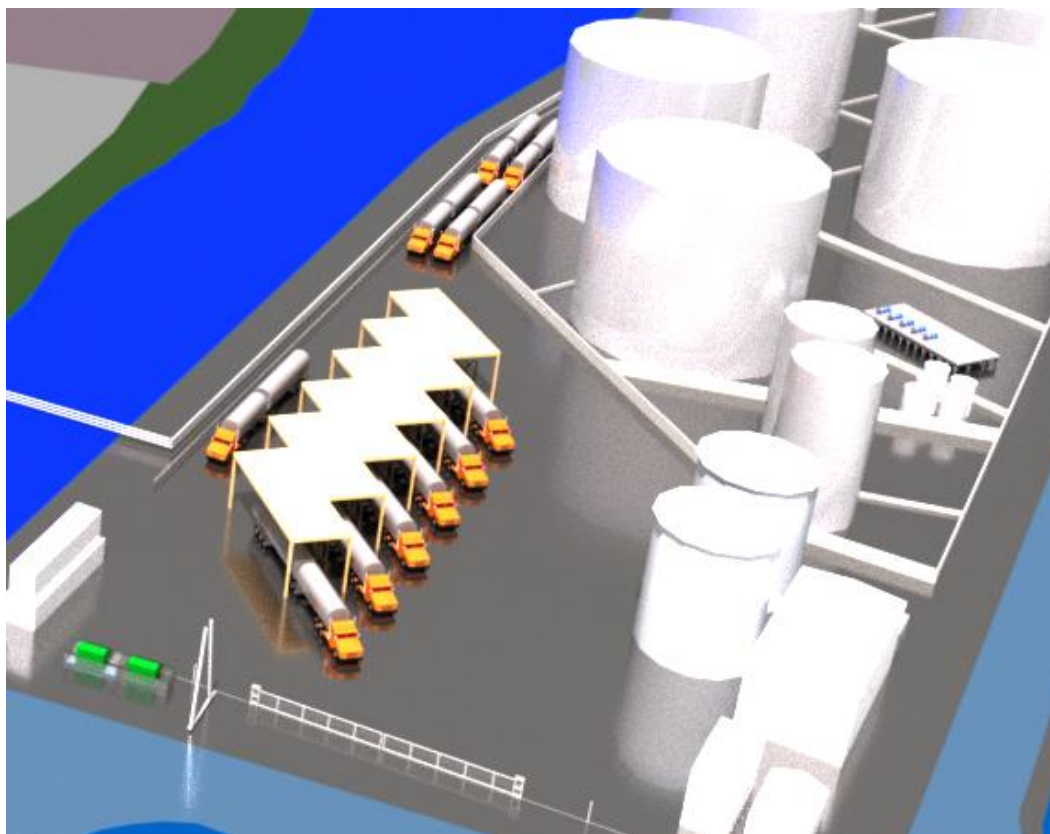
Tank	Site	Internal Floating Roof	Diameter (m)	Height (m)	Tank Volume
TK-01	Site 1	No	20	21.5	6ML
TK-02	Site 1	No	20	21.5	6ML
TK-03	Site 1	No	20	21.5	6MI
TK-04	Site 1	No	29	28.9	18ML
TK-05	Site 1	No	29	28.9	18ML
TK-06	Site 1	No	29	28.9	18ML
TK-07	Site 1	Yes	29	28.9	18ML
TK-08	Site 1	Yes	29	28.9	18ML
TK-09	Site 1	Yes	29	28.9	18ML
TK-10	Site 1	Yes	10	21.5	1.5ML
TK-11	Site 1	Yes	10	21.5	1.5ML
TK-12	Site 1	No	10	21.5	1.5ML
TK-13	Site 1	No	3	4.8	32m ³
TK-14	Site 1	No	3	4.8	32m ³
TK-15	Site 1	No	3	4.8	32m ³
TK-16	Site 1	No	3	4.8	32m ³
TK-17	Site 1	No	3	4.8	32m ³
TK-18	Site 1	No	3	4.8	32m ³
TK-23	Site 2	Yes	10	21.5	1.5ML
TK-24	Site 2	Yes	10	21.5	1.5ML
TK-25	Site 2	Yes	29	28.9	18ML
TK-26	Site 2	Yes	29	28.9	18ML
TK-27	Site 2	Yes	29	28.9	18ML
TK-28	Site 2	No	29	28.9	18ML
TK-29	Site 2	No	29	28.9	18ML
TK-30	Site 2	No	3	4.8	32m ³

TK-31	Site 2	No	3	4.8	32m ³
TK-32	Site 2	No	3	4.8	32m ³
TK-33	Site 2	No	3	4.8	32m ³
TK-34	Site 2	No	3	4.8	32m ³
TK-35	Site 2	Yes	29	28.9	18ML
TK-36	Site 2	Yes	29	28.9	18ML
TK-37	Site 2	No	29	28.9	18ML
TK-38	Site 2	No	24	28.9	12ML
TK-39	Site 2	No	3	4.8	32m ³
TK-40	Site 2	No	3	4.8	32m ³
TK-41	Site 2	No	3	4.8	30m ³
TK-42	Site 2	No	3	4.8	30m ³

3.7.3 Truck Loading Bays

The site will have covered truck loading bay structures with provision for up to six loading bays as indicated below in **Figure 3-5**.

Figure 3-5 Truck Loading Bay Arrangement (on Site 2)



Note: 3D visualisation of proposed development looking south over Site 2

Each truck loading bay will also include the following key infrastructure:

- > Human Machine Interface (HMI) for the driver to enter in driver and load details and select loading arms in accordance with the TAS approvals, including dead man switch.
- > Scully overfill protection and earth connection point.
- > Roll over spill containment bunds.
- > Tanker compartment vapour connection line.
- > Spill kits and safety shower.

3.7.4 Truck Loading Operations

Truck loading operations will be via a secure and electronic load ordering, queuing, vehicle/driver identification and truck filling control system. Detailed truck loading procedures will be provided and followed by all drivers to ensure safe and efficient transfer of bulk liquids from the terminal to the trucks.

Dedicated unloading skids with pumps will be provided for the unloading of renewable fuel products stored on the site. This equipment is designed to safely unload a truck delivering product to the terminal, e.g. ethanol. The system is controlled by the truck driver with the product being directed to the appropriate bulk storage tank by the terminal operator. The truck unloading skid is connected to the truck via an articulated hose. The system includes an unloading pump, air elimination, flow meter, flow control valve and isolation valve. The unloading skid controls the unloading flow rate to ensure all the product is unloaded from the truck at a steady rate and that no air is introduced into the flow meter or piping system.

The unloading of any distressed cargos/mistaken loads into the temporary storage tanks/slops tanks can be achieved using the slops / unloading pump. Refer to **Figure 3-6** and **Figure 3-7** for example of typical loading/unloading skids which will be situated in the truck loading bays.

Figure 3-6 Loading Skid Typical Arrangement

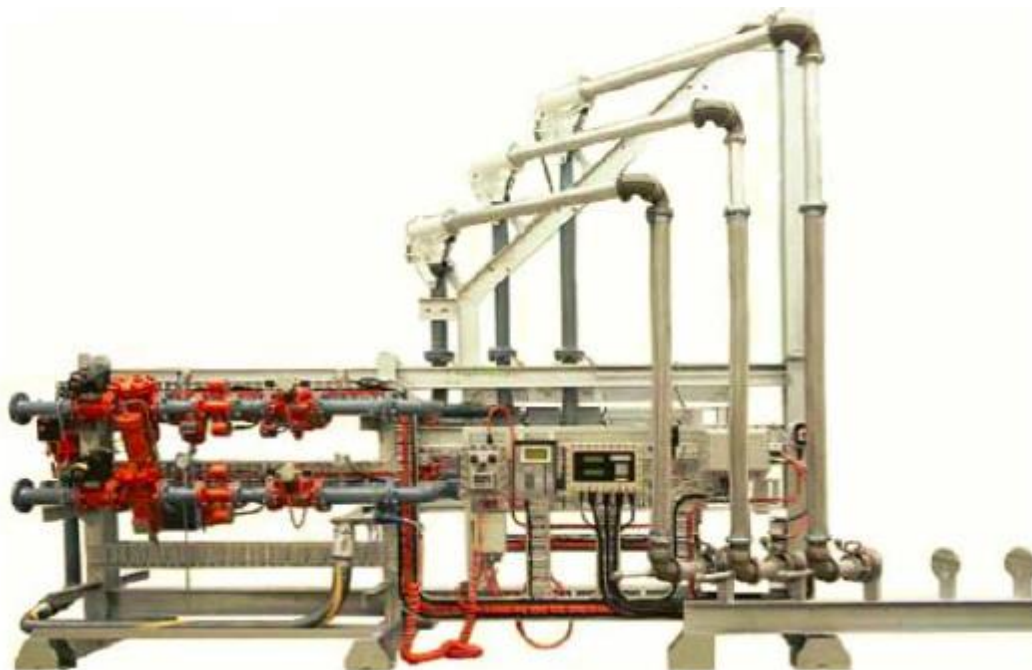
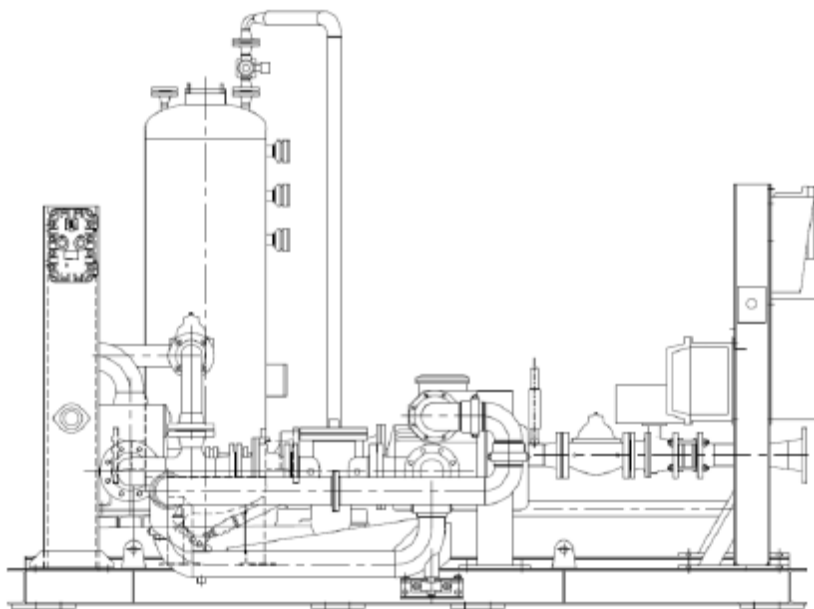


Figure 3-7 Unloading Skid Typical Arrangement



3.7.5 Control Systems for Preventing Overfilling and Spills

All tanks are provided with radar gauge level indication, as well as protection against overfill and overdraught. All tank levels will be displayed within the control room with alarm systems activated at maximum working levels with manual and automatic overfill prevention and shutdown mechanisms in place. These automatic shutdowns will also be included on tank valves, shore line valves at Berth 104 and road tanker unloading pumps.

3.7.6 Vapour Recovery Unit

A Vapour Recovery Unit (VRU) will be provided to process product vapours displaced from road tanker compartments during loading. The vapours are collected from the road tanks during loading by a vapour hose connection and transferred to the VRU via pipelines. Product is recovered by carbon absorption in the VRU. The VRU carbon absorption vessels are regenerated under vacuum to recover the captured product. At any one time, one vessel is on being desorbed while the other is on line. Recovered product is then pumped into a bulk storage tank.

3.7.7 Additive and Dye Injection

The gantry loading system within the loading bays will be capable of accepting injection of additives such as dyes, if required, from Intermediate Bulk Containers (IBC) or small tanks by means of dosing pumps according to customers' requirements.

3.7.8 Fire Controls and Protocols

Fire control systems and protocols have been considered in **Section 7.3**, with fire safety design based on *AS 3846 The handling and transport of dangerous cargoes in port areas* for the berth and *AS 1940 The Storage and Handling of Flammable and Combustible Liquids* for the bulk liquid storage components. Fire control includes a monitoring, response and control system.

The PK BLT fire system will include cooling water sprays and foam pourers within the terminal area. The berth fire suppression system will have two fire monitors to deliver a foam and/or water mix to suppress a fire on the berth. The fire monitors will have the capacity of being controlled remotely to direct the firewater. A *Fire Safety Study* will be performed in consultation with NSW Fire and Rescue and outcomes of this study and liaison will also feed into fire protection system detail design and *Emergency Response Plans* for the terminal.

3.7.9 Signage

All fuel storage tanks will be labelled in accordance with the requirements of Section 3.8 of AS1940, *The Storage and Handling of Flammable and Combustible Liquids*. Each bulk liquids tank that is storing flammable liquids must also have correct placarding required by State legislation covering storage and handling of dangerous goods attached to the tank. Tanks used for the storage of fuel will have appropriate signage, including Hazchem signage when appropriate, "No Smoking" warnings, and identification of the product contained in the tank.

Generally, petroleum fuels carry the Hazchem code 3[Y]E. Tanks containing flammable goods are to be labelled with the placarding requirements of the relevant State legislation covering the storage and handling of dangerous goods.

The PK BLT will have appropriate signage in accordance with the regulations and to ensure transportation, visitor and personnel movements on site remain safe at all times. Signage will be provided at the entry to the site identifying the company details. This sign shall be developed in accordance with the style of signs within the port precinct.

3.7.10 Waste Management

Only small amounts of general construction, maintenance, office building and factory waste would be produced by the Proposal due to the generally prefabricated nature of the new plant equipment and small workforce operating the plant on an ongoing basis. Solid waste material would be sorted and reused where practical with any surplus waste being collected from the site via an appointed private contractor for recycling or disposal as required.

Bulk liquid storage facilities generate minimal waste during operations as they simply receive, store and handle finished liquid products. An oil separator will be used to clean storm water from bunded areas and waste fuel streams will be kept to a minimum due to the potential for recovery of fuel from slops tanks.

Further assessment details relating to waste management during construction and operations are provided in **Section 7.10**.

4 Project Justification

4.1 Legislative Requirements

Clause 7(1)(c) of Schedule 2 of the EP&A Regulation requires an analysis of any feasible alternatives to the carrying out of the development, including the consequences of not proceeding with the Proposal. The following subsections address the requirements of Clause 7(1)(c).

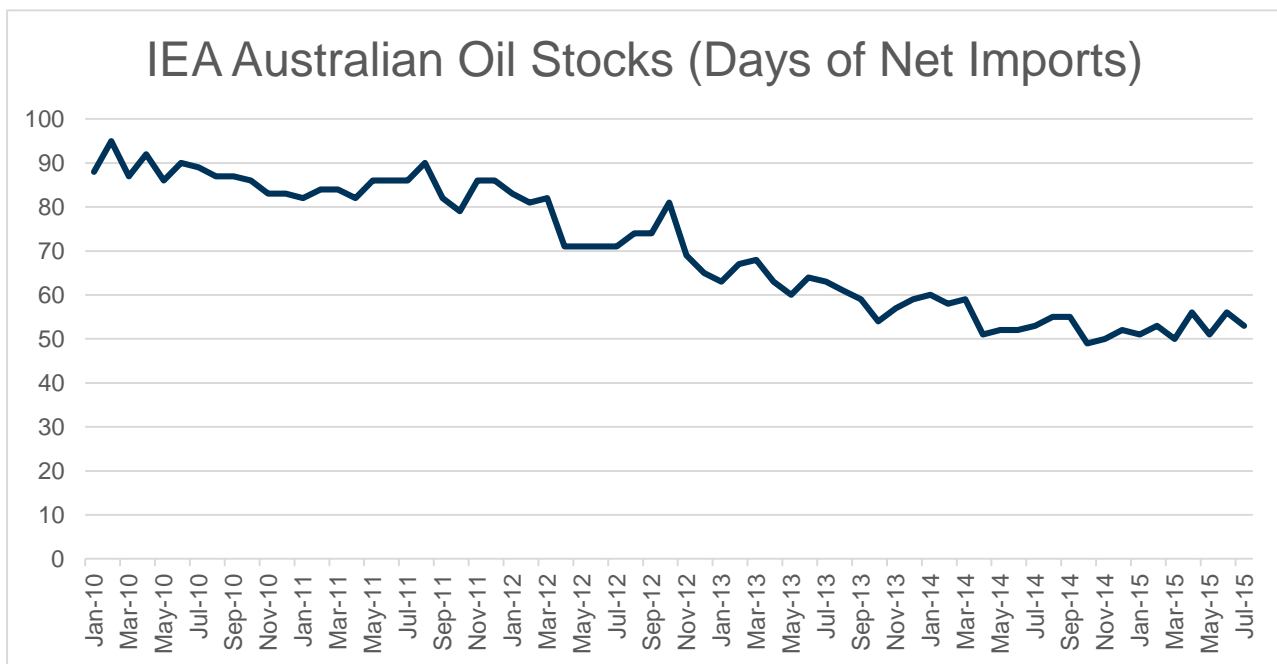
TQ has determined that the approved development (MP 08_0083) was not viable following a number of business model reviews and in consideration of available lease areas within the Port Kembla Port Precinct. Also, the shift in long term market conditions for soybean crushing and biodiesel production means that these aspects of the Proposal are no longer viable. However, the recent decline and cessation of all fuel refining in NSW and the ongoing need for the State to have a secure and diverse fuel supply network means that the fuel storage component remains viable with strong demand for further fuel storage facilities for both conventional petroleum and biodiesel products (URS, 2014).

4.2 Justification for the Proposed Development

Australia is a member of the International Energy Agency (IEA), an organisation established in the wake of the 1973 oil crisis to enable a coordinated international response to oil supply disruptions. Initially the IEA coordinated the distribution of oil supplies and reserves; however in 1984 this was replaced with a market centric approach which includes an obligation for member countries to retain a reserve equal to 90 days of the previous year's net petroleum imports. Historically Australia has met this requirement entirely through commercial energy storage, which in the event of a liquid fuels supply problem can be controlled directly by the Commonwealth Government under the *Liquid Fuel Emergency Act 1984 (LFE Act)*.

In recent years, Australia's net oil imports have grown as a result of falling domestic oil production and rising consumption. The increasing imports have not been matched with an increase in storage, resulting in a rapidly growing deficiency in Australia's oil reserves. Refer to **Table 4-1** for a snap shot of Australian Oil Stocks.

Table 4-1 International Energy Agency Estimates of Australia's Fuel Stockpile



(Produced from IEA Data from January 2010 to July 2015, <http://www.iea.org/netimports>)

As of July 2015, Australia is the only IEA member which does not meet the minimum 90 day oil stockpile requirement. Consequently, additional storage must be built for Australia to meet its treaty obligations and provide a sufficient buffer against the potential for an oil supply disruption. This has been recognised in the Commonwealth Government's *2015 Energy White Paper* as a significant problem.

The proposed PK BLT will add the equivalent of 2.6 days national supply at 2014 import rates and will therefore make a minor but nonetheless important contribution to national energy security.

The proposal would allow TQ to contribute to meeting the growing demand for imported petroleum products in the Illawarra and southern NSW. The PK BLT site is located in close proximity to port infrastructure and their principal markets to reduce truck journey lengths and associated costs for the company as well as the environment. The existing road network provides for the rapid transfer of materials to and from the site and nearby port facilities, with minimal disruption to local roads. The site is connected to the Southern Freeway via Springhill Road and Masters Road which are both high capacity arterial roads (approximately 4km).

The proposed site is located within an existing port area, which contains port and industrial land uses to the north, south, east and west. The TQ site and proposed facilities are located approximately 1,200m from any potentially sensitive residential receivers and there are no heritage impacts expected from the development.

The location of the PK BLT on existing port land, adjacent to existing terminal facilities ensures that a new incompatible use is not being introduced to the area. Furthermore, the facility would not create any environmental impacts that cannot be appropriately managed through on site mitigation measures.

The development represents opportunities to reduce transport emissions as the site is located in proximity to existing material suppliers and port facilities as well as an existing customer base in the Illawarra region.

The sites which TQ is proposing to utilise for the PK BLT are underutilised special activities zoned lots well separated from residential areas or environmental constraints. They have good access for the import and distribution of liquid fuel products and would provide local employment opportunities.

In summary, the benefit would comprise the provision of fuel import capacity and storage to meet the transport energy needs of NSW. The process would utilise an existing underutilised site, creating employment without affecting the amenity of the surrounding area and ensuring the future energy security of Australia.

The site is currently available to allow TQ to commence construction and operation immediately once approval is received. The ready access to a work force for both on-site and off-site construction and operations, as well as the lack of environmental impacts associated with the site contributed to the decision by TQ to undertake the proposal at this location.

Furthermore, the wider Port Kembla Precinct is identified within the *Navigating the Future: NSW Ports 30 Year Master Plan* (NSW Ports, 2015) as underutilised and holding substantial capacity future growth such as the potential for economic activity and job creation as envisaged by the applicable land use policies and zoning. The proposed development is consistent with the *Navigating the Future: NSW Ports 30 Year Master Plan* in utilising currently vacant land to enhance the ports capacity. The proposed development is also consistent with the projected role of Port Kembla within the next 30 years to cater for a "growing range of dry bulk, bulk liquids and general cargo".

Further details on the *Navigating the Future: NSW Ports 30 Year Master Plan* is provided in **Section 5.6.4**.

4.3 Review of Alternatives

Potential alternatives to the proposal include finding another site for the proposed PK BLT or to not construct a terminal at all. Other potential sites for the upgraded facilities were found to be less isolated from sensitive uses such as residential areas, thus imposing greater environmental impacts; were more pristine sites and so the introduction of a bulk liquids terminal would create a greater impact; and often included limited existing infrastructure, thus required a greater amount of construction to achieve the same outcome. Alternative sites lacked the benefits of using the proposed site, which is vacant and in close proximity to the existing Port. The PK BLT would provide a higher level land use for the site.

4.4 Do Nothing Option

The do nothing alternative would result in a lost opportunity to improve Australia's energy security through the creation of new fuel storage. This alternative would limit the growth of TQ within Port Kembla and would also limit the potential for future jobs created by this industry, during both the construction and operational phases of the proposal.

Additionally the site would remain dormant if the proposal does not receive approval, limiting the potential to create and sustain employment in the region, which is a key objective of the *State Plan – NSW 2021* (NSW Government, 2011) and the *Illawarra Regional Strategy 2006-31* (Regional Strategy) (Department of Planning [DoP], 2006). Furthermore, the proposal would contribute to meeting the demand for petroleum products, which are vital for the regional, state and national economies.

4.5 Identification of a Preferred Option

The installation of a bulk liquids terminal facility on the site at Port Kembla is the preferred option based on the location in proximity to the port and markets, the infrastructure available (primarily roads) and the location of the land in an industrial port area that would not be impacted by the plant subject to the proposed mitigation measures. Additionally, the construction of a new terminal provides Australia with new fuel importation and storage capacity. The accessibility of the site to major roads for the dispatch of fuel around southern NSW was a unique feature and contributed to the construction of a new plant in Port Kembla being the preferred option.

Construction of the proposed terminal and storage facility would occur in stages. The development will be staged and subject to future development consents required to allow successful and complete operation of the facility.

5 Regulatory Framework

5.1 Commonwealth Legislation

The following Commonwealth legislation is potentially applicable to the proposed development.

5.1.1 Environmental Protection & Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the relevant Commonwealth environment and heritage legislation applicable to matters of national significance (NES). The EPBC Act requires approval from the Department of Environment (DoE) for any action that has, will have or is likely to have a significant impact on the eight listed matters of national environmental significance, which are:

- > World Heritage properties
- > National Heritage places
- > Wetlands of international importance
- > Threatened species and ecological communities
- > Migratory species
- > Commonwealth marine or land areas
- > The Great Barrier Reef Marine Park
- > Nuclear actions (including uranium mining).

The location of the TQ site is not within a World Heritage site, a National Heritage place, a wetland or a Commonwealth marine or land area. The site is an existing industrial premise and has been subject to extensive earthworks limiting the potential for aboriginal heritage items to be found during works.

The Green and Golden Bell Frog *Litoria aurea* (GGBF) is listed as a vulnerable species under the EPBC Act, with a referral required to DoE for any action which is deemed likely to have a significant impact on a vulnerable species. In determining whether a significant impact would occur as a result of an action it should be considered whether the impact is important, notable, or of consequence, in regards to its context or intensity.

Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts. Cardno & Ecoplanning (2015) carried out a Commonwealth Significant Impact Assessment, which found that there will be no significant impacts on the GGBF from the proposal, with further discussion at **Section 7.9**. Therefore, a referral to the DoE is not required under the EPBC Act.

5.2 NSW Legislation

The following State legislation is potentially applicable to the proposed development.

5.2.1 Environmental Planning & Assessment Act 1979 and Regulation 2000

The EP&A Act and associated EP&A Regulation provide the legislative framework for the assessment and determination of the development.

5.2.1.1 **State Significant Development**

Section 89C of the EP&A Act identifies SSD, which due to their size or level of impact are potentially of State significance. Subject to Section 89C(2):

“A State environmental planning policy may declare any development, or any class or description of development, to be State significant development”.

The Project is defined as SSD as it meets the requirements of *State Environmental Planning Policy (Three Ports) 2013* (Port SEPP), Clause 27. Furthermore, the Project also satisfies the criteria for SSD under Schedule 1, Clause of *State Environmental Planning Policy (State and Regional Development) 2011* (State and Regional SEPP).

Section 78(A) (8A) of the EP&A Act requires an SSD application to be accompanied by an EIS, with Schedule 2 of the EP&A Regulation identifying the EIS requirements. The requirements of Schedule 2 (6 and 7), which identify the form and content of an EIS are reviewed in **Table 5-1** below.

Table 5-1 Environmental Planning and Assessment Regulation 2000 (Schedule 2, Part 3 Review)

EP&A Regulation – Part 3 Review	Comment
<i>6 Form of environmental impact statement</i>	NA
<i>An environmental impact statement must contain the following information:</i>	
<i>(a) the name, address and professional qualifications of the person by whom the statement is prepared,</i>	Declaration
<i>(b) the name and address of the responsible person,</i>	Declaration
<i>(c) the address of the land:</i>	Declaration
<i>(i) in respect of which the development application is to be made, or</i>	
<i>(ii) on which the activity or infrastructure to which the statement relates is to be carried out,</i>	
<i>(d) a description of the development, activity or infrastructure to which the statement relates,</i>	Section 3
<i>(e) an assessment by the person by whom the statement is prepared of the environmental impact of the development, activity or infrastructure to which the statement relates, dealing with the matters referred to in this Schedule,</i>	Declaration
<i>(f) a declaration by the person by whom the statement is prepared to the effect that:</i>	Declaration
<i>(i) the statement has been prepared in accordance with this Schedule, and</i>	
<i>(ii) the statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates, and</i>	
<i>(iii) that the information contained in the statement is neither false nor misleading.</i>	
<i>7 Content of environmental impact statement</i>	Declaration
<i>(1) An environmental impact statement must also include each of the following:</i>	
<i>(a) a summary of the environmental impact statement,</i>	Executive Summary
<i>(b) a statement of the objectives of the development, activity or infrastructure,</i>	Section 3
<i>(c) an analysis of any feasible alternatives to the carrying out of the development, activity or infrastructure, having regard to its objectives, including the consequences of not carrying out the development, activity or infrastructure,</i>	Section 4.3

EP&A Regulation – Part 3 Review	Comment
(d) an analysis of the development, activity or infrastructure, including:	
(i) a full description of the development, activity or infrastructure, and	Section 3
(ii) a general description of the environment likely to be affected by the development, activity or infrastructure, together with a detailed description of those aspects of the environment that are likely to be significantly affected, and	Section 7
(iii) the likely impact on the environment of the development, activity or infrastructure, and	Section 7
(iv) a full description of the measures proposed to mitigate any adverse effects of the development, activity or infrastructure on the environment, and	Section 7 and Section 10
(v) a list of any approvals that must be obtained under any other Act or law before the development, activity or infrastructure may lawfully be carried out,	Section 5
(e) a compilation (in a single section of the environmental impact statement) of the measures referred to in item (d) (iv),	Section 10
(f) the reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development set out in subclause (4).	Section 7
Note. A cost benefit analysis may be submitted or referred to in the reasons justifying the carrying out of the development, activity or infrastructure.	

Section 89J and 89K of the EP&A Act outline the authorisations that do not apply to SSD projects, as well as those that cannot be used to refuse SSD applications. **Table 5-2** identifies the relevant authorisations under 89J and their applicability to the Project.

Table 5-2 Environmental Planning and Assessment Act 1979 (Section 89J)

Section 89J Approvals that do not apply	Comment
(a) the concurrence under Part 3 of the Coastal Protection Act 1979 of the Minister administering that Part of that Act,	Note
(b) a permit under section 201, 205 or 219 of the Fisheries Management Act 1994,	Note
(c) an approval under Part 4, or an excavation permit under section 139, of the Heritage Act 1977,	Not applicable as the site is not heritage listed
(d) an Aboriginal heritage impact permit under section 90 of the National Parks and Wildlife Act 1974,	Note
(e) 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,	Not applicable, as the site does not contain native vegetation or State protected land
(f) a bush fire safety authority under section 100B of the Rural Fires Act 1997,	Not applicable, as the site is not bushfire prone
(g) 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.	Note

Table 5-3 identifies the relevant authorisations under 89K and their applicability to the Project.

Table 5-3 Environmental Planning and Assessment Act 1979 (Section 89K Authorisations)

Section 89K Approvals that must be applied consistently	Comment
(a) an aquaculture permit under section 144 of the Fisheries Management Act 1994	NA
(b) an approval under section 15 of the Mine Subsidence Compensation Act 1961,	NA
(c) a mining lease under the Mining Act 1992	NA
(d) a production lease under the Petroleum (Onshore) Act 1991	NA
(e) an environment protection licence under Chapter 3 of the Protection of the Environment Operations Act 1997 (for any of the purposes referred to in section 43 of that Act),	Applicable (refer to Section 5.2.7)
(f) a consent under section 138 of the Roads Act 1993,	NA (refer to Section 5.2.9)
(g) a licence under the Pipelines Act 1967.	NA

5.2.2 Designated Development

The EP&A Regulation at Schedule 3 identifies projects classified as Designated Development. Schedule 3(10) identifies Chemical storage facilities that meet the criteria below as Designated Development.

“Chemical storage facilities:

(a) that store or package chemical substances in containers, bulk storage facilities, stockpiles or dumps with a total storage capacity in excess of:

- (i) 20 tonnes of pressurised gas, or
- (ii) 200 tonnes of liquefied gases, or
- (iii) 2,000 tonnes of any chemical substances, or

(b) that are located:

- (i) within 40 metres of a natural waterbody or wetland, ...”

The project meets the Designated Development criteria identified in Schedule 3(10). However, Section 77A(2) of the EP&A Act identifies that:

“Designated development does not include State significant development despite any such declaration.”

Consequently, the proposal is not considered Designated Development, with an EIS prepared under the provisions of SSD required.

5.2.3 Coastal Protection Act 1979

The *Coastal Protection Act 1979* (Coastal Act) is administered by OEH and aims to protect the coastal environment of NSW for the benefit of both present and future generations. Objectives applicable to the Project include:

- > To protect, enhance, maintain and restore the environment of the coastal region
- > To recognise and foster the significant social and economic benefits to the State that result from a sustainable coastal environment.

The site is located within the Coastal Zone and would be affected by Sections 38 and 39 of the Coastal Act. However, subject to Section 89J of the EP&A Act authorizations under the Coastal Act are not required for SSD. A review of the provisions of *State Environmental Planning Policy No. 71 (Coastal Protection)* (SEPP 71) has been undertaken in **Section 5.3.5** below illustrating the limited extent of impact.

5.2.4 Contaminated Land Management Act 1997

The aim of the Contaminated Land Management Act 1997 (CLM Act) is:

“to establish a process for investigating and (where appropriate) remediating land areas where contamination presents a significant risk of harm to human health or some other aspect of the environment”.

The CLM Act also ensures the accountability for remediation of contamination and appropriate level and qualification of auditing of such works.

The proposal is to be located on heavy industrial zoned land, with a range of industrial uses occurring on and around the site since the 1940's. The previous industrial uses on and surrounding the site have resulted in the potential contamination of soils within the site, although investigations associated with previous Project approvals for the site found the site to be suitable for the proposed use. It is likely that the site would remain suitable, however, a contamination assessment has been undertaken as discussed at **Section 7.13**. The investigations found that the site is suitable for the proposed development subject to consideration of the identified recommendations.

5.2.5 Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) lists and protects items and areas of heritage significance in NSW. The Heritage Branch (formerly Heritage Office), which is part of OEH administers the Heritage Act and listings.

There are no heritage items or areas within the site, which are listed under the Heritage Act as the site is cleared, with much of the surrounding area heavily disturbed by earth works undertaken during reclamation works in the 1940's and the industrial and port related subdivision. Subject to Section 89J of the EP&A Act an approval under Part 4 or an excavation permit under Section 139 of the Heritage Act are not applicable to SSD.

5.2.6 National Parks and Wildlife Act 1974

OEH administers the *National Parks & Wildlife Act 1974* (NP&W Act) that manages:

- > Conservation of nature
- > Conservation of objects, places and features of cultural value
- > Public appreciation, understanding and enjoyment of nature and cultural heritage
- > Land reserved under this Act.

When determining applications under the NP&W Act, OEH must consider the objectives listed above, the public interest and appropriate management of the subject land. The NP&W Act stringently controls activities carried out in designated Parks, Reserves and Aboriginal areas. The site is not within a Park, Reserve or Area designated under Part 4 of the NP&W Act. Furthermore, the proposed works are taking place on cleared land that has been heavily disturbed. Subject to the provisions of Section 89J of the EP&A Act the need for an Aboriginal Heritage Impact Permit under Section 90 of the NP&W Act are not applicable to SSD.

5.2.7 Protection of the Environment Operations Act 1997

Subject to Section 48 of the *Protection of the Environment Operations Act 1997* (POEO Act) a license is required to authorise the carrying out of scheduled activities. Schedule 1 of the POEO Act identifies those activities categorised as 'scheduled activities', which require a licence. Schedule 1(9) relates to Chemical Storage, with the proposal requiring a licence from the EPA to guide emissions to water, land and air.

Management and mitigation measures addressing emissions to water, land and air have been identified within **Section 10** of this EIS. An application for a licence would be made once Part 4 of the EP&A Act

approval is obtained. The EPA would review and consider the proposed mitigation and management measures prior to issuing a licence, which would include discharge limits.

5.2.8 Protection of the Environment Operations (Clean Air) Regulation 2010

The Protection of the Environment Operations (Clean Air) Regulation 2010 (the "Clean Air Regulation") provides regulatory measures to control emissions from wood heaters, open burning, motor vehicles and fuels and industry. Part 6 of the Clean Air Regulation specifies control equipment required for volatile organic liquids in areas of the Sydney, Newcastle and Wollongong Metropolitan areas. Requirements are outlined for control equipment for large storage tanks (Clause 63), large loading plants (Clause 64) and small storage tanks (Clause 65).

Given that the bulk liquids terminal is located in Port Kembla, the operations are exempt from the requirements for control equipment for large loading plants and small storage tanks; however the requirements for control equipment for large storage tanks must be met.

The following control equipment on large storage tanks is required:

- > A drainage system comprising of a small sump or tundish fitted under each water draw-off valve and connected to a totally enclosed drain, or
- > For volatile organic liquid stored in a tank with a vapour pressure ≤ 75 kPa the tank must have either a floating metal roof, a floating cover constructed of material impervious to vapour that floats on the liquid surface inside a fixed roof, or a vapour disposal or recovery system that meets the requirements of the Clean Air Regulation.
- > For volatile organic liquid stored in a tank with a vapour pressure > 75 kPa the tank must have a vapour disposal or recovery system that meets the requirements of the Clean Air Regulation.

It is also noted that clauses 66 and 67 of the Clean Air Regulation outline the requirements for control equipment for large tank vehicles, as well as methods for loading and unloading large tank vehicles.

It is understood that, through the full contact internal floating roof technology proposed, combined with the use of VRUs for road tanker loadout and pigging activities, the facility will meet the relevant requirements of the Clean Air Regulation.

5.2.9 The Roads Act 1993

Subject to Section 138 of the *Roads Act 1993* permission is required from the roads authority to carry out works in, on or over a public road. The Project would include access points to Tom Thumb Road. An assessment of traffic generation and potential impacts has been carried out at **Section 7.6**. The assessment found that subject to appropriate mitigation and management measures the proposal is acceptable. An application would not need to be submitted to the roads authority prior to obtaining the construction certificate as the development does not include any work in, on or over a public road.

5.2.10 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) outlines protection of threatened species, communities and critical habitat in NSW. Protection is provided under the TSC Act for species, populations and ecological communities considered to be endangered, vulnerable or extinct.

Any activity which may have an impact on protected animals, plants or locations is rigorously assessed to ensure the justification is strong enough to permit the impact to progress. The TSC Act links with the EP&A Act to ensure consideration of these matters during the determination of applications.

Cardno & Ecoplanning (2015) undertook a Flora and Fauna Assessment comprising a data review and site investigation (refer to **Section 7.9** and **Appendix K**). The likelihood of occurrence analysis and field assessment identified that the GGBF was the only species identified to having either 'high' or 'moderate' potential to use the subject site.

Cardno & Ecoplanning (2015) carried out a Section 5A Assessment of Significance, which found that there will be no significant impacts on the GGBF from the proposal, with a Species Impact Statement not required. In accordance with the SEARs an assessment in accordance with the *Framework for Biodiversity Assessment* is currently being undertaken to determine if biodiversity offsetting of the project is required.

5.2.11 Water Management Act 2000

The *Water Management Act 2000* (WM Act) provides that certain types of development and activities that are carried out within 40m of a river, lake or estuary are controlled activities. A controlled activity includes the following:

- > The erection of a building or the carrying out of a work (within the meaning of the EP&A Act), or
- > The removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise, or
- > The deposition of material (whether or not extractive material) on land, whether by way of landfill operations or otherwise, or
- > The carrying out of any other activity that affects the quantity or flow of water in a water source.

Section 344(1)(a) requires that "*a person must not carry out a controlled activity in, or under waterfront land otherwise than in accordance with a controlled activity approval*". Port Kembla Harbour falls within the meaning of an estuary under the WM Act. However, subject to Section 89J of the EP&A Act the requirements of the WM Act do not apply to SSD projects. Consequently, a controlled activity approval is not required under Section 91 of the WM Act.

5.3 State Environmental Planning Policies

The following State Environmental Planning Policies are potentially applicable to the proposed development.

5.3.1 State Environmental Planning Policy (Three Ports) 2013

Subject to Section 89C(2) of the EP&A Act: *"A State environmental planning policy may declare any development, or any class or description of development, to be State significant development"*.

State Environmental Planning Policy (Port Botany and Port Kembla) 2013 (Port SEPP) aims to streamline and rationalise the land use planning and assessment framework for Port Kembla. The Port SEPP allocates the site an SP1 Special Activities land use zonings (refer to **Figure 2-3**), with the project permissible with consent.

Subject to Port SEPP the Minister for Planning would be the consent authority for the project, as the site is on land within the Port Lease Area.

The Project is defined as SSD as it meets the requirements of the Port SEPP, Clause 27 associated with both the site location within the Port Lease Area and the capital cost of works in excess of \$100 million. The Project also satisfies the criteria for SSD under Schedule 1, Clause of State and Regional SEPP, as discussed at **Section 5.3.2**.

Section 78(A) (8A) of the EP&A Act requires an SSD application to be accompanied by an EIS, with Schedule 2 of the EP&A Regulation identifying the EIS requirements, which are identified in **Table 5-1**.

5.3.2 State Environmental Planning Policy (State & Regional Development) 2011

Subject to Section 89C(2) of the EP&A Act: *"A State environmental planning policy may declare any development, or any class or description of development, to be State significant development"*.

The aim of State & Regional SEPP is to identify projects of State and regional significance. Schedule 1 of State and Regional SEPP identifies SSD. Subject to Schedule 1, Division 10(2):

"Development with a capital investment value of more than \$30 million for any of the following purposes:

(a) liquid fuel depots,"

The proposal has a capital investment value greater than \$30 million. Consequently, the proposal satisfies the criteria of State & Regional SEPP and is categorized as SSD. As identified at **Section 5.3.1** the project would also be identified as SSD subject to the Port SEPP.

5.3.3 State Environmental Planning Policy No 33 - Hazardous and Offensive Development

State Environmental Planning Policy No 33 - Hazardous and Offensive Development (SEPP 33) aims to regulate the control of hazardous or offensive developments through the Planning process. SEPP 33 lists the type of development considered hazardous or offensive by DP&E. A "hazardous industry" means:

A "hazardous storage establishment" means:

"Any establishment where goods, materials or products are stored that, when in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the establishment from existing or likely future development on other land in the locality), would pose a significant risk in the locality:

- a. to human health, life or property, or*
- b. to the biophysical environment."*

The proposed development has the potential to impact on human health, life or property and the biophysical environment. However, subject to employing appropriate measures these risks are minimised. Sherpa

Consulting (2015) has prepared a PHA for the PK BLT (refer to **Appendix D**). The PHA has been prepared in accordance with the requirements of SEPP 33. The PHA was conducted in accordance with the *Hazardous Industry Planning Advisory Paper 6* (HIPAP 6) ‘Guidelines for Hazard Analysis’ (DoP, 2011b).

The PHA comprised gathering the type and quantities of dangerous goods that are proposed to be stored onsite and transported by road tankers and comparing these with the threshold quantities to determine whether a PHA and transport risk assessment are required. A review of the SEPP33 provisions found that the quantities of Class 3 Packaging Group (PG) II, (gasoline), stored onsite exceeded the threshold quantities stated in the SEPP33 guideline the proposed development is ‘potentially hazardous’ and a PHA study is required.

A transport route evaluation study is also required as weekly vehicle movements of Class 3 PG II materials are above the SEPP33 transport screening threshold levels. A Route Selection Assessment has also been prepared and is included within **Appendix I**. The PHA was carried out in conjunction with TQ, with design modifications implemented where necessary to reduce the level of hazard and risk as discussed at **Section 7.3**.

5.3.4 State Environmental Planning Policy No 55-Remediation of Land

State Environmental Planning Policy No 55-Remediation of Land (SEPP 55) provides a State-wide approach to the remediation of contaminated land, with the aim of promoting the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. SEPP 55, Clause 7 details matters for consideration when determining an application, which are reviewed in **Table 5-4** with further detailed assessment provided in **Section 7.13**.

Table 5-4 SEPP 55 – Matters for Consideration

Matters for Consideration (Clause 7 of SEPP 55)	Comment
<i>it has considered whether the land is contaminated, and</i>	Cardno (2015) undertook a Soil and Groundwater Impact Assessment comprising a review existing information relating to soils, contamination and groundwater for the site, with potential soils, contamination and groundwater impacts specific to the Project identified. The Assessment found that “general concentrations of potential contaminants of concern in a limited number of soil and groundwater samples analysed, were below the adopted assessment criteria for a commercial / industrial land use setting. Some elevated concentrations of metals (copper and zinc) were reported in groundwater collected from groundwater monitoring bores at and surrounding the site” (Cardno, 2015). Consequently, the Assessment included recommendations to manage construction and operation through an environmental management plan, with key measures including the use of appropriate sediment and erosion control in accordance with <i>Managing Urban Stormwater, Soils & Construction, Volume 1</i> (Landcom, 2004).
<i>if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and</i>	As discussed above the assessment found that the site is suitable subject to the implementation of appropriate management and mitigation measures.
<i>if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.</i>	Remediation is not required.

The review of the SEPP 55 matters for consideration illustrates that the proposal would not be impacted by contamination subject to the appropriate mitigation and management measures being implemented.

5.3.5 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (iSEPP) is designed to regulate development and activities related to the provision and maintenance of infrastructure. Under Section 104 of iSEPP, development proposals may require referral to Roads and Maritime Services (Roads and Maritime) due to its traffic generation and potential to impacts on the road network.

Schedule 3 of iSEPP identifies development which is of sufficient size to require referral to Roads and Maritime.

Table 5-5 Criteria for Referral to RMS (iSEPP, Schedule 3)

Land Use Definition	Referral Criteria
Transport terminals, bulk stores, container depots or liquid fuel depots	Size greater than 8,000m ²

The size of the proposed PK BLT is larger than the 8,000m² criteria set in Schedule 3. Consequently the proposal will require referral to Roads and Maritime.

5.3.6 State Environmental Planning Policy 71 – Coastal Protection

State Environmental Planning Policy 71 – Coastal Protection (SEPP 71) is aimed at protecting the NSW coast, ensuring the public have access to the waterfront, maintaining amenity and protecting environmentally and culturally significant aspects.

The site is located within the 'coastal zone' as defined by SEPP 71. Clause 8 details the matters for consideration when determining a development, with a review of the matters for consideration undertaken in **Table 5-6** below.

Table 5-6 SEPP 71 – Matters for Consideration

Matters for Consideration (Clause 8 of SEPP 71)	Comment
a) <i>the aims of this Policy set out in clause 2 [of SEPP 71]</i>	The proposed development is not contrary to any of SEPP 71 aims as there are no impacts on coastal access or the environment, with the site located solely on private land that does not currently provide access to the coast.
b) <i>existing public access to and along the coastal foreshore for pedestrians or persons with a disability should be retained and, where possible, public access to and along the coastal foreshore for pedestrians or persons with a disability should be improved</i>	The proposed development will have no bearing on public access to coastal foreshores as the site is private property located within a working port. The provision of access would incorporate a potentially conflicting use into the site.
c) <i>opportunities to provide new public access to and along the coastal foreshore for pedestrians or persons with a disability</i>	The site is unsuitable for public access, with the provision of access incorporating a potentially conflicting use into the site.
d) <i>the suitability of development given its type, location and design and its relationship with the surrounding area</i>	The development is suitable in the port location and would site maximizing utilisation of the surrounding roads and berth infrastructure.
e) <i>any detrimental impact that development may have on the amenity of the coastal foreshore, including any significant overshadowing of the coastal foreshore and any significant loss of views from a public place to the coastal foreshore</i>	The project would not result in any loss of views from a public place and would only result in a very minor increase in shadow within the site.
f) <i>the scenic qualities of the New South Wales coast, and means to protect and improve these qualities</i>	The development will not alter the existing scenic qualities of the coast, with the proposal located within a working port surrounded by an existing grain terminal to the west and Quattro's grain terminal to the south and the coal stockpiles and yard machines of PKCT to the east.
g) <i>measures to conserve animals (within the meaning of the Threatened Species Conservation Act 1995) and</i>	The GGBF has been found nearby the proposed site. A management plan would be put in place to mitigate

Matters for Consideration (Clause 8 of SEPP 71)	Comment
<i>plants (within the meaning of that Act), and their habitats</i>	impacts on the Frog population.
<i>h) measures to conserve fish (within the meaning of Part 7A of the Fisheries Management Act 1994) and marine vegetation (within the meaning of that Part), and their habitats</i>	The development will not impact fish.
<i>i) existing wildlife corridors and the impact of development on these corridors</i>	The proposal will not affect wildlife corridors, with a management plan to be put in place to address potential impacts on the GGBF.
<i>j) the likely impact of coastal processes and coastal hazards on development and any likely impacts of development on coastal processes and coastal hazards</i>	No likely impacts are expected on the proposal from coastal processes or hazards.
<i>k) measures to reduce the potential for conflict between land-based and water-based coastal activities</i>	The development does not conflict with coastal activities.
<i>l) measures to protect the cultural places, values, customs, beliefs and traditional knowledge of Aboriginals</i>	The development will have no impact on Aboriginal cultural heritage as it is a heavily disturbed site. An unexpected finds protocol would be put in place to guide construction.
<i>m) likely impacts of development on the water quality of coastal waterbodies</i>	Mitigation measures would be put in place to ensure that there would not be an impact on water quality due to sediment laden runoff during construction and operation.
<i>n) the conservation and preservation of items of heritage, archaeological or historic significance</i>	The site has no heritage significance.
<i>o) only in cases in which a council prepares a draft local environmental plan that applies to land to which this Policy applies, the means to encourage compact towns and cities</i>	Not applicable.
<i>p) only in cases in which a development application in relation to proposed development is determined:</i>	
<i>i. the cumulative impacts of the proposed development on the environment, and</i>	The proposal would not result in negative cumulative impacts subject to appropriate management and mitigation measures.
<i>ii. measures to ensure that water and energy usage by the proposed development is efficient.</i>	

The review of the SEPP 71 matters for consideration illustrates that the proposal would not have any impact on the coast of NSW.

5.3.7 Illawarra Regional Environmental Plan No. 1

The *Illawarra Regional Environmental Plan No. 1* (IREP) provides strategic planning controls and guidance for the Illawarra Region as a whole in order to ensure local environmental plans within the Region remain consistent.

There are several sections within IREP of relevance to the proposal. The relevant sections of IREP include:

- > Provisions relating to energy
- > Provisions relating to coastal lands, wetlands and other water bodies.

The proposal complies with the objectives of the provisions relating to energy for the following reasons:

- > The Project would help to limit energy use through the provision of a local source of fuel, negating the need to transport fuel from beyond the region, thus reducing transport related fuel use.

The proposed Project complies with the objectives of the provisions relating to coastal lands for the following reasons:

- > The proposal would not impact on beach systems, scenic, recreational or natural values as the works are solely within an industrial area
- > Public access is not available through the site as it is located within a secure operational industrial area
- > The proposal would not impact on the coastal ecosystems subject to the management and mitigation measures included in **Section 10** of this EIS.

5.4 Local Planning Context

The following local planning policies are potentially applicable to the proposed development.

5.4.1 Wollongong Local Environmental Plan 2009

The Wollongong Local Environmental Plan (WLEP) 2009 applies to the majority of the Wollongong LGA. Whilst the Port SEPP prevails over the WLEP the following clauses of the LEP have been considered within this assessment:

- > Clause 5.5 Development within the coastal zone (Discussed in **Section 5.3.5**)
- > Clause 7.1 Public utility infrastructure (Discussed in **Section 7.14**)
- > Clause 7.3 Flood Planning (Discussed in **Section 7.7**)
- > Clause 7.5 Acid Sulfate Soils (Discussed in **Section 7.13**)
- > Clause 7.6 Earthworks (Discussed throughout **Section 7**).

5.5 Guidelines

The following Guidelines are potentially applicable to the proposed development.

5.5.1 EIS Guidelines - Chemical Facilities

The *Chemical Facilities EIS Guideline* (NSW Department of Urban Affairs and Planning, 1996) identifies some of the key factors to be considered when preparing an EIS. The Guideline relates to chemical industries and storage facilities. The Guideline identifies key issues for chemical facilities, which are identified in **Table 5-7** below, with the relevant section of the EIS noted.

Table 5-7 Chemical Facilities EIS Guideline – Key Issues

Key Issues	Comment
<i>Hazard</i>	Refer to Section 7.3
<i>Soil contamination</i>	Refer to Section 7.13
<i>Air and water quality</i>	Refer to Section 7.4 and Section 7.8
<i>Transport</i>	Refer to Section 7.6

These issues were given careful consideration through an iterative design process in conjunction with environmental specialists, with management and mitigation measures identified to guide construction and operation. Given the industrialised location of the site and management measures proposed, it is considered that the matters identified in the Guidelines can be adequately addressed.

5.5.2 NSW Ports Overarching Environmental Management Plan – Port Kembla

The NSW Ports Overarching Environmental Management Plan – Port Kembla (Ports EMP) (NSW Ports, 2015a) has been prepared to ensure environmental considerations are incorporated into decision making, with NSW Ports committing to continued improvement in environmental performance. The Ports EMP covers the Port Lease Area, which includes the subject site. NSW Ports as the land manager has

overarching responsibility for the application of the EMP and is in the process of transitional process to ensure that existing and future tenants and licensees are consistent with and comply with this EMP.

To satisfy the requirements of the EMP TQ have prepared environmental management plans aligned with the Ports EMP for the initial stages of the project. The proposed management and mitigation measures identified in **Section 10** of this EIS would be incorporated into an EMP once Part 4 approval is obtained, with the EMP's provided to NSW Ports for review and comment to ensure consistency with the Ports EMP.

The Ports EMP includes the key legal environmental obligations applicable to both construction and operational activities, with the key compliance obligations and associated approvals identified in Table 4.1 of the Ports EMP. A review of the legislative requirements applicable to the TQ site are identified in **Section 5** of this EIS.

The Ports EMP identifies the procedure for obtaining landowners consent from the Port Lessor in the development application process. The process illustrates where the EMP provisions will be considered and the roles and responsibilities associated with key steps in the process. Prior to lodging the EIS with DP&E, the EIS was provided to NSW Ports for review and comment. NSW Ports as the land manager will seek Landowners Consent from the Port Lessor. Once both NSW Ports and the Port Lessor are satisfied with the proposal, DP&E can complete their assessment of the SSD application. Preparation of management plans is then required following project approval.

The Ports EMP includes a risk assessment, with environmental aspects and impacts identified, followed by the quantification of risk and identification of management measures for those risks identified as medium or higher. The risk matrix methodology is reflective of the risk assessment included at **Section 6** of this EIS.

The Ports EMP identifies potentially environmentally sensitive areas within and adjacent to the Port, as illustrated by Ports EMP Figure 8. Environmentally sensitive areas include locations where the following environmental attributes are present:

- > Ecosystems of significant conservation value.
- > Known or potential habitats for threatened species and other significant species.
- > Cultural heritage items and precincts.

Environmentally sensitive areas also include surrounding suburbs that may be affected by environmental impacts including Port Kembla, Wollongong, Coniston and Mt St Thomas. The closest environmentally sensitive areas to the subject site comprises Area 14 located to the north of the site is the Gurungaty Waterway, which is identified as comprising mangroves, riparian vegetation and a potential GGBF movement corridor. Ecology including GGBF habitat and movement corridors are addressed in **Section 7.9**. The assessment undertaken identified that subject to implementation of the identified GGBF Management Plan requirements, specific impacts on the species are not anticipated.

The Environmental Management Measures identified in the Ports EMP would be considered and incorporated into the TQ Environmental Management Plans following the Part 4 EP&A Act approvals process. The TQ Environmental Management Plans would also include monitoring, reporting and incident response protocols aligned with the Ports EMP.

5.6 Strategic Planning

The following Strategic Planning documents are potentially applicable to the proposed development.

5.6.1 Illawarra Regional Strategy

The Regional Strategy is a 25 year blue print for the administrative areas of Wollongong, Shellharbour and Kiama. The Regional Strategy has a strong focus on job creation and sustainable settlements.

The Regional Strategy recognizes the importance of the port of Port Kembla to the Region stating that the growth of port activities would be a key source of employment and economic activity, as well as supporting the \$140 million port expansion of the Outer Harbour. The Regional Strategy also notes that vehicle importation and other freight tasks are no longer suitable in Port Jackson and are being transferred to Port Kembla. The Regional Strategy commits that freight volumes at Port Kembla will be monitored to ensure that adequate road and rail networks are maintained.

Increased throughput resulting from the facility meets the general aims of the Regional Strategy as the Terminal would become an integral facility in the Port, providing key inputs to the local economy. The proposal would have direct benefits through additional employment on site, as well as indirect benefits to the State and Regional economy through job creation as discussed at **Section 7.15**. The PK BLT is consistent with the increased importance of Port Kembla and the greater diversity of tasks it performs.

5.6.2 Draft Illawarra Regional Growth and Infrastructure Plan

The Draft Illawarra Regional Growth and Infrastructure Plan (Draft Growth Plan) has been released by Planning and Environment (2014) for public comment. Growing the economy is identified as the key aim, with Port Kembla identified as a key regional asset that can play a transformative role in this process.

The Port is identified for ongoing expansion, with the proposal located well within the identified heavy industrial growth area. The project would contribute to the ongoing growth of Port Kembla, with jobs created locally on site, as well as in the wider region associated with transport of liquids to and from the site, along with flow on services. Further details of the economic benefits of the project are discussed at **Section 7.15**.

5.6.3 NSW Freight and Ports Strategy

This strategy sets out the future direction and challenges for freight and port infrastructure in NSW. The strategy forecasts that freight volumes through NSW will double by 2031. Port Kembla is identified as crucial to meeting future state freight demands, in part due to constraints on the capacity of Port Botany.

The strategy identifies the Maldon-Dumbarton Rail Link as crucial to expanding the capacity of Port Kembla by removing rail network bottlenecks. The strategy notes that planning work for the Maldon-Dumbarton Rail Link is funded and underway. The strategy also commits to the development of a Port Kembla Growth Plan to better manage future activity.

The proposed PK BLT aligns with this strategy through the expansion freight activities at Port Kembla whilst minimising and mitigating impacts on connecting transport networks.

5.6.4 Navigating the Future: NSW Ports' 30 Year Master Plan

This plan aims to develop a long-term sustainable approach to the operation of NSW Ports assets Port Botany, Port Kembla, Enfield Intermodal Terminal and Cooks River Intermodal Terminal to ensure impacts on the environment and economic sustainability are minimised. The plan identifies the current and future key uses of the port and develops key strategies to ensure that successful continuation of these operations.

Within the plan, Port Kembla is recognised as a key infrastructure asset for NSW and an economic driver in the Illawarra region with key strengths identified as handling large cargo vessels and close proximity to growing areas such as south-west Sydney and the Illawarra. The importation of bulk liquids such as the proposed PK BLT are identified within this plan as a key growth area enforcing the consistency of the proposed works with port objectives and strategies.

6 Risk Assessment and Hazard Analysis

6.1 Overview

The *Chemical Facilities EIS Guideline* (NSW Department of Urban Affairs and Planning, 1996) notes that controlling the risks to people and the biophysical environment from the operation of specific processes and the storage of chemicals is an important aspect in making a development acceptable (NSW Government, 1996).

The level of analysis of individual issues in an EIS should be reflective of the significance of their impacts. The *Chemical Facilities EIS Guideline* (NSW Department of Urban Affairs and Planning, 1996) states that the key issues for chemical facilities usually include:

- > Hazards issues
- > Soil Contamination
- > Air and water quality
- > Transport.

Therefore the identification of hazards and associated level of risk is an important first step taken in this EIS development process through a formal Hazard Identification (HAZID) process as well as QRA and preparation of a PHA. Further detail on the risk assessment process is provided in this section.

Section 7 of this EIS identifies the environmental aspects considered to relate to the Proposal. These aspects comprise:

1. Hazard and Risk
2. Air quality
3. Noise and Vibration
4. Traffic & Transport
5. Surface Water, Waste Water and Flooding
6. Soil, Contamination and Groundwater
7. Greenhouse Gas and Climate Change
8. Biodiversity
9. Waste Management
10. Visual Amenity
11. Heritage
12. Socio-economic
13. Ecologically Sustainable Development
14. Cumulative Impacts.

The environmental aspects assessed have been identified after reviewing the assessment criteria outlined in the SEARs and following a Preliminary Environmental Risk Analysis (PERA) (refer to **Table 6-4**) using the methodology identified below. Each environmental aspect has been prioritised based on the level of identified risk, with the analysis based on the methodology contained within the document *HB 203:2006 Environmental Risk Management - Principles and Process*, *Australian Standard AS/NZ 4360:2004 Risk Management*, and *AS/NZS ISO 31000:2009 Risk Management - Principles and Guidelines*. The methodology is identified below.

6.2 Assessment Methodology

The basis for the identification of environmental risks/impacts associated with the proposed development is an appreciation of the site and the existing environment and an understanding of potential impacts as a result of the construction of each stage. The PERA provides direction and context for the identification of environmental impacts from the proposed project and has been used as a basis for the environmental assessment scope of works for the EIS.

The PERA is based on an index formed from the perceived likelihood of an occurrence, and the subsequent consequence of that occurrence using the process outlined in the *Australian Standard AS/NZS ISO 31000:2009 Risk Management- Principles and Guidelines*. Both likelihood and consequence are measured on a scale of 1 to 5 or A to E. The outcome of the likelihood and consequence analysis provides a subsequent index, which classifies risks as belonging to either 'Low', 'Medium', 'High' or 'Very High' categories as illustrated in **Table 6-1**. This is a conservative index, emphasised by the number of Medium, High and Very High risks identified.

Table 6-1 Environmental Risk Assessment Matrix

Likelihood	Consequence				
	(1) Not Significant	(2) Minor	(3) Moderate	(4) Major	(5) Severe
(A) Almost Certain	Medium	High	High	Very High	Very High
(B) Likely	Medium	Medium	High	High	Very High
(C) Possible	Low	Medium	Medium	High	High
(D) Unlikely	Low	Low	Medium	Medium	High
(E) Rare	Low	Low	Low	Medium	High

Risk category is determined on the basis of the considered likelihood and consequences of the impact occurring. The criteria for evaluating likelihood and consequence are identified in **Table 6-2** and **Table 6-3** respectively.

Table 6-2 Criteria for evaluating likelihood

Level	Descriptor	Description	Frequency of Occurrence
A	Almost Certain	Is expected to occur in most circumstances	Once per month
B	Likely	Will probably occur in most circumstances	Between once a month and once a year
C	Possible	Might occur at some time	Between once a year and once in 5 years
D	Unlikely	Could occur at some time	Between once in 5 years and once in 20 years
E	Rare	May occur in exceptional circumstances	Once in more than 20 years

Table 6-3 Criteria for evaluating consequence

Level	Category	Safety	Financial	Operational	Environmental	Community
1	Not Significant	No medical control	<\$250,000	< 6 hours disruption to facility operations	Release to the environment immediately contained. No impact on the environment.	No community or Stakeholder complaints
2	Minor	Lost time Injury occurs or medical control required	≥ \$250,000 but less than \$2,000,000	≥ 6 hrs but less than 24 hrs disruption to facility operations	Release to environment contained with internal assistance Short term impact on the environment.	Several community or stakeholder complaints. Complaints rectified within adequate timeframes.
3	Moderate	Serious injury occurs	≥ \$2M but less than \$10M	≥ 24 hrs but less than 48 hrs disruption to facility operations	Release to the environment and contained with external assistance. Impact to the environment requiring action to correct.	Multiple and sustained community or stakeholder complaints. Complaints addressed after an interval. Limited media coverage of issues raised.
4	Major	Single fatality occurs	≥ \$10M but less than \$50M	2 days but less than 5 days disruption to facility operations	Pollution event with short-term detrimental effect. Short term impact on the environment requiring action to correct.	Widespread community and stakeholder concern. Sustained failure to address complaints. Extensive media coverage.
5	Severe	Multiple but localized Fatalities occur	≥ \$50M	≥ 5 days disruption to facility operations	Pollution event with long-term detrimental effect. Long term impact on the environment requiring action to correct; possibly requiring the provision of offsets.	Ongoing and widespread community and stakeholder concern, culminating in litigation. Inability to address complaints. Extensive and sustained negative media coverage.

Note: that the Preliminary ESA provided an alternative risk matrix categorisation, however outcomes are generally consistent.

6.2.2 Preliminary Environmental Risk Assessment

The methodology identified above has been used to carry out a preliminary risk assessment associated with the Proposal, with the environmental aspects subsequently assessed in detail in **Section 7** below.

The Preliminary Environmental Risk Assessment is provided below in **Table 6-4**, which has guided the preparation of the EIS studies.

Table 6-4 Preliminary Environmental Risk Assessment

Category	Environmental Impact	Risk Rating			How risks have been addressed
		Potential Likelihood	Potential Consequence	Potential Risk	
Hazard and Risk	Hazards are associated with bulk storage and transportation of flammable and combustible material, including spills, fires and explosions. Staff, the community and the surrounding terrestrial and aquatic environment may be exposed to such hazards.	E	5	High	A PHA has been undertaken that includes a formal hazard identification workshop. An assessment of environmental risk has also been undertaken using the PHA as a basis, to identify: <ul style="list-style-type: none"> > Potential environmental impacts associated with the Project, environmental performance criteria and development standards. > Control measures and any significant residual impacts. > The nature and extent of environmental impacts likely to remain after the implementation of control measures. Potential risks have been initially ranked between low and very high based on the environmental impacts that could potentially result if the issue was un-mitigated, with mitigation measures identified and residual impacts reassessed.
	Dust impacts to sensitive receptors during construction.	A	2	High	An assessment of likely air emissions during construction has been undertaken to assess likely impacts and ensure appropriate dust control measures are implemented to manage potential air quality and dust impacts from construction activities, vehicle movements and material stockpiles.
Air Quality	Emissions during operation from tanks resulting in odour impacts and reduced local air quality.	C	2	Medium	An assessment of likely air emissions during operations has been undertaken quantitatively using modelling to ensure that sensitive receivers are not affected and that relevant emission performance criteria are met. Review engineering design aspects (i.e. floating roof used on all tanks storing volatile liquids to reduce emissions) and other proposed emission control measures to ensure any residual impacts are acceptable.
	Noise and vibration impacts to sensitive receptors during construction that exceed background levels.	D	3	Medium	A quantitative assessment of construction noise impacts should be undertaken to confirm that impacts at any sensitive receptors are negligible. This will also include an assessment of noise impacts from any non-standard hours of construction proposed. Ensure proposed controls provide sufficient mitigation to keep residual impacts to acceptable levels.
Noise and Vibration	Noise and vibration impacts to sensitive receptors during operation that exceed background levels.	C	2	Medium	A quantitative assessment of operational noise impacts has been undertaken to confirm that impacts at any sensitive receptors are negligible.

Category	Environmental Impact	Risk Rating			How risks have been addressed
		Potential Likelihood	Potential Consequence	Potential Risk	
Traffic and Access	Damage to surrounding buildings and infrastructure, as well as disturbance of sensitive residential receivers from vibration during construction.	D	2	Low	A quantitative review of construction vibration impacts have been undertaken to confirm that impacts to adjoining infrastructure and sensitive residential receivers are minimised. The scenarios in the assessment have also provided a justification for any non-standard work hours which are likely to be required during construction.
	Safety issues arising from existing road conditions.	C	3	Medium	A detailed Traffic Impact Assessment has been undertaken to review traffic routes, volumes, road capacity and to identify potential road safety issues and implement management measures where required and to ensure any residual impacts are acceptable. The PHA has considered traffic movements and identified the need for a Route Evaluation Study, which has also been completed in accordance with the hazardous material transport requirements of SEPP 33 and HIPAP 11.
	Construction related traffic delays to road users and impacts to local transport operations.	C	3	Medium	TQ has commenced consultation with NSW Ports and surrounding commercial operations within the Port precinct to advise them of the upcoming construction works and associated traffic impacts. This consultation will continue as required throughout the development of the project. Appropriate advisory signage on works periods, expected delays and alternative routes if road closure will also be required and will be covered in any future Traffic Management Plans required during both construction and operations to ensure residual risks are managed appropriately.
	Operational related traffic delays to road users and impacts to local transport operations.	D	2	Low	TQ will prepare drivers code of conduct in consultation with fleet transport company(s) prior to commencing operations.
Surface Water, Wastewater and Flooding	Release of sediment laden and contaminated run-off with the potential to impact on surrounding water quality during construction.	B	3	High	Appropriate sediment and erosion controls shall be in place during construction. Temporary and/or long term drainage and flow control structures shall minimise scour and erosion issues in adjoining drainage lines and waterways.
	Release of sediment laden and contaminated run-off with the potential to impact on surrounding water quality during operation.	C	3	Medium	Appropriate ground stabilisation works and erosion controls shall be in place during operations to prevent erosion and contaminated run-off. Long term drainage and flow control structures shall minimise scour and erosion issues in adjoining drainage lines and waterways.
	Spills and leaks to surface waters	D	3	Medium	A review of design features will be provided to assess the potential risks and mitigation measures to be implemented to avoid spills and leaks to surface waters and surrounding environment. This will include an outline of

Category	Environmental Impact	Risk Rating			How risks have been addressed
		Potential Likelihood	Potential Consequence	Potential Risk	
					emergency response requirements. A separated water drainage system for clean water (i.e. stormwater) and potentially contaminated water collection from any product spills (i.e. from liquid transfer area and tank bunds) will be designed and implemented prior to operations commencing. Also firefighting foam as part of the fire suppression system, to be detailed in accordance with outcomes of the <i>Fire Study</i> , will be selected in consideration of toxicity to humans and the surrounding environment. Foam will be collected in bunded areas across the site and procedures for foam collection and clean up (in the event of a fire) will also be outlined during the detailed design stage and incorporated in the OEMP.
	Potential for inundation of facility from surrounding water courses and the Harbour.	C	3	Medium	A detailed hydrological study has been undertaken to determine the extent of flooding impacts and suitable mitigation measures which can be employed to reduce the impacts to an acceptable level of risk.
Soils, Groundwater and Contamination	Release of contaminated material or sediments to the environment during construction earthworks.	B	3	High	Suitable soil and erosion control measures shall be integrated in to the construction management plan to ensure that erosion and scour risk is minimised and erodible surfaces are stabilised throughout the project. Equipment maintenance and refuelling activities during construction should be managed to avoid potential contamination to surrounding environment.
	Exposure of construction personnel to contaminated material.	D	4	Medium	An unexpected finds protocol shall be developed for use in all options which ensures that contaminated material can be identified, treated and disposed of safely and lawfully. The contingency plan details will be incorporated into any future CEMP to ensure any residual risks are managed appropriately.
Waste Management	Waste generated during construction and operations	A	2	High	A waste management strategy has been prepared based on the waste hierarchy and in accordance with the <i>NSW Waste Avoidance and Resource Recovery Strategy 2007</i> and <i>NSW Waste Avoidance and Resource Recovery Strategy 2014-2021</i> . All other waste that cannot be avoided, reused or recycled shall be classified in accordance with the EPA Waste Classification Guidelines and disposed of by a licensed contractor (as required) at an appropriately licensed waste facility.
Biodiversity	Potential impacts on the Green and Golden Bellfrog (GGBF), and any other threatened species listed under State and Commonwealth Legislation. The GGBF was previously recorded	E	5	High	A detailed habitat assessment has been undertaken with appropriate mitigation and management measures identified to be implemented to address potential impacts. This include a finds protocol relating to GGBF included for reference in future inductions, CEMP and OEMP documentation to increase awareness and inform construction and operational staff of response requirements.

Category	Environmental Impact	Risk Rating			How risks have been addressed
		Potential Likelihood	Potential Consequence	Potential Risk	
	near the site and can occupy highly modified environments.				Further investigations in accordance with the FBA will be undertaken in conjunction with ongoing liaison with OEH.
	Potential impacts from construction on Coastal Salt marsh, a threatened ecological community listed under State legislation. Impacts on this TEC may be associated with the release of sediment laden/contaminated runoff.	D	2	Low	A detailed ecology assessment has been undertaken to identify the presence of Coastal Salt marsh and any other significant ecology communities or species. Suitable soil and erosion control measures shall be integrated in to the CEMP to ensure that erosion and scour risk is minimised and erodible surfaces are stabilised throughout the project.
Aboriginal Heritage	Impacts to Aboriginal heritage items and areas during construction.	E	3	Low	A due diligence heritage assessment has been undertaken for the proposed development. Details of "Unexpected archaeological finds procedure" in accordance with aboriginal heritage guidelines will be incorporated into the contractors CEMP and site inductions to provide construction staff with training and increased awareness prior to works commencing.
	Discovery of unanticipated Aboriginal cultural material and/or human remains.	E	3	Low	Should an unexpected find be identified during construction, all works in the vicinity of the find must cease and the "Unexpected archaeological finds procedure" be implemented.
Climate Change	General impacts relating to climate change which include sea level rise, increased temperatures, natural hazards (flooding and bushfire) and changes in rainfall patterns.	C	3	Medium	The EIS assesses risks relating to climate change which include: <ul style="list-style-type: none"> Sea Level Rise – An assessment of flood impacts has considered assumptions that sea level along the NSW coast will raise relative to 1990 mean sea levels of 0.4 m by 2050. Increased Temperatures – The design of equipment will need to consider likely temperature ranges across the life of the project Natural Hazards – Changes in rainfall patterns arising from climate change can also affect bushfire and flooding regimes. The site is not situated in an area of bushfire risk and flooding impacts have been assessed with consideration of sea level rise and rainfall patterns.
Greenhouse Gases	Greenhouse Gas emissions during construction associated with construction activities on site and transport to and from site.	A	1	Medium	A detailed Greenhouse Gas assessment has been undertaken to quantify the likely impacts from the construction phase of the project and propose an emissions reduction protocol to guide the construction phase of works. Measures would include the use of fuel efficient modern vehicles, minimise idling times of vehicles, appropriate vehicle and equipment selection and contractor training.
	Greenhouse Gas emissions during operations associated with	A	1	Medium	Prepare and implement an Energy Efficiency and Greenhouse Gas Management Plan to guide ongoing operations, inclusive of a fleet

Category	Environmental Impact	Risk Rating			How risks have been addressed
		Potential Likelihood	Potential Consequence	Potential Risk	
	electricity consumption and transport for staff and bulk liquid product.				management plan that bulk transport vehicles must comply with.
Visual and Landscape Character	Reduction in the quality of the surrounding landscape character as a result of construction and operation.	D	1	Low	A Visual Impact Assessment has been undertaken to identify potential visual impacts with measures implemented to address these impacts including the use of non-reflective finishes and appropriate lighting design aspects to reduce light spill.

The Preliminary Environmental Risk Assessment summarised in **Table 6-4** identified a number of environmental constraints. The levels of risk associated with each environmental aspect are identified in **Table 6-5** below.

The level of risk associated with each item has been used to inform the extent of assessment within this EIS, with the higher risk aspects attracting a more detailed assessment.

Table 6-5 Prioritisation of Environmental Aspects

Risk Level	Very High Risk	High Risk	Medium Risk	Low Risk
Environmental Aspect	<ul style="list-style-type: none"> ▪ Nil 	<ul style="list-style-type: none"> ▪ Hazard and Risk ▪ Air Quality and Odour ▪ Surface Water, Wastewater and Flooding ▪ Soils, Contamination and Groundwater ▪ Waste. ▪ Biodiversity (GGBF) 	<ul style="list-style-type: none"> ▪ Noise and Vibration ▪ Traffic and Access ▪ Climate Change ▪ Greenhouse Gas. 	<ul style="list-style-type: none"> ▪ Visual and Landscape Character ▪ Heritage.

6.3 Preliminary Hazard Analysis

The Proposal is considered potentially hazardous subject to SEPP 33, therefore a PHA must be prepared and submitted in support of the EIS. The PHA needs to be prepared in accordance with the *Hazardous Industry Planning Advisory Paper No. 6 — Guidelines for Hazard Analysis* (DoP, 2011a), which sets out the general requirements for the preparation of a PHA. The purpose of the PHA is to:

- > identify potential hazards associated with the Proposal
- > analyse hazards in terms of their consequences (effects) on people and the biophysical environment, and their likelihood of occurrence
- > quantify resultant risks to surrounding land uses and the environment
- > assess the risks in terms of location, land use planning implications and existing criteria, and ensure that the proposed safeguards are adequate and demonstrate that the operation will not impose an unacceptable level of risk.

A summary of the PHA findings for the Proposal can be found in **Section 7.3** and a copy of the technical can be found in **Appendix D**.

The PHA included the following tasks:

- > SEPP 33 analysis
- > Hazard Identification (HAZID) study
- > Consequence Assessment
- > Frequency Assessment; and
- > Risk Analysis and Evaluation.

The PHA risk contours do not reach recreational, commercial, residential or sensitive land uses which are approximately 1,200m from the site. The findings of the PHA are discussed further in **Section 7.3**.

A Hazard Identification Risk Register was developed as part of the PHA (**Appendix D**). This register will be reviewed and the risks will be reassessed throughout the detailed design construction and operational phase of the project.

6.3.1 Hazard Identification

A formal HAZID workshop to inform the QRA and PHA was facilitated by Sherpa Consulting, which included representatives from Cardno, as well as key engineering personnel from TQ who have an in depth knowledge of the proposed development context, site design and future operational requirements. To ensure that the Hazard Analysis process is informed by qualified and experienced personnel the following attendees were involved in the HAZID workshop:

- > Sherpa Consulting as HAZID Facilitator and QRA specialist (significant experience in risk assessment, chemical and process engineering design, heavy industry, port operations and transport logistics)
- > Cardno EIS Project Manager (significant experience in environmental impact assessment, engineering design, heavy industry, port operations and transport logistics)
- > TQ Engineering Manager (significant experience in the design and management of fuel terminals in heavy industry and port contexts)
- > TQ Lead Process Engineer (significant experience in process design, heavy industry, port and logistical operations)
- > TQ Lead Electrical Engineer (significant experience in electrical design, heavy industry)
- > TQ Lead Mechanical Engineer (significant experience in mechanical design, heavy industry, and logistical operations)
- > TQ Operations Specialist (significant experience in fuel terminal design and operations, heavy industry, port and transport logistics)
- > TQ Mechanical Designer (significant experience in mechanical design and heavy industry operations).

The HAZID workshop was an important step in the identification of hazards and risk factors that were then incorporated into a QRA and the PHA document (refer **Appendix D**).

6.3.2 Factors Considered

The following factors were considered:

- > Environmental conditions (existing site constraints)
- > Operational aspects (external and internal interactions)
- > Operating conditions (throughput and performance requirements) that could result in hazards
- > Operational scenarios that could induce hazards
- > Potential internal and external influences on the operations that could introduce hazards
- > Design aspects that need to be considered.

6.4 Environmental Risk Assessment

An Environmental Risk Assessment (ERA) has also been undertaken using the PHA (see **Section 6.3**) as a basis, which identified:

- > Potential environmental impacts associated with the Project, environmental performance criteria and development standards.
- > Control measures and any significant residual impacts.
- > The nature and extent of environmental impacts likely to remain after the implementation of control measures.

The ERA has identified and assessed the potential environmental impacts associated with the Proposal and assigned a risk ranking to each of the impacts identified. Each of the potential environmental impacts were initially ranked between low and very high based on the environmental impacts that could potentially result if the issue was un-mitigated.

Mitigation measures to ameliorate the risks, as identified in the specialist studies were applied to each impact and a residual risk ranking was assigned. The ERA found that, with the application of the proposed mitigation measures, no environmental impacts were assessed as having unacceptable risks associated with the PK BLT once the appropriate mitigation measures had been applied.

7 Assessment of Environmental Impacts

7.1 Environmental Context

The PK BLT site is located within the Inner Harbour of the Port Kembla Port precinct approximately 70 km from Sydney and 3 km from the Wollongong City Centre in the Wollongong Local Government Area (LGA). The Port is connected to Wollongong via the arterial road Spring Hill Road and to Sydney via the Princes Motorway. The Port is located on a trained and highly modified estuary at the mouth of Allans Creek and Gurungaty Waterway (also known as the Western Drain) with the Tasman Sea to the east. Port Kembla consists of a number of industrial land uses with various berths for the loading and unloading of shipping.

The locality consists of predominantly cleared and/or disturbed lands largely due to industrial, commercial and residential development. The remnant of Tom Thumb Lagoon is located to the north of the site that is connected to the Gurungaty Waterway, which flows into the enclosed waters of Port Kembla and the Tasman Sea. Notable features of the surrounding area comprise:

- > The industrial complex of Port Kembla and the steelworks
- > Relatively flat topography around the Port comprising industrial development, with the residential suburb of Coniston 1,200m northwest
- > The undulating hills of Mount Saint Thomas and Lake Heights, with the Illawarra Escarpment further to the west
- > The Tasman Sea and coastline east of Port Kembla
- > Flagstaff Hill to the north and Hill 60 to the south
- > Suburbs of Mount Saint Thomas, Coniston, Wollongong and Cringila.

Refer to **Figure 2-1** for a Site Location Plan, which provides site context.

7.2 Environmental Aspects

This section provides a review of potential environmental impacts based on an initial review of the site and surrounds, as well as a review of existing environmental studies undertaken. Specific environmental information has been obtained from the documents below. However, it is noted that the scope of development and extent of the subject site applicable to these documents is varied by this current proposal:

- > Maunsell-AECOM (2008) *Soybean Processing and Biodiesel Production Facility Environmental Assessment. Prepared for National Biodiesel.*
- > National Biodiesel (2012) *Soybean Processing and Biodiesel Production Facility (Approval No. 08_0083) Section 75W Modification Application Environmental Assessment.*
- > Cardno (2015a) *Environmental Scoping Assessment: Proposed Bulk Liquids Terminal. Prepared for TQ Holdings Australia Pty Ltd.*

The following environmental aspects are addressed:

1. Hazard and Risk
2. Air quality
3. Noise and Vibration
4. Traffic & Transport
5. Hydrology - Surface Water, Waste Water and Flooding
6. Greenhouse Gas and Climate Change
7. Biodiversity
8. Waste Management
9. Visual Amenity
10. Heritage
11. Soils and Groundwater
12. Utilities
13. Socio-economic
14. Ecologically Sustainable Development
15. Cumulative Impacts
16. Consultation.

7.3 Hazard and Risk

An ERA has been prepared (refer to **Section 6**) and a detailed PHA has been completed by Sherpa Consulting to address the SEARs (**Appendix D**). The SEARs addressed in this section are identified in **Table 7-1**.

Table 7-1 Secretary's Environmental Assessment Requirements (Hazard and Risk)

Secretary's Environmental Assessment Requirements	Where Addressed
Hazards and Risks	
Hazards and Risks - including	
<ul style="list-style-type: none"> ▪ summary of the results of a Preliminary Hazard Analysis (PHA) undertaken for the proposed development with consideration of the existing site. The PHA should be prepared in accordance with Hazardous Industry Planning Advisory Paper No.6 – Guidelines for Hazard Analysis. The PHA should: <ul style="list-style-type: none"> – identify the hazards associated with the existing site and proposed development, as well as any external hazards (i.e. natural hazards) to determine the potential for off-site impacts; – address all relevant recommendations arising from the Buncefield accident; – demonstrate that the proposed development complies with the criteria set out in Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning; and – estimate the cumulative impacts from the overall site and the surrounding potentially hazardous developments in the area (if any) and demonstrate that the proposed development does not increase the cumulative risk of the area to unacceptable levels; and ▪ an evaluation of the impacts of the transport of Dangerous Goods to and from the site in the immediate vicinity. 	<p>Section 6, Section 7 and Appendix D</p> <p>Section 7.3.3 and Section 7.3.4</p> <p>Section 7.3.5 and Appendix D</p> <p>Section 7.3.4 and Section 7.3.5</p> <p>Section 7.3.4 and Appendix D</p> <p>Appendix I and Appendix D</p>

7.3.2 Assessment Methodology

In order to identify and assess the risk associated with the Proposal, a risk screening and PHA has been undertaken. This PHA has been prepared by Sherpa Consulting in accordance with:

- > SEPP 33 – Hazardous and Offensive Development
- > The Hazardous Industry Planning Advisory Paper No. 6 (HIPAP 6) - Guidelines for Hazard Analysis (DoP, 2011b)
- > Hazardous Industry Planning Advisory Paper No 4 (HIPAP 4) – Risk Criteria for Land Use Safety Planning (DoP, 2011a)
- > *Multi-level Risk Assessment* (DoP, 2011b).

The PHA has been conducted for the currently approved development (Stage 1A) and for the future (Stage 3) overall layout. This allows for a comparison between the risk profile of the currently approved development and the proposed future development.

The PHA has been developed as per HIPAP 6 requirements and utilised the following methodology:

- > SEPP 33 analysis – Obtaining the list and quantities of dangerous goods that are proposed to be stored onsite and transported by road tankers and comparing with the threshold quantities to determine whether a PHA and transport risk assessment are required. The SEPP 33 analysis involved assessing the proposed site as a '*potentially hazardous*' installation only.
- > Hazard Identification (HAZID) study – To identify the hazards, causes, consequences and existing safeguards. The findings allowed identification of hazardous scenarios that have the potential for offsite impact.
- > Consequence Assessment - To determine the impact area of the hazardous scenarios and the resulting extent of injury or fatality effects.

- > Frequency Assessment - To determine the likelihood of each loss of containment and ignition scenario using historical leak frequency data.
- > Risk Analysis and Evaluation - To establish whether the offsite risk levels comply with the risk criteria in the NSW HIPAP 4 'Risk Criteria for Land Use Safety Planning' (DoP, 2011a), which covers:
 - Injury, irritation and fatality risks to offsite land uses, expressed as individual risk; and
 - Risk of property damage to neighbouring hazardous installations.

As part of this assessment the following factors were considered:

- > Environmental conditions (existing site constraints)
- > Operational aspects (external and internal interactions)
- > Operating conditions (throughput and performance requirements) that could result in hazards
- > Operational scenarios that could induce hazards
- > Potential internal and external influences on the operations that could introduce hazards; and
- > Design aspects that need to be considered.

7.3.3 Existing Environment

The land uses surrounding the project site are primarily categorised as heavy industrial. Due to the surrounding waterways and the presence of fences there would not be a constant human presence immediately surrounding the site. There are no significant commercial office spaces, warehouses open to the public, retail centres or similar developments that routinely have a large number of people occupying them adjacent to the site. There are no flammable or combustible materials in these areas. The nearest residential area is located approximately 1,200m north-west of the proposed PK BLT.

7.3.4 Assessment of Potential Impacts

Materials to be handled at the PK BLT include biofuels as well as petroleum based hydrocarbons and small quantities of additives with similar properties to fuels. These fuels such a gasoline are identified as Class 3 Packing Group (PG) II. The SEPP 33 analysis identified that since the quantities of Class 3 Packing Group (PG) II, stored on site exceed the threshold quantities stated in the SEPP 33 guideline, the PK BLT site is considered '*potentially hazardous*'.

A number of scenarios were developed for the Proposal in order to identify potential hazards to allow mitigation measures to be developed. Potential consequences were developed for each scenario (source of initial event) and are defined in **Table 7-2**.

Table 7-2 Potential Scenarios

Initial Event	Consequence
Berth 104	Jet fire Pool fire Flash fire
Pipeline – Ship Import	Jet fire Pool fire Flash fire
Manifold and Pipework to Tanks	Jet fire Pool fire Flash fire
Storage Tank	Tank full surface fire
Storage Tank Spill to Tank Compound Bund	Tank bund fire

Initial Event	Consequence
	Flash fire
Tank Overfill	Pool fire Flash fire
Pump Manifold (including Booster Pumps)	Jet fire Pool fire Flash fire
Road Tanker Loading Release	Jet fire Pool fire Flash fire
Ethanol Unloading Release	Jet fire Pool fire
Biodiesel Unloading Release	Jet fire Pool fire

These consequences were then combined with outputs from the frequency of occurrence analysis and risk analysis. The resulting fatality risk contours are presented in **Figure 7-1** and are assessed against the HIPAP 4 Criteria in **Table 7-3**.

Figure 7-1 Individual fatality risk contours (Sherpa, 2015)

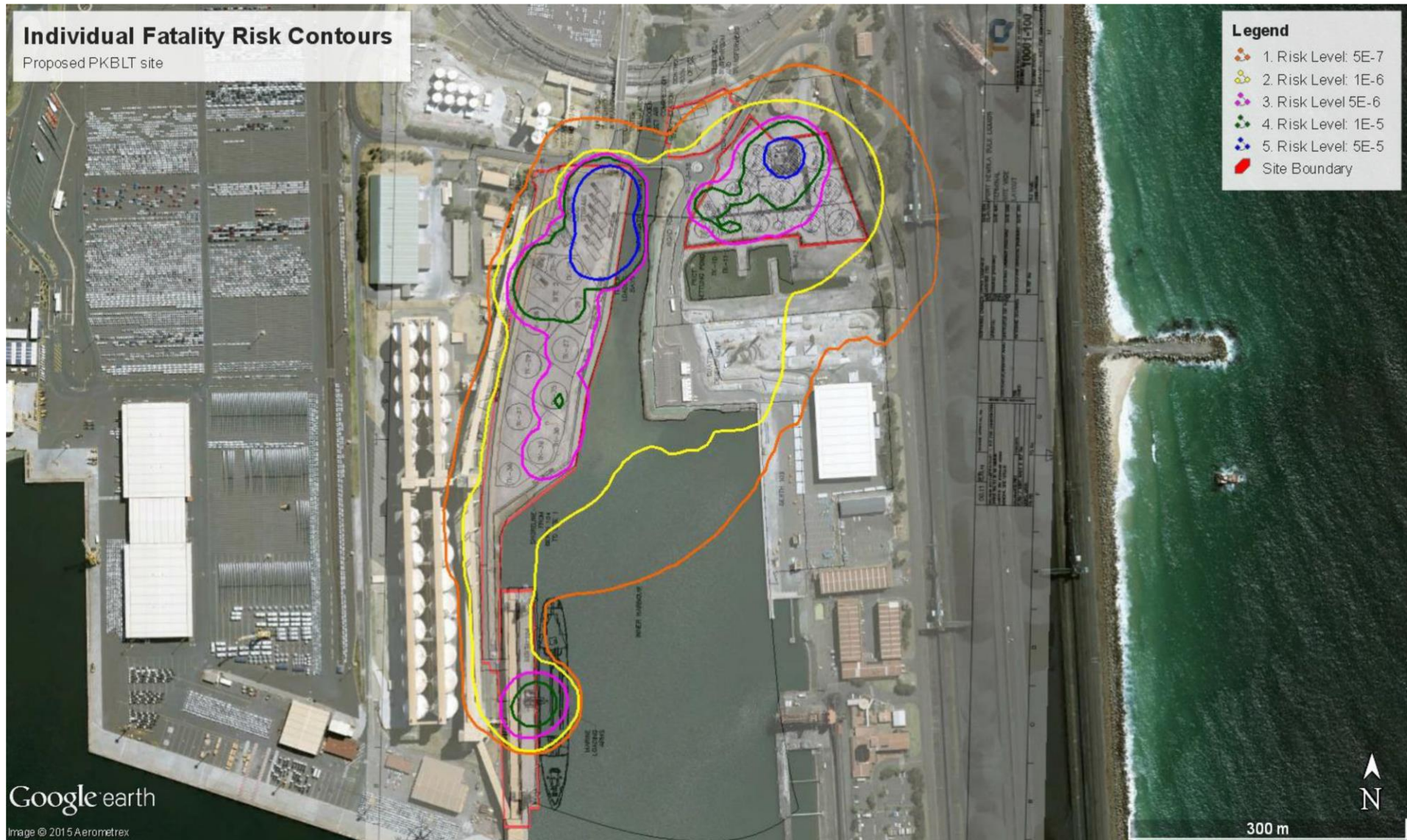


Figure 7-3 Damage and propagation risk contour – Stage 3 (Sherpa, 2015)



Table 7-3 Summary of compliance of HIPAP 4 risk criteria

Description and land use	HIPAP 4 Criteria (per year)	Criteria Met
Individual fatality risk		
Hospitals, child-care facilities and old age housing (sensitive land use).	5×10^{-7}	Yes
Residential developments and places of continuous occupancy such as hotels and tourist resorts (residential land use).	1×10^{-6}	Yes
Commercial developments, including offices, retail centres, warehouses with showrooms, restaurants and entertainment centres (commercial land use).	5×10^{-6}	Yes
Sporting complexes and active open space areas (recreational land use).	1×10^{-5}	Yes
For industrial sites, individual fatality risk level should, as a target, be contained within the boundaries of the site where applicable.	5×10^{-5}	No
Injury risk – heat radiation exceeding 4.7 kW/m²		
Residential and sensitive use.	5×10^{-5}	Yes (Note 1)
Injury risk – explosion overpressure exceeding 7 kPa		
Residential and sensitive use.	5×10^{-5}	Yes (Note 2)
Risk of property damage and accident propagation – 23 kW/m² heat flux		
Neighbouring potentially hazardous installations or at land zoned to accommodate such installations.	5×10^{-5}	No
Risk of property damage and accident propagation – 14 kPa explosion overpressure		
Neighbouring potentially hazardous installations, at land zoned to accommodate such installations or at nearest public buildings.	5×10^{-5}	Yes (Note 2)

Notes:

1. Injury heat radiation contours do not extend into the nearest residential and sensitive land use areas.
2. Explosion overpressures were not evaluated in relation to injury and property damage/propagation risk as they are not generated.

The resulting risk contours identified that the 5×10^{-5} per year individual fatality risk contour extends outside the site boundary to the east of Site 2 by 20m and into the Gurungaty waterway (**Figure 7-1**). The affected area is a shallow waterway, which precludes ship or boat access, and is within the port area, which restricts public access. Hence it is unlikely people will be present in this area and exposed to the risk.

The 5×10^{-5} per property damage and accident propagation risk contour extends offsite to the north of Site 1 into neighbouring land by up to 5m (**Figure 7-3**). This land is zoned to accommodate potentially hazardous installation and it is noted there is currently no equipment, structures or dangerous goods located in the area the risk contour extends into. TQ have advised PKCT of the resulting risk contours on to their land arising from the PHA in its current state and will continue discussions with PKCT to ensure appropriate risk management measures are agreed (refer to **Section 9.4.4**).

The risk that the PK BLT site adds to the cumulative risk profile for the area was assessed qualitatively in relation to the adjacent coal stockpiles and grain silos. The main risks associated with the coal stockpiles and grain silos are dust explosions and stockpile fires (coal stockpiles). Dust explosion risks are typically managed by design codes and standards and consequences are typically limited to structural damage onsite. The separation distance from the coal stockpile to the nearest tank on PK BLT site is 90 m. Escalation from a coal stockpile fire to the nearest tank is not considered likely based on the separation distance.

As coal stockpile fires and coal and grain dust explosion consequences typically remain onsite, there is low cumulative risk in the area. Risk contours from PK BLT are unlikely to significantly increase the risk in the area.

An evaluation of the impacts of the transport of Dangerous Goods to and from the site is covered in the Traffic Impact Assessment in **Section 7** and a Route Selection Assessment provided in **Appendix I**.

7.3.5 Environmental Management Measures

From the PHA findings and HIPAP 4 compliance, the following recommendations are made:

- > Ongoing consultation with PKCT is recommended to ensure that fatality and escalation risks are minimised and agreed measures are developed to ensure risks are managed.
- > To apply the relevant recommendations arising from the final Buncefield Investigation to PK BLT site as detailed in Appendix G of the PHA (see **Appendix D** of this report) and consider these recommendations in the detailed design phase.

7.4 Air Quality

Pacific Environment prepared the *Air Quality and Greenhouse Gas Assessment* (Pacific Environment, 2015a) and Environmental Risk Sciences prepared the *Human Health Risk Assessment* (Environmental Risk Sciences, 2015) for the Proposal to address the SEARs. The SEARs addressed in this Section are identified in **Table 7-4**.

Table 7-4 Secretary's Environmental Assessment Requirements (Air Quality)

Secretary's Environmental Assessment Requirements	Where Addressed
Air Quality – including:	
<ul style="list-style-type: none"> a description of all potential air emissions and odours and their sources, including construction, operational and transport sources; 	Section 7.4.3
<ul style="list-style-type: none"> a quantitative assessment of all potential air quality impacts and odour impacts for the development, including cumulative, on surrounding land and sensitive receptors under the relevant Environmental Protection Authority (EPA) guidelines; 	Section 7.4.3 and Appendix E
<ul style="list-style-type: none"> details of any pollution control equipment and other impact mitigation measures for fugitive and point source emissions 	Section 7.4.4 and Appendix F.
<ul style="list-style-type: none"> Details of the proposed management, mitigation and monitoring measures. 	Section 7.4.4

7.4.1 Assessment Methodology

The Air Quality Assessment (**Appendix E**) was prepared to identify all sources of air emissions and emission rates for the proposed operation of the PK BLT. The assessment was conducted and assessed against Stage 3 of the proposal, at maximum throughput and with tank out breathing losses. Dispersion modelling was conducted to predict and determine compliance of the proposal against air and odour goals. Dispersion modelling was carried out for the purpose of determining air, odour and pollutant emissions. This assessment considered air quality parameters, air quality criteria, developed estimates of emissions utilising TANKS and CALPUFF modelling systems and conducted a meteorological data analysis. Further, dispersion modelling was completed to evaluate the impacts of ship unloading (use of auxiliary engines in berth) and road tanker loading. The Air Quality Assessment was prepared in accordance with EPA guidelines.

Environmental Risk Sciences prepared a Human Health Risk Assessment (**Appendix F**) to assess potential risks to the surrounding local community from emissions to air during normal operations of the proposed development. The Assessment considered the acceptability of risks associated with the release of potential contaminants into the environment on human health. The assessment was prepared in accordance with national and international guidelines, endorsed and accepted by Australian health and environmental authorities and was prepared against the proposed operation of Stage 3 of the proposal. It assessed inhalation exposures, the nature of pollutants and the release of chemicals against acute and chronic health risks from volatile chemicals derived from the storage of fuels.

7.4.2 Existing Environment

No specific meteorological data was available for the PK BLT site. The Port Kembla Signal Station (Site 68053) was the closest fit for meteorological data for the site and is summarised in **Table 7-5**.

Table 7-5 Monthly Climate Statistics

Heading	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean maximum temperature (°C)	24.1	24.4	24.1	22.4	19.4	17.5	16.7	17.3	19.2	20.7	22.4	23.4
Mean minimum temperature (°C)	18.4	18.7	18	15.7	12.7	10.9	9.8	10.3	11.8	13.7	15.3	17.1
Mean rainfall (mm)	116.1	157.5	183.7	92.9	89	140.3	62.6	87.7	55	108	94.3	90.4
Mean 9am temperature (°C)	21.4	21.6	21.1	18.9	15.6	13.4	12.4	13.4	15.6	17.5	19.1	20.5
Mean 9am relative humidity (%)	77	78	76	70	67	67	63	61	61	66	68	74
Mean 9am wind speed (km/h)	17.4	16.1	14.7	14.7	16.7	17.4	17.7	18.5	18.7	19.7	19.5	18.1
Mean 3 pm temperature (°C)	22.5	22.9	22.5	21	18.2	16.2	15.5	16.1	17.4	18.6	20.3	21.6
Mean 3pm relative humidity (%)	75	76	74	68	62	61	57	57	61	67	67	72
Mean 3pm wind speed (km/h)	24.4	23.7	22.9	22.8	21.9	22	24.6	25.4	27.1	26.3	26.5	25.

Ambient air quality was recorded by the NSW EPA for the period between 1996 and 2001. Volatile Organic Compounds (VOCs) and Polycyclic Aromatic Compounds (PAHs) were recorded at three locations within Port Kembla. The three closest monitoring locations to the site were identified as Wollongong, Kembla Grange and Warrawong. In relation to ambient levels of BTEX and PAHs, most of the data is dated and does not reflect ambient air concentrations that are typically dominated by emissions from vehicles/trucks as the fuels used in Australia has changed from 2001 to 2015 particularly in relation to the percentage of benzene. No further air monitoring has been completed for the area since the 2001 reporting.

The 1996 to 2001 air monitoring identified the following average VOC concentrations recorded from the three closest monitoring locations to the site:

- > Benzene = 0.87 to 2.6 µg/m³
- > Toluene = 1.5 to 4.1 µg/m³
- > Ethylbenzene = 0.4 µg/m³
- > Xylenes = 1.7 to 3 µg/m³.

The sampling previously undertaken reported average concentrations of total PAHs in the Illawarra region that ranged from 0.62 to 1.71 µg/m³.

Benzene and PAH levels are recorded by BlueScope Steel on a regular basis. BlueScope Steel is located within the Industrial complex at Port Kembla, within the vicinity of the proposed development. Environmental Risk Sciences sourced a license monitoring report for the period of 1 August 2013 to 31 August 2013 which found:

- > Benzene is typically reported in air at a concentration of 0.061 to 0.17 µg/m³, which is lower than reported in earlier sampling undertaken by the NSW EPA. This reflects the lower percentage of benzene in current fuels,
- > Total PAHs (as particulate phase only) are typically reported in air at concentrations in the order of 0.67 to 1.88 µg/m³, similar to the averages of total PAHs reported by the NSW EPA.

PK BLT is surrounded by a number of suburbs within a 2km radius of the site including Coniston (north-northwest), Mount St Thomas (east-northeast), and Cringila (southwest). A number of sensitive receptors including schools and aged care facilities are located within these three townships. From these areas 14 key sensitive receptors were identified in the Air Quality Impact Assessment. These are summarised in **Table 7-6**.

Table 7-6 Sensitive Receptors

ID	Location	Approximate Distance from Site
1	Coniston Public School	1320
2	Wollongong Greenhouse Park	710
3	Wollongong Baptist Church	1800
4	Coniston train Station	1510
5	392 Keira St, Wollongong	1300
6	42 Swan St, Wollongong	1540
7	163 Kembla St, Wollongong	1480
8	179 Corrimal St, Wollongong	1470
9	314 Gladstone Ave, Mt St Thomas	2260
10	240 Gladstone Ave, Mt St Thomas	1820
11	350 Gladstone Ave, Mt St Thomas	2610
12	111 Gladstone Ave, Mt St Thomas	1530
13	33 Five Islands Rd, Cringila	2750
14	Entrance to Site	50

7.4.3 Assessment of Potential Impacts

The greatest source of emissions from the proposal is expected to come from tank venting and breathing losses. Tanks holding finished fuel products have the potential to release various VOCs and PAHs, several of which may be toxic at high concentrations. The most significant potential air quality emission is expected to be from petroleum products.

Based on the proposed scope of works, identified additional emission sources include:

- > Tank breathing
- > Ship unloading and truck loading operations
- > Combustion emissions (auxiliary engine) from ships importing finished petroleum products at Berth 104
- > Fugitive emissions from leakages, spills and Truck Loading Gantry (TLG)
- > Vehicle Movements
- > Construction activity.

Tanks holding organic hydrocarbons (finished fuel products) have the potential to release a collection of VOCs and PAHs, several of which may be toxic at high concentrations. The Air Quality Impact Assessment identified that VOCs in petroleum products are anticipated to comprise the most significant potential air quality emission from the PK BLT. The projects contribution to emissions of Oxides of Nitrogen (NO_x) and Sulphur Oxides (SO_x) associated with additional vehicle movements is anticipated to be negligible in comparison to other local sources in Port Kembla. Therefore it is considered unlikely that the project would contribute to an exceedance of the SO₂ and NO₂ criteria and hence a cumulative assessment for SO₂ and NO₂ was not undertaken as part of the Air Quality Impact Assessment.

Air dispersion modelling results for tank venting in line with the Proposal predicted ground-level concentrations of odour, speciated VOCs and PAHs. These results were calculated for each of the sensitive receptors, the results of which are included in **Table 7-7** and included in **Figure 7-4** and **Figure 7-5**.

Figure 7-4 Predicted 99th Percentile for 1-Second Odour Concentrations for Stage 3) (Pacific Environment Limited, 2015a)

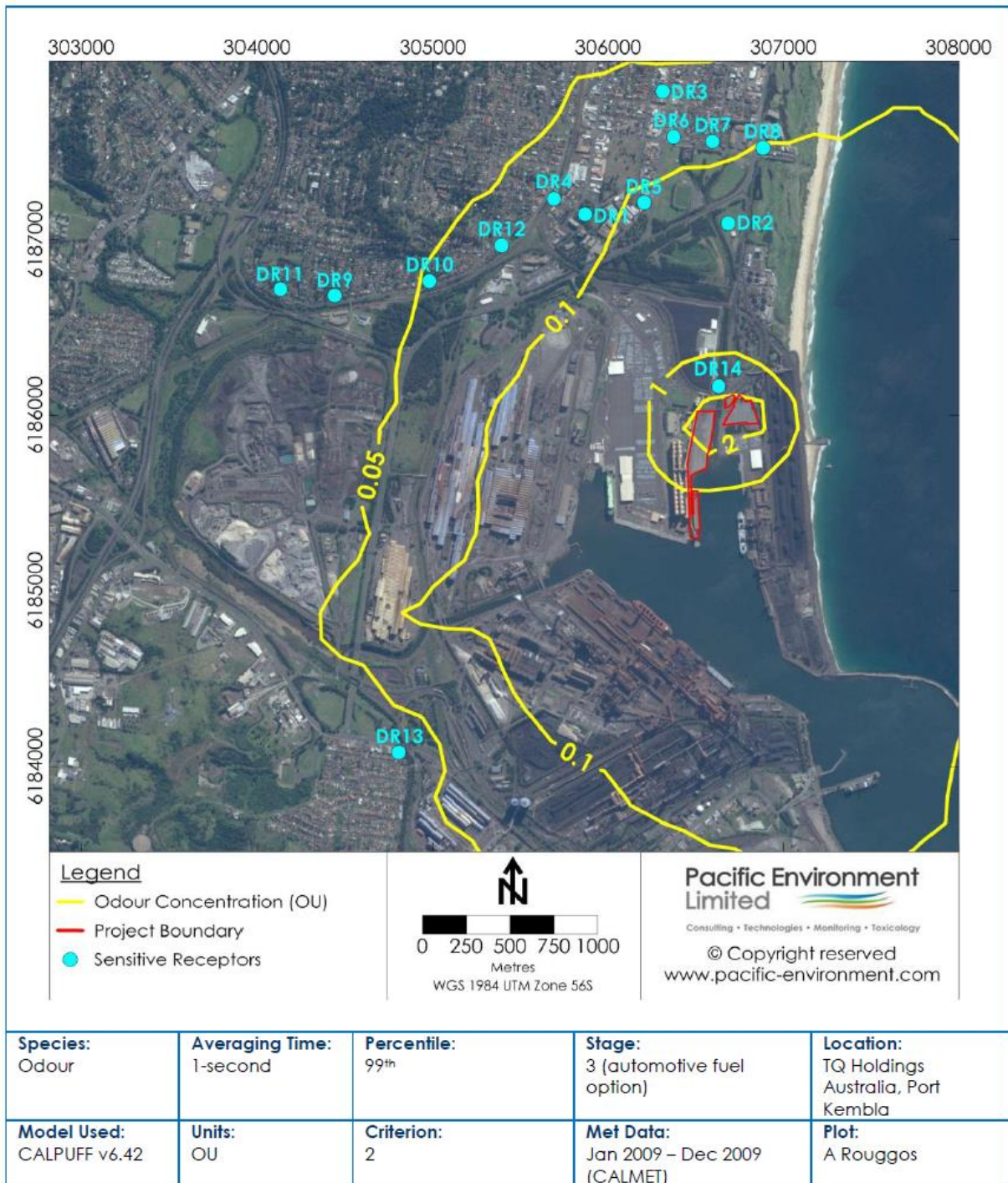


Figure 7-5 Predicted 99th Percentile for 1-Second Xylene Concentrations for Stage 3) (Pacific Environment Limited, 2015a)

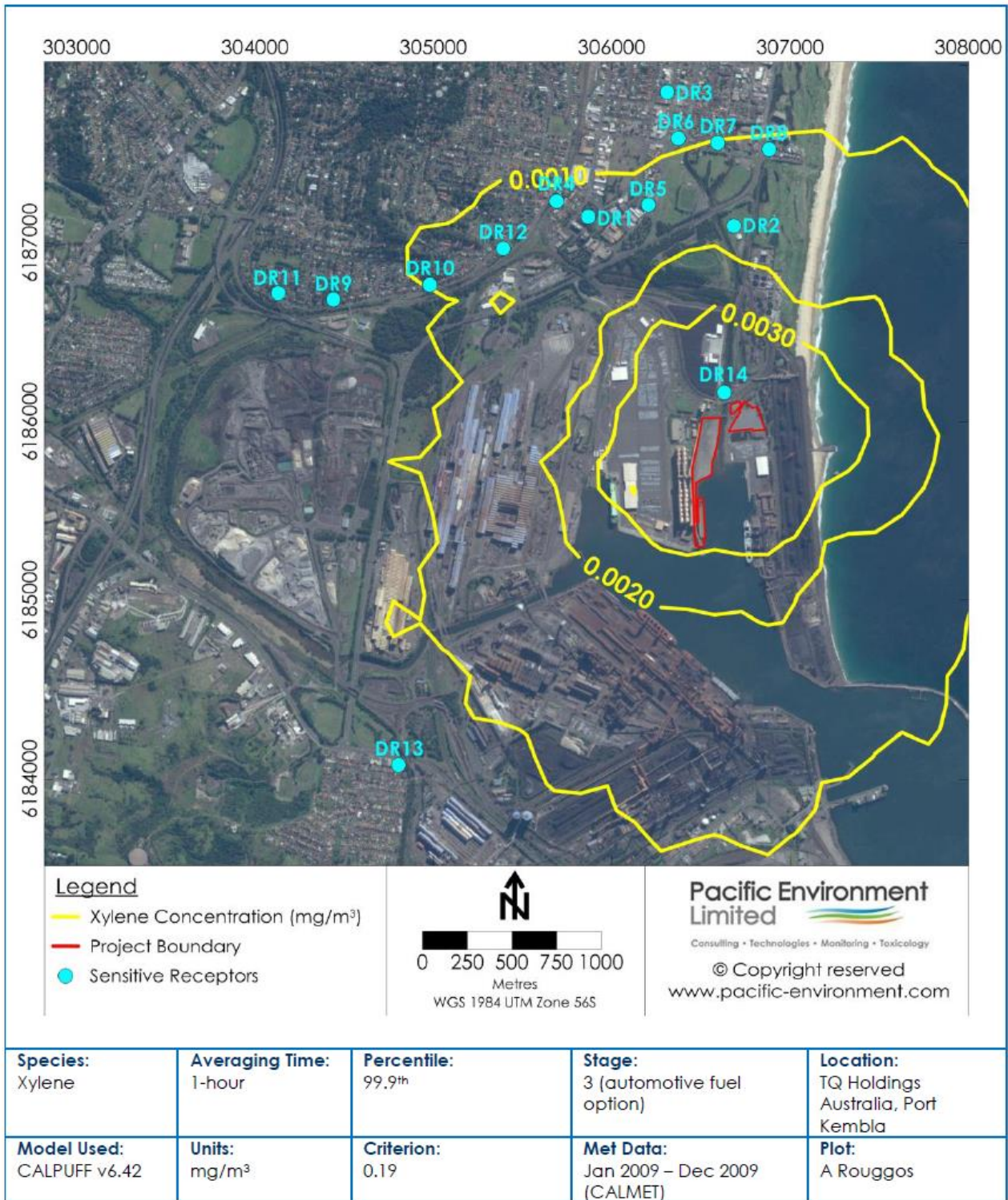


Table 7-7 Dispersion Modelling Results – Tank Venting

Receptor ID	Odour (OU)	Benzene (mg/m ³)	Toluene (mg/m)	Xylene (mg/m ³)	Ethylbenzene (mg/m ³)	PAH (as Benzo[a]pyrene) (mg/m ³)
	1-second	1-hour	1-hour	1-hour	1-hour	1-hour
	Assessment Criteria					
	2	0.029	0.036	0.19	8.0	0.0004
1	0.1	1.29E-04	1.02E-03	1.20E-03	2.19E-04	1.23E-07
2	0.2	2.71E-04	2.14E-03	2.52E-03	4.60E-04	2.51E-07
3	0.1	7.91E-05	6.25E-04	7.37E-04	1.34E-04	7.63E-08
4	0.1	1.08E-04	8.55E-04	1.01E-03	1.84E-04	1.04E-07
5	0.1	1.20E-04	9.52E-04	1.12E-03	2.05E-04	1.16E-07
6	0.1	1.10E-04	8.68E-04	1.02E-03	1.87E-04	1.06E-07
7	0.1	1.03E-04	8.11E-04	9.57E-04	1.75E-04	9.95E-08
8	0.1	1.07E-04	8.42E-04	9.94E-04	1.81E-04	1.03E-07
9	0.0	1.19E-04	9.42E-04	1.11E-03	2.03E-04	1.14E-07
10	0.0	9.27E-05	7.33E-04	8.64E-04	1.58E-04	8.74E-08
11	0.0	5.79E-05	4.57E-04	5.40E-04	9.84E-05	5.64E-08
12	0.1	1.13E-04	8.96E-04	1.06E-03	1.93E-04	1.09E-07
13	0.0	7.65E-05	6.05E-04	7.14E-04	1.30E-04	8.42E-08
14	1.9	1.06E-03	8.37E-03	9.87E-03	1.80E-03	9.7E-07

The impact of odour from the PK BLT at the nearest sensitive receptor locations is predicted to be negligible. The sites entrance (Receptor 14) was found to have the highest predicted odour, which was below the assessment criteria. The nearest receiver (Receptor 2) was found to be well below the assessment criteria. Xylene was found at worst case to result in 5% of the assessment criteria value at the site entrance. All other parameters above were found to be well below the assessment criteria and considered to be acceptable.

Due to the location of sensitive human receptors (Receptor 14 is not defined as a human receptor by NSW EPA) being located greater than 350m from PK BLT a construction dust assessment was not deemed necessary. A construction screening analysis identified that potential construction impacts are considered to be minimal.

Environmental Risk Services prepared a Human Health Risk Assessment (**Appendix F**) for the site which focused on activities that have the potential to result in exposures in the surrounding areas. The key risk issue in regards to human health for this project related to the release of VOCs to air from stored fuel products. PAHs were also considered in regards to human health. The report assessed VOCs and PAHs against inhalation exposure only, at the maximum level of operation (Stage 3) for the proposal. As the PAHs for the proposal are considered to be toxic, carcinogenic compounds, the report assessed health impacts against benzo(a) pyrene (BaP). The report found that exposures to VOCs over a maximum short duration of approximately 1 hour are below the relevant peer reviewed health based guidelines that are relevant to acute exposures. Consequently, all concentrations in the air are at a level well below the potential rate of exposure for adverse health effects in all members of the public for a short-duration.

An assessment of chronic health impacts found that concentrations of VOCs and BaPs in surrounding air concentrations for the Proposal are below relevant long-term health based guidelines. Adverse impacts to human health are not expected. The report concluded that the proposed development, at its maximum level of operation (Stage 3) will have no acute or chronic impacts on the local community surrounding the PK BLT (Environmental Risk Sciences, 2015) and concluded that the proposed development will have no acute or chronic impacts on the health of the surrounding community.

7.4.4 **Environmental Management Measures**

The following mitigation measures are proposed to ensure emissions are reduced or eliminated where possible:

Construction

- > An Air Quality Management Plan will be developed as part of the CEMP including:
 - Methods to monitor the effects of construction activities
 - Measures required to minimize dust and vehicle emissions during the construction of the project.
- > The number and sizes of stockpiles will be kept to a minimum.
- > Dust suppression shall be undertaken during construction and clearing activities, particularly during high wind conditions. Haul roads and other unsealed areas may be watered to suppress dust.
- > Ensure that all vehicles and machinery are fitted with appropriate emission control equipment, maintained frequently and serviced to the manufacturers' specification.
- > Minimise construction equipment idling time.

Operations

- > Each shore line will be equipped with a pig launcher and receiver in order to clear fuel product into the tank and leave the line clear for the next product. Pig propulsion will be via nitrogen pressure using a reticulation system from the terminal nitrogen tank.
- > The pigging facilities will be equipped with containment and sump for hydrocarbon and pump out. Once pigged clear, the line is depressurised into a cyclone column that separates hydrocarbon droplets and vapours vented from the shore lines. The collected liquid is then pumped across to the slops tank, and the vapour fed into the Vapour Recovery Unit to recover the remaining hydrocarbon vapours.
- > When the vessel has finished pumping and the surveyor has confirmed the ship's tank is empty and dry, the ships manifold valve is closed and the MLA cleared by draining and pumping in a closed system. The shore pipeline is then pigged to the tank, the line depressurised (as detailed above), pig removed from the receiver and the line left in nitrogen at atmospheric pressure.
- > These processes are included to mitigate against potential emissions from product unloading. The pigging operations and vapour recovery underlie the assumption of not including this phase of the operational process in the emissions estimation.
- > The piping design will minimise the potential for surge overpressure via the provision of expansion loops, soft-seat valve closures, check valves in tanks and product piping. Product pumps will have variable speed drives with soft start up and shut down to prevent surging.
- > Pipework which is normally full with product that has closed sections will be protected by thermal relief around isolation valves. This will ensure that no product (and emissions) is lost to the environment.
- > Bunds will be utilised to ensure that in the unlikely case of leakages, fuel products will not seep into groundwater and leave the site. Bunds containing pipework and equipment that is normally full with product will include level detection and hydrocarbon detection so that any leakage can be readily detected, in addition to routine inspections by operators. These site bunds will incorporate a pump out system to drain any spilled product to a closed slops handling system.
- > Full contact internal floating roofs will be installed on all bulk storage tanks with flammable liquids to effectively mitigate against vapour headspace emissions during tank filling operations.
- > PK BLT will utilise a vapour recovery unit to recover vapours and minimise emissions associated with the loading of fuels into road tankers. The vapour recovery unit will be located near the truck loading gantry. The recovered product will be pumped into the slops tank near the truck loading bay for eventual recovery into a nominated bulk tank.

- > Product will be recovered by carbon absorption in either one of two absorption vessels, which are regenerated by vacuum. At any one time, it is expected that one vessel is being desorbed while the other is on the line.
- > Vapours from the vacuum process will be passed through a liquid vapour separator vessel then into a packed absorption tower which is supplied by a cold gasoline stream from the duty gasoline tank. The gasoline absorbs the vapours within the tower and the gasoline is returned to the duty gasoline tank. Residual vapours are repassed through the active absorption vessel to recover the remaining product.
- > Requirements outlined in Clause 63 of the Clean Air Regulation for control equipment for large storage tanks should be implemented. The following control equipment is required:
 - A drainage system comprising of a small sump or tundish fitted under each water draw-off valve and connected to a totally enclosed drain, or
 - For volatile organic liquid stored in a tank with a vapour pressure ≤ 75 kPa the tank must have either a floating metal roof, a floating cover constructed of material impervious to vapour that floats on the liquid surface inside a fixed roof, or a vapour disposal or recovery system that meets the requirements of the Clean Air Regulation.
 - For volatile organic liquid stored in a tank with a vapour pressure > 75 kPa the tank must have a vapour disposal or recovery system that meets the requirements of the Clean Air Regulations.

7.5 Noise and Vibration

Pacific Environment has undertaken an assessment to determine the level of impact of the proposed development on noise and vibration. The *Noise and Vibration Assessment* (Pacific Environment Limited, 2015b) is included in **Appendix G** and summarised below. The assessment has been undertaken in accordance with the relevant SEARs which are provided in **Table 7-8**.

Table 7-8 Secretary's Environmental Assessment Requirements (Noise and Vibration)

Secretary's Environmental Assessment Requirements	Where Addressed
Noise and Vibration – including:	
<ul style="list-style-type: none"> a description of all potential noise sources, including construction, operational and transport sources; 	Section 7.5.4
<ul style="list-style-type: none"> a quantitative assessment of construction, operational and transport noise and vibration impacts to surrounding receivers from on site and off site activities (including shipping) in accordance with the relevant EPA guidelines; and 	Section 7.5.4
<ul style="list-style-type: none"> Details of the proposed management, mitigation and monitoring measures. 	Section 7.5.5

7.5.2 Assessment Methodology

The Noise and Vibration Assessment (**Appendix G**) included the determination of noise and vibration levels in the existing environment, noise and vibration generated by construction, noise generated from operational activities and road noise traffic.

The existing acoustic environment was quantified by background noise monitoring across three locations at the closest residential receivers north to north-west of the site (refer **Table 7-9**). Data was collected between the 28 May and 5 June 2015. The monitoring consisted of both attended and unattended monitoring with A-weighted noise levels recorded every 15 minutes. Weather conditions were also monitored during the collection of noise data.

A computer based noise model was developed for the construction and operational phases to assess worst case scenarios and predict likely noise impacts at sensitive receiver locations. Cumulative noise impacts from existing industry in Port Kembla were accounted for in the noise criteria selected for both construction and operational phases. Road noise impacts were assessed by using measured traffic volumes to estimate the impact of the PK BLT generated traffic on Springhill Road and Masters Road.

As construction vibration assessment was also conducted to develop safe working distances for vibration activities to occur to avoid adverse impacts.

Table 7-9 Noise Monitoring Locations, MGA Zone 56

Location ID	Noise Catchment Area	Address	Suburb	Easting (m)	Northing (m)
BG01		91 Evans St		306534	6187559
Attended Measurement	A	16 Swan St	Wollongong	306951	6187490
BG02	B	176 Gladstone Ave	Coniston	305336	6186953
BG03	C	318-320 Gladstone Ave	Mt St Thomas	304442	6186671

Source: *Pacific Environment, 2015b*.

Key noise and vibration assessment criteria utilised in the assessment included:

- > *Industrial Noise Policy* (INP) (EPA, 2000)
- > *Draft Industrial Noise Guideline* (draft ING) (EPA, 2015)
- > *Interim Construction Noise Guidelines* (DECC, 2009a)
- > *World Health Organisation Guidelines for Community Noise* (WHO, 1999)
- > *Assessing Vibration: A Technical Guideline* (DEC, 2006)
- > *Road Noise Policy* (DECCW, 2011).

7.5.3 Existing Environment

Monitoring of the existing environment indicated that the urban noise environment is influenced by industrial and traffic noise at each of the monitoring locations. Noise levels follow typical diurnal patterns with increased levels of traffic and community noise during the day and lower ambient noise levels during night time hours. Some natural noise such as wind rustling, bird and dogs was also found to occur at all three areas. Traffic noise was found to be the primary influencing noise whilst industrial noise was audible during lulls in existing traffic noise. A summary of the results are included in **Table 7-10**.

Table 7-10 Long Term Noise Monitoring Results (Pacific Environment Limited, 2015b)

Location ID	Noise Catchment Area	Measured Noise Level, dB(A)								
		Day			Evening			Night		
		L ₁₀	RBL	L _{eq}	L ₁₀	RBL	L _{eq}	L ₁₀	RBL	L _{eq}
BG01	A	56	41	51	53	42	49	49	39	44
BG02	B	71	48	65	68	50	62	64	47	58
BG03	C	64	51	60	62	50	58	60	46	56

Source: *Pacific Environment Limited, 2015b*

Meteorological monitoring identified dominant winds (0.5 -3.0 m/s more than 30% of the time) to occur during evening and night between the north-east and south-east. Temperature inversions were identified to occur for 24% of the time during winter nights.

7.5.4 Assessment of Potential Impacts

The noise and vibration assessment was conducted with reference to the SEARs and other relevant agency's requirement according to current guidelines, standards and assessment methods.

During September 2015, the NSW EPA released an update noise policy document in draft format for consultation. The document is titled the draft Industrial Noise Guideline (draft ING).

The draft ING amenity goals are consistent with the INP as presented in Table 3.1 of the *Noise and Vibration Assessment* (Pacific Environment Limited, 2015b) (**Appendix G**), however the draft ING recommends a project amenity noise level of the recommended amenity level minus 5 dB(A). The draft ING also identified a night time project trigger level of LA_{eq} 15minute of 40 dB(A) and a maximum noise level screening criteria of LA_{max} 52 dB(A). As such a night time noise limit of 40 dB(A) would apply for all residential receivers.

The road traffic noise assessment indicated that the majority of PK BLT related traffic is expected on Springhill Road and Masters Road. The assessment indicated that increases in traffic noise during both construction and operation would be below the traffic noise increase criteria of 2 decibels.

Construction Impacts

The proposed construction works will result typically in the following potential sources of noise:

- > Excavator
- > Roller
- > Grader
- > Concrete truck and pump
- > Concrete mixer
- > Pile driving rig
- > Crane
- > Hand tools
- > Welder
- > Generator
- > Heavy vehicle access
- > Light vehicle access
- > Heavy vehicle idling.

For construction noise and vibration, the assessment considered four construction scenarios including civil earthworks (scenario 1), establishment of foundations (scenario 2), assembly of plant infrastructure (scenario 3) and work outside of standard hours (scenario 4). The results are summarised in **Table 7-11**.

Table 7-11 Predicted Construction Noise - Scenarios 1-3

Receiver ID	Receiver Type	Criteria $L_{Aeq, 15min}$	Predicted Noise Level $L_{Aeq, 15min}$ dB(A)		
			Scenario 1	Scenario 2	Scenario 3
5	Residence	51	23	28	21
16	Residence	58	27	32	26
18	School	55	27	32	26
20	School	55	29	35	27
21	Passive recreation Area	60	29	34	27
24	Residence	61	28	33	26
27	Place of Worship	55	25	30	23
36	Residence	61	27	32	25
40	Commercial	65	31	36	30
42	Active Recreation Area	65	37	42	35
43	Active Recreation Area	65	35	42	34

Table 7-12 Predicted Construction Noise – Scenario 4 (outside of standard hours)

Receiver ID	Receiver Type	Predicted Noise Level $L_{Aeq, 15min}$ dB(A)									
		Criteria		(Neutral)		(NE Wind)		(E Wind)		(SE Wind)	
		$L_{Aeq, 15min}$	L_{Amax}	$L_{Aeq, 15min}$	L_{Amax}	$L_{Aeq, 15min}$	L_{Amax}	$L_{Aeq, 15min}$	L_{Amax}	$L_{Aeq, 15min}$	L_{Amax}
5	Residence	46	50	20	33	26	39	26	39	26	39
16	Residence	53	50	24	37	24	37	30	42	30	42
36	Residence	56	50	24	37	20	32	20	32	30	42

It is predicted that there will be no sensitive receivers exceeding the adopted criteria and therefore the impacts are considered negligible.

No receivers are predicted to be highly noise affected (noise levels of 75 dB(A) or above) for any of the construction scenarios.

Vibration from construction activities was not found to exceed the adopted criteria and thus would not likely have a significant impact on the nearest sensitive receivers.

Road Traffic Noise

Predicted road traffic volumes are summarised in **Table 7-13**.

Table 7-13 Project Daily Vehicle Movements

Vehicle Type	Stage 1 (Operation), Stage 2 (Construction)		Stage 3 (Operation)	
	Day Period	Night Period	Day Period	Night Period
Light Vehicles	150	150	12	12
Heavy Vehicles	118	70	254	158

Based on Daily Vehicle Movements, the associated predicted increase in traffic noise levels are identified in **Table 7-14**.

Table 7-14 Predicted Increase in Traffic Noise Levels

Road	Distance (m)	Stage 1 Construction and Operations		Stage 3 Peak Operations	
		Day Period (dB)	Night Period (dB)	Day Period (dB)	Night Period (dB)
Springhill Road	240	0.2	0.9	0.2	0.8
Masters Road	140	0.2	0.9	0.2	0.8

Based on these results the worst case traffic noise level increases as a result of the Proposal will increase existing noise levels by less than 1dB which is within the 2bD(A) increase criteria.

Operational Impacts

The proposed operational works will result typically in the following potential sources of noise:

- > Marine loading arm
- > Air compressor
- > Loading and product pump
- > Vapour recovery pump
- > Fuel tanker
- > Light vehicle
- > Idling vehicle
- > Ship auxiliary power
- > Hand tools
- > Welder
- > Heavy vehicle access
- > Light vehicle access
- > Heavy vehicle idling.

The modelled utilised these predicted noise sources to develop predicted operational noise levels at sensitive receivers which are summarised in **Table 7-15**, **Figure 7-6** and **Figure 7-7**.

Table 7-15 Predicted Operational Noise

Receiver ID	Noise Catchment Area	Receiver Type	Criteria LAeq, 15min			Predicted Noise Level LAeq, 15min dB(A)				
			Day	Eve	Night	Day 1 (Neutral)	Night 2 (Neutral)	Night 3 (NE wind)	Night 4 (E wind)	Night 5 (SE wind)
5	A	Residence	46	47	43	24	26	31	31	31
16	B	Residence	53	46	38	29	30	30	35	35
18	B	School	45	-	-	29	31	30	36	36
20	B	School	45	-	-	31	32	30	37	37
21	B	Passive recreation Area	50	50	50	30	31	27	36	37
24	B	Residence	56	44	39	30	31	27	35	36
27	C	Place of Worship	50	50	50	26	27	24	31	33
36	C	Residence	56	44	39	29	30	26	29	35
40	C	Commercial	65	65	65	34	34	33	34	39
42	A	Active Recreation Area	55	55	55	40	40	39	39	44
43	A	Active Recreation Area	55	55	55	38	39	37	41	43

In relation to operational noise, the assessment indicated the following:

- > There are no exceedances of noise criteria predicted.
- > There are no anticipated impacts on receivers from low frequency noise.

The cumulative noise impact resulting from existing industry around the proposed facility has been accounted for during criteria setting for amenity noise limits. As predicted noise levels meet the noise criteria, cumulative industrial noise impacts are not anticipated.

No significant operational vibration sources are anticipated to impact on the nearest residential areas from operations on the facility.

7.5.5 Environmental Management Measures

A noise management plan within the CEMP and OEMP is recommended for the ongoing monitoring and management of potential noise impacts resulting from the Proposal. Noise management measures should include:

- > Selection of quiet plant and equipment, particularly Larger Excavators and Haulage Trucks;
- > Limiting the times of operation for noisier plant items to the Daytime, or Evening period;
- > Scheduling noisier activity to regular hours and less noisy activity to non-scheduled hours.
- > Staff and contractor education and training of road traffic noise and appropriate driving behaviours.

Further noise reduction measures will be considered during the detailed design phase.

Figure 7-6 Predicted Operational Noise Contours (Daytime Neutral) (Pacific Environment Limited, 2015b)

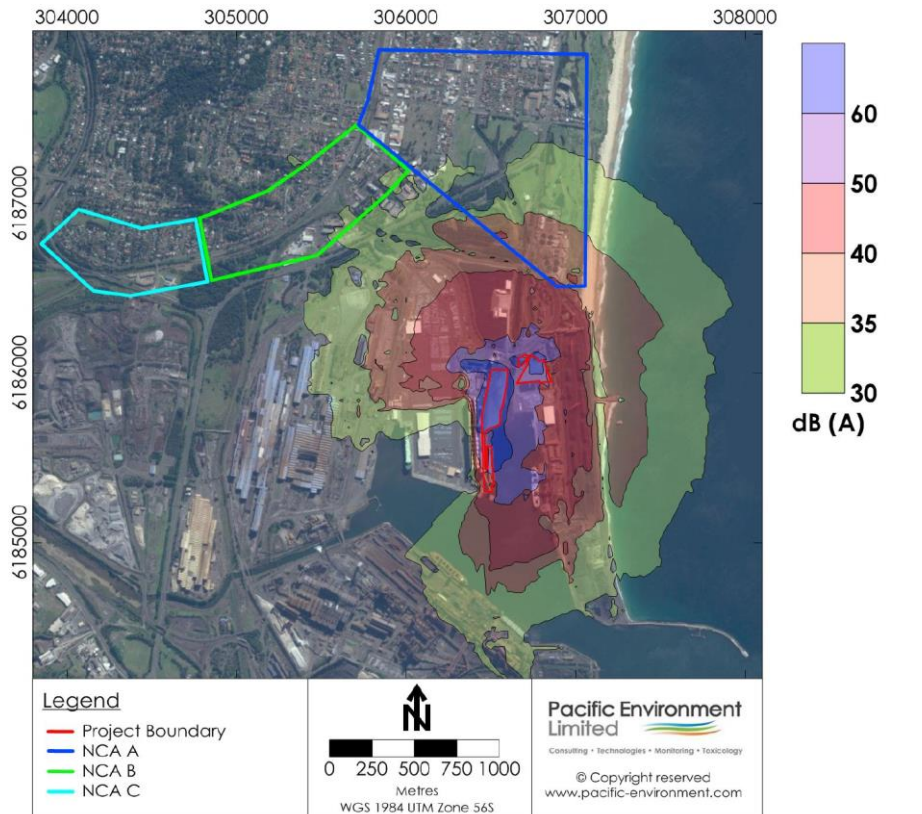
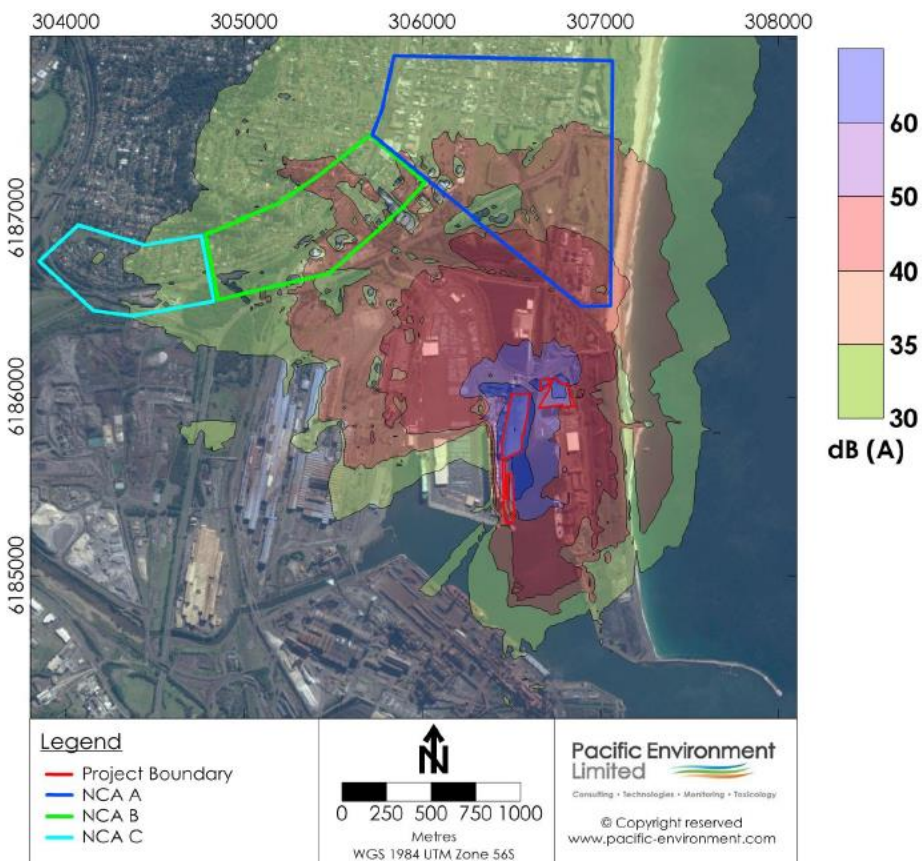


Figure 7-7 Predicted Operational Noise Contours (Night time South East Winds) (Pacific Environment Limited, 2015b)



7.6 Traffic and Transport

Cardno has undertaken a Traffic Impact Assessment (TIA) for the PK BLT to address the SEARs (Appendix H). The SEARs addressed in this Section are identified in Table 7-16.

Table 7-16 Secretary's Environmental Assessment Requirements (Traffic and Transport)

Secretary's Environmental Assessment Requirements	Where Addressed
Traffic and Transport – including:	
<ul style="list-style-type: none"> ▪ details of traffic types and volumes likely to be generated during construction and operation of the development; 	Section 7.6.4.1
<ul style="list-style-type: none"> ▪ details of the proposed transport routes, site access, internal roadways, parking and updates to road and shipping infrastructure; 	Section 7.6.4
<ul style="list-style-type: none"> ▪ detailed plans of the proposed layout of the internal road network and parking on site in accordance with the relevant Australian Standards; 	Refer to Concept Layout in Appendix B Detailed plans will be produced at the detailed design stage
<ul style="list-style-type: none"> ▪ a detailed traffic impact study of the proposed development, with consideration of the predicted traffic impacts on the safety and capacity of the surrounding road network and the shipping capacity of Port Kembla and cumulative traffic impacts from other developments, using SIDRA or a similar traffic model; and 	Section 7.6.4
<ul style="list-style-type: none"> ▪ a description of the measures that would be implemented to upgrade and/or maintain the surrounding road network and shipping infrastructure over time. 	Section 7.6.5

7.6.2 Assessment Methodology

Cardno reviewed the existing road network and background information such as existing development approvals (outer harbour, GrainCorp), the *NSW Freight and Ports Strategy* (2013) and the *Five Year Port Development Plan – NSW Ports* (2014). The transport needs of the Proposal were considered and assessed as part of a separate Route Selection Assessment, which considered the target markets of the proposed PK BLT, the existing road network and sensitive land uses that the facility's traffic should avoid. This identified a preferred traffic route which connects the proposal to the Princes Motorway via Springhill Road and Masters Road or Five Islands Road.

The capacity and performance of the existing road network was assessed to determine that there was sufficient capacity to support the proposal. Traffic counts were conducted on Springhill Road and Masters Road as well as the internal Port access roads.

These traffic counts were used to develop SIDRA models of the following intersections:

- > Masters Road / Springhill Road
- > Springhill Road / Tom Thumb Road
- > Tom Thumb Road / Yampi Way
- > Tom Thumb Road / Farrer Road; and
- > Tom Thumb Road Roundabout.

The traffic generation from the Proposal was assessed based on the expected throughput. The storage capacity of the PK BLT was used to estimate the number and type of vehicle trips the Proposal was likely to generate. The number of employees and other staff required during construction and operations was used to estimate components of the development traffic and to determine the facility's parking requirements.

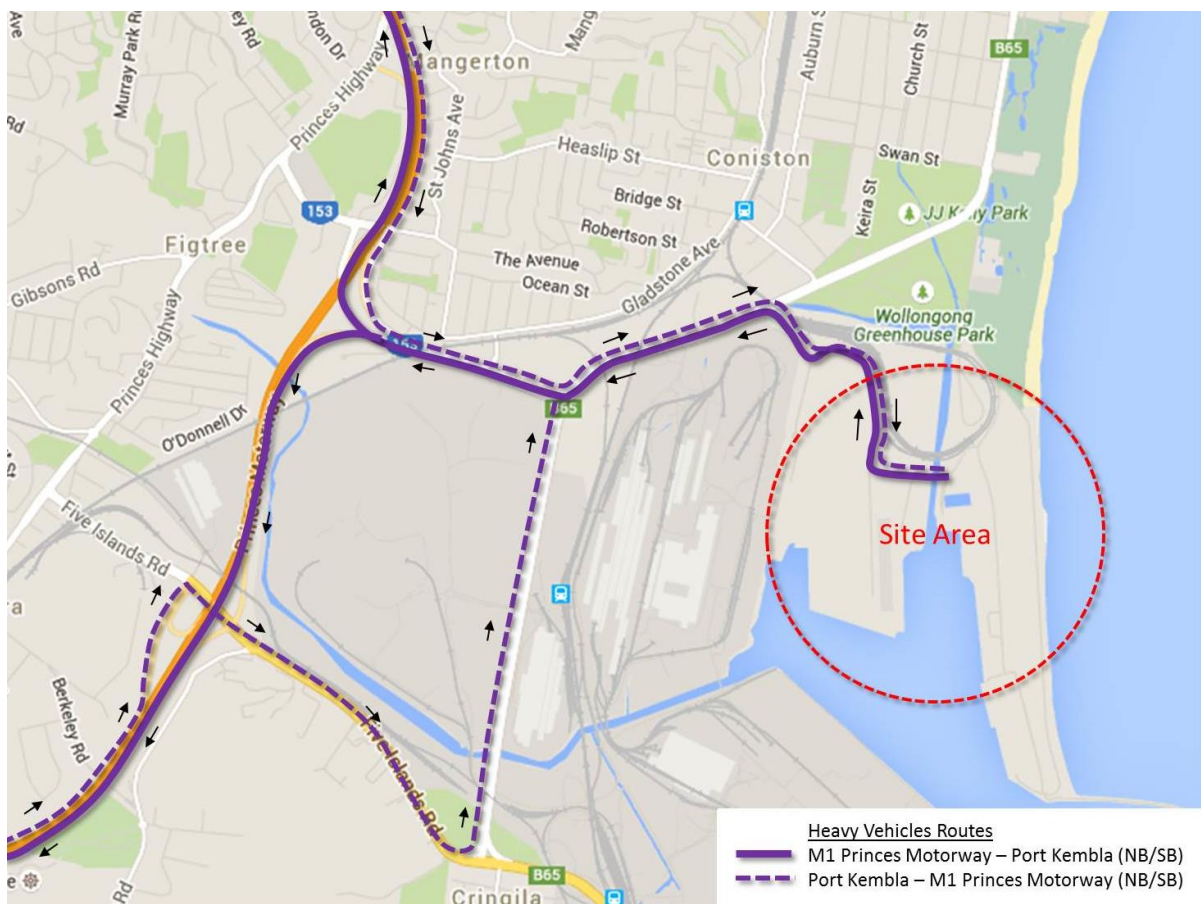
The SIDRA models were used to determine the performance of the intersections under existing conditions and to forecast the future performance of the intersection under separate construction and full operations scenarios. A future scenario including traffic growth to 2026 was used to determine the likely longer term impacts of the proposal and assess a worst case scenario and cumulative traffic impact. The results of these scenarios were used to inform mitigation measures.

RMS stationary traffic counts were obtained to estimate the performance of the key arterial roads which connect the Illawarra to other regions. These counts were compared to the Highway Capacity Manual (HCM) 2010 to categorise the performance of these existing roads in terms of lane capacity.

7.6.3 Existing Environment

The Route Selection Assessment (**Appendix I**) identified that there were sensitive land uses surrounding alternative routes to the Princes Motorway, such as via Corrimal Street and King Street. The selected route via Masters Road and Five Islands Road is also shorter, faster and passed through areas which are less sensitive to the transport of dangerous goods. The selected route is shown below in **Figure 7-8**.

Figure 7-8 Designated Transport Route



As noted above, traffic counts were conducted on the internal Port service roads and the key roads along the designated transport route leading to the Princes Motorway. These traffic counts were then used to simulate key intersections along the route under existing conditions.

Table 7-17 summarises the performance of the existing conditions at key intersections for the AM and PM peak periods.

Table 7-17 Existing Conditions Intersection Performance

Intersection	Control Type	AM Peak			PM Peak		
		Degree of Saturation (DoS)	Average Delay (s)	Level of Service	Degree of Saturation	Average Delay (s)	Level of Service
Masters Road / Springhill Road	Signal Controlled	0.85	37	C	0.80	37	C
Springhill Road / Tom Thumb Road	Signal Controlled	0.81	18	B	0.80	19	B
Tom Thumb Road / Yampi Way	Priority Controlled	0.06	2	A	0.08	1	A
Tom Thumb Road / Farrer Road	Priority Controlled	0.02	6	A	0.03	6	A
Tom Thumb Road Roundabout	Roundabout	0.02	1	A	0.04	1	A

The SIDRA results indicate that the key intersections operate at acceptable Level of Service (LoS) C or better during the AM and PM peak periods.

The lane capacity was determined through reference to traffic counts obtained by RMS. The HCM was used to assess the performance of the key regional travel routes relevant to the Proposal.

Table 7-18 summarises the performance of the existing conditions for the AM and PM peak periods

Table 7-18 Lane Capacity Level of Service (LoS) - Peak Hour

Location	Travel Direction	AM Peak Level of Service	PM Peak Level of Service
Springhill Road, east of Masters Road	Eastbound	C	A
	Westbound	A	B
Springhill Road, west of Tom Thumb Road	Eastbound	C	A
	Westbound	A	B
M1 Princes Motorway, south Memorial Drive	Northbound	C	C
	Southbound	C	C
Picton Road, east of Hume Highway	Eastbound	C	C
	Westbound	C	B

The HCM results indicate that the key travel routes operate at acceptable LoS C or better during the AM and PM peak periods. In general, the TIA identified that the existing road network was suitable for the Proposal and that there was spare capacity available in both the local and regional road network.

7.6.4 Assessment of Potential Impacts

The impact of the proposal was determined through an assessment of scenarios based on the traffic generated by the proposal.

7.6.4.1 *Development Traffic Generation*

The PK BLT preferred design vehicles that will utilise the truck loading bays within the proposed development include:

- > B-Double Trucks (50,000L) = 50%
- > Single Trucks (31,000L) = 40%
- > Rigid Trucks (18,000L) = 10%.

The truck movements from the PK BLT were assessed and used to estimate the trip generation for Stages 1 to 3. The traffic generation rates during the construction and operations phases are summarised below.

A summary of daily development traffic is shown below as **Table 7-19**. Assessment of Peak Traffic Generation is contained in **0**.

Table 7-19 Summary of Traffic Generation (daily)

Stage	Construction		Operations		Total	Duration (months)
	(No. of Vehicles)		(No. of Vehicles)			
	Light Vehicles	Heavy Vehicles	Light Vehicles	Heavy Vehicles		
Stage 1A Construction	7 – 15	10 – 20	0	0	17 – 35	4
Stage 1B (Balance) Construction	7 – 15	8 – 16	0	0	15 – 31	15
Stage 1 Operations & Stage 2 Construction	38 – 138	5 – 10	5 – 12	53 – 84	131 – 265	6
Stage 2 Operations	0	0	5 – 12	84 – 140	89 – 186	TBA
Stage 2 Operations & Stage 3 Construction	38 – 78	5 – 10	5 – 12	84 – 140	132 – 274	12
Stage 3 Operations	0	0	5 – 12	140 – 206	145 – 273	Ongoing

Table 7-20 Summary of Traffic Generation (peak hour)

Stage	Duration of Peak (months)	TOTAL per DAY		AM Peak		PM Peak	
		Light Vehicles (per day)	Heavy Vehicles (per day)	Light Vehicles (hourly)	Heavy Vehicles (hourly)	Light Vehicles (hourly)	Heavy Vehicles (hourly)
Stage 1A Construction	4	15	20	9	20	9	20
Stage 1B (Balance) Construction	15	15	16	9	16	9	16
Stage 1 Operations & Stage 2 Construction	6	150	94	120	24	120	24
Stage 2 Operations	TBA	12	140	10	24	10	24
Stage 2 Operations & Stage 3 Construction	12	90	150	72	36	72	36
Stage 3 Operations	Ongoing	12	206	10	36	10	36

7.6.4.2 Parking Provision

At Stage 3 the PK BLT is forecast to require 12 parking spaces for employees. The Proposal includes 20 parking spaces located at Site 3 near the control room, office block and maintenance workshop.

7.6.4.3 Road and Intersection Performance

The impact of the Proposal was determined through an assessment of scenarios based on the traffic generated during the Stage 1 Operations and Stage 2 Construction phase, separately via a Scenario assessing the impact of the Stage 3 operational phase and a final scenario assessing the operation of Stage 3 with background traffic growth to the year 2026 (including traffic from the neighbouring Quattro site). These three scenarios were selected as they are considered to provide the worst case (greatest) level of traffic generation.

Table 7-21, Table 7-22 and Table 7-23 summarise the performance of the construction and operational staging for the conservative scenario traffic conditions at key intersections for the AM and PM peak periods.

Table 7-21 Stage 1 Operations & Stage 2 Construction – Intersection Performance

Intersection	Control Type	AM Peak			PM Peak		
		Degree of Saturation	Average Delay (s)	Level of Service	Degree of Saturation	Average Delay (s)	Level of Service
Masters Road / Springhill Road	Signal Controlled	0.88	39	C	0.86	34	C
Springhill Road / Tom Thumb Road	Signal Controlled	0.81	19	B	0.80	20	B
Tom Thumb Road / Yampi Way	Priority Controlled	0.12	1	A	0.25	1	A
Tom Thumb Road / Farrer Road	Priority Controlled	0.10	7	A	0.11	6	A
Tom Thumb Road Roundabout	Roundabout	0.04	1	A	0.05	1	A

The SIDRA results indicate that the key intersections operate at acceptable LoS C or better during the AM and PM peak periods.

Table 7-22 Stage 3 Operations – Intersection Performance

Intersection	Control Type	AM Peak			PM Peak		
		Degree of Saturation	Average Delay (s)	Level of Service	Degree of Saturation	Average Delay (s)	Level of Service
Masters Road / Springhill Road	Signal Controlled	0.89	44	D	0.86	36	D
Springhill Road / Tom Thumb Road	Signal Controlled	0.84	21	B	0.83	21	B
Tom Thumb Road / Yampi Way	Priority Controlled	0.18	2	A	0.21	2	A
Tom Thumb Road / Farrer Road	Priority Controlled	0.08	7	A	0.09	6	A
Tom Thumb Road Roundabout	Roundabout	0.02	1	A	0.04	1	A

The SIDRA results indicate that the key intersections operate at acceptable LoS C or better during the AM and PM peak periods. The SIDRA analysis indicates that the Masters Road and Springhill Road intersection would perform at acceptable LoS of D near capacity during the PM Peak period.

Table 7-23 Future Year 2026 Plus PK BLT

Intersection	Control Type	AM Peak			PM Peak		
		Degree of Saturation	Average Delay (s)	Level of Service	Degree of Saturation	Average Delay (s)	Level of Service
Masters Road / Springhill Road (Present Condition)	Signal Controlled	0.95	63	E	0.88	44	D
Masters Road / Springhill Road (Upgraded)	Signal Controlled	0.91	46	D	0.88	44	D
Springhill Road / Tom Thumb Road	Signal Controlled	0.88	25	B	0.84	21	B
Tom Thumb Road / Yampi Way	Priority Controlled	0.21	3	A	0.26	2	A
Tom Thumb Road / Farrer Road	Priority Controlled	0.09	7	A	0.10	6	A
Tom Thumb Road Roundabout	Roundabout	0.04	1	A	0.06	1	A

The SIDRA results indicate that most of the key intersections would operate at LoS B or better during the AM and PM peak periods. The SIDRA analysis indicates that the existing Masters Road and Springhill Road intersection would operate at LoS of E, at capacity during the AM Peak period.

This modelling of future traffic scenario 2026 has identified that the intersection at Springhill Road and Masters Road would reach an unacceptable level of service by 2026 regardless of the traffic generated by the PK BLT at full operation. It is therefore evident that this intersection represents a key constraint on the future development of Port Kembla and a suitable mitigation measure (either the Cardno proposed upgrade or some other) will be required to be developed by NSW Roads and Maritime Service in the medium term. Further discussion on this finding is provided in **Section 7.17.4** as it has implication for future port road traffic capacity irrespective of the proposed PK BLT development.

7.6.4.4 Regional Road Performance

The HCM was used to assess the performance of the regional road links likely to carry the proposal's traffic. **Table 7-24** and **Table 7-25** summarise the performance of the conservative scenario for the construction and operational staging during the AM and PM peak periods.

Table 7-24 Stage 1 Operations & Stage 2 Construction – Lane Capacity

Location	Travel Direction	AM Peak Level of Service	PM Peak Level of Service
Springhill Road, east of Masters Road	Eastbound	C	A
	Westbound	A	B
Springhill Road, west of Tom Thumb Road	Eastbound	C	A
	Westbound	A	B
M1 Princes Motorway, south Memorial Drive	Northbound	C	C
	Southbound	C	C
Picton Road, east of Hume Highway	Eastbound	C	C
	Westbound	C	B

The HCM results indicate that the key travel routes operate at acceptable LoS C or better during the AM and PM peak periods.

Table 7-25 Stage 3 Operations – Lane Capacity

Location	Travel Direction	AM Peak Level of Service	PM Peak Level of Service
Springhill Road, east of Masters Road	Eastbound	C	A
	Westbound	A	B
Springhill Road, west of Tom Thumb Road	Eastbound	C	A
	Westbound	A	B
M1 Princes Motorway, south Memorial Drive	Northbound	C	C
	Southbound	C	C
Picton Road, east of Hume Highway	Eastbound	C	C
	Westbound	C	B

The HCM results indicate that the key travel routes operate at acceptable LoS C or better during the AM and PM peak periods.

Marine shipping traffic into and out of PK BLT will be scheduled and directed by the Port Kembla Harbour Master. Vessels will follow standard Port procedures for navigation through the Port, including turning, berthing and mooring. The PK BLT will have multiple MLAs and shore lines to minimise the time at berth. It is expected that the PK BLT will increase berth utilisation by between 5 and 12 percent per year once operational.

The traffic generated by the PK BLT during Stage 3 Operations (full development of site) scenario would result in a negligible increase in traffic generation. The road network will be able to cater for the traffic generated by the Proposal.

The general morning peak traffic in the local area occurs between 8:15 AM and 9:15 AM and between 4:30 PM and 5:30 PM during the afternoon. This traffic impact assessment has demonstrated that the local road network currently has adequate capacity to cater for PK BLT operational traffic during the morning and evening peak hours.

7.6.5 Environmental Management Measures

This assessment has identified that there are no critical capacity issues arising during the Stage 1 Operation/Stage 2 Construction scenario. Cardno has proposed a number of generic mitigation and management measures for the PK BLT to ensure construction and operational traffic is managed appropriately during this phase.

The following measures are proposed to minimise impacts associated with the construction development including transportation of materials, components and equipment:

- > Develop a detailed Traffic Management Plan for the construction stages of the project in accordance with the Traffic Control at Worksites, version 4.0 (NSW Roads and Maritime Services, June 2010). The Traffic Management Plan would include:
 - Hours of haulage, which do not impose on peak periods and school drop-off and pick-up times.
 - Haulage routes, in accordance to the RMS restricted access to heavy vehicles.
 - Designated areas within the site for heavy and light vehicles turning movements, parking, loading and unloading.
 - Sequence for implementing traffic works and traffic management devices if required.
 - Safety principles for construction activities, such as speed limits around the site and procedures for specific activities.
 - Assessing the need for oversize/over mass vehicle and management of their movements.

- > The internal access and parking areas will be designed such that all vehicles, including the largest design vehicle (25m B-Double) are able to easily drive through the sites to ensure safe turning manoeuvres without requiring excessive reversing.
- > Parking facilities will be provided in accordance with Australian Standards (AS2890 Series).

The following measures are proposed to minimise impacts associated with the operational phase of the development:

- > The general morning peak traffic in the local area occurs between 8:15 AM and 9:15 AM and between 4:30 PM and 5:30 PM during the afternoon. This traffic impact assessment has demonstrated that the local road network has adequate capacity to cater for PK BLT operational traffic during the morning and evening peak hours.
- > Any site entry gates installed shall also be setback from the road to accommodate the longest vehicle accessing each site to allow free flow of internal and external vehicles.
- > TQ will utilise a truck slot booking system to prevent queueing on internal and external roads.
- > The internal access and parking areas will be designed such that all vehicles, including the largest design vehicle (25m B-Double) are able to turn around within the sites. This will ensure safe turning manoeuvres without excessive reversing necessary.
- > Parking facilities will be provided in accordance with Australian Standards (AS2890 Series).
- > Risk management strategies should be considered when planning for the transport of hazardous materials. Risk management strategies have several aspects, including:
 - Choice of best routes
 - Identification of the main risk contributors
 - Identification and implementation of risk reduction measures
 - Measures to avoid avoidable risk
 - Adoption of the most cost beneficial safeguards; and
 - Ensuring appropriate and comprehensive emergency plans.

7.7 Surface Water

Cardno has undertaken a Surface Water Assessment for the Proposal to address the SEARs (**Appendix J**). The SEARs addressed in this Section are identified in **Table 7-26**.

Table 7-26 Secretary's Environmental Assessment Requirements (Soil and Water)

Secretary's Environmental Assessment Requirements	Where Addressed
Soil and Water - including:	
> details of water supply including annual volumes of surface and groundwater required by the proposal and options for reuse of process water;	Section 7.7.4
> a detailed consolidated site water balance	Section 7.7.4
> An assessment of the potential soil, groundwater and surface water impacts and the measures proposed to mitigate these impacts;	Section 7.7.5
> proposed erosion and sediment controls (during construction) and the proposed stormwater management system (during operation);	Section 7.7.5
> Potential impacts of flooding, with consideration of climate change and projected sea level rises.	Section 7.7.4.1

The Surface Water Assessment (**Appendix N**) concluded that the Site is mostly free from constraints of flooding and stormwater. The Proposal is not likely to impact on the water quality of adjoining waterways and wastewater will be suitably managed to reduce any potential adverse impacts. Water supply to the site is considered acceptable. The projected sea level rise would not pose a risk to PK BLT due to site elevations. Where impacts arising from the development of the PK BLT were identified, such as sub-catchment flooding or potential malfunction of contamination containment systems, appropriate mitigation measures will be employed. It is considered that with application of the recommended mitigation measures, the Proposal will have minimal impacts to flow regimes, flooding and water quality. Overall, the Assessment concluded that the proposed development is considered suitable for the site and proposed minimal impacts during construction and operation.

7.7.2 Assessment Methodology

Cardno prepared a Surface Water Assessment (**Appendix J**) to identify potential impacts associated with hydrology, flooding, water quality, water supply and waste water in terms of existing conditions and conditions during the construction phase and operational phases. The Assessment was prepared in accordance with the SEARs and in consideration of State Government and Council's Floodplain Management Policies.

7.7.3 Existing Environment

The Proposal is mostly located within the Gurungaty Waterway catchment. Flows from the southern extent of the Site are directed into the Port Kembla Inner Harbour. Existing conditions of the harbour are impacted by urban runoff from the Gurungaty Waterway Catchment and from industrial uses within the Port Kembla industrial complex. Existing water quality levels have been found to have elevated levels of metals, organic pollutants and moderate turbidity.

The PK BLT is located across four (4) site areas. Site 1 consists of compacted gravel and has no pipe drainage or formalised swales. As a result sheet flow from the site onto Tom Thumb Road is considered likely in the event of minor and major storms. The majority of the site drains towards an existing sediment basin to the north-west, adjacent to Tom Thumb Road, which is connected to the stormwater network on Tom Thumb Road via an overflow orifice. The stormwater network connects to the larger sediment basin located on Site 3 before discharge into Gurungaty Waterway. The sediment basin on Site 3 also receives runoff from the western extent of Tom Thumb Road catchment via a stormwater line under Tom Thumb Road Bridge. Total catchment area for the sediment basin is 5.5 ha.

Site 2 consists of compacted gravel surface that grade towards Gurungaty Waterway. Site 2 does not contain any stormwater network, swales or stormwater quality treatment measures and as a result, runoff is conveyed into adjacent waterbodies as sheet flow. Two existing stormwater lines traverse Site 2, connecting upstream stormwater network and existing low points on Morton Way to receiving waterbodies, however apart from Morton Way, Site 2 does not connect to these pipes.

Berth 104, is predominantly paved with other impervious surfaces comprising the remainder of the site. Berth 104 is serviced by multiple downpipes that discharge directly into the underlying Inner Harbour waterbody. There are no existing stormwater network or treatment devices for the Berth.

7.7.4 Assessment of Potential Impacts

7.7.4.1 Flooding

An assessment of flooding was conducted to identify any areas within the Site potentially impacted by flooding. Flooding from Gurungaty Waterway, from local sub catchments, tidal planes and sea level rise was considered. All four (4) sites identified in the proposed development are a minimum of 1.7m above the Probable Maximum Flood (PMF) levels of the Gurungaty Waterway and as a result will not be impacted by riverine flooding from the watercourse.

Site 1 and Site 3 are not anticipated to be significantly affected by flooding from external sub catchments. Site 2 will likely be affected by flooding from sub catchments, specifically two low points along Morton Way adjacent to the Site. The two low points are serviced by stormwater pipes that traverse Site 2. It is anticipated that flooding at the site will occur if capacity of pipes is exceeded or if pipes are blocked. The hydraulic calculation demonstrated that the existing stormwater lines have sufficient capacity to cater for major storms provided that the total pit inlet capacity on Morton Way is aligned with the pipe capacity. Should pits be blocked, overland flows would traverse Site 2 and discharge to Gurungaty Waterway.

The Proposal comprises a 1.8m bund wall, which would block flows from traversing Site 2. As a result, it is anticipated that Morton Way would be subject to increased depth and duration of ponding in the event of major storms or blocked drains. Mitigation measures are proposed to address the potential impacts. These mitigation measures include upgrade and realignment of existing stormwater pipes and pits, or alternatively constructing a new stormwater diversion pipe on Morton Way that runs to the south around Site 2.

The subject site is not likely to be affected by future sea level rise. The Sea Level Rise Policy Statement produced by the NSW State Government in 2009 provides benchmarks for sea level rise planning. Sea level rise is expected to increase +0.4m by 2050 and +0.9m by 2100. Sea level rise may reduce the capacity of drainage systems discharging into tidal waterbodies and will impact on tidal regimes. Therefore the year 2050 benchmark shall be adopted for design of stormwater upgrade works on Morton Way. The projected sea level rise would not, however, pose a risk to PK BLT due to site elevations.

The report provided an analysis of existing flood risk precincts (FRP) for the site. The majority of the Site was identified as being within the medium FRP. A small amount of land identified in Site 2 and Site 3 is identified as high FRP, however due to outdated data the Assessment concluded that the whole Site area can be categorised as medium FRP. Medium FRP can be defined as land below the 100 year flood level (plus 500mm freeboard) that is not within the high FRP. The site is identified as medium FRP as it is subject to overland flows from local catchments.

Filling of the Site may be required during construction works for the PK BLT. It is a requirement of Council that filling on flood prone land requires a flood study to be undertaken to quantify impacts to flooding. As the riverine flooding from Gurungaty Waterway does not extend into the Site, filling will not affect flooding within the upstream extents of the Gurungaty Waterway catchment.

The Surface Water Assessment indicated that fill requirements on Sites 1 and 3 will only affect internal drainage which will be accounted for in site drainage design. Filling within Site 1 and 3 will also not increase flood affection elsewhere. Introducing fill on Site 2 would impede major flows from the upstream catchment, which in existing conditions flow through Site into Gurungaty Waterway. This would likely result in increased depth and duration of ponding on Morton Way in major storms. In order to mitigate impacts to flooding on Morton Way runoff from external catchments will be captured and conveyed into Inner Harbour via upgraded

road drainage on Morton Way. Several conceptual drainage designs were considered and design criteria established as part of the Surface Water Assessment. These requirements will need to be considered during the detailed engineering design phase. While the Surface Water Assessment does not result in strict compliance with the Wollongong DCP, it has considered the impacts and found them to be limited, with these impacts proposed to be addressed during the detailed design phase due to their limited extent. Any adverse local flood impacts to the west of Site 2 will be mitigated during the detailed design stage by providing upgraded drainage on Morton Way to cater for major storms.

The Surface Water Assessment and associated modelling has sought to comply with the objectives and requirements presented in the various sections of the DCP as far as practicable within the development context. The PK BLT has therefore been deemed to be compliant with prescriptive floodplain management controls.

7.7.4.2 Construction

The Assessment provides an investigation into stormwater management during construction. The construction phase has the potential to impact on the surface water flow regimes within the Site. The Proposal will result in increased impervious surface area within the Site. The Proposal will also require re-grading of existing surfaces, alteration to the existing drainage network, construction of new drainage infrastructure, construction of new structures and the discharge of treated water into the local stormwater system, Gurungaty Waterway or the Inner Harbour. Impacts from these works may include the following:

- > Increased peak flow rates and runoff volumes discharging from sites due to an increase in impervious surface areas within the project area.
- > Increased flooding on Morton Way due to construction of Site 2 earthworks that may impact on the surface flow paths from Morton Way to Gurungaty Waterway.
- > Localised flooding within construction sites during high rainfall events due to discontinuous overland flow paths and temporary stormwater detention measures.

Potential water quality impacts were also identified during construction works. Water quality within the Port Kembla Inner Harbour may be affected by pollutant containing site runoff. Identified impacts include:

- > Fuel and oil spills occurring due to use of construction machinery or temporary storage of construction materials, chemicals and equipment on site.
- > Litter originating from use and storage of construction materials.
- > Generation and mobilisation of fine particles and associated heavy metal and organic contaminants from eroding soils.
- > Increased sediment loads due to sediment trapped to vehicles. This concerns specifically Morton Way that has two direct drainage connections to Gurungaty Waterway / Inner Harbour.
- > Direct disturbance of Gurungaty Waterway or Inner Harbour due to installation of new drainage infrastructure at the waterfront areas, especially on Site 3 at the site discharge point.
- > Sedimentation of Gurungaty Waterway or northern extent of Inner Harbour as a result of erosion within construction sites.

7.7.4.3 Operation

The assessment report provides an assessment of the Proposal during operation. During operation of the proposed development the management of the quality and quantity of stormwater for Site 1, Site 2 and Site 3 will be governed by a Stormwater Management Concept that has been prepared by Cardno (**Appendix J**). Due to the minimal water usage within the PK BLT detailed site water balance calculations (as noted in SEARs) are not considered relevant for the Proposal.

The bunds provided on Site 1 and Site 2 will provide sufficient capacity for storing any major storm event, while still providing capacity for containing major product spills. The Oil Water Separator (OWS) combined

with multi-staged containment using bunds and slops tanks is considered acceptable in treating stormwater runoff. The OWS would be able to treat stormwater temporarily stored within the bunded area in a reasonable timeframe. A tank bund will be available at Berth 104 that is considered capable of containing the largest credible fuel spill.

The operation of the PK BLT has the potential to impact water quality; however risks are considered low due to the commitment to prevent any spill of products, slops or contaminated stormwater into adjoining water bodies. Potential risk may occur due to a malfunction in the system that may cause product spills, however the multi-staged containment and water quality treatment facilities of the development reduce this risk. During operation itself, the PK BLT will not pose any additional risk to water quality due to existing surface water conditions and similar use of adjacent developments.

The peak flow assessment indicates that the peak flows and hydraulic loads at the existing discharge points will be reduced from the existing conditions. This is due to temporary storage of stormwater within the bunded areas of PK BLT and slow release of runoff through the stormwater quality treatment systems. This attenuation of flows compensates for any increase in the amount of impervious surfaces runoff elsewhere within the Site.

Potential hazards to the environment associated with Berth 104 activities are identified in the Pollution Incident Reduction Management Plan (PIRMP). Potential impacts include water pollution, specifically sediment / turbidity and hydrocarbons occurring due to a product spill or release of polluted ballast water during loading operation. However, the PIRMP indicates that the likelihood of these pollution events is low.

Water supply to the Site, including the use for fire tanks and a cooling water system are considered appropriate for the Site. Environmental impacts of fire-fighting foams will be considered including methods for collection and dewatering. The management of wastewater is also considered appropriate and risk of wastewater discharge into the Inner Harbour is considered low.

7.7.5 Environmental Management Measures

The detailed Surface Water Assessment (**Appendix J**) has considered the Proposal from hydrological, stormwater management, flooding and wastewater standpoint and has identified the following mitigation measures for the Proposal:

- > Development of an Erosion and Sediment Control plan (ESCP) with measures to be in place prior to any works commencing at the site. The ESCP will be prepared as part of the CEMP in accordance with the *Landcom Managing Urban Stormwater; Soils and Construction Manual 2004*. The ESCP would be maintained for the duration of construction, to prevent any polluted water and sediment entering receiving waterbodies.
- > Installation of erosion and sedimentation control devices prior to commencement of any site works. Erosion controls would remain in place until the bare soils and surfaces are stabilised (by revegetation or other means) and removed when redundant. This needs to include the diversion of 'clean' water around the site in order to avoid treating it and also to avoid potential additional erosion from off-site sources.
- > Appropriate erosion and sediment control devices would be placed down-slope of all excavation works, spoil stockpiles or works that would disturb the ground surface, down-slope of access roads that are highly utilised as well as in other areas as appropriate.
- > Sedimentation is likely to be due to sheet flows occurring within the site. This type of sedimentation can be effectively controlled by using vegetated buffers (e.g. turf where appropriate), sediment barriers and sediment fences.
- > Minimise the extent and duration of disturbance by means of work planning and staging.
- > Disturbed areas would be restored (sealed or covered with pebbles/gravel or vegetated, as appropriate) upon the completion of the works in that area to ensure that the exposure of soils is minimised.
- > Embankments and other areas subject to earthworks and grading would be revegetated with an appropriate cover crop or stabilised with other means as soon as possible following achievement of final levels.

- > Where revegetation is required and where deemed feasible, locally indigenous plant species, including shrubs, grasses and other groundcovers, would be planted in appropriate locations to assist in soil stabilisation following completion of construction. Maintenance of these plantings would include regular watering and appropriate weed control to ensure the plants survive and continue to enhance the site.
- > Daily visual inspections of erosion and sediment control devices to determine the condition and effectiveness of control measures. Immediate action would be taken to repair any control devices that have failed to work adequately.

During Operation

- > All water which has been in contact with potentially hydrocarbon-soiled surfaces within the bunded area is contained and processed to Environmental Protection Agency (EPA) standard by using an Oil Water Separator (OWS) that will be strategically located on Site 3.
- > Sites 1 and 2 will have centralised collection sumps that will include a gravity oil separation and oil recovery system. Before an intermediate bund sump transfers water to the centralised collection sump, the pump must be locally started so that inspection for potential oil spills can take place. If a spill is detected in an intermediate bund sump the spill can be redirected away from the centralised collection sump for recovery.
- > Bund walls (1.8m high) will be established around the storage tank areas on Site 1 and 2. In addition, separate intermediate bunds (0.6m high) will be constructed to contain most tanks individually. All product spillage and stormwater runoff would be contained inside the bunded area. Each intermediate bund has a sump that can be drained individually into a central bund water collection pit for the site. Free hydrocarbons are recovered in these central sumps and water from the central bund water collection pit on either Site 1 or Site 2 can then be pumped into the two stage gravity settling pit on Site 3, prior to being treated by OWS-3 and then discharged from site in accordance with an EPA license.
- > Recovered hydrocarbons from the OWS system are directed to the waste oil decanter tank where they can be recovered or transferred to a waste collection vehicle for disposal.
- > Hydrocarbon and waste collection piping will be designed to run above ground so that any potential leaks are visible and can be detected and repaired, rather than underground where a leak poses a potential ground contamination issue.
- > Any underground stormwater pipes that may potentially be exposed to hydrocarbon contaminated water will be equipped with hydrocarbon compatible sealed joints to prevent infiltration into ground.
- > In order to mitigate the impacts, runoff from external catchments will be captured and conveyed into Inner Harbour via upgraded road drainage on Morton Way. This may include upsizing existing pipes and pits as well as installing new stormwater lines. The upgrade works will increase the total inlet capacity on Morton Way and reduce the risk of pit inlets becoming blocked by debris.
- > Water from the central bund water collection pit on either Site 1 or Site 2 will be pumped into the two stage gravity settling pit on Site 3, prior to being treated by an OWS and then discharged from site in accordance with an EPA license. An underground Gross Pollutant Trap (GPT) will be installed on Site 3 for the treatment of stormwater flows from the existing Tom Thumb Road drainage network prior to discharging the treated stormwater into Gurungaty Waterway (non-licensed discharge point). In addition to gross pollutants and sediments, the treatment system will be designed to capture oil and grease. The GPT treatment system will be sized for the full road catchment including the western extent of Tom Thumb Road connecting to Site 3 across the bridge. Runoff from the PK BLT sites will bypass the GPT and be directed to an OWS on Site 3 instead.
- > The access road on the southern and eastern extent of Site 2 will be used as a truck staging area for empty trucks waiting for loading. Runoff from this area will be discharged directly into Inner Harbour via stormwater treatment system consisting of a GPT and oil capture system to collect oil and grease from runoff. In case of spill, a clean-up will also be initiated using spill kits.
- > A designated overland flow path will be provided at the low point for flows in excess of the drainage system.

- > Leakage, spillage and wash down water within the bunded truck loading bays will be collected in grated pits at each bay. The bunded area at each truck bay will be sized to contain the contents of a tanker compartment as well as normal wash down water. Any waste collected from the truck loading bay will be pumped to the above ground slops tank. All waste piping from each truck loading bay remains above ground to eliminate the possibility of undetected subsurface contamination
- > A detailed Fire Safety Study and fire system design will be undertaken to determine optimal type and methods for collection and dewatering of foams within bunded areas. Consideration for foam selection will include water quality and contamination impacts of the foam solution.

7.8 Greenhouse Gas and Climate Change

An assessment of Greenhouse Gas (GHG) and Climate Change for the Proposal has been prepared to address the requirements of the SEARs which are identified in **Table 7-27 (Appendix E)**.

Table 7-27 Secretary's Environmental Assessment Requirements (GHG and Climate Change)

Secretary's Environmental Assessment Requirements	Where Addressed
Greenhouse Gas and Climate Change – including:	
<ul style="list-style-type: none"> ▪ An assessment of the potential greenhouse gas emissions of the proposed development. 	Section 7.8.3

Growth in the concentration of GHG in the atmosphere is changing global climate. Even if global negotiations and actions succeed in achieving deep cuts in GHG emissions, further change to the climate and biophysical environment is inevitable. Over the coming years, the environment is likely to experience higher temperatures, altered rainfall patterns, a rise in sea level, and changes to natural hazards like bushfires, flooding and heatwaves.

Climate change will therefore have the potential to increase the magnitude of risks faced by private industry, infrastructure providers and the broader community.

7.8.2 Assessment Methodology

A detailed Air Quality and GHG Assessment (**Appendix E**) has been prepared by Pacific Environment in accordance with the GHG assessment protocols. The assessment explores the annual GHG emissions for each identified scope as defined for GHG accounting and reporting purposes for the each stage of the development. The assessment provides a specific explanation of anticipated GHG for Scope 3 emissions. GHG emissions were estimated based on the methods outlined in the:

- > *National Greenhouse and Energy Reporting (Measurement) Determination 2008 - Technical Guidelines for the estimation of Greenhouse gas Emissions by Facilities in Australia* (DoE, 2014a)
- > *Australian National Greenhouse Accounts - National Greenhouse Accounts Factors* (DoE, 2014b).

The potential impacts of climate change have been assessed based on the assumptions that sea level along the NSW coast will rise relative to 1990 mean sea levels by 0.4m by 2050. These direct impacts have been assessed as part of the Surface Water, Wastewater and Flooding assessment in **Section 7.7**, with sea level rise implications incorporated into modelling parameters

7.8.3 Assessment of Potential Impacts

The assessment identified the sources of GHG for the proposed development and categorised them into Scope 1, Scope 2 or Scope 3 in accordance with GHG accounting and reporting definitions.

- > Scope 1 sources of emission are identified as emissions that occur from sources that are owned or controlled by the reporting entity. The assessment concluded that Scope 1 sources of GHG for the proposal include fuel consumption (diesel) during operations and emissions associated with on-site electricity generation (diesel generator) during the construction phase.
- > Scope 2 sources of emission can be defined as indirect emissions that account for GHG emissions from the generation of purchased energy products by the entity. The assessment concluded that Scope 2 sources of GHG for the proposal include indirect emissions associated with the purchased electricity brought into the organisational boundary.
- > Scope 3 sources of emission are identified as those emissions that are a consequence of the activities of an entity, but which arise from sources not owned or controlled by that entity. Scope 3 GHG emissions were reported separately under the assessment to reduce the possibility of double counting data and to ensure the assessment is as accurate as possible. Scope 3 emissions for the project have been identified as indirect emissions associated with the production and transport of fuels, emissions from

product fuel transportation and emissions from the use of product fuels. The operation and purpose of the proposal is to store and distribute fuels for the purpose of use. These activities will result in the combustion of fuel, creating emissions. The GHG assessment concluded that Scope 3 emissions are independent of the project. The emissions result from fuel use in NSW and therefore the net change in Scope 3 emissions linked with this project are negligible.

An assessment of the GHG emissions associated with the Project indicates that average annual scope 1 emissions would be 0.2 ktpa CO₂-e and represent approximately 0.0001% of Australia's commitment under the Kyoto Protocol (591.5 Mtpa) carbon dioxide equivalent [CO₂-e]).

The GHG Assessment (**Appendix E**) concluded that the proposed development would produce a very small portion of GHG. Additionally, the project would generate approximately 0.0001% of Australia's commitment under the original Kyoto Protocol.

A review of Appendix 2 of the *Guide to Climate Change Risk Assessment for NSW Local Government* (Office of Environment and Heritage, 2011b) has been undertaken. The key Climate Change risks associated with the PK BLT include:

- > Sea Level Rise
- > Increased occurrences of extreme weather
- > Increased temperatures.

Sea level rise has been considered in the Hydrology Assessment at **Section 7.7**, which identified that the proposed design and location was acceptable for the PK BLT.

Extreme weather includes increased storm event intensity and frequency, causing high winds and rainfall, as well as increased bushfire threat and extreme temperatures. The site is not bushfire prone and should not therefore be affected by increased bushfire threat. The detailed design would be in accordance with the relevant Australian Standards and include the regulated contingency to address extreme heat events, as well as high winds. Consequently, the PK BLT design has been developed to address potential Climate Change impacts, with no adverse impacts anticipated.

7.8.4 Environmental Management Measures

TQ will implement emission capture and abatement technology throughout the detailed engineering design and equipment procurement processes. This will include specification of floating roof tank designs, vapour recovery units and associated fuel emission capture and abatement technology to ensure the PK BLT is built to standard industry practices.

In addition to mitigation measures described in **Section 7**, it is also suggested by TQ that the form of transportation may incorporate rail once new infrastructure is developed to meet the demand criteria, thus reducing future greenhouse emissions from this process.

7.9 Biodiversity

Cardno has undertaken an assessment of Biodiversity (see **Appendix K**) for the Proposal to address the SEARs. The aspects which are addressed in this Section are outlined in **Table 7-28**.

Table 7-28 Secretary's Environmental Assessment Requirements (Biodiversity)

Secretary's Environmental Assessment Requirements	Where Addressed
Biodiversity – including:	
<ul style="list-style-type: none"> ▪ an assessment of the potential impacts on critical habitats, threatened species (including <i>Litoria aurea</i>), populations or ecological communities and their habitats in accordance with the <i>Framework for Biodiversity Assessment</i> or relevant Office of Environment Guidelines. 	Section 7.9 and Appendix K

The Ecological Impact Assessment (**Appendix K**) identified the Green and Golden Bell Frog (*Litoria aurea*) as the only species to have either a 'high' or 'moderate' potential to use the subject site. A Commonwealth Significant Impact Assessment and NSW Assessment of Significance found that there will be no significant impacts to Green and Golden Bell Frogs from the proposal, and a referral to the Commonwealth is therefore not required.

In accordance with the Secretary's Environmental Assessment Requirements (SEARs) an assessment in accordance with the Framework for Biodiversity Assessment (FBA) is in the process of being undertaken. In addition to this the SEARs have nominated Green and Golden Bell Frog as an Impact for Further Consideration (IFC) in accordance with Section 9.2 of the FBA. Consultation with the NSW Office of Environment and Heritage has specified that due to the listing of an IFC within the project, there is a requirement for an 'expert report' to determine the size of the impact on breeding, foraging and shelter habitat of the Green and Golden Bell Frog in accordance with Section 9.2.5 of the FBA. Appendix D of the Ecological Impact Assessment (**Appendix K**) includes the expert report which has been issued to NSW Office of Environment and Heritage. This expert report identified that the proposal is unlikely to:

- > cause the extinction of a species or population from an IBRA (Interim Biogeographic Regionalisation for Australia) subregion (i.e. the Illawarra), or
- > significantly reduce the viability of a Green and Golden Bell Frog population.

As such the expert report recommends that Green and Golden Bell frogs be removed from the SEARs as an IFC.

The expert report also defines a 'species polygon' for Green and Golden Bell Frog for the purposes of quantifying impacts from the proposal under the greater FBA. The species polygon is 0.09 ha in area, and preliminary calculations utilising the Major Projects module of the Biobanking Credit Calculator have identified that 1 species credit will need to be obtained to meet the offset obligations of the FBA. Following confirmation from OEH that the Green and Golden Bell Frog has been eliminated as an IFC, an assessment of the impacts will proceed following the FBA and the preparation of a Biodiversity Assessment Report in accordance with the FBA will be necessary for this proposal. This process will be undertaken in parallel to the State Significant Development Approval.

7.9.2 Assessment Methodology

The Ecological Impact Assessment (Cardno and Ecoplanning, 2015) consisted of a literature and database review prior to undertaking an initial field survey on the 20 May 2015. Additional surveys were undertaken targeting the Green and Golden Bell Frog on 22 October 2015. Survey followed an extended period of rain in the days preceding the survey and weather on the day was initially warm, but following a southerly bluster in the early afternoon temperatures dropped to ~17°C with consistent heavy rainfall.

The literature and database review included the analysis aerial photography and regional scale mapping as well as the review of previous reports including the 2015 Green and Golden Bell Frog Survey (BEC, 2015).

The field survey undertaken consisted of terrestrial and aquatic surface observations. The preliminary terrestrial field survey involved traversing the site recording native and exotic flora species to validate the presence of any native vegetation species and to validate the vegetation mapping of NPWS (2002). No targeted flora or fauna surveys, apart from the Green and Golden Bell Frog Survey (BEC, 2015), were

undertaken. Faunal recordings included incidental sightings and habitat assessment particularly for amphibian habitat due to the key population of Green and Golden Bell Frog known to occur across the Port Kembla area.

The additional field survey was undertaken during daylight hours, at dusk and after dark throughout the subject site in an attempt to locate any Green and Gold Bell Frog specimens. A known and accessible reference site was inspected at South Port Kembla in an attempt to determine Green and Golden Bell Frog activity and hence validate that conditions were suitable for detecting the species and in accordance with species survey guidelines (NPWS 2003; DECC 2009b).

Inspection of aquatic flora and fauna was conducted on foot along the shore line. Visible species were recorded. An in-water inspection of aquatic species was not undertaken as the proposed works will not be constructed within the watercourses.

Following the field survey and desktop review the potential for a species to utilise the site and be affected either directly or indirectly by the proposed action was considered. Species were classed as high, medium, low or not present depending on the level of potential impact.

As part of the development of the Expert Report (Ecoplanning, 2015), further desktop analysis was undertaken as well as an initial field survey on the 20th May 2015 (evening) and an additional survey on the 22 October 2015. The evening field survey included the attendance of representatives from TQ, NSW Ports, Cardno and OEH and consisted of an inspection of the proposal site and adjacent sites where Green and Golden Bell Frogs had been previously recorded. The survey during daylight hours was undertaken to identify frogs located within the minimal habitat available on site. Dip netting was also undertaken to determine the presence of any tadpoles present.

7.9.3 Existing Environment

The project site is located within the Port Kembla industrial complex which is situated within a highly modified estuary at the mouth of Allan's Creek and Gurungaty Waterway. The locality surrounding the site (within 5km) consists of predominantly cleared and/or disturbed lands largely due to industrial, commercial and residential development. Tom Thumb Lagoon located north of the site adjacent to the Gurungaty Waterway consists of some of the only remnant vegetation in the area.

A desktop search of the locality area identified six threatened flora species, 32 threatened fauna species (including one amphibian, one reptile, 24 birds and six mammals), and eight migratory birds. These are detailed in Appendix A of the assessment report (**Appendix K**). Of these only one species was found to have a high potential to utilise the site for habitat, the Green and Golden Bell Frog (*Litoria aurea*).

Four main sub-populations of Green and Golden Bell Frog have been identified in the Port Kembla area. The PK BLT site is identified as being within the North Port Kembla sub-population (DEC, 2007). In March 2015 a targeted survey was undertaken for Green and Golden Bell Frogs in the project site (BEC, 2015). The survey report is included in Appendix C of the Ecology Impact Assessment (**Appendix K**) and did not identify any Green and Golden Bell Frogs at the project site.

Aquatic flora and fauna identified at the site included Sydney Rock Oysters (*Soccoatrea glomerata*), Barnacles (*Austrominius modestus*) and Periwinkles (*Bembicium auratum*) at site 2; and a school of five Sea Mullet (*Mugil cephalus*) and a single Grey Mangrove (*Avicennia marina*) ~60cm in height at site 3. The grey mangrove was located at the southern end of Site 3 in the centre of the channel outside the proposed area of works.

No threatened flora or fauna were identified across the site during the site surveys. The only amphibian found in the neighbouring reference sites was the Brown-striped Marsh Frog (*Limnodynastes peronii*). Several invasive aquatic and terrestrial flora species were also identified across the site. These include Bitou Bush (*Chrysanthemoides monilifera*), Fishbone Fern (*Nephrolepis cordifolia*), Cobblers Pegs (*Bidens pilosa*), Kikuyu (*Pennisetum clandestinum*) and Fennel (*Foeniculum vulgare*).

7.9.4 Assessment of Potential Impacts

Due to the highly disturbed nature of the site, impacts from the proposed works are limited to the threatened species habitat of the Green and Golden Bell Frog and impacts on the adjacent aquatic environment. Whilst Green and Golden Bell Frogs have not been identified in the immediate vicinity of the site, the existing artificial storm water detention area could provide potential habitat for this species. This structure is to be removed as part of the proposed works potentially resulting in lost habitat for this species. As this species is listed as 'endangered' under the EPBC Act and the TSC Act, an assessment of significance consistent with the Department of Environment and Conservation (2007) requirements was undertaken. The assessment found that there will be no significant impacts to this species as a result of the proposal, and a referral to the Commonwealth Government under the EPBC Act is not required.

In accordance with the Secretary's Environmental Assessment Requirements (SEARs) an assessment in accordance with the Framework for Biodiversity Assessment (FBA) has been undertaken to determine biodiversity offset requirements of the project under State legislation. The SEARs have nominated Green and Golden Bell Frog as an Impact for Further Consideration in accordance with Section 9.2 of the FBA. Consultation with the NSW Office of Environment and Heritage has specified the requirement for an 'expert report' to determine the size of the impact on breeding, foraging and shelter habitat of the Green and Golden Bell Frog in accordance with Section 9.2.5 of the FBA. An expert report (Ecoplanning, 2015) has been developed in accordance with the FBA which identifies that the proposed development is unlikely to:

- > Cause the extinction of a species or population from the Interim Biogeographic Regionalisation for Australia subregion (Illawarra); or
- > Significantly reduces the viability of a Green and Golden Bell Frog population

As such the expert report recommends that the Green and Golden Bell Frog be removed from the SEARs as an IFC.

The expert report also defines a 'species polygon' for Green and Golden Bell Frog for the purposes of quantifying impacts from the proposal under the greater FBA. The species polygon is 0.09 ha in area, and preliminary calculations utilising the Major Projects module of the Biobanking Credit Calculator have identified that 1 species credit will need to be obtained to meet the offset obligations of the FBA.

Under the FM Act there is a requirement to protect marine vegetation such as mangroves. As such the identified grey mangrove was considered in relation to the proposed works. Due to the proposed works not being located within the waterway it was identified that the proposed development was not likely to impact on this individual. As discussed in Section 9.5 mitigation measures will be in place during construction and incorporated in the project design to ensure impacts to the waterways do not occur such as:

- > Removal of potential Green and Golden Bell Frog habitat
- > Construction activities directly damaging the mangrove present in the Gurungaty Waterway near Site 3
- > Mobilisation of sediments associated with bank stabilisation works at Site 3 decreasing water quality within Gurungaty waterway and the greater port area
- > Hydrocarbon spills from machinery involved in construction activities could enter the waterway and decrease water quality
- > Wastewater from cleaning construction equipment and plant could enter the waterway and decrease water quality; and
- > Sediment mobilised during on land construction activities could enter the waterway and decrease water quality.

This will ensure that impacts to other species potentially utilising the Port Kembla aquatic environment will not be impacted by the proposed development.

During operation identified impacts to ecology may include:

- > Potential summer Green and Golden Bell Frog vagrants moving through the site

- > Green and Golden Bell Frog are known to have utilised bunded areas as breeding habitats, particularly if water is retained within the bunds for extended periods
- > Increased risk of hydrocarbon spills from additional vehicular movements within the TQ Bulk Liquids Terminal site entering the waterway resulting in decreased water quality
- > Increase in the chance gross pollutants being introduced to the waterway via stormwater
- > Wastewater from cleaning construction equipment and plant could enter the waterway and decrease water quality
- > Increased shipping movements within the port could increase the risk of a pollution incident
- > Increased shipping movements within the port could provide a vector for the introduction of harmful aquatic organisms into Australian waters and specifically into Port Kembla.

7.9.5 Environmental Management Measures

To eliminate or reduce the potential impacts associated with this development it is recommended that the following mitigation measures be utilised:

Construction

- > A frog-exclusion fence should be put in place along the fence line to the rail corridor and around the western boundary of Site 3, limiting access for the frogs during this period. This fence should be consistent with the Green and Golden Bell Frog Best Practice Guidelines and the Green and Golden Bell Frog Survey (BEC 2015). It can be attached to the existing fence lines or the proposed retaining wall and should have a lip to ensure frogs do not jump over it
- > Pre-clearance surveys should be consistent with the Management Plan for the site (BES 2012).
- > If extended periods occur between erection of the fence and construction work further pre-clearance survey should be undertaken to clear any stranded frogs.
- > During construction activities at Site 3 construction contractors should be made aware of the position of the mangrove seedling so as to reduce the potential to cause damage.
- > Sediment control devices including silt curtains should be used during bank stabilisation works at Site 3 to prevent runoff causing increased turbidity within Gurungaty waterway and the greater port area.
- > Remove and dispose of bitou bushes within the construction area via methods described within the Weeds of national Significance 'Bitou bush Current management and controls options for bitou bush (*Chrysanthemoides monilifera* spp. *rotundata*) in Australia' (Winkler et al., 2008).
- > Appropriate hydrocarbon spill kits should be in the vicinity of construction activities to contain any spills. In the event that the spill kit is unable and hydrocarbons enter the waterway an absorbent boom should be available to be deployed to reduce the spread of any such spill.
- > Machinery and equipment associated with construction activities should be cleaned within a designated wash down area that ensures wastewater does not enter the waterway
- > Sediment control devices such as hay bales and geofabrics should be deployed throughout the construction area in the vicinity of storm water drains to reduce mobilised sediments entering the waterway.
- > Follow the measures to be provided in the Pollution Incident Response Management Plan developed for the project as part of the Construction Environment Management Plan (CEMP).
- > Ensure training and inductions for all personnel include Green and Golden Bell Frog awareness aspects and response requirements. Green and Golden Bell Frog management and response requirements need to be outlined within the Construction Environment Management Plan (CEMP).

Operations

- > Potential for frog migration through the site is most likely at night-time during the summer months after heavy rain. Staff and contractors should be made aware of the Green and Golden Bell Frog Management Plan prepared by BES (2012), which should be amended to reflect future operational risks and requirements prior to operations commencing.
- > Bund and sump management procedures should consider the potential for Green and Golden Bell Frog breeding within bunds
- > The site manager should be made aware of any discoveries and contact an ecologist or the Wollongong Office of Environment and Heritage so that appropriate relocation of the frog/s can be undertaken if necessary.
- > Ensure that appropriate hydrocarbon spill kits are placed at various locations throughout the site to contain any spills. In the event that the spill kit is unable to contain a spill and hydrocarbons enter the waterway an absorbent boom should be available to be deployed to reduce the spread of any such spill.
- > Gross pollutant traps and hydrocarbon removal should be a priority for stormwater catchments which service areas accessed by tanker trucks.
- > Implement a stormwater management plan that incorporates gross pollutant traps prior to waste water discharge. Employee and contractor induction should include a section dealing with the potential for gross pollutants to impact the site.
- > Clean machinery and equipment associated with construction activities within a designated wash down area that ensures wastewater does not enter the waterway.
- > Follow the measures to be provided in the Pollution Incident Response Management Plan developed for the project as part of the Operation Environment Management Plan (OEMP).
- > Ensure training and inductions for all personnel include Green and Golden Bell Frog awareness aspects and response requirements. Green and Golden Bell Frog management and response requirements need to be outlined within the OEMP.
- > Ensure that all vessels comply when appropriate with the International Maritime Organisation (IMO) Ballast Water Convention to reduce the potential of harmful aquatic organisms being discharged into Australian waters. The IMO Ballast Water Convention requires that all vessels must have and comply with a 'Ballast Water Management Plan'.

7.10 Waste Management

Cardno has undertaken an assessment of Waste Management from the Proposal to address the SEARs. The SEARs which are addressed in this Section are provided in **Table 7-29**.

Table 7-29 Secretary's Environmental Assessment Requirements (Waste Management)

Secretary's Environmental Assessment Requirements	Where Addressed
Waste Management – including:	
<ul style="list-style-type: none"> ▪ details of all the quantities and classification of all waste streams to be generated on site; 	Table 7-31 and Table 7-32
<ul style="list-style-type: none"> ▪ details of waste storage, handling and disposal and how slops will be managed; 	Section 7.10.2
<ul style="list-style-type: none"> ▪ wastewater predictions and the measures that would be implemented to treat, reuse and/or dispose of this water; and 	Table 7-31 and Table 7-32
<ul style="list-style-type: none"> ▪ the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the NSW Waste Avoidance and Resource Recovery Strategy 2007 and Draft NSW Waste Avoidance and Resource Recovery Strategy 2013-2021. 	Section 7.10.5

7.10.1 Assessment Methodology

The *NSW Waste Avoidance and Resource Recovery Strategy 2007* and *NSW Waste Avoidance and Resource Recovery Strategy 2014-2021* (WARR Strategy) provides guidance and priorities for action to ensure efficient resource use and impacts on the environment are considered throughout the life cycle of goods and materials.

The key result areas identified in the WARR Strategy to drive improvements in NSW waste and resource recovery up until 2021 include:

- > Avoid and reduce waste generation
- > Increase recycling
- > Divert more waste from landfill
- > Manage problem wastes better
- > Reduce litter
- > Reduce illegal dumping.

The strategy also sets the following state wide performance targets:

- > Avoiding and reducing the amount of waste generated per person in NSW
- > Increasing recycling rates to
 - 70% for municipal solid waste
 - 70% for commercial and industrial waste
 - 80% for construction and demolition waste
- > Increasing waste diverted from landfill to 75%
- > Managing problem wastes better, establishing 86 drop-off facilities and services across NSW
- > Reducing litter, with 40% fewer items (compared to 2012) by 2017
- > Combatting illegal dumping, with 30% fewer incidents (compared to 2011) by 2017.

These waste management strategies aim to maximise conservation of our natural resources and to minimise environmental harm from improved waste management measures to reduce disposal volumes of wastes.

The legislative and policy drivers relating to waste management and the implementation of the above mentioned strategies include state government legislation such as the POEO Act and imposed

environmental levies such the 'Waste Levy' which provide financial incentives to encourage reuse/recycling and reduce volumes of waste disposal at landfills.

7.10.1.1 Identification and Classification of Potential Waste Sources

Cardno, with the support of TQ engineering personnel have identified the waste generating activities for the Proposal. These potential waste sources have been reviewed and assessed in accordance with waste classification guidelines as well as the above mentioned resource recovery and waste minimisation strategies. The following sections provide a detailed review of waste identification and management requirements for the construction and operational phases of the Proposal.

Expected volumes of each waste stream have been estimated and assessed against waste classification guidelines to ensure appropriate waste minimization and management measures are provided to reduce potential impacts.

7.10.2 Assessment of Potential Impacts

To ensure that appropriate waste management strategies can be adopted a summary of potential sources and expected volumes of liquid and non-liquid wastes has been provided in **Table 7-31** for construction related activities and **Table 7-32** for operational activities.

The classification of potential waste streams needs to be done in accordance with the *Waste Classification Guidelines, Part 1: Classifying Waste* (2014). The following classes of waste are defined in clause 49 of Schedule 1 of the POEO Act 1997:

- > Special waste
- > Liquid waste
- > Hazardous waste
- > Restricted solid waste
- > General solid waste (putrescible); and
- > General solid waste (non-putrescible).

7.10.3 Waste Management Strategy

The Waste Management Strategy (WMS) below has been prepared in accordance with the aims, objectives and guidelines in the *NSW Waste Avoidance and Resource Recovery Strategy 2007* and *NSW Waste Avoidance and Resource Recovery Strategy 2014-2021*. This will ensure that waste generation is minimized and that recycling and reuse of materials are promoted during all stages of the Project.

The purpose of the WMS is to identify potential waste sources and to promote recycling and re-use and to minimise the amount of waste taken to landfills and thereby reduce environmental impacts associated with the Project. The WMS has also been developed in consideration of the waste hierarchy provided as **Figure 7-9**.

Figure 7-9 Waste Hierarchy



Source: Draft NSW Waste Avoidance and Resource Recovery Strategy 2014-2021 (2014)

The WMS has identified a number of avoidance and re-use opportunities for potential waste streams within both the construction and operational stages of the project.

A summary of the WMS for construction and operational wastes is provided in **Table 7-30** below.

Table 7-30 Summary of Waste Management and Minimization Strategies

Construction Waste	Operational Waste
Reduce potential waste by ordering the correct quantities and specification of materials	Appropriate areas should be defined and signposted for the storage of waste and recyclable materials
Coordinate and sequence construction works and teams to minimise waste	Domestic waste should be stored separately and collected regularly and disposed of at a licensed waste receiving facility
Prefabricate structures and equipment items off-site where possible	Collect and store any off-cuts and scrap steel and timber separately to allow reuse or recycling
Procuring products, equipment and materials that are recycled, recyclable, repairable, refillable, reusable or biodegradable where possible	Procuring products, equipment and materials that are recycled, recyclable, repairable, refillable, reusable or biodegradable where possible
Collect and store any off-cuts and scrap steel and timber separately to allow reuse or recycling	Separating and segregating recyclables to avoid cross contamination of incompatible materials.
Excavated spoil should be classified and stockpiled in segregated areas for beneficial reuse (where feasible) with surplus disposed at a licensed waste facility	Recover any distressed/ mistaken loads through the slops tanks and recover into product storage tanks
Concrete components will where possible be crushed and reused on site as fill	Any hazardous waste should be stored separately and collected and disposed of at a licensed waste receiving facility.
Excess clean water from commissioning activities shall be stored and beneficially reused where possible	-
Domestic waste should be stored separately and collected regularly and disposed of at a licensed waste receiving facility	-

7.10.4 Waste Types

All waste generated shall be classified in accordance with the *EPA Waste Classification Guidelines, Part 1: Classifying Waste* (2014). An appropriately licenced waste removal contractor will be engaged for collection and disposal of all waste from the site.

The appropriate segregation and storage of waste materials, fluids and recyclables will be critical to ensuring that efficient disposal methods are available, as well as to minimise risks to the surrounding environment and personnel. Storage requirements are discussed further below.

Solid Waste

Solid waste streams would be expected during both construction and operational phases. Any solid waste will be:

- > Avoided through the procurement of products that are recyclable, repairable, refillable, reusable or biodegradable where possible;
- > Beneficially reused either on site or on another nearby site where possible;
- > Removed from site and recycled/recovered;
- > Taken to an appropriately licensed solid waste facility for disposal.

Liquid Waste

Limited liquid waste streams will be produced from the operation of the proposed Bulk Liquid Fuels Terminal and will include domestic and industrial liquid waste streams.

Domestic liquid waste will be limited to the following sources:

- > Domestic wastewater and sewerage from general hygiene amenities (to be piped directly into a Sydney Water sewer).

Industrial liquid waste will be limited to the following sources:

- > Oily water decanted from product (to be trucked from site);
- > Oily waste from oil/water separator (to be trucked from site);
- > Workshop waste water (to be trucked from site);
- > Ethanol waste water (trade waste disposal contingency required. Only minimal quantities expected as only required as contingency in event of leak occurring in the bund while raining or if a spill drains into the bund sump that is filled with rain water);
- > Workshop and operational waste grease and oil (minor quantities expected).

General Waste

The following storage requirements will be followed on site for general waste at all times:

- > Recyclable materials should be segregated and stored in a separate bin for collection by a licensed recycling contractor.
- > General solid waste (putrescibles and non-putrescibles) will be stored in separate bins, tanks or containers depending on the waste type, disposal method and waste collection contractor requirements.
- > Waste levels in bins, tanks, containers and skips will be monitored and emptied on a regular basis to prevent overflow of materials.

Hazardous Waste

Hazardous waste will be stored so as to prevent or control accidental releases to the air, soil, and water environments.

The following storage measures will be implemented for hazardous waste:

- > Sufficient space shall be provided between incompatible materials and/or physical separation such as walls or containment curbs;
- > Hazardous waste shall be stored in closed containers away from direct sunlight, wind and rain.
- > Secondary containment systems will be constructed with materials appropriate for the wastes being contained to prevent release to the environment;
- > The available volume of secondary containment will be at least 110 percent of the largest storage container, in that specific location;
- > Adequate ventilation will be provided where volatile wastes are stored;
- > Hazardous waste storage activities will be subject to special management actions. All employees involved in handling and storage of hazardous wastes will require specific training in safe and environmentally aware handling practices.

Additional management actions for hazardous waste materials will include:

- > Provision of Safety Data Sheets (SDS) and any other available information on chemical compatibility to employees for reference, including labelling containers to identify its contents;
- > Limiting access to hazardous waste storage areas to employees who have received proper training;
- > Clearly identifying, labelling and demarcating the waste storage areas, including documentation of storage locations on a facility map or site plan;
- > Provision of spill kits and clean up procedures;
- > Conducting periodic inspections of waste storage areas and documenting findings;
- > Preparing and implementing spill response and emergency plans to address accidental releases.

Hazardous waste will be disposed of via an appropriately licensed contractor to an approved waste disposal site.

7.10.5 General Waste Management

Waste Storage

TQ will ensure any required permits, certifications, and approvals from the EPA (or other relevant authorities) are obtained for the temporary storage of waste on-site or any other areas. It is anticipated that waste will be stored in a range of permanent and temporary vessels that include:

- > Waste bins
- > Waste oil tanks (i.e. from oil/water separator)
- > Slops tanks
- > Temporary toilet facility septic tanks.

Liquid Waste Management

- > Liquid waste slops from tank filling and transfer operations will be captured and blended (where product specifications allow) with existing product stored in other areas on the subject site.
- > All liquid waste removal during construction and operations will be undertaken by a licenced contractor.

Transportation

- > On-site and off-site transportation of waste will be conducted so as to prevent or minimize spills, releases, and exposures to employees and the public.
- > All waste containers designated for off-site shipment will be secured and labelled with the contents and associated hazards, be properly loaded on the transport vehicles before leaving the site, and be accompanied by the requisite documentation (i.e., manifest) that describes the load and any associated hazards.

Monitoring

Monitoring activities associated with the management of hazardous and non-hazardous waste will include:

- > Regular visual inspection of all waste storage collection and storage areas for evidence of accidental releases and to verify that wastes are properly labelled and stored.
- > Inspection of vessels for leaks, drips or other indications of loss
- > Identification of cracks, corrosion, or damage to tanks, protective equipment, or floors
- > Verification of locks, emergency valves, and other safety devices for easy operation (lubricating if required and employing the practice of keeping locks and safety equipment in standby position when the area is not occupied)
- > Checking the operability of emergency systems
- > Documenting results of testing for integrity, emissions, or monitoring stations (air, soil vapour, or groundwater)
- > Documenting any changes to the storage facility, and any significant changes in the quantity of materials in storage.

Audits

Waste audits would comprise:

- > Regular audits of waste segregation and collection practices
- > Tracking of waste generation trends by type and amount of waste generated
- > Characterising waste in the event of a new waste stream being created, and periodically documenting the characteristics and proper management of the waste, especially hazardous wastes
- > Keeping waste register or other records that document the amount of waste generated and its destination.

Records

Monitoring records for hazardous waste collected, stored, or shipped will include:

- > name and identification number of the material(s) composing the hazardous waste
- > physical state (i.e., solid, liquid, gaseous or a combination of one, or more, of these)
- > quantity (e.g., kilograms or litres, number of containers)
- > waste shipment tracking documentation
- > transported date and date of receipt, record of the originator, the receiver and the transporter
- > method and date of storing, repacking, treating, or disposing at the proposed waste receiving facility, cross-referenced to specific manifest document numbers applicable to the hazardous waste
- > location of each hazardous waste within the proposed PK BLT facility, and the quantity at each location.

7.10.6 Construction Waste Management

A CEMP will be prepared prior to the commencement of construction and will include specific waste management measures to be implemented during the construction phase of works. The CEMP should consider the WMS details and waste hierarchy outlined above in **Section 7.10.3**.

The range of management measures during construction are outlined in **Table 7-30**.

It is anticipated that waste will be stored in a range of permanent and temporary vessels that include:

- > Waste oil containers (to be collected and disposed of by licensed contractor)
- > Septic tanks (for pump out and disposal by truck at regular intervals).

The CEMP will address the following waste management requirements:

- > Consideration of waste minimisation and avoidance opportunities
- > Waste identification and classification (including any testing requirements for potentially contaminated or hazardous liquids)
- > Handling (including sorting and specialised handling methods for the variety of waste types)
- > Storage (including segregation methods and storage locations)
- > Disposal (including licensed contractor and waste disposal facility details)
- > Transport tracking (including delivery docket records management)
- > Reduce potential waste by ordering the correct quantities of materials
- > Coordinate and sequence trades people to minimise waste
- > Prefabricate materials where possible
- > Use modular construction and basic designs to reduce the need for off-cuts
- > Reuse formwork
- > Recycling will have priority over disposal
- > Separate off-cuts to facilitate reuse, resale or efficient recycling
- > Minimise site disturbance and limit unnecessary excavation
- > Select waste removal contractors to guarantee that recyclable waste are recycled
- > Set up schemes with suppliers to take back packaging material e.g pallets
- > Concrete components will where possible be crushed and reused on site, the remainder will be sent to a recycling facility
- > Asphalt will be re-used by transferring it to a batching plant or using it as a base layer for access roads;
- > Excavated earth will be used for infill and landscaping where feasible, the remainder will be sent to a recycling facility
- > Fuel and oil storage from demolition machinery will be secured and managed responsibly within compound sites during works, and removed upon completion of works.
- > Sewage waste shall be disposed of by a licensed waste contractor in accordance with Sydney Water and OEH requirement.

A discussion of CEMP requirements which cover Waste Management is included in **Section 8.1**.

Table 7-31 Construction Waste Assessment and Mitigation Measures

Activity	Waste Source	Potential classification as per EPA Waste Classification Guidelines (2014)	Estimated Quantities	Management Measures
Site preparation and excavations	Excess spoil	General Solid Waste (Non Putrescible)	Nil	Bulk earthworks plans note cut/fill operations shall either be net neutral or likely to require importation of fill rather than have a surplus
	Contaminated spoil	General Solid Waste (Non Putrescible)	Limited	No contamination soil has been identified. If any is discovered during construction, it will be disposed of in accordance with the Unexpected Finds Protocol to be incorporated into the CEMP.
		Hazardous waste	Nil	No demolition works are required and therefore likelihood to encounter hazardous materials (i.e. asbestos etc.) is very low.
	Ground water	Liquid Waste	Limited	Some groundwater may be experienced in excavations.
General administration activities	Paper, boxes, cartridges, toners	General Solid Waste (Non Putrescible)	Limited	TQ has adopted a paperless document management system and actively seeks to reduce the need to print paper copies where possible
	Temporary ablutions	Liquid Waste	Average 10,000L /week	All sewerage waste will be collected in a septic tank and trucked off site by licensed contractor until connection to existing rising main and agreement with Sydney Water has been established
	Food waste	General Solid Waste (Putrescible)	Limited	Food scraps and waste will be limited and only expected from crib rooms/site offices.
Construct foundations and access roadways	Excess concrete/ asphalt	General Solid Waste (Non Putrescible)	Limited	Excess materials will be limited due to costs of waste and only ordering what is needed for construction.
	Timber formwork	General Solid Waste (Non Putrescible)	Moderate amounts	Timber formwork will be reused where possible. Any damaged or unusable timber will be recycled, or disposed at a licensed receiving facility.
Delivery of construction plant and equipment	Steel pallet straps	General Solid Waste (Non Putrescible)	Approx. 500kg	Steel will be collected and recycled.
	Timber (packing crates, pallets, formwork)	General Solid Waste (Non Putrescible)	Approx. 1,000kg	Standard timber pallets will be reused where possible. Any damaged or unusable timber will be recycled, or disposed at a licensed receiving facility.
	Plastic (containers, wrapping)	General Solid Waste (Non Putrescible)	Minimal amounts	Plastics will be recycled where possible

Activity	Waste Source	Potential classification as per EPA Waste Classification Guidelines (2014)	Estimated Quantities	Management Measures
Erection of structures, equipment	Steel and other metals (offcuts, surplus reinforcing rods/mesh)	General Solid Waste (Non Putrescible)	Approx. 1,000kg	Most equipment will be prefabricated thus reducing the potential for waste to be on site during construction. Reuse or sell surplus material All steel and metal offcuts will be sorted for recycling.
Electrical installation and commissioning	Cabling offcuts and excess materials	General Solid Waste (Non Putrescible)	Approx. 500kg	Excess cable will be collected and reused or recycled by the electrical installation contractor.
Equipment and pipework commissioning	Gearbox oils	Liquid Waste	Limited	Provide to licensed contractor for processing, recycling and disposal (None of the major equipment has gearboxes, and small amount of lubrication oils are required).
	Hydrodynamic testing of pipework and vessels (using fresh water)	Liquid Waste (only if not deemed suitable for reuse or safe discharge into receiving environment)	Approx. 18ML	It is expected that clean fresh water used for hydrodynamic testing will be collected for beneficial use either on site or on a neighbouring facility.

7.10.7 Operational Waste Management

An OEMP will be prepared prior to the commencement of site operations. The OEMP will address appropriate waste identification, handling, storage and disposal requirements to be followed on-site during operations. The following aspects will be included and addressed in the OEMP to ensure that the potential waste sources are managed appropriately.

Details of the operational waste management requirements will be provided in the OEMP (refer to **Section 8.2.1**). The OEMP will also address the following waste management requirements:

- > Appropriate areas shall be provided for the storage of waste and recyclable material
- > Standard signage on how to use the waste management system and what materials are acceptable in the recycling will be posted in all waste collection and storage areas
- > All domestic waste shall be collected regularly and disposed of at a licensed facility
- > Waste collection vehicles will need to be able to service the development efficiently and effectively
- > An education programme and on-going monitoring will to be implemented for training personnel to properly sort and transport waste into the right components and destinations
- > Slops waste from fuel fill overflow capture bunds and sumps will be reused where possible
- > Sewage waste under operational conditions will be discharged via connection to rising main to Sydney Water under a trade waste agreement with Sydney Water.

The proposed PK BLT facility will generate both solid and liquid waste during operation. General solid waste will be collected and disposed of via a licensed contractor. Hazardous waste storage activities will be subject to special management actions and will be disposed of via an authorised contractor to an approved site. Specific details of hazardous waste disposal will be provided in the OEMP prepared for the proposed PK BLT facility prior to commissioning of the plant. Any trade waste considered suitable for discharge to sewer will be confirmed with Sydney Water's trade waste officer and be included in the trade waste agreement with Sydney Water.

With the implementation of the identified mitigation and management measures outlined above and summarised in **Section 11.2**, the waste generated by the proposed PK BLT will not have a significant adverse impact on the environment.

Table 7-32 Operational Waste Assessment and Mitigation Measures

Activity	Waste Source	Potential classification as per EPA Waste Classification Guidelines (2014)	Estimated Qty	Management Measures
General administration activities	Paper, cardboard	General Solid Waste (Non Putrescible)	Minor amounts during operation phase	TQ has adopted a paperless document management system and actively seeks to reduce the need to print paper copies where possible Recycle General Solid Waste (Non Putrescible) Separate and stockpile paper and cardboard materials in appropriate area on site for collection and recycling
	Sewage	General Solid Waste (Putrescible)	Minor amounts during operation phase	Connection to sewer main. Enter into Trade Waste Agreement with Sydney Water.
	Domestic and kitchen wastes	General Solid Waste (Putrescible)	Minor amounts during construction phase	On site separation, with collection from site by a licensed contractor
Delivery of plant and equipment for maintenance and operational activities	Steel pallet straps	General Solid Waste (Non Putrescible)	Approx. 500 kg	Separate and stockpile metals in appropriate area on site for collection and recycling All steel and metal strapping will be recycled.
	Timber (packing crates, pallets, formwork)	General Solid Waste (Non Putrescible)	Approx. 1,000 kg	Separate and stockpile timber materials in appropriate area on site for reuse or disposal at licensed waste receiving facility Recycle General Solid Waste (Non Putrescible)
	Plastic (containers, wrapping)	>General Solid Waste (Non Putrescible)	Minor amounts during construction phase	Separate and stockpile plastic in appropriate area on site for collection and recycling Recycle or dispose as General Solid Waste where unable to be recycled
Maintenance of structures and equipment	Steel and other metals (offcuts, surplus reinforcing rods/mesh)	General Solid Waste (Non Putrescible)	Approx. 1,000kg (reuse or sell surplus material and recycle offcuts)	All steel and metal offcuts will be sorted for recycling.
	Old equipment components and parts	General Solid Waste (Non Putrescible) or Hazardous Waste	Variable, but limited quantities anticipated	To be removed from site by licensed contractor.

Activity	Waste Source	Potential classification as per EPA Waste Classification Guidelines (2014)	Estimated Qty	Management Measures
	Cabling offcuts and excess materials	General Solid Waste (Non Putrescible)	Approx. 500 kg (store/sell usable excess cable for reuse and recycle offcuts)	Recycle General Solid Waste (Non Putrescible)
	Gearbox oils	Hazardous waste	Variable, but limited quantities anticipated	Waste oil to be stored in appropriate container on site. To be removed from site by licensed contractor for re-processing, recycling or appropriate disposal.
Receipt, storage and delivery of bulk fuels	Fuel spills	Hazardous Waste	Minor amounts of fuel captured by bunds	Fuel spills will be contained and collected in bunded areas or drip trays and transferred to slops tanks for product recovery. Remaining slops tank contents will be pumped to oily water separator for final treatment prior to clean water discharge.
	Slops from shore line flushing following a product change	Hazardous Waste	Moderate amounts to be stored in slops holding tanks	Test and blend slops with product stored on site if product specifications can still be maintained. Otherwise slops to be removed from site by licensed contractor.
	Slops from draining road tanker compartments prior to loading	Hazardous waste	Minor amounts of less than 1 litre per tanker.	Waste water is pumped from slops tank to oily water tank on each site.

7.11 Visual Amenity

Cardno has undertaken an assessment of Visual Amenity for the Proposal to address the SEARs. The SEARs addressed in this Section are provided in **Table 7-33**.

Table 7-33 Secretary's Environmental Assessment Requirements (Visual Amenity)

Secretary's Environmental Assessment Requirements	Where Addressed
Visual Amenity – including:	
<ul style="list-style-type: none"> ▪ an assessment of the potential visual impacts of the proposed development on the amenity of the surrounding area 	Section 7.11.4

7.11.2 Assessment Methodology

Cardno undertook a detailed Visual Impact Assessment (**Appendix J**) of the PK BLT to identify any potential visual impacts and to identify mitigation measures to reduce potential loss of amenity for surrounding areas. Cardno completed a preliminary viewshed analysis, site inspection, visualisation of the development, examination of surrounding development, lighting impact assessment and identified the visual impacts of the Proposal.

7.11.3 Existing Environment

The Proposal is to be located within an established industrial complex which operates 24 hours a day and 7 days a week. Areas within this complex are used and occupied for the purposes of industrial and port activities and include activities of the Port Kembla Coal Terminal, GrainCorp Grain Terminal, GrainCorp Liquids Terminal and BlueScope Steel and Australian Amalgamated Terminals.

The existing landscape is generally of low visual quality, with elements of higher visual quality north and south along the coastline. The Visual Assessment concluded that the existing environment is of generally low visual sensitivity with the capacity to absorb development due to existing industrial character. There were no identified issues that were considered important in maintaining the local visual quality.

7.11.4 Assessment of Potential Impacts

Cardno concluded that the proposed development will have minimal visual impact.

A viewshed analysis was completed to develop realistic representations of the visibility of the PK BLT from particular view points in the surrounding area. The analysis identified a number of locations that the Proposal will or may be visible from. The Proposal will likely be visible from residential areas in Coniston, Cringila and southern parts of the Wollongong CBD; beaches and coastal open space between Flagstaff and the Wollongong Golf Club; east facing sections of the elevated suburbs of Farmborough Heights, Cordeaux Heights; and areas within Port Kembla.

Views are not significant in these areas due to the existing industrial complex, filtered/blocked views by existing development or vegetation and the occupation of similar land uses. The PK BLT will not be visible from most surrounding residential suburbs. The viewshed analysis concluded that the Proposal will only be visible from scattered vantage points. **Figure 7-10** and **Figure 7-11** show a visualisation of the development from Flagstaff Hill and Mount Keira - two popular tourist locations with views of the industrial lands at Port Kembla. Due to the industrial appearance of the port and the activities that take place at the site, the proposal integrates with the existing development. Refer to Appendix A of the Visual Assessment located at **Appendix J** of this EIS for a comparison of the existing vista and vista inclusive of the PK BLT.

Figure 7-10 Existing & Proposed View of Development from Flagstaff Hill



Figure 7-11 Existing & Proposed View of Development from Mount Keira



Cardno assessed the impact of the Proposal on light spill in the context of the surrounding industrial development. Surrounding development is extensively illuminated by numerous large industrial facilities that operate continuously. Existing facilities contribute significantly to light pollution. The PK BLT will require specific lighting fixtures in accordance with Australian Standards. The extent and height of proposed lighting fixtures are not expected to introduce a visual impact associated with light spill.

The Proposal is located in an existing industrial area and is to some degree sheltered and filtered by existing industrial development around the site. Additionally, the visual character of the Proposal integrates well with existing industrial development. The materials, geometrics and scale of development are similar to surrounding land uses; therefore the Proposal will not appear as visually dominant or intrusive. The assessment concluded that where development is visible, it will appear integrated with existing development. Therefore the proposed PK BLT will have minimal visual impact on the amenity of surrounding areas.

7.11.5 Environmental Management Measures

Cardno provided the following recommendations to reduce the potential impact of the development:

- > Use of materials and paints to mimic the existing industrial development as far as reasonably practical;
- > Design and implementation of lighting in accordance with:
 - AS 4282 – 1997 Control of the obtrusive effects of outdoor lighting
 - AS 1940 – The storage and handling of flammable and combustible liquids
 - AS NZS 1680.5:2012 Australia and New Zealand Interior and workplace lighting, Part 5: outdoor workplace lighting.

7.12 Heritage

Cardno has undertaken an assessment of Heritage from the Proposal to address the SEARs. The SEARs addressed in this Section are identified in **Table 7-34**.

Table 7-34 Secretary's Environmental Assessment Requirements (Heritage)

Secretary's Environmental Assessment Requirements	Where Addressed
> Heritage – including:	
<ul style="list-style-type: none"> ▪ Aboriginal and non-Aboriginal heritage items and values of the site and surrounding area, taking into account the NSW Heritage Manual and Assessment Heritage Significance Guidelines. 	Section 7.12.3

The assessment identified that the site is highly modified and disturbed following a history of dredging and reclamation at the site. The site was found to have no Aboriginal or European heritage sites or object listed at the site. Due to the disturbance of the site and the absence of heritage significance the site has a low potential to result in the impact of heritage objects or places.

7.12.2 Assessment Methodology

Aboriginal and Non-Aboriginal Heritage was reviewed and assessed utilising the following methodology.

Aboriginal Heritage

An assessment of Aboriginal Heritage was undertaken in accordance with *the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010), Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH, 2011) and the NPW Act 1974 and consisted of the following process:

1. Identify whether or not Aboriginal objects are, or are likely to be, present in an area
 - a. Search the Aboriginal Heritage Management Information System (AHIMS) database, Australian Heritage Database, NSW State Heritage Inventory and any other sources of information
 - b. Characterisation of the landscape features and whether the landscape feature indicates the likely existence of Aboriginal objects
 - c. Determine the level of historical disturbance in the area
2. Determine whether or not their activities are likely to harm Aboriginal objects (if present)
 - a. Determine the extent of proposed works (including operation) in relation to known sites or areas of potential sites (if relevant)
 - b. Determine is impact can be avoided through project design (if relevant)
3. Determine whether an Aboriginal Heritage Impact Permit (AHIP) application is required

Within this process the following definitions are used as per NPW Act.

Aboriginal objects - "*any deposit, object or material evidence (not being a handicraft for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of the area by persons of non-Aboriginal extraction, and includes Aboriginal remains*".

Aboriginal places - "*a place declared under section 84*" of the NPW Act 1974 that, in the opinion of the Minister, is or was of special significance to Aboriginal culture. Such areas need not contain any Aboriginal objects but can only be gazetted with the approval of the Minister.

Harm - "destroying, defacing, damaging the object or place" or to "move the object from the land on which it is has been situated". There are a number of defences and exemptions to the offences of harming an Aboriginal object or place.

Section 5 of the Due Diligence Code of Practice for the Protection of Aboriginal Objects states that consultation with the Aboriginal community is not a formal requirement of the due diligence process. As such no formal consultation has been undertaken as part of this investigation consistent with Section 5 of the Code of Practice.

Non-Aboriginal Heritage

Non-Aboriginal Heritage was reviewed through desktop research including review of:

- > World Heritage List
- > National Heritage List (Australian Heritage Council)
- > The Commonwealth Heritage List (Australian Heritage Council)
- > The State Heritage Register (NSW Heritage Branch, Office of Environment and Heritage)
- > Section 170 NSW State Agency Heritage Register
- > Heritage Schedule(s) from the Wollongong City Council Local Environmental Plan 2009
- > The State Heritage Inventory (NSW Heritage Branch, Office of Environment and Heritage)
- > OEH Maritime Heritage Sites Database
- > The Register of the National Estate (Australian Heritage Council)
- > Register of the National Trust of Australia (NSW); and
- > Australian Institute of Architects, Heritage Buildings List.

Available historical reports from the area were also considered including:

- > Soybean Processing Facility and Biodiesel Production Facility Environmental Impact Statement (Maunsell, 2008)
- > Thematic History of the City of Wollongong (Kass, 2010).

7.12.3 Existing Environment

The pre-settlement environment of Port Kembla was defined by the confluence of Tom Thumbs Lagoon and Allans Creek. This environment including shallow embayments, rock pools and surrounding forests and grasslands provided a variety of available food sources for local Aboriginal people including fish and shellfish, as well as small marsupials and native tubers and grasses.

Port Kembla was identified by Captain Cook as Red Point in 1770. Prior to this time, Aboriginal people had been living in the area for at least 30,000 years (Kass, 2010). Clans in this area belonged to the Dharawal language group within a sub group referred to as the Wodi Wodi. In 1816 military detachments were stationed at Red Point by order of Governor Macquarie to 'clear' the Illawarra and south coast areas of indigenous people to ensure the safety of settlers. Numerous conflicts between the local Aboriginals and European settlers have been recorded throughout the early 1800s.

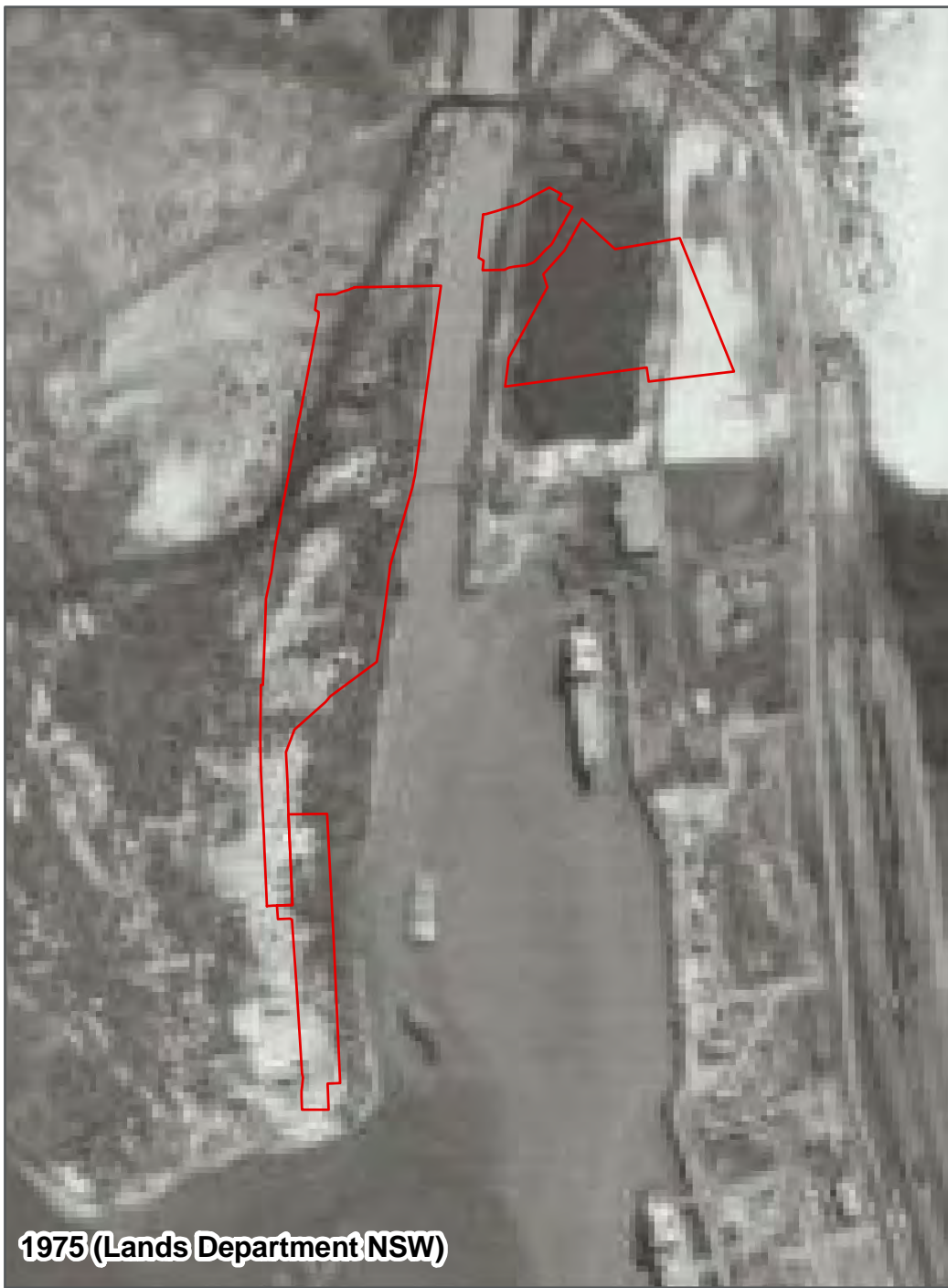
In 1883 the Mount Kembla Coal and Oil Company built a railway from Mount Kembla mine to the coast to ship coal to other parts of the colony (Kass, 2010). There was no natural harbour at this time and so the company constructed a jetty just north of Red Point which was named Port Kembla. In 1898, the then NSW government designated to build a deep water harbour at Port Kembla. Under the Port Kembla Act 1898 (repealed) the government built a deep water harbour including the eastern breakwater, necessary jetties and rail lines. Construction commenced in 1900 and was completed in 1908. The northern breakwater was subsequently completed in 1925. On 27 December 1963, the first coal export berth (No1) came into service.

A grain-loading terminal was opened in 1990. Two oil platforms were constructed on the land to the west of the Grain Terminal in 1996.

Throughout the development of the harbour, natural shorelines and watercourses in the Port Kembla area have become highly modified through a continuous process of dredging and emplacement of fill. **Figure 7-12** shows the modifications of the project site from 1975 to today (2015). In 1975 and 1985 the shoreline extends beyond Berth 104 and appears to consist of stockpiled material. In 2001 it can be seen that a large portion of the shoreline has been removed to a substantial depth to allow for ships to dock. The shorelines along Gurungaty Waterway have also become formalised through the use of retaining walls, preventing the movement of sediment within the waterway. The portion of the site to the east also appears to have large volumes of material removed post 1985 resulting in relatively flat areas. However, post 2001 additional fill has been emplaced on the site.

Due to the high level of modification at this site, there is a low potential for objects or places of Aboriginal significance to remain at this location. A search of the NSW Aboriginal Heritage Information Management System (AHIMS) did not identify and registered sites at the project area. Searches in the NSW Heritage Inventory and Australian Heritage Database were also found to yield no results. There are no heritage sites listed within the WLEP located at or near the project site.

A search of the relevant non-Aboriginal Heritage database searched was also found to yield no results for the project site however, it is noted that the OEH Maritime Heritage Sites Database identified that there are a number of ships lost within and surrounding Port Kembla.



Legend

 Project Site



FIGURE 7-12
1:6,000 Scale at A3



Historical Aerial Imagery

PORT KEMBLA



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2015-12-04
Coordinate System: GDA 1994 MGA Zone 56
Project: 82015103_001
Map: 82015103-GS-022-HistoricalAerial.mxd 04

7.12.4 Assessment of Potential Impacts

In accordance with the relevant legislation Aboriginal and non-Aboriginal heritage was considered in relation to proposed works.

Aboriginal Heritage

No Aboriginal archaeological objects or places were identified within the site through the desktop database search. A review of historical imagery indicates that the site is highly modified through continual placement and removal of fill. Due to this level of disturbance and modification there is a low potential for object or places of Aboriginal significance to be located at the proposed site. This is consistent with Section 7.5 of the Due Diligence Code of Practice which defines the undertaking of activities upon disturbed land as a low impact activity. In addition to this, consultation undertaken for the site as part of the Proposed Soybean Processing and Biodiesel Production Facility Environmental Assessment identified that Illawarra Local Aboriginal Land Council have no objection to works being undertaken at this location.

Based on this review of available information it is determined that:

- > The proposed work site has a low potential for objects or places of Aboriginal significance
- > No constraints relating to Aboriginal objects and values and their protection under the NPW Act or other legislation have been identified for the proposed works
- > In the event that Aboriginal artefacts are discovered during the works, all works are to cease and protocol consistent with requirement 25 in the Code of Practice for Archaeological Investigation of Aboriginal Objects be implemented
- > No further action is warranted regarding the protection of Aboriginal objects.

Historic Heritage

As discussed above, the PK BLT site is identified as a highly disturbed and highly modified environment. Additionally, there are no sites of local, state or commonwealth heritage significance identified at the site or within three kilometres of the site. Due to this lack of sites and object of historic heritage a Statement of Heritage Impact is not required for the project as the project has a low potential to impact on objects or places of European heritage.

7.12.5 Environmental Management Measures

The following mitigation measures have been developed for the Proposal to ensure the protection of heritage objects and places in the event of the discovery of such items during the site works. The mitigation measures will be included in the CEMP and OEMP:

- > In the event that potential Aboriginal or European artefacts are discovered during the works, all works are to cease immediately within the direct area. TQ is to immediately inform NSW Ports, the NSW Office of Environment and Heritage and a member of the Illawarra Aboriginal Land Council (if in relation to an Aboriginal place or object). Appropriate management of the site will be coordinate with the relevant agencies.

7.13 Soils and Groundwater

Cardno has undertaken an assessment of potential soils and groundwater impacts to address the SEARs. The SEARs addressed in this Section are identified in **Table 7-35**.

Table 7-35 Secretary's Environmental Assessment Requirements (Soil and Water)

Secretary's Environmental Assessment Requirements	Where Addressed
> Soil and Water– including:	
<ul style="list-style-type: none"> ▪ an assessment of the potential soil, groundwater and surface water impacts and the measures proposed to mitigate these impacts; 	Section 7.13.4
<ul style="list-style-type: none"> ▪ an assessment of pollutant loads and concentrations, contaminated groundwater and soils, acid sulfate soils and proposed mitigation and management measures, particularly in the event of a product spill; and 	Section 7.13.4

Port Kembla Harbour is a highly modified environment which has been developed through a number of dredging and emplacement processes resulting in its current landform. Due to this history of imported fill, soil quality and type needs to be considered as part of this assessment.

7.13.2 Assessment Methodology

To assess the potential for environmental impacts relating to soils, a Soils and Groundwater Impact Assessment was undertaken by Cardno (**Appendix K**). This impact assessment aimed to:

- > Review available background documentation relating to soils, groundwater and contamination; and
- > Identify potential impacts to soils, groundwater and contamination associated with the proposed development.

The literature review considered a number of assessment which have previously been undertaken for the site including:

- > URS (2005) *National Biodiesel Production Facility: Contamination Assessment, Inner Harbour, Port Kembla, NSW*
- > URS (2008) *National Biodiesel Production Facility: Contamination Assessment, Inner Harbour, Port Kembla, NSW*
- > URS (2012) *National Biodiesel Production Facility: Contamination Assessment, Inner Harbour, Port Kembla, NSW*
- > Coffey (2012) *Preliminary Baseline Contamination Assessment – Proposed Biodiesel Facility Inner Harbour, Port Kembla.*

In addition to the Soils and Groundwater Impact Assessment, a geotechnical investigation report which was prepared for the site in 2012 was also reviewed. This investigation was undertaken by Douglas Partners (2012) to provide information on the subsurface conditions for foundation design. The investigation included test excavation pits and cone penetration tests, followed by laboratory testing of typical soil samples recovered from the pits. The complete report is included within **Appendix K**.

7.13.3 Existing Environment

The *Wollongong – Port Hacking 1:100 000 Geological Series Sheet* (Stroud et. al. 1996) indicates the site is underlain by the Dapto Latite Member, a formation of Permian age belonging to the Shoalhaven Group. The Dapto Latite Member typically weathers to form clays of high plasticity (Douglas Partners, 2012).

The *Wollongong – Port Hacking 1:100,000 Soil Landscape Sheet* (Hazelton and Tille, 1990) defines the underlying soil landscape as “Disturbed Terrain”. The subsequent review of previous testing undertaken within the site supports this with evidence of fill such as slag, gravel, concrete and sand logged in borehole and test pits along with clay and sandy clay. A typical soil profile provided in URS (2005) defines a typical cross section of the site (refer to **Table 7-36**).

Table 7-36 Geological (Soil) Profile (URS, 2005)

Depth (mBGL)	Current Land Use
0.0-0.2	FILL: Slag, gravel, sand, rock fragments, mostly dry.
0.5-2.0	SILTY CLAY: Soft, moist, dark brown; some sand, medium plasticity.
2.0-5.5	SAND: Moist, medium-grained, some shells, some clay.
3.4-4.4	GRAVEL: Black, some clay, wet.
4.5-6.0	SANDY CLAY: Black, moist, soft, plastic, some gravel.

The review of data such as the Australian Soil Resource Information System (ARSIS) and the Acid Sulfate Soil Risk Map, Wollongong (9029S2, Department of Land and Water Conservation, Edition 2) indicate that the probability of Acid Sulfate Soil (ASS) occurrence is low for the site due to the site occurring within high disturbed terrain. The *Geotechnical Investigation Report* (Douglas Partners, 2012) identified that samples greater than 5m in depth below the site were found to incur Potential Acid Sulphate Soils (PASS) with a calculated preliminary liming rate requirement of up to 8.4kg CaCO₃/tonne.

The Soils and Groundwater Impact Assessment identified the following existing soil contamination trends:

- > Concentrations of Total Recoverable Hydrocarbons (TRH) and Benzene, Toluene, Ethyl-benzene, Xylenes and Naphthalene (BTEXN) in the soils sampled were generally below the laboratory detection limits. Where TRH was detected it was below the adopted Health Screening Level for a commercial / industrial land use setting.
- > Concentrations of Volatile Organic Compounds (VOCs), phthalate esters, pesticides and polychlorinated biphenyls in the limited number of soils sampled were less than the laboratory detection limits and the adopted assessment criteria.
- > Concentrations of VOCs, phthalate esters, pesticides and polychlorinated biphenyls in the limited number of soils sampled were less than the laboratory detection limits and the adopted assessment criteria.
- > Concentrations of Poly Aromatic Hydrocarbons (PAHs) and Phenols were generally below the laboratory detection limits. Where PAHs were detected they were at concentrations below the adopted Health Screening Level for a commercial / industrial land use setting.
- > Laboratory analysis of a limited number of soils for metals (arsenic, cadmium, chromium, copper, lead, mercury and zinc) indicates that concentrations of metals in soils sampled were less than the adopted assessment criteria for a commercial / industrial land use setting.

Groundwater data reviewed within the soil and groundwater impact assessment identified that groundwater levels of parameters such as TRH, BTEXN, VOCs, OCPs, OPPS, PCBs, PAHs and Phenols were all found to be below the adopted Health Screening Level for commercial/ industrial land use setting. Most heavy metals tested were also found to be below the adopted criteria with the exception of some elevated concentrations of copper and zinc in some samples.

The geotechnical classification of the fill on site defined the fill as to predominantly consist of non-cohesive sands and gravels with some exceptions which consisted of low plasticity clay. The predominant gravel fill (slag and coal wash) and natural sand soils on the site were classified as "Mildly Aggressive" when assessed in accordance with *AS 2159-2009 Piling-Design and Installation*.

7.13.4 Assessment of Potential Impacts

During construction, the risk of onsite soil erosion will increase due to the works resulting in exposure of soils through earthworks. Expected earthworks will include excavation, transportation of soils and fill, the construction of subgrade, embankments and culverts; and temporary stockpiling of material. These activities increase the risk of erosion and subsequent transportation soils and sediments by water runoff and wind into nearby waterways including Port Kembla. It is noted that shallow soils have been identified as slag and as such are defined as unlikely to be highly erodible.

There is a potential for ASS to occur in material greater than 5m below the surface. Sulfide minerals within ASS are generally stable under reducing conditions however, on exposure to the atmosphere the acidity

produced from sulfide oxidation can impact water quality and corrode concrete and steel structures. Excavation of material down to 5m depth is not likely as a result of the works, however, mitigation measures identified in **Section 7.13.5** below will be in place in the contractors CEMP to ensure that in the event that PASS are exposed risks are managed in accordance with the *Acid Sulfate Soils Assessment Guidelines* (Ahern et al., 1998) and *Acid Sulphate Soil Manual* (Stone et al., 1998).

Although contaminated soils and groundwater have not been identified in the study area, there is a risk that previously unidentified contamination may be exposed during construction activities such as excavation. Additional groundwater and soil testing will be undertaken prior to the development of the CEMP to greater identify potential areas of contamination which may require mitigation and management. Groundwater monitoring will be ongoing through construction and operation and will be reported as part of the regular Environment Condition Reports to NSW Ports as part of leasing requirements. The low risk of exposing contamination will be managed during construction through the implementation of an Unexpected Finds Protocol in the contractors CEMP. The protocol is described in **Section 7.13.5** below. As there is a deficit of fill on site no fill from the site is proposed to be exported from the site.

During operation, there is a risk of spills and leakages from the PK BLT. The proposed operations has the potential to result in the leakage of number of chemicals which could have potential impacts on the surrounding environment if adequate measures are not in place to contain and remediate accidental spills. To minimise or eliminate this risk, the following design features will be incorporated within the development:

- > Construction of hardstand areas with appropriately sized bunding, or self-bunded tanks around liquid storage and refuelling areas as described in **Section 3**
- > Construction of appropriate enclosed and separate drainage systems, oil/water separators (further described in **Section 3**)
- > Implementation of maintenance inspections/audits during operation.

Due to the shallow nature of the groundwater at this location mitigation measures will be required to protect the groundwater systems from accidental spills or leakages migrating into the groundwater system. If groundwater is encountered during excavation adequate assessment of the volume and quality of that water will be undertaken to determine and guide the need for any dewatering permits.

7.13.5 Environmental Management Measures

Based on the identified risk to soil and groundwater the following mitigation measures are proposed:

Construction

- > Development of a CEMP including a Soil and Water Management Sub-plan to manage potential erosion and sediment impacts during construction
- > Sediment and erosion control devices should be installed to minimise transport of sediment in accordance with *Managing Urban Stormwater, Soils & Construction, Volume 1* (Landcom, 2004). These devices should be inspected regularly and immediately after rainfall to ensure effectiveness over the duration of works. Any damage to erosion and sediment controls should be rectified immediately
- > Risks associated with the disturbance of any ASS encountered during construction would be managed through an expected finds protocol outlined in the CEMP
- > Construction of hardstand areas with appropriately sized bunding around fuel storage and refuelling areas
- > Construction of appropriate enclosed and separated clean and oily water drainage systems which shall include the installation and operation of an oil/water separator
- > If groundwater is encountered during excavation, a groundwater assessment will be undertaken to determine the volume and quality of the water to determine if appropriate permits are required.

Operation

- > Development of an OEMP to manage and monitor potential operational phase soil and groundwater impacts, such as spills and leakages
- > Implementation of regular maintenance inspections/audits during operation
- > Ongoing groundwater monitoring will be undertaken prior and during construction and throughout operations to monitor for potential contamination.

7.14 Utilities

7.14.1 Assessment Methodology

TQ has undertaken an analysis of utilities required to service the site throughout all development stages. The proposed development is located within a well-established, highly utilised industrial complex. Many required services for the development are already located on or adjacent to the site and as such, the development will rely upon existing utilities. Utilities required for the site include High Voltage Power Supply, Low Voltage Power Supply, Portable Water, Telecommunications, Plant/Instrument Air, Nitrogen and Sewerage.

The PK BLT site facilities will need to be connected to electricity and mains water. A stormwater management system to manage surface runoff will be an integral part of the site infrastructure. The clean stormwater water catchment and collection system will be separated from any bunded areas that have the potential to collect any leaks or spills from tanks or transport operations.

Further discussion on the stormwater management system is provided in **Section 7.7**.

7.14.2 Existing Environment

The site will utilise existing ring main circuits to provide high voltage power to Site 2 and Site 3 of the proposed development. These two sites will contain two 1MVA 11k/415V pad mount transformers which will be fitted with a LV circuit breaker rated for full capacity. Transformers will also be utilised for temporary power during the construction phase. A switch room is to be constructed adjacent to each pair of transformers. Endeavour Energy is the service provider.

Motor Control Centres (MCCs) will be supplied in each of the switch rooms for the purpose of low voltage power supply and will be used to supply power to equipment on Site 1, Site 2 and Site 3, lighting, general power distribution as well as a backup supply in the instance of high voltage power supply failure.

Water for the site will be piped from the existing 150 MS water main on the site. It will supply water for the control room and surrounds, the loading gantry, product pump, inlet areas and the berth.

TQ has advised that plant and instrument air will be supplied from a compressor and dryer system with a main receiver located on Site 3. A liquid nitrogen storage tank will also be located on Site 3 for pigging and purging operations. Sewerage facilities will discharge to an existing rising main on the adjacent side of Gurungaty Waterway. Sewerage will only be generated at Site 3.

7.14.3 Assessment of Potential Impacts

The utility supply requirements for the PK BLT development will be designed to appropriate Australian Standards and relevant authority guidelines to consider the existing capacity and future performance of all utility servicing. The connection and augmentation of all utility works requirements will be designed, planned and carried out in a manner that will minimise impacts on the existing neighbouring operations.

7.14.4 Environmental Management Measures

Consultation will continue to occur with NSW Ports and relevant service providers to discuss design and access requirements for the site. Prior to construction, all existing utilities and their locations will be confirmed to avoid any conflicts. Any associated servicing augmentation approvals and requirements will be arranged by TQ with the appropriate servicing authorities prior to construction commencing.

TQ will also operate the PK BLT in accordance with any utility supply agreements.

7.15 Socio Economic

Cardno has undertaken an assessment of Socio-Economic impacts for the proposed PK BLT.

7.15.1 Assessment Methodology

This Socio-Economic assessment has been undertaken to gain an understanding of the potential social and economic impacts arising from the construction and operation of the Proposal. In assessing these impacts, a review of available data has been undertaken to gain an understanding of the characteristics and trends of the community surrounding the Site.

The assessment of social impacts included consideration of the existing social environment, identifying potential impacts from the construction and operation of the Proposal. These impacts include noise, air quality, traffic, water quality and visual impacts on the social environment.

The assessment of economic impacts included consideration of employment opportunities during the construction and operation, along with an overview of the Proposal's relationship to the wider liquids storage and energy industry in Australia.

7.15.2 Existing Environment

The existing social and economic environment in the context of the PK BLT relates to the wider Illawarra Region, comprising the Wollongong, Shellharbour, Kiama and Shoalhaven LGAs, along with the Wollongong locality and the immediate surrounding suburbs to the site. Surrounding suburbs include Port Kembla and Cringila to the south, and Coniston, Mount St Thomas and Wollongong to the north.

The demographic and economic profiles of these areas are detailed below.

7.15.2.1 *Illawarra Region*

The Illawarra Region had a population of 385,250 people at the 2011 Census, with population predictions from DP&E identifying that the Region will grow by 65,050 people by 2031. This represents a population growth rate of 0.86 percent per annum.

The existing population profile of the Region is defined by an older population compared to the NSW average, with the median age of the region at 38.5 in 2011, compared to the NSW median age of 37.6. This older population is evident in the 2011 population profile, with 24.12 percent of the region's population aged 60 or older, compared to the NSW average of 20.37 percent. Younger generations aged 20 to 39 years are less represented compared to the NSW average, with this age bracket containing 23.73 percent of the Region's population, compared to the NSW average of 27.17 percent.

In terms of jobs growth, the DP&E has identified that to support the predicted growth of 65,050 people, the Region will need to create 32,150 new jobs. The DP&E in 2014 noted that jobs growth in the Illawarra has been slowing over the past 10 years, with growth rates at 1.7 percent per annum. A primary cause of this declining jobs growth has been the reduction of traditional industrial jobs, with many of these located in industries directly linked to the port of Port Kembla. Despite this, the *Draft Illawarra Regional Growth and Infrastructure Plan* (DP&E, 2014) identified the Port as one of the main economic drivers of the region moving forward. Other growth industries included health care and social assistance, tourism, education and ICT and knowledge services.

7.15.2.2 *Wollongong LGA*

The Wollongong LGA covers an area of 714km² comprising a narrow coastal plain approximately 80km south of Sydney. The LGA is bound by the Royal National Park to the north, the Pacific Ocean to the east, Lake Illawarra to the south and the Illawarra Escarpment to the west. The population of the Wollongong LGA was 192,421 people at the 2011 Census. This has increased by 4.6 percent from 184,207 in 2006.

The most common housing type in the Wollongong LGA is family households, representing 69.9 percent of all household types. This is in comparison to the NSW average of 71.9 percent. The average number of people per house is 2.5, compared to the NSW average of 2.6.

The main employment industries in the Wollongong LGA are Health Care and Social Assistance, Manufacturing, Education and Training and Retail Trade. This is consistent with the main employment industries throughout NSW, with Health Care and Social Assistance, Retail Trade, Manufacturing and Education and Training being the four major industries.

The average personal income at the 2011 census was \$52,936, compared to the NSW average of \$53,917.

The unemployment rate at the 2011 census was 7 percent for the LGA, compared to the NSW average of 5.9 percent.

24.7 percent of the LGA's population has post school qualifications, which compares to the NSW average of 28.2 percent.

The most common transportation means for workers to travel to work is car, representing 70 percent of all trips to work. The use of public transport (bus and train) is lower, with these two methods totalling 4.8 percent of all trips to work. This compares to the NSW average of 62.6 percent for car travel and 9.9 percent for public transport usage.

These social and economic indicators are listed in **Table 7-37** below.

Overall, this profile illustrates that the Wollongong LGA is generally consistent with the NSW averages in terms of annual salary and household size. The LGA contains a slightly older population, with its higher unemployment rate potentially linked to its higher rate of employment in the manufacturing industry, which is in decline. This higher proportion of the population employed in manufacturing may also be linked to the LGA's lower proportion of post school qualifications. The reliance on the car as the main means of travel to work is also noticeable in the comparison with the NSW average.

Table 7-37 Social and Economic Indicators, Wollongong LGA

Indicator	Wollongong LGA	NSW
Median Age	38.2	37.6
Average Household Size	2.5 people	2.6 people
Unemployment Rate	7%	5.9%
Top Three Largest Employers by Industry	Health Care and Social Assistance – 15.45% Manufacturing – 11.91% Education and Training – 11.35%	Health Care and Social Assistance – 11.9% Retail Trade – 10.65% Manufacturing – 8.64%
Average Annual Wage	\$52,936	\$53,917
Percentage of Population with Post School Qualification	24.7%	28.2%
Percentage of Workforce Using Car as Means of Travel to Work	70%	62.6%
Percentage of Workforce Using Public Transport (Bus and Train) as Means of Travel to Work	4.8%	9.9%

Source: ABS, 2011

7.15.2.3 Surrounding Suburbs

As noted above, the suburbs surrounding the Site include Port Kembla and Cringila to the south, and Coniston, Mount St Thomas and Wollongong to the north. Each of these suburbs vary in terms of their population and demographic.

The Port Kembla and Cringila communities to the south of the site are linked with the industrial history associated with the Port. Both suburbs underwent rapid growth in the 1950s and 1960s, with immigration from European areas resulting in multicultural communities.

The Coniston and Mount St Thomas areas to the north of the Site are predominantly residential areas, with these suburbs and their housing growing during the post war periods. These communities also have higher levels of languages other than English spoken at home.

Wollongong is the commercial and cultural hub of the Wollongong LGA, containing a number of major commercial services, government agencies and the region's major hospital. Wollongong has undergone recent growth, with residential apartments increasing in their prevalence.

An assessment of the key social and economic indicators of these suburbs is listed in **Table 7-38**.

Table 7-38 Social and Economic Indicators, Surrounding Suburbs

Indicator	Port Kembla	Cringila	Coniston	Mount St Thomas	Wollongong
Population	4,883	2,115	2,181	1,423	16,719
Unemployment Rate	4.89%	5.17%	5.7%	4.45%	5.14%
Top Average Weekly Household Income Bracket	\$1,500-\$1,999 – 11.47%	\$1,500-\$1,999 – 12.49%	\$1,500-\$1,999 – 11.21%	\$2,000-\$2,499 – 15.33%	\$1,500-\$1,999 – 9.75%
Main Housing Type	Detached dwelling – 83.4%	Detached dwelling – 96.99%	Detached dwelling – 62.88%	Detached dwelling – 93.49%	Apartment – 63.17%
Top Three Languages Spoken at Home	English – 63.18% Macedonian – 16.87% Italian – 5.04%	English – 32.67% Macedonian – 20.76% Arabic – 12.77%	English – 12.47% Macedonian – 12.47% Serbian – 5.23%	English – 76.95% Macedonian – 3.72% Spanish – 2.39%	English – 62.31% Mandarin – 4.68% Macedonian – 3.27%
Top Three Industries of Employment	Manufacturing – 13.24% Retail Trade – 12.96% Health Care and Social Assistance – 12%	Manufacturing – 13.92% Retail Trade – 12.37% Accommodation and Food Services – 11%	Health Care and Social Assistance – 13.07% Construction – 9.55% Retail Trade – 9.43%	Education and Training – 14.17% Health Care and Social Assistance – 12.26% Public Admin and Safety – 10.35%	Health Care and Social Assistance – 13.17% Education and Training – 11.91% Accommodation and Food Services – 10.01%

Source: ABS, 2011

7.15.3 Assessment of Potential Impacts

Potential impacts have been considered during both the construction and operation of the PK BLT. The facility is generally deemed to have a positive economic impact through its capital investment and direct and indirect employment. Social impacts can largely be considered as amenity impacts to the community, with the mitigation measures identified within in this EIS largely able to minimise these impacts to the surrounding communities.

Consequently, this assessment has considered the following impacts to the social and economic environment during the construction and operation:

- > Air Quality
- > Greenhouse Gas and Climate Change
- > Hazard and Risk

- > Traffic and Transport
- > Noise and Vibration
- > Waste
- > Ecology
- > Soils and Water
- > Visual
- > Employment.

7.15.3.1 Construction Phase

The construction of Stage 1 and Stage 2 of the facility is expected to occur over a 25 month period. The duration of construction for Stage 3 is expected to be 12 months, commencing in the future as per market demand. Throughout this time a number of temporary impacts will occur. These impacts will be considered within the requisite CEMP, which will include mitigation measures for site establishment, earthworks, construction of the facility and associated infrastructure, and final site clean-up. These measures will be in accordance with the mitigation and management measures derived from the specialist environmental assessments undertaken as part of this EIS.

Overall, the construction phase is anticipated to have temporary impacts on the social environment due to increased traffic and noise. However, these will be managed appropriately throughout the construction phase, as identified above. The construction phase will have a number of economic benefits to the community through increased employment directly on the project and also indirectly through the provision of materials and equipment necessary to construct the facility.

Potential impacts during the construction phase are assessed below.

Air Quality

The generation of dust and vehicle emissions during the construction phase and during the transportation of goods to and from the Site has the potential to cause air quality impacts to surrounding sensitive receivers. These receivers include local residential areas and commercial areas. These impacts will be temporary and will vary in intensity during the stages of construction.

As detailed at **Section 7.4**, a number of mitigation measures will be implemented during construction to minimise air quality impacts. These include an Air Quality Management Plan, a CEMP in accordance with EPA requirements and the covering of all vehicle loads to and from the site. The implementation of these measures will effectively minimise social amenity impacts to sensitive receivers.

Greenhouse Gas

Emissions from construction equipment and plant will occur as they consume fossil fuels including diesel and petrol. These subsequent GHG emissions have the potential to cause impacts by way of climate change and sea level rise, which is a significant societal concern. However, all GHG emissions will be monitored and managed during construction to ensure the facility is constructed in accordance with standard industry practices. As a result, GHG impacts are deemed to be effectively minimised. Further mitigation measures are located at **Section 7.8**.

Hazard and Risk

The hazards and risk associated with the proposed have been assessed in an ERA at **Section 6** and PHA at **Section 7.3**. This assessment found that, subject to the implementation of mitigation measures, there will be a tolerable risk to surrounding sensitive receivers.

Therefore, the social impact is considered extremely low as the events identified in the analysis that have off-site impacts within the port precinct area are low, along with low population density and the low risk of off-site individual fatality or injury to occur within the port precinct area.

Traffic and Transport

The construction of the facility will have impacts on surrounding traffic flows due to additional heavy vehicle movements. This will have potential temporary social and economic impacts associated with increased congestion along key thoroughfares surrounding the site. These impacts are deemed to be low and manageable subject to the mitigation and management measures listed at **Section 7.6**.

The implementation of these measures will ensure social and economic impact through additional congestion will not be significant.

Noise and Vibration

A noise and Vibration Assessment was undertaken by Pacific Environment (refer to **Section 7.5**), which considered the noise and vibration impacts to surrounding sensitive receivers. Noise levels that exceed noise criteria for these receivers would have the potential to cause social impact.

Significantly, the assessment found that no sensitive receivers would be highly noise affected during all construction scenarios. A contributing factor to this assessment is the location of the construction site within the port precinct area, which is 1,200m from the nearest residential receiver.

Waste

Waste generated through the construction of the facility may have potential social amenity impacts if poorly managed or incorrectly disposed. Waste is not anticipated to have any substantial amenity impacts as the CEMP will cover waste management protocols including identification, handling, storage and disposal during construction activities.

Ecology

Adverse ecological impacts during the construction of the facility will have societal impacts if poorly managed and addressed. The Green and Golden Bell Frog is a threatened species that may be impacted during the construction of the facility. However, the mitigation measures at **Section 7.9** will ensure any impacts to the Green and Golden Bell Frog and other ecology impacts are successfully managed.

Soils and Water

Soil and water contaminants, if poorly managed during construction, may cause impact to surrounding waterways which may cause societal impacts. However, a number of site management measures will be implemented during construction (identified in **Section 7.13**) to minimise these impacts, including best practice sediment and erosion controls, materials handling and excavation works in accordance with relevant standards.

Visual

Visual impacts during construction are considered to be temporary and will not have any major impact to surrounding areas (**Section 7.11**). The construction activities will occur in an industrial setting and will be consistent with surrounding activity. Additionally, all light spill from any construction works in the evening, if necessary, will be controlled in accordance with relevant Australian standards.

Employment

Positive social and economic impacts are attributed to the increased employment generation during the construction of the facility. The Capital Investment Value Report (refer to **Appendix M**) identified that during the construction of the facility 139 jobs will be created.

This employment is not expected to have any broad demographic or social change as it is expected that the majority of these workers will be sourced from the local area. As demonstrated in **Section 7.15.2**, the surrounding suburbs and the wider Wollongong LGA contain a high proportion of industrial workers in the manufacturing industry.

The capital investment necessary for the construction of the facility will be \$172 million, resulting in significant expenditure and investment in the region.

Additionally, the local industry will be further strengthened by the construction works through the procurement of materials, equipment and services from local industries.

Overall, the employment generation associated with the construction of the PK BLT will have positive social and economic benefits through direct and indirect job creation from local catchments. This job creation will assist the wider Illawarra Region to meet its future target of 32,150 new jobs by 2031.

7.15.3.2 Operational Phase

The operation of the Proposal is expected to have positive economic and social benefits through its sustained employment which can be sourced locally, along with the development of land that is currently underutilised at the port. Further, the storage facility and associated infrastructure will continue to diversify current economic activity at the port, which will strengthen the port as a key economic driver of the Illawarra Region. Similarly, the operation of the facility will have direct benefits to securing the future energy security of the liquid fuels sector in the national economic context.

The operation of the Proposal is not expected to have any negative impact on the surrounding community, with all impacts identified in various specialist studies able to be effectively managed and mitigated against.

Air Quality

The generation of dust and emissions during tank filling and truck haulage has the potential to cause air quality impacts to surrounding sensitive receivers. As listed at **Section 7.4** a number of mitigation and management measures will be implemented during the operation of the PK BLT. These measures will be formalised within the OEMP to ensure all operating procedures are in accordance with current practices and guidelines. These measures will ensure impacts to the social amenity of the surrounding area will not be significant throughout the lifecycle of the Proposal.

Greenhouse Gas

Emissions from the operation of the PK BLT will have the potential to cause impacts by way of climate change and sea level rise, which are both significant societal concerns. The GHG Assessment identified that the operation of the PK BLT will contribute 0.0001% to Australia's commitment under the protocol which was considered to be minor. The emissions will be further minimised through engineering specification including floating roof tank design, vapour recovery units and fuel abatement and capture technology in accordance with industry practices. It is also noted that future operations are likely to involve the increased use of rail

over trucks, which will further minimise greenhouse gas emissions to the surrounding environment. These measures ensure societal impacts due to climate change and sea level rise will be negligible.

Hazard and Risk

The hazards and risk associated with the proposal have been assessed in an ERA at **Section 6** and PHA at **Section 7.3**. These assessments found that, subject to the implementation of mitigation measures, there will be tolerable risk to surrounding sensitive receivers. Consequently, the social impact of the PK BLT operations are identified as low.

Traffic and Transport

The operation of the PK BLT will require vehicle movements associated with the haulage of liquids. These movements have the potential to cause impacts to the existing traffic flows with increased congestion causing social and economic impacts. The Traffic and Transport Assessment at **Section 7.6** determined that the facility will have negligible traffic impacts, with the road network able to cater for this additional traffic. Consequently, traffic and transport impacts will not have an impact on the surrounding social and economic environments.

Noise and Vibration

The Noise and Vibration Assessment undertaken by Pacific Environment (refer to **Section 7.5**) considered a number of scenarios associated with the operation of the PK BLT. The assessment concluded that there will be no impacts to the surrounding social environment as there will be no noise exceeding relevant criteria and no impact to surrounding receivers from low frequency noise.

Waste

Waste generated through the operation of the PK BLT may have potential social amenity impacts if poorly managed or incorrectly disposed. Waste is not anticipated to have any substantial amenity impacts as the OEMP will cover waste management protocols including identification, handling, storage and disposal during all on site activities.

Ecology

Ecological impacts as a result of the operation will have societal impacts if poorly managed. The Ecological Assessment (refer to **Section 7.16**) identified that these impacts, particularly to the GGBF, can be managed through the implementation of a GGBF Management Plan, and the implementation of the stormwater management plans. These measures will ensure the Proposal will operate with no negative social impacts associated with environment degradation.

Soils and Water

Soil and water contaminants, if poorly managed during operation, may cause impact to surrounding waterways which may cause societal impacts. However, a number of site management measures will be implemented during operation to minimise these impacts (identified in **Section 7.13**), including best practice sediment and erosion controls, materials handling and tank filling works in accordance with relevant standards.

Visual

The development of the PK BLT will result in the permanent alteration of the visual catchment surrounding the Site with potential impacts to the social amenity of the surrounds. The Visual Impact Assessment (refer to **Section 7.11**) identified that the visual impact of the Proposal can be effectively managed through the use of existing industrial materials and finishes to ensure the industrial character of the site is retained.

Additionally, any light spill impacts during night time periods will be managed in accordance with relevant Australian standards and will be similar in nature to existing illuminated developments adjacent to the PK BLT.

Employment

Positive social and economic impacts are attributed to the increased employment generation during operations. It has been estimated that the operation of the PK BLT will result in the creation of 5-12 jobs. A range of jobs would be generated associated with the operation and maintenance, technical and labouring positions and administrative duties.

The operation of the PK BLT would provide a regional asset within the Port at Port Kembla. The PK BLT operation will result in the ongoing diversification of the Port, contributing to its primacy as the major economic driver of the Illawarra economy. The creation of 5-12 jobs during operation and approximately 139 jobs during construction will have a direct benefit to local workers, with the local area containing qualified workers necessary for these roles. Additionally, the \$172 million in capital investment needed for the construction will result in a significant investment in the region, with the range of materials, equipment and labour necessary to be sourced from local industries. This direct and indirect job creation is in accordance with wider strategic planning and economic development goals for the region. Specifically, this project will contribute to the jobs target of 32,150 people identified in the *Draft Illawarra Regional Growth and Infrastructure Plan*. The direct employment of combined construction and operations represents 0.5% percent of this job target.

As identified in the social and economic profiles above, the workforce of the Wollongong LGA and in surrounding suburbs contains a high proportion of manufacturing and construction workers compared to NSW averages. These workers are therefore well positioned to be employed during the operation of the facility.

The job creation during the operation of the PK BLT will result in major social and economic benefits for the Wollongong LGA and wider Illawarra Region. Expenditure associated with these jobs will be spent in the local economy. This will have benefits for the wider economy including the housing market, hospitality industry, tourism and other goods and services consumed by workers.

The addition of the PK BLT to the Port of Port Kembla will increase the diversity of Port related activity into the future. The future identification of rail as the main transportation means of liquids from the Site will assist in furthering the business case for the Maldon-Dombarton Rail Line, which has been identified as a key piece of enabling infrastructure for future economic growth in the region.

Overall, the Proposal will result in a significant social and economic benefit to the local and regional economy through its job creation and associated expenditure in local markets.

Global Economic Market Considerations

The National Energy Security Assessment (NESA) released in December 2011 identified that while Australia is a country that is well endowed with energy resources, moving forward the nation will face a period of change as liquid fuels, natural gas and energy sectors need to continually invest to meet future demand. The NESA report assesses the security of these key energy sectors by giving them a rating of low, moderate or high security.

The NESA noted that liquid fuels security is high, trending to moderate, with the trend towards moderate due to the reliance of the industry on the global economy. In particular, the NESA report noted that Australia's liquid fuel security, compared to other energy sources, is more dependent on global supply chains and international outcomes rather than domestic decision making. Consequently, the report noted that:

“the continued rise in Australia’s imports of petroleum products will place greater reliance on international supply chains and the consequential need for investment in adequate import and storage infrastructure”

The proposed PK BLT will therefore be an integral piece of liquid fuels storage infrastructure that aligns with the overall economic strategic direction of the Australian economy. It will directly contribute to the future energy security of the Australian economy.

A report released in 2014 by Hale & Tworney assessed the current market resilience to global supply chain disruptions. They noted that a key component of the bulk liquids supply chain is storage, with sufficient supply of bulk liquids in storage important in ensuring minimal impacts during global supply disruptions. TQ’s proposed facility would facilitate greater storage of bulk liquids in the Australian market.

The need for additional oil stockpile locations in Australia was identified in March 2015 by the IEA which noted that Australia is the only IEA member that does not meet the minimum 90 day oil stockpile requirement. Additional storage was also identified in the Commonwealth Government’s *2015 Energy White Paper* as a significant problem. The facility will therefore directly contribute to the economic security of this sector, with the terminal anticipated to add the equivalent of 2.6 days of national supply, when measured at 2014 import rates.

Overall, the Proposal would be beneficial from a global and national economic context, contributing the future security of the liquids energy market.

7.15.4 Environmental Management Measures

Overall, this assessment has identified that the Proposal will not have any negative impacts during construction and operation. The development is considered to have positive benefits to the social and economic contexts throughout the Region and surrounding suburbs by providing increased direct and indirect employment creation. Similarly, at a national scale, the PK BLT will continue to support the future energy security of Australia, with increased competition in this sector likely to ensure lower costs for the general public. These positive benefits of the development are summarised as follows:

- > Providing up to 139 direct jobs during the construction of the facility
- > Providing up to 12 direct jobs during the operation of the facility
- > The capital investment of \$172 million will require significant expenditure on metal supply, fabrication, building trades and other services, all which are based locally.
- > Improved national fuel security.

A number of potential impacts associated with the social amenity of the area were identified. However, subject to the mitigation measures listed throughout **Section 7** of this document, these impacts will not be significant.

7.16 Ecologically Sustainable Development

7.16.1 Assessment Methodology

The excerpt below is from the *Chemical Facility EIS Guidelines* (NSW Government, 1996). Under the EP&A Regulation, it is necessary to justify the Proposal having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development (ESD).

Ecological sustainability requires a combination of good planning and an effective and environmentally sound approach to design, operation and management. The proponent should have regard to the principles of ESD throughout the whole project life cycle, and especially:

- > when developing the objectives for the project
- > during project formulation, planning and design
- > when considering project options and alternatives
- > during construction
- > for the operational life of the proposal
- > afterwards during decommissioning, site rehabilitation and reuse.

Continual reference should be made to the question '*Is this proposal ecologically sustainable?*'

Subject to Clause 7(4) of Schedule 2 of the EP&A Regulation consideration of the principles of Ecologically Sustainable Development (ESD) is required. The four ESD principles are outlined below:

- > **Precautionary Principle** – if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- > **Inter-generational Equity** – the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.
- > **Conservation of Biological Diversity and Ecological Integrity** – these are fundamental considerations to the sustainability of development.
- > **Improved Valuation, Pricing and Incentive Mechanisms** – that user's pay for their products or services including their full life-cycle impacts and cost-effective market mechanisms to attribute externalities should be implemented.

The following subsections address ESD considerations.

7.16.2 Location

The site is located within an existing industrial area zoned to accommodate and support industrial and Port related development. TQ has selected this location due to the proximity to existing port, road and rail transport infrastructure suitable for the ongoing operations of the PK BLT as well as being situated in proximity to strategic business markets and supporting supply chains in Sydney, regional NSW and the ACT.

The site is well serviced by existing transport and port infrastructure, with access via Tom Thumb Road, Springhill Road, Masters Road to the Princes Motorway and Inner Harbour berth areas of Port Kembla. Consequently, trucks travelling to and from the site are not required to travel through extensive urban areas reducing potential impacts on amenity by way of noise, reduced air quality and congestion. Furthermore, the location of the site in proximity to an international shipping port and the regional road network allows for rapid and efficient movement of product reducing associated GHG emissions.

7.16.3 Design

The plant has been designed to minimize energy usage as illustrated by the GHG assessment at **Section 7.8** resulting in a highly energy efficient design that is comparable to other bulk liquids terminals within Australia. The GHG assessment illustrates the negligible contribution that the plant would make to GHG emissions as a proportion of the Australian total.

A CEMP is proposed to be prepared in conjunction with the contractor engaged to undertake the construction to guide the selection of materials where possible, noting that much of the plant is pre-manufactured prior to being shipped to site for installation. The CEMP would also guide construction practices such as waste management. The following criteria would be considered when selecting materials:

- > Recyclability
- > Sustainable sourcing
- > Embodied energy
- > Transport costs
- > Environmental impact
- > Durability and maintenance requirements
- > Eco-labelling / certification.

These criteria would assist in reducing the potential environmental footprint of the PK BLT while providing TQ with an efficient facility at reasonable cost.

7.16.4 Construction

The CEMP would contain procedures to address risks and incidents during construction, as well as operation. Procedures would be developed for incidents including chemical spills, flooding, excavation of contaminated material uncovering of heritage items or relics. Additional details relevant to the CEMP are located at **Section 8**.

Waste reduction has been addressed through the guiding waste management principles and proposed management measures for both construction and operation at **Section 7.10**.

7.16.5 Operation

A proposed stormwater drainage infrastructure plan is located at **Appendix N** which provides for the capture and management of runoff from the site.

It is not anticipated that substantial volumes of waste would be generated during operation with only limited office and general industrial waste generated. Waste would be disposed of through the engagement of a licensed contractor.

Air quality and noise assessments have been undertaken to ensure that the operation of the site would not adversely impact on the amenity of the site and surrounds. Details of the findings of the air quality and noise assessments are located at **Section 7.4** and **Section 7.5** respectively.

7.16.6 Summary

The proposed development incorporates the principles of ESD through the implementation of the recommended mitigation measures detailed within the specific environmental assessments. Consequently, the proposal aligns with the ESD requirements identified within Clause 7(4) of Schedule 2 of the EP&A Regulation and would not create a significant environmental impact.

7.17 Cumulative Impacts

Cardno has undertaken an assessment of Cumulative Impacts for the Proposal to address the SEARs. The SEARs addressed in this Section are identified in **Table 7-39**.

Table 7-39 Secretary's Environmental Assessment Requirements (Cumulative Impacts)

Secretary's Environmental Assessment Requirements	Where Addressed
General	
<ul style="list-style-type: none"> ▪ a detailed assessment, where relevant, of the key issues below, and any other potential significant issues identified in the risk assessment. This must include: <ul style="list-style-type: none"> – an assessment of the potential impacts of all stages of the proposed development, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes; and 	Section 7
<ul style="list-style-type: none"> – Notwithstanding the key issues specified below, the EIS must include: <ul style="list-style-type: none"> – Likely interactions between the development and other existing, approved and proposed port and industrial operations in the vicinity of the site 	Section 7.17.2 and Section 7.17.4
Cumulative Impacts	
<ul style="list-style-type: none"> ▪ Including all industrial facilities in the area and other nearby approved and proposed development, particularly in relation to hazards and risk, air quality, noise and vibration, traffic and soil and water. 	Section 7.17
Hazard and Risk – including:	
<ul style="list-style-type: none"> ▪ Estimate cumulative impacts from the overall site and the surrounding potentially hazardous developments in the area (if any) and demonstrate that the proposed development does not increase the cumulative risk of the area to unacceptable levels 	Section 6.3 and Section 7.14.4
Air Quality - Including:	
<ul style="list-style-type: none"> ▪ A quantitative assessment of all potential air quality impacts and odour impacts for the development, including cumulative, on surrounding land and sensitive receptors under the relevant Environmental Protection Authority (EPA) guidelines; 	Section 7.4 and Section 7.17.4
Traffic and Transport – including:	
<ul style="list-style-type: none"> ▪ A detailed traffic impact study of the proposed development, with consideration of the predicted traffic impacts on the safety and capacity of the surrounding road network and the shipping capacity of Port Kembla 	Section 7.6 and Section 7.17.4

Cumulative impacts relate to the compounding effects of individual environmental impacts resulting from developments proposed or operating within the locality at a similar time. Together these impacts can affect the natural or built environment. Consideration of cumulative impacts ensures that environmental impacts from the proposal are not viewed in isolation from surrounding developments.

7.17.2 Assessment Methodology

Consideration of the cumulative impacts is primarily achieved by each specific environmental assessment within this EIS, with each assessment that has the potential to affect offsite locations (i.e. hazard & risk, air quality, noise/vibration, health and traffic) undertaken in the context of the heavy industrial environment within which the proposed PK BLT would operate. This approach ensures that both off-site impacts from the Proposal and those existing impacts within the surrounding environment are considered.

Developments considered to contribute to cumulative environmental impacts in conjunction with the PK BLT are those activities within the immediate vicinity of the operating port of Port Kembla.

Environmental impacts from the following developments, either as existing background or predicted future emissions, have been considered (where appropriate) by the environmental assessments in this EIS:

- > Existing operations including:
 - BlueScope Steel – to the west and south of the subject site
 - Port Kembla Coal Terminal (including rail balloon loop and truck receiving station – to the east and north of the subject site)

- Car Carriers (Patrick Autocare, PrixCar Services, CIVA, AutoNexus) – to the west and north of the subject site
 - GrainCorp Grain Terminal – to the west of the subject site
 - GrainCorp Grain Bulk Chemical Storage – to the north-west of the subject site
- > Future operations
- Quattro Grain Terminal – to the south of the subject site.

Surrounding developments are identified in **Figure 2-5**.

7.17.3 Existing Environment

The key issues associated with the existing environment that are covered in this cumulative impact assessment are discussed in the following sections:

- > Hazard and Risk – **Section 7.3**
- > Traffic and Transport – **Section 7.6**
- > Air Quality – **Section 7.4**
- > Greenhouse Gases – **Section 7.8**
- > Noise and Vibration – **Section 7.5**
- > Human Health – **Section 7.4**
- > Visual Amenity and Landscape – **Section 7.11**.

7.17.4 Assessment of Potential Impacts

The individual environmental assessments within **Section 7** of this EIS identify the associated impacts. The individual impact assessments demonstrate that the Proposal, in conjunction with existing and known future developments, would not have a significant level of impact.

As discussed in **Section 7.3.4**, the risk that the PK BLT site adds to the cumulative risk profile for the area was assessed qualitatively in relation to the adjacent coal stockpiles and grain silos. Dust explosion risks are typically managed by design codes and standards and consequences are typically limited to structural damage onsite. Escalation from a coal stockpile fire to the nearest tank is not considered likely based on the separation distance. As coal stockpile fires and coal and grain dust explosion consequences typically remain onsite, there is low cumulative risk in the area.

Air quality modelling undertaken for the Proposal focused on the cumulative effects the Proposal would have on the local surrounding community. The modelling concluded that the proposed development at its maximum level of operation (Stage 3) will have no acute or chronic impacts on the health of the surrounding community.

Traffic modelling undertaken of future traffic scenario 2026 has identified that the intersection at Springhill Road and Masters Road would reach an unacceptable level of service by 2026 regardless of the traffic generated by the PK BLT at full operation. Based on this result, the proposed additional traffic volume from PK BLT would not result in any additional cumulative impacts on the local road network requiring an upgrade of the road network. As upgrades of the road network will be required by 2026 regardless of the proposed development and therefore the Proponent should not be responsible for this upgrade as this is an evident issue affecting future port road traffic capacity irrespective of the proposed PK BLT development.

7.17.5 Environmental Management Measures

The individual environmental assessments within **Section 7** of this EIS identify the mitigation and management measures required to address the potential environmental impacts. A summary of these mitigation measures are included in **Section 11.3** and commitments are outlined in **Section 10**.

8 Environmental Management

8.1 Construction Management

Enabling works including bulk earthworks, piling, installation of footings, roadways, pipelines and service trenching would be undertaken prior to installation of the plant. Building structures are expected to be modular in construction and where possible the majority of tanks, plant equipment and structures will be manufactured offsite and brought to site for assembly.

8.1.1 Construction Environmental Management Plan

The Construction Contractor/s appointed to undertake each package of construction works would be responsible for the preparation of health, safety and environmental documentation, including a CEMP that will include details of the environmental controls to be implemented.

Any CEMP document shall be prepared in accordance with the following:

- > Recommendations and mitigation measures outlined in this EIS.
- > *NSW Ports Overarching Environmental Management Plan – Port Kembla* (February 2015).
- > *Guideline for the Preparation of Environmental Management Plans* (DIPNR, 2004).
- > *AS/NZS ISO 14001 – Environmental Management Systems*.
- > *Sustainability Plan 2015 (NSW Ports, 2015c)*

It is expected that a CEMP will be prepared for construction phase of works prior to works commencing. An outline of the specific CEMP requirements is provided below to assist in preparation of the final CEMP. TQ will ensure the requirements prescribed within the CEMP and any additional environmental management documentation for the project will also:

- > Clearly define the purpose, objectives and scope of the CEMP.
- > List any relevant approvals, conditions and any other documents incorporated into approvals or commitments relating to the environment or relevant legislation.
- > Assess any environmental risks and prescribe appropriate mitigation and control measures to reduce or eliminate risks.
- > Include measures used to control the occurrences of any pollution incident.
- > Ensure effective emergency response equipment (in the form of spill kits, personnel protective equipment) is located in areas of potential hazard.
- > Minimise and manage the disturbance area and protect vegetation and soil outside of the disturbance area during construction.
- > Ensure appropriate measures are in place to control stormwater and silt runoff during construction. Measures include the installation, monitoring and maintenance of silt fencing and clean water diversion drains.
- > Manage noise, vibration and dust impacts during construction.
- > Manage traffic movements during construction.
- > Manage any Aboriginal artefacts or non-Aboriginal relics discovered during construction.
- > Ensure waste streams are identified and that they are appropriately managed.
- > Follow the measures to be provided in the Pollution Incident Response Plan to be developed for the project as part of the CEMP and OEMP.

- > Contain detailed baseline data and the relevant limits, or performance measures, or criteria to allow judgement of performance and to provide a guide for the implementation of any management measures that may be required.
- > Provide a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria.
- > Provide a program to monitor and report on the impacts and environmental performance of the project; as well as the effectiveness of any management measures.
- > Provide a program to investigate and implement ways to improve the environmental performance of the project over time.
- > Establish and implement a protocol for managing and reporting any environmental incidents, complaints, non-compliance with statutory requirements and/or exceedance of safety/impact performance criteria and to periodically review the plans that are in place.
- > Ensure effective communications are provided to all staff in the form of inductions, operating procedures, training sessions and signage to inform personnel of operational hazards, controls and emergency response planning, preparedness and response.

Details of the stormwater drainage and erosion control features proposed will be incorporated into the Erosion and Sediment Control Plan in the CEMP. Compliance with all such protection measures outlined in the Soil and Water Management Plan and CEMP will be mandatory.

Standard construction hours will be utilised for the duration of construction works to reduce noise impacts, and should any work outside these standard hours be required then the Contractor will ensure appropriate controls are in place, i.e. the noise does not exceed noise affected RBL + 5dBA, and that the work does not create any significant impacts to surrounding residents.

8.2 Operations Management

An OEMP will be prepared to provide an overarching environmental management strategy for the project. The OEMP will incorporate a range of management plans and procedures to ensure impacts to the environment, community and adjoining port operations are managed and to ensure ongoing compliance with relevant legislation, approvals, licences, permits and any other commitments.

The OEMP document shall be prepared in accordance with the following:

- > Recommendations and mitigation measures outlined in this EIS.
- > *NSW Ports Overarching Environmental Management Plan – Port Kembla* (February 2015).
- > *Guideline for the Preparation of Environmental Management Plans* (DIPNR, 2004).
- > *AS/NZS ISO 14001 – Environmental Management Systems*.
- > *Sustainability Plan 2015 (NSW Ports, 2015c)*.

8.2.1 Operations Environmental Management Plan

TQ will ensure the requirements prescribed within the OEMP and any additional environmental management documentation and procedures for the project will also:

- > Clearly define the purpose, objectives and scope of the OEMP.
- > List any relevant approvals, conditions and any other documents incorporated into approvals or commitments relating to the environment or relevant legislation.
- > Assess any environmental risks and prescribe appropriate mitigation and control measures to reduce or eliminate risks.
- > Include measures used to control the occurrences of any pollution incident.

- > Ensure effective emergency response equipment (in the form of spill kits, personnel protective equipment) is located in areas of potential hazard.
- > Manage noise, vibration and dust impacts during operations.
- > Manage traffic movements and behaviours during operations.
- > Contain detailed baseline data and the relevant limits, or performance measures, or criteria to allow judgement of performance and to provide a guide for the implementation of any management measures that may be required.
- > Ensure that all vessels comply when appropriate with the International Maritime Organisation (IMO) Ballast Water Convention to reduce the potential of harmful aquatic organisms being discharged into Australian waters. The IMO Ballast Water Convention requires that all vessels must have and comply with a 'Ballast Water Management Plan'.
- > Provide a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria.
- > Provide a program to monitor and report on the impacts and environmental performance of the project; as well as the effectiveness of any management measures.
- > Provide a program to educate and inform all personnel working on site as to any significant environmental aspects (i.e. Green and Golden Bell frogs) hazards, risks and emergency response requirements to pollution events and to familiarise them with any associated management plans.
- > Provide a program to investigate and implement ways to improve the environmental performance of the project over time.
- > Establish and implement a protocol for managing and reporting any environmental incidents, complaints, non-compliance with statutory requirements and/or exceedance of safety/impact performance criteria and to periodically review the plans that are in place.
- > Effective communications shall be provided to all staff in the form of inductions, operating procedures, training sessions and signage to inform personnel of operational hazards, controls and emergency response planning, preparedness and response.

9 Consultation

9.1 Consultation Requirement

The SEARs issued by NSW Department of Planning and Environment requested TQ consult with various project stakeholders.

Table 9-1 Secretary's Environmental Assessment Requirements (Consultation)

Secretary's Environmental Assessment Requirements	Where Addressed
Consultation – including:	
<p>During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners.</p> <ul style="list-style-type: none"> ▪ In particular you must consult with: <ul style="list-style-type: none"> ▪ The City of Wollongong; ▪ Environment Protection Authority; ▪ Roads and Maritime Services; ▪ Office of Environment and Heritage; ▪ NSW Department of Primary Industries; ▪ NSW Ports; ▪ SafeWork NSW (formerly NSW Workcover); ▪ NSW Health; and ▪ The local community and stakeholders. 	Section 9
<p>The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.</p>	Section 9

9.2 Consultation Strategy

TQ has developed a stakeholder consultation strategy that will ensure that transparent, open and honest communications with key stakeholders (as outlined above in **Table 9-1**) are undertaken.

TQ are committed to ongoing consultation with relevant stakeholders to ensure any issues and concerns are adequately addressed through the planning, approvals, detailed design, certification, construction and operational phases of the proposed PK BLT development.

TQ has commenced early consultation by means of holding a Planning Focus Meeting as well as direct forms of consultation with relevant stakeholders as outlined in the following sections.

9.3 Agency Stakeholders and Consultation to Date

9.3.1 Planning Focus Meeting

Meeting held on 29th January 2015 - TQ commenced consultation by with various agencies, by means of holding a Planning Focus Meeting to ensure any issues and concerns could be understood and considered in the preliminary design, planning and environmental impact assessment phases of the PK BLT project.

The following agencies were represented at the meeting:

1. Environment Protection Authority (EPA)
2. NSW Department of Planning and Environment (DP&E)
3. NSW Ports

4. SafeWork NSW (formerly NSW WorkCover)
5. Roads and Maritime
6. Wollongong City Council (WCC).

The meeting was held in NSW Ports' boardroom. TQ gave a presentation and held a general question and answer session. The questions and comments were documented in a formal set of meeting minutes (**Appendix O**) and incorporated into the various assessments associated with this EIS.

The Planning Focus Meeting then conducted a site inspection of the PK BLT project sites to allow each of the attendees to inspect the location and surrounds. Additional questions and answers and comments were noted during the site inspection.

The feedback obtained during the Planning Focus Meeting, informed the parameters and scope of the concept design and this EIS. The TQ project email address and contact details were provided to attendees to enable further communication after the Planning Focus Meeting.

Items raised within the Planning Focus Meeting and associated responses include:

- a. RMS requested that the Traffic Impact Assessment (TIA) should consider all key intersections. TIA should look at the volume of traffic, and provide a strong justification for the traffic generated from first principles using the "Guide for traffic generating developments.

TQ Response: *The Traffic Impact Assessment considered the major intersections, the volume of traffic utilising the recommended guidelines. Refer **Section 7.6**. The transport route options have also been evaluated in the Route Selection Assessment. Refer to **Section 7.6**.*

- b. WCC noted their interest in the amount of traffic to be generated by this project, and the impact on the traffic on Mount Ousley and the potential justification for the Maldon-Dombarton rail link.

TQ Response: *Discussion in relation to the truck movements on Mt Ousley is included in the Traffic Impact Assessment. The Traffic Impact Assessment and Socio Economic Assessment includes a brief discussion about the Maldon-Dombarton rail link. Refer to **Section 7.6** and **Section 7.15**.*

- c. WCC commented on that other developments have taken place since 2008 when the original project plans were assessed and suggested a requirement to assess the cumulative impact of these developments with the proposed development.

TQ Response: *The EIS includes a Cumulative Impact Assessment to qualitatively address the cumulative effects of recent nearby developments. Refer to **Section 7.17**.*

- d. NSW Ports requested that the hazard and risk work needs to ensure we're not compromising the safety of existing tenants. Access and Egress of trucks entering onto Tom Thumb Road including lines of sight. New Berth 104 equipment needs to accommodate all berth users.

TQ Response: *The PHA assessed the risk to existing tenants. Refer to **Section 7.3***

- e. *The layout of the truck loading bay has been modified to improve truck egress onto Tom Thumb Road to prevent trucks needing to drive onto the opposite side of the road. The design of the berth equipment on Berth 104 accommodates other berth users. The MLA will be movable and park at the end of the berth deck. The operation room will be located off the berth deck allowing other equipment to utilise the berth. TQ is committed to ongoing liaison with NSW Ports and surrounding operators.*

- f. WCC expressed concern about noise generated from piling during construction.

TQ Response: *The Noise Impact Assessment has assessed the impact of piling and construction noise on the local environment and sensitive receptors. Refer to **Section 7.5***

- g. WCC asked about Construction hours.

TQ Response: *Construction hours are discussed in **Section 3.4.3**.*

- h. EPA expressed a concern about ongoing air impacts from operations. EPA requested that the project assess and propose measures to control volatiles and air emissions at transfer points including loading/unloading trucks/ships.

TQ Response: An Air Quality and GHG Impact Assessment was undertaken as part of the EIS. The AQIA addresses emissions from tanks, vapour recovery. Emissions from vessel tanks only occur during loading and these impacts have been quantified and described within **Section 7.4** of the EIS.

- i. *WorkSafe NSW made comments about MHF notification*

TQ Response: *Follow-up meetings have been held with WorkSafe NSW regarding the project and ongoing liaison with WorkSafe NSW to ensure all safety and legislative requirements are satisfied.*

- j. EPA asked about treatment of stormwater before discharge.

TQ Response: *Stormwater management measures during operation include multi-staged containment and treatment using a hydrocyclone oil water separator, to prevent any spill of products, slops or contaminated stormwater into the Inner Harbour. Refer to **Section 7.7**.*

9.3.2 SafeWork NSW (formerly NSW WorkCover)

Meeting held on 29th January 2015 – SafeWork NSW attended the Planning Focus Meeting. Refer to notes on the Planning Focus Meeting in **Section 9.3.1**.

Meeting held on 19th August 2015 – TQ met with SafeWork NSW to provide an overview of the project and discuss the PK BLT approach to safety during design, and construction and the role of Principal Contractor during construction.

9.3.3 NSW Department of Planning and Environment

Meeting held on 29th January 2015 – NSW Department of Planning and Environment attended the Planning Focus Meeting. Refer to notes on the Planning Focus Meeting in **Section 9.3.1**.

Meeting held on 20th August 2015 – TQ met with NSW Department of Planning and Environment to discuss the project plans and planning approval process and requirements.

Briefing document provided on 10th September 2015 – TQ provided the Environmental Scoping Assessment (ESA) was provided to NSW Department of Planning to inform the development of the SEARs.

SEARs provided to TQ on 8th October 2015 – NSW Department of Environment Issued the SEARs (SSD 7264) to outline the assessment requirements of the EIS. The EIS has been prepared in accordance with the SEARs (SSD 7264).

9.3.4 Office of Environment and Heritage

Meeting held on 29th January 2015 – NSW Environment and Heritage attended the Planning Focus Meeting. Refer to notes on the Planning Focus Meeting in **Section 9.3.1**.

Meeting held on 22nd October 2015 – NSW Office of Environment and Heritage attended a site inspection with TQ to discuss how to assess the potential impact of the proposed development on potential Green and Golden Bell Frog habitat. This meeting informed the development of this EIS and the details of the biodiversity assessment requirements outlined in **Section 7.9**.

9.3.5 NSW Department of Primary Industries

Briefing letter provided on 27th October 2015 – TQ issued letter to NSW Department of Primary Industries - Office of Water (DPI) which provided a summary of the PK BLT proposal and the how to access detailed information of the project and contact details if they require additional information.

Response email provided on 16th October 2015 – DPI issued a response in an email to TQ which stated:

“Thank you for your request for any further EIS requirements from Fisheries NSW in relation to the Port Kembla Bulk Liquids Terminal Project. The issues of potential concern for the Department have been adequately identified in the SEARS issued by the Department of Planning and Environment.

We look forward to reviewing the EIS”

DPI is therefore content with the information provided to date and TQ will expect a comment from this department once the EIS has been submitted.

9.3.6 NSW Health

Direct phone liaison on 27th October 2015 – Phone call with NSW Deputy Director, Public Health Unit to inform NSW Health of the PK BLT proposal and to obtain relevant contacts for future liaison in relation to the project.

Direct phone liaison on 27th October 2015 – Phone call with Public Health Unit - South East Sydney and Illawarra Area Health Service. TQ was requested to conduct emissions modelling and a Human Health Risk Assessment, both of which are covered in **Section 7.4**.

Briefing letter provided on 28th October 2015 – TQ issued letter to NSW Director of Public Health Unit - South East Sydney and Illawarra Area Health Service providing a summary of the PK BLT and explaining how to access detailed information of the project and contact details if they require additional information.

9.3.7 Roads and Maritime Service

Meeting held on 29th January 2015 – Roads and Maritime attended the Planning Focus Meeting. Refer to notes on the Planning Focus Meeting in **Section 9.3.1**.

9.4 Port Operator Stakeholders and Consultation to Date

The following additional consultation was undertaken.

9.4.1 NSW Ports

NSW Ports has been consulted with at all stages during the development of the PK BLT project and TQ will continue to consult with them as the land manager and key operational stakeholder.

Meeting held on 28th November 2014 – NSW Ports were consulted regarding plans for trucks to egress Site 2. NSW Ports requested the truck egress to be reviewed to ensure when trucks egress Site 2, they can do so without needing to drive onto the opposite side of the road. The design of the truck loading bay was revised to allow trucks to exit onto Tom Thumb Road without needing to drive onto the opposite side of the road.

Meeting held on 29th January 2015 – NSW Ports attended the Planning Focus Meeting. Refer to notes on the Planning Focus Meeting in **Section 9.3.1**.

Briefing document provided on 27th August 2015 – NSW Ports were issued with the draft ESA for review and comments.

Meeting held on 4th September 2015 – NSW Ports meeting held to discuss the review comments from NSW Ports and how to incorporate them into the ESA to ensure key issues and concerns are covered in the final EIS.

Letter provided to TQ on 8th September 2015 – NSW Ports reviewed the updated ESA and provide letter of support for lodging the SSD Application.

Draft assessment reports and EIS issued for review on 30th September to 20th October 2015 – Draft EIS documents issued to NSW Ports for review and comment.

Comments on draft assessment reports and EIS provided to TQ between 15th October and 4th November 2015 - Comments were received for consideration and incorporation in the EIS documentation to ensure satisfaction of NSW Ports.

Reviews and comments on Draft EIS and Technical Studies from 4th September 2015 to 25th November 2015 – NSW Ports was provided with the opportunity to review and comment on the EIS and technical studies within the period of 30th September to 25th November. This process was to ensure that

NSW Ports was satisfied with the level of assessment and detail within the documentation to be submitted to DP&E prior to land owners consent being issued for the development application.

Meeting held on 22nd October 2015 – NSW Ports arranged Port Users Council (PUC) meeting where TQ gave a PK BLT project presentation to the general PUC audience.

9.4.2 Port Kembla Port User Council Meeting

Meeting held on 22nd October 2015 – TQ attended PUC where TQ gave a PK BLT project presentation to the general PUC audience. The attendees of the PUC included:

1. Port Kembla Coal Terminal
2. AAT
3. BlueScope
4. CEVA Logistics
5. Department of Agriculture
6. GrainCorp
7. IXOM
8. LBH
9. Mission to Seafarers
10. Monson Agencies Australia
11. NSW Ports
12. Pacific National
13. Patrick Stevedoring
14. Port Authority of NSW
15. Port Kembla Gateway
16. Quattro Ports
17. Qube Ports
18. Svitzer
19. TQ Holdings
20. Transport for NSW
21. Water Police
22. Wilhelmsen Ship Services.

Questions raised and addressed in the Port User Council meeting included:

- a. PKCT – What colour is planned for the tanks?

TQ Response: *White, for environmental reasons to reduce higher temperatures and resulting emissions. More assessment details on visual impacts are discussed in **Section 7.11**.*

- b. AAT – How many truck movements are planned?

TQ Response: *Around 100 per day initially but increasing to 200 trucks per day as the terminal grows.*

- c. AAT – Has a truck route out the south end of the port been considered?

TQ Response: *Not at this stage as the transport route evaluation looks at trucks leaving the port through the main northern entrance at Tom Thumb Road onto Spring Hill Road. Refer to **Section 7.6** for more details.*

- d. AAT – What is the blast risk from the tanks?

TQ Response: *Explosions are not a large risk from these tanks as the flammable tanks include IFRs to reduce vapours inside the tank. Fire is a more likely event and foam systems and cooling water systems will be installed on the tanks as required by AS1940. The risks contours are largely contained within the site boundaries and a QRA is being carried out for the project. Refer to **Section 9.3** for more details.*

- e. Port Authority of NSW – What is being done around Berth 104?

TQ Response: *The GrainCorp northern loader will be relocated to the southern end and the TQ MLAs will be located at the northern end of the berth. Fire suppression systems will also be installed on the berth for potential use while vessels are unloading. Refer to **Section 3** for more details.*

- f. Port Authority of NSW – What vessel sizes are planned and how long will they be in port, also how often?

TQ Response: *Up to 120,000 DWT LR2 vessels are planned as per the Berth 104 limit. Initially it will be MR and some LR1 vessels and moving towards LR2 and the terminal develops. Smaller vessels will be in port for around 24 hours though the larger LR2 vessels will be up to 48 hours. Initially vessels will be once a month and moving to twice a month in future.*

9.4.3 Port Authority

Meeting held on 9th March 2015 – Meeting held with Roger Kirk to discuss the PK BLT requirements associated with the berthing and loading arrangements for Berth 104.

Meeting held on 22nd October 2015 – Port Authority attended PUC where TQ gave a PK BLT project presentation to the general PUC audience. Port Authority raised questions about the size of vessels to be berthed at Berth 104. TQ advised that the project design will accommodate vessels up to 120,000 DWT.

9.4.4 Port Kembla Coal Terminal

Meeting held on 14th August 2015 – Meeting held to provide PK BLT project overview and address questions.

Request for information issued to TQ 31st August 2015 – PKCT issued an email request for information.

Response to request for information issued on 23rd September 2015 – TQ issued an email response.

Acknowledgement to RFI issued on 30th September 2015 – PKCT advised that TQ had satisfactorily addressed their request for information.

Meeting held on 22nd October 2015 – PKCT attended PUC where TQ gave a PK BLT project presentation to the general PUC audience.

Meeting Held in 17th November 2015 – TQ met with PKCT to discuss the PHA modelling results. TQ committed to continue discussions with PKCT to ensure risk contours entering the PKCT site are acceptable.

9.4.5 GrainCorp

TQ undertook a brief teleconference was held with GrainCorp to provide a high level description of the project and potential items that will need further discussion.

Meeting held on 22nd October 2015 – GrainCorp attended PUC where TQ gave a PK BLT project presentation to the general PUC audience.

9.5 Local Community Stakeholders and Consultation to Date

The following additional consultation has been undertaken to date:

9.5.1 Port Kembla Pollution Group

This group consists of a number of Port Kembla residents who actively represent the interests of the local community. An invitation has been extended to the group to attend an information session where TQ can provide an overview of the project and provide an opportunity for the group to ask questions and make comments regarding the development.

Meeting held on 5th November 2015 – Representatives from the Port Kembla Pollution Group attended an information session where an overview of the project was provided. The representatives of the group raised concerns about potential vapour impact on the local community. TQ provided an outline and description of the project emission control measures and the Port Kembla Pollution Group were satisfied with the measures, namely the Vapour Recovery Unit used to recover vapours from truck loading and pigging, and the internal floating roof design on flammable tanks to restrict the formation of vapours within bulk storage tanks.

A detailed assessment of air emissions and appropriate mitigation measures are outlined in **Section 7.4** and **Section 7.8**.

9.5.2 Port Kembla Harbour Environment Group

The Port Kembla Harbour Environment Group is a community-based organisation which has a primary goal of monitoring and improving the environmental condition of the Port and surrounding area. This environmental interest group comprises of a range of interested community member representatives and also includes a number of agencies, and Port Kembla residents, including EPA, Wollongong City Council, Port Authority of NSW, and University of Wollongong. TQ has extended an invitation to the group to attend an information session where TQ aim to provide an overview of the project and provide an opportunity for the group to ask questions and make comments regarding the development.

Due to the limited frequency of meetings available TQ has not been able to meet with the Port Kembla Harbour Environment Group at the time of reporting, however TQ will attend their next available meeting to ensure that they can provide a general overview of TQ Holdings Australia and the PK BLT project.

9.5.3 Wollongong City Council

Briefing document provided on 25th August 2015 – The Lord Mayor of Wollongong (Hon. Gordon Bradbery OAM) was issued an introductory letter was providing a brief outline of TQ Holdings Australia and the PK BLT project.

Briefing document provided on 25th August 2015 – General Manager of Wollongong was issued an introductory letter was providing a brief outline of TQ Holdings Australia and the PK BLT project.

Meeting held on 28th September 2015 – TQ met with the Lord Mayor and the General Manager to provide a general overview of TQ Holdings Australia and the PK BLT project. There were not items requiring follow up by TQ.

9.5.4 State Politicians

Briefing document provided on 25th August 2015 – NSW Member of the Legislative Assembly, Member for Wollongong (Ms Noreen Hay) was issued an introductory letter was providing a brief outline of TQ Holdings Australia and the PK BLT project.

9.5.5 Federal Politicians

Briefing document provided on 25th August 2015 – Senator Concetta Fierravanti-Wells was issued an introductory letter was providing a brief outline of TQ Holdings Australia and the PK BLT project.

Briefing document provided on 25th August 2015 - Federal Member of Parliament for Cunningham (Hon. Sharon Bird) was issued an introductory letter was providing a brief outline of TQ Holdings Australia and the PK BLT project.

10 Statement of Commitments

The following table outlines the Draft Statement of Commitments proposed by the proponent for the proposed PK BLT development.

It incorporates each of the recommendations provided in the specialist consultant reports to mitigate the environmental impacts, monitor the environmental performance and/or achieve a positive environmentally sustainable outcome.

Table 10-1 Draft Statement of Commitments

Subject	Commitment	Phase
General	The proponent commits to:	
	<ul style="list-style-type: none"> ▪ The preparation of a Staging Report to allow partial compliance with commitments that may relate more specifically within Stages 1, 2 and 3. 	Prior to Construction
	<ul style="list-style-type: none"> ▪ Ensure that all mitigation measures outlined in this EIS (and summarised in Table 13-1) are implemented to ensure that impacts to the environment and local community are minimised. 	Detailed Design, Construction and Operations
	<ul style="list-style-type: none"> ▪ Ensure that all personnel working on the PK BLT project are inducted and made aware of their environmental responsibilities and site management plans and procedures. 	Construction and Operations
	<ul style="list-style-type: none"> ▪ Continue to liaise with NSW Ports and surrounding operators to ensure any potential impacts to operations of the port are minimized. 	Detailed Design, Construction and Operations
	<ul style="list-style-type: none"> ▪ Continue to liaise with the Environmental Protection Authority (EPA) to confirm and negotiate requirements of an Environmental Protection License (EPL) for both construction and operational phases of the Project. 	Detailed Design, Construction and Operations
	<ul style="list-style-type: none"> ▪ Liaise with NSW Ports, Port Authority, GrainCorp and any other relevant stakeholder to develop appropriate Emergency and Pollution Incident Response Plans for the site (including Berth 104). 	Prior to Construction
	<ul style="list-style-type: none"> ▪ Continue to liaise with NSW Ports and Port Authority (Port Kembla) to ensure that berthing procedures are access requirements are developed in consideration of broader port management requirements. 	Prior to Operations
	<ul style="list-style-type: none"> ▪ Undertake a detailed Fire Study as part of the subsequent detailed design phase and recommendations shall be implemented prior to operations commencing. 	Prior to Operations
	<ul style="list-style-type: none"> ▪ Ensure the fire suppression system installed will utilise fire suppression foam that is effective to bulk liquid fires whilst also being non-toxic to humans or the surrounding environment. 	Prior to Operations
	<ul style="list-style-type: none"> ▪ Implement practical and feasible recommendations from the EIS, including specialist supporting studies (PHA, Air Quality, GHG, Noise/Vibration, Visual Amenity, Soil/ Water and Traffic/Transport) this will inform the detailed design and final equipment specification and procurement. 	Detailed Design
	<ul style="list-style-type: none"> ▪ Ensure that site management activities during construction and operation consider the NSW Ports Overarching Environmental Management Plan – Port Kembla (NSW Ports 2015a). 	Construction and Operations
	<ul style="list-style-type: none"> ▪ Ensure that that a Construction Environmental Management Plan (CEMP) will be prepared in accordance with the requirements outlined in Section 10 of this EIS prior to construction commencing. 	Prior to Construction
	<ul style="list-style-type: none"> ▪ Ensure that the Construction Contractor is aware of any obligations outlined in the EIS which are also to be included in the CEMP. 	Construction
	<ul style="list-style-type: none"> ▪ The following management plans shall be prepared and included in the CEMP prior to construction commencing: <ul style="list-style-type: none"> – Traffic Management Plan (including pedestrian 	Prior to Construction

Subject	Commitment	Phase
	<p>management details)</p> <ul style="list-style-type: none"> – Noise Management Plan – Air Quality Management Plan – Soil and Water Management Plan – Pollution Incident Response Management Plan – Waste Management Strategy <ul style="list-style-type: none"> ▪ Ensure that that an Operational Environment Management Plan (OEMP) will be prepared in accordance with the requirements outlined in Section 10 of this EIS. This OEMP may be staged to align with operations commencing. ▪ Provide sufficient resources; expertise and materials to ensure the CEMP and OEMP and can be fully implemented. ▪ Undertake additional site geotechnical, contamination and groundwater baseline investigations as part of the detailed design phase of the project. These additional studies will inform the detailed engineering design and will also be used as baseline information for lease purposes with NSW Ports and ongoing environmental monitoring purposes. ▪ Consider applying to surrender any existing planning consents once consent has been provided for this (SSD 7264) application and prior to operations commencing for the site. This commitment will satisfy DP&E's preference for the operation of the facility to be covered by a single, modern development consent. 	<p>Prior to Operations</p> <p>Prior to Construction and Prior to Operations</p> <p>Prior to Construction and Prior to Operations</p> <p>Prior to Operations</p>
Hazards and Risks	<p>The proponent commits to:</p> <ul style="list-style-type: none"> ▪ Ongoing consultation with PKCT and adjacent operators to ensure that fatality and escalation risks are minimised and agreed measures are developed in accordance with the recommendations in the PHA. ▪ Apply the relevant recommendations, where possible, arising from the final Buncefield Investigation to PK BLT site throughout the detailed design phase as detailed in Appendix G of the PHA (see Appendix D of this report). 	<p>Construction and Operations</p> <p>Detailed Design</p>
Air Quality	<p>The proponent will prepare and submit an Air Quality Management Plan. The Plan will take into account the final design, layout and operational details for each of the future stages and detail the proposed mitigation measures for the construction and operational phases, including consideration of the following:</p> <ul style="list-style-type: none"> ▪ Methods to monitor the effects of construction activities. ▪ Measures to minimize dust and vehicle, ship unloading, fugitive and combustion emissions. ▪ Implementation of control requirements outlined in Clause 63 of the Clean Air Regulation for control equipment for large storage tanks. 	<p>Prior to Construction</p>
Noise and Vibration	<p>The proponent will prepare and submit a Noise Management Plan for the ongoing monitoring and management of potential noise impacts resulting from the Proposal, including consideration of the following:</p> <ul style="list-style-type: none"> ▪ Selection of quiet plant and equipment, particularly larger excavators and haulage trucks. ▪ Limiting the times of operation for noisier plant items to the Daytime, or Evening period (where possible). ▪ Scheduling noisier activity to regular hours and less noisy activity to non-scheduled hours. 	<p>Prior to Construction</p>
Traffic and Transport	<p>The proponent commits to:</p> <ul style="list-style-type: none"> ▪ Ensure that a Traffic and Transport Management Plan is prepared in liaison with NSW Ports, port operators, Roads and Maritime Service and Wollongong Council to ensure potential traffic and transport impacts from the proposed PK BLT are minimised. This plan shall be developed and incorporated into 	<p>Prior to Construction</p>

Subject	Commitment	Phase
	<p>the CEMP.</p> <ul style="list-style-type: none"> ▪ Develop the Traffic Management Plan for the construction stages of the project in accordance with the Traffic Control at Worksites, version 4.0 (NSW Roads and Maritime Services, June 2010). ▪ Provide parking facilities in accordance with Australian Standards (AS2890 Series). 	<p>Prior to Construction</p> <p>Detailed Design</p>
<p>Surface Water</p>	<p>The proponent commits to:</p> <ul style="list-style-type: none"> ▪ Develop an Erosion and Sediment Control plan (ESCP) with measures to be in place prior to any works commencing at the site. The ESCP will be prepared as part of the CEMP in accordance with the Landcom <i>Managing Urban Stormwater; Soils and Construction Manual 2004</i>. The ESCP will be maintained for the duration of construction, to prevent any polluted water and sediment entering receiving waterbodies. ▪ Contain and process all water which has been in contact with potentially hydrocarbon-soiled surfaces within the bunded to Environmental Protection Agency (EPA) standard by using an Oil Water Separator (OWS) that utilises advanced hydrocyclone technology that separates out any hydrocarbon droplets, significantly reducing the residual oil content as compared with traditional gravity separation units. ▪ Establish bund walls (1.8m high) around the storage tank areas on Site 1 and 2. In addition, separate intermediate bunds (0.6m high) will be constructed to contain most tanks individually. All product spillage and stormwater runoff will be contained inside the bunded area. Each intermediate bund has a sump that can be drained individually into a central bund water collection pit for the site. Free hydrocarbons will be recovered in these central sumps and water from the central bund water collection pit on either Site 1 or Site 2 can then be pumped into the two stage gravity settling pit on Site 3, prior to being treated by OWS-3 and then discharged from site in accordance with an EPA license. ▪ Capture and convey runoff from external catchments into the Inner Harbour via upgraded road drainage on Morton Way. This may include upsizing existing pipes and pits as well as installing new stormwater lines. The upgrade works will increase the total inlet capacity on Morton Way and reduce the risk of pit inlets becoming blocked by debris. ▪ An underground Gross Pollutant Trap (GPT) will be installed on Site 3 for the treatment of stormwater flows from the existing Tom Thumb Road drainage network prior to discharging the treated stormwater into Gurungaty Waterway (non-licensed discharge point). In addition to gross pollutants and sediments, the treatment system will be designed to capture oil and grease. The GPT treatment system will be sized for the full road catchment including the western extent of Tom Thumb Road connecting to Site 3 across the bridge. Runoff from the PK BLT sites will bypass the GPT and be directed to an OWS on Site 3 instead. ▪ Continue to liaise with NSW Ports during the detailed design phase to ensure stormwater capture and treatment infrastructure associated with the development considers the following strategic goals: <ul style="list-style-type: none"> – Capture and treatment of water/spillage from the truck loading area – Provide appropriate levels of treatment of runoff from the Site 2 access road for gross pollutants, oil & grease – Integrate leak prevention measures from in-ground drainage/collection infrastructure, sediment retention and oil and grease separation from Tom Thumb Road via the Site 3 GPT; and 	<p>Prior to Construction</p> <p>Operations</p> <p>Prior to Operation</p> <p>Prior to Operation</p> <p>Prior to Operation</p> <p>Prior to Construction and Operations</p>

Subject	Commitment	Phase
	<ul style="list-style-type: none"> – Provide additional environmental assessment and selection of appropriate firefighting foam within the detailed Fire Study. 	
Green House Gas and Climate Change	<p>The proponent commits to the following measure in accordance with the GHG assessment protocols:</p> <ul style="list-style-type: none"> ▪ Implement emission capture and abatement technology throughout the detailed engineering design and equipment procurement processes. This will include specification of floating roof tank designs, vapour recovery units and associated fuel emission capture and abatement technology to ensure the PK BLT is built to standard industry practices. 	Detailed Design
Biodiversity	<p>The proponent commits to:</p> <ul style="list-style-type: none"> ▪ Prepare a Biodiversity Assessment Report and Biodiversity Offset Strategy in accordance with the Framework for Biodiversity Assessment (FBA). ▪ Ensure that associated liaison with NSW Office of Environment and Heritage will continue to ensure acceptable outcomes are achieved. ▪ Ensure training and inductions for all personnel include Green and Golden Bell Frog awareness aspects and response requirements which are consistent with the Green and Golden Bell Frog Best Practice Guidelines and the site Plan of Management for this species (BEC 2012). ▪ Include Green and Golden Bell Frog management and response requirements within the CEMP and OEMP. ▪ Erect a frog-exclusion fence which is consistent with the Green and Golden Bell Frog Best Practice Guidelines and the site Plan of Management for this species (BEC 2012). ▪ Pre-clearance surveys are recommended consistent with the Management Plan for the site (BES 2012). ▪ Remove and dispose of bitou bushes within the construction area via methods described within the Weeds of national Significance 'Bitou bush Current management and controls options for bitou bush (<i>Chrysanthemoides monilifera</i> spp. <i>rotundata</i>) in Australia' (Winkler et al., 2008). ▪ Ensure that all vessels comply when appropriate with the International Maritime Organisation (IMO) Ballast Water Convention to reduce the potential of harmful aquatic organisms being discharged into Australian waters. The IMO Ballast Water Convention requires that all vessels must have and comply with a 'Ballast Water Management Plan'. 	<p>Prior to Construction</p> <p>Detailed Design</p> <p>Prior to Construction</p> <p>Prior to Construction and Prior to Operations</p> <p>Prior to Construction</p> <p>Prior to Construction</p> <p>Construction</p> <p>Operations</p>
Waste Management	<p>The proponent commits to:</p> <ul style="list-style-type: none"> ▪ Liaise with Sydney Water to negotiate any required trade waste agreement for long term management of onsite sewerage waste. ▪ Sewage waste shall be disposed of by a licensed waste contractor in accordance with Sydney Water and OEH requirement. ▪ Ensure that waste is avoided, reused or recycled as a priority in accordance with the NSW Waste Avoidance and Resource Recovery Strategy 2007 and NSW Waste Avoidance and Resource Recovery Strategy 2014-2021 (WARR Strategy). Any other wastes will be classified in accordance with EPA Waste Guidelines and disposed of appropriately at a licensed waste receiving facility. 	<p>Prior to Operations</p> <p>Construction</p> <p>Construction and Operation</p>
Visual Amenity	<p>The proponent commits to:</p> <ul style="list-style-type: none"> ▪ Design and implement lighting in accordance with: <ul style="list-style-type: none"> – AS 4282 – 1997 Control of the obtrusive effects of outdoor lighting – AS 1940 – The storage and handling of flammable and 	Detailed Design

Subject	Commitment	Phase
	combustible liquids – AS NZS 1680.5:2012 Australia and New Zealand Interior and workplace lighting, Part 5: outdoor workplace lighting	
Heritage	In the event that potential Aboriginal or European artefacts are discovered during the works, the proponent commits to: <ul style="list-style-type: none"> ▪ Cease all works immediately within the direct area. ▪ Immediately inform NSW Ports, the NSW Office of Environment and Heritage and a member of the Illawarra Aboriginal Land Council (if in relation to an Aboriginal place or object). ▪ Coordinate appropriate management of the site with the relevant agencies. 	Construction and Operations
Soils and Groundwater	The proponent commits to: <ul style="list-style-type: none"> ▪ Install sediment and erosion control devices to minimise transport of sediment in accordance with <i>Managing Urban Stormwater, Soils & Construction, Volume 1</i> (Landcom, 2004). ▪ Include soil and groundwater impacts as well as risk associated with ASS in the OEMP and CEMP. ▪ Ongoing groundwater monitoring taken prior and during construction and throughout operations to monitor for potential contamination. ▪ Undertake a groundwater assessment if groundwater is encountered during excavation. The assessment will consider: <ul style="list-style-type: none"> – Volume and quality of the water. – Requirements of appropriate permits if required. 	Prior to Construction Prior to Construction Prior to and during Construction and Operations Construction
Utilities	The proponent commits to: <ul style="list-style-type: none"> ▪ Continue consultation with NSW Ports and relevant service providers to discuss design and access requirements for the site. ▪ Arrange any associated servicing augmentation approvals and requirements with the appropriate servicing authorities prior to construction commencing. ▪ Operate the PK BLT in accordance with any utility supply agreements. 	Detailed Design Prior to Construction Operations
Ecologically Sustainable Development	The proponent commits to: <ul style="list-style-type: none"> ▪ Submit detailed engineering solutions and plans for the proposed internal port precinct stormwater system modifications to NSW Ports for approval prior to construction commencing. 	Prior to Construction
Consultation	The proponent commits to: <ul style="list-style-type: none"> ▪ Commit to ongoing consultation with relevant stakeholders in accordance with their stakeholder consultation strategy. 	Construction and Operation

11 Conclusions and Recommendations

11.1 Conclusions

TQ Holdings Australia Pty Ltd (TQ) proposes to develop the Port Kembla Bulk Liquids Terminal (PK BLT) at Port Kembla. The Proposal requires development approval and is identified as State Significant Development (SSD) subject to Section 89C of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Consequently, the application is required to be supported by an Environmental Impact Statement (EIS).

The Proposal includes the following works:

- > Establishment of infrastructure on Berth 104 to enable the unloading of bulk liquid tanker vessels
- > Construction of bulk liquids storage tanks on Site 1 and Site 2
- > Truck loading and unloading equipment on Site 2
- > Terminal Office and Operator Control Room and utilities on Site 3
- > Operation of the Bulk Liquid Terminal.

Construction works will be staged and the Stage 1A component will be constructed under an existing Major Project Approval (08_0083) and associated modification under S75W (by MOD 1, MOD 2 & MOD3).

This EIS has identified the range of environmental aspects and reviewed and assessed the environmental impacts associated with the proposed PK BLT, as required by Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation).

The risks and hazards associated with the Proposal have also been identified and assessed through Preliminary Hazard Analysis (PHA) and Qualitative Risk Assessment (QRA) processes. The layout and engineering design aspects of the Proposal have been informed by the hazard and risk analysis to ensure that potential impacts are avoided or effectively controlled or mitigated.

The Proposal would allow TQ to contribute to meeting the growing demand for fuel products in the Illawarra, Central and Southern NSW. The TQ site is located in close proximity to existing port infrastructure and their principal markets to reduce truck journey lengths and associated costs, as well as the environmental impact of transporting fuel to end users. The existing road network provides for the rapid transfer of materials to and from the site and nearby port facilities, with minimal disruption to local roads. No upgrades to any Wollongong City Council or Roads and Maritime road infrastructure have been identified by the Traffic Impact Assessment as being required as a result of the Proposal, however it is noted that without the proposed development the intersection of Master Road and Springhill Road will reach an unacceptable level of service by 2026. Although some localised pedestrian access, driveway crossover and signage improvements will be required immediately adjacent to the site within the Port precinct managed by NSW Ports to ensure any operational impacts are minimised.

The location of the PK BLT on portside land, adjacent to existing terminal facilities ensures that the Proposal is compatible with other existing and proposed developments in the immediate area. Furthermore, the Proposal would not create any environmental impacts that cannot be appropriately managed through on site mitigation measures. The PK BLT will be situated on currently underutilised special activities zoned land well separated from residential areas or environmental constraints. The Proposal will have good access to existing road, port and rail infrastructure with proven capacity for the import and distribution of petroleum products and would provide local employment opportunities during both construction and operational phases.

The recent decline and cessation of all fuel refining in NSW and the ongoing need for the State to have a secure and diverse fuel supply network has created a strong market demand for fuel storage facilities of both conventional petroleum and renewable fuel products. The provision of additional capacity for the importation and storage at Port Kembla will contribute to meeting the growing energy needs of NSW. The Proposal would develop an underutilised site, creating employment without affecting the amenity of the surrounding area and ensuring the future energy security of both NSW and Australia.

The site is currently available to allow TQ to commence construction and subsequent operations immediately once approval is received.

Once consent has been provided for this SSD application TQ will apply to surrender any existing planning consents prior to operations commencing for the site, as DP&E would prefer the operation of the facility to be covered under a single, modern development consent.

11.2 Recommendations

TQ will ensure that the mitigation (**Section 11.3**) and commitments (**Section 10**) identified within this document will be adhered to as part of the proposed development and operation works.

11.3 Summary of Mitigation and Management Measures

The following mitigation measures outlined in Table 11-1 are recommended to be implemented during either the construction or operational phases of the proposed PK BLT project:

Table 11-1 Summary of Mitigation and Management Measures

Parameter	Discussion	Mitigation Measures
1	Hazards and Risk	<p>Materials to be handled at the PK BLT include biofuels as well as petroleum based hydrocarbons and small quantities of additives with similar properties to fuels. Due to fencing and natural barriers such as waterways, there will not be a constant presence of people within these areas. This coupled with an absence of flammable and combustible material in these areas results in the offsite fatality risk due to PK BLT operations identified by the PHA as tolerable.</p> <ul style="list-style-type: none"> ▪ Ongoing consultation with PKCT is recommended to ensure that fatality and escalation risks are minimised and agreed measures are developed ▪ To apply the relevant recommendations arising from the final Buncefield Investigation to PK BLT site as detailed in Appendix G of the PHA (see Appendix D of this report).
2	Air Quality	<p>There are no privately owned receptors, recreation areas or on-site locations predicted to exceed the NSW EPA's average criteria for the air quality metrics assessed or the NSW EPA's nose-response criteria for odour. The results indicate that the operation of the bulk liquids terminal will have negligible impact on the air quality in Port Kembla and surrounding townships.</p> <p>Construction</p> <ul style="list-style-type: none"> ▪ An Air Quality Management Plan will be developed as part of the CEMP including: <ul style="list-style-type: none"> - Methods to monitor the effects of construction activities - Measures required to minimize dust and vehicle emissions during the construction of the project. ▪ The number and sizes of stockpiles will be kept to a minimum. ▪ Dust suppression shall be undertaken during construction and clearing activities, particularly during high wind conditions. Haul roads and other unsealed areas may be watered to suppress dust. ▪ Ensure that all vehicles and machinery are fitted with appropriate emission control equipment, maintained frequently and serviced to the manufacturers' specification. ▪ Minimise construction equipment idling time. <p>Operations</p> <ul style="list-style-type: none"> ▪ Each shore line will be equipped with a pig launcher and receiver in order to clear fuel product into the tank and leave the line clear for the next product. Pig propulsion will be via nitrogen pressure using a reticulation system from the terminal nitrogen tank. ▪ The pigging facilities will be equipped with containment and sump for hydrocarbon pump out. Once pigged clear, the line is depressurised into a cyclone column that separates hydrocarbon droplets and vapours vented from the shore lines. The collected liquid is then pumped across to the slops tank, and the vapour fed into the Vapour Recovery Unit to recover the remaining

Parameter	Discussion	Mitigation Measures
		<p>hydrocarbon vapours.</p> <ul style="list-style-type: none"> ▪ When the vessel has finished pumping and the surveyor has confirmed the ship's tank is empty and dry, the ships manifold valve is closed and the MLA cleared by draining and pumping in a closed system. The shore pipeline is then pigged to the tank, the line depressurised (as detailed above), pig removed from the receiver and the line left in nitrogen at atmospheric pressure. ▪ These processes are included to mitigate against potential emissions from product unloading. The pigging operations and vapour recovery underlie the assumption of not including this phase of the operational process in the emissions estimation. ▪ The piping design will minimise the potential for surge overpressure via the provision of expansion loops, valve closure times, check valves in tanks and product piping. Product pumps will have variable speed drives with soft start up and shut down to prevent surging. ▪ Pipework which is normally full with product that has closed sections will be protected by thermal relief around isolation valves. This will ensure that no product (and emissions) is lost to the environment. ▪ Bunds will be utilised to ensure that in the unlikely case of leakages, fuel products will not seep into groundwater and leave the site. Bunds containing pipework and equipment that is normally full with product will include level detection and hydrocarbon detection so that any leakage can be readily detected, in addition to routine inspections by operators. These site bunds will incorporate a pump out system to drain any spilled product to a closed slops handling system. ▪ Full contact internal floating roofs will be installed on all bulk storage tanks with flammable liquids to effectively mitigate against vapour headspace emissions during tank filling operations. ▪ PK BLT will utilise a vapour recovery unit to recover vapours and minimise emissions associated with the loading of fuels into road tankers. The vapour recovery unit will be located near the truck loading gantry. The recovered product will be pumped into the slops tank near the truck loading bay for eventual recovery into a nominated bulk tank. ▪ Product will be recovered by carbon absorption in either one of two absorption vessels, which are regenerated by vacuum. At any one time, it is expected that one vessel is being desorbed while the other is on the line. ▪ Vapours from the vacuum process will be passed through a liquid vapour separator vessel then into a packed absorption tower which is supplied by a cold gasoline stream from the duty gasoline tank. The gasoline absorbs the vapours within the tower and the gasoline is returned to the duty gasoline tank. Residual vapours are repassed through the active absorption vessel to recover the remaining product.

Parameter	Discussion	Mitigation Measures
		<ul style="list-style-type: none"> ▪ Requirements outlined in Clause 63 of the Clean Air Regulation for control equipment for large storage tanks will be implemented. The following control equipment is required: <ul style="list-style-type: none"> - A drainage system comprising of a small sump or tundish fitted under each water draw-off valve and connected to a totally enclosed drain, or - For volatile organic liquid stored in a tank with a vapour pressure ≤ 75 kPa the tank must have either a floating metal roof, a floating cover constructed of material impervious to vapour that floats on the liquid surface inside a fixed roof, or a vapour disposal or recovery system that meets the requirements of the Clean Air Regulation. - For volatile organic liquid stored in a tank with a vapour pressure >75 kPa the tank must have a vapour disposal or recovery system that meets the requirements of the Clean Air Regulations.
<p>3 Noise and Vibration</p>	<p>The majority of PK BLT related traffic is expected on Springhill Road and Masters Road. Increases in traffic noise during both construction and operation would be below the traffic noise increase criteria of 2 decibels. No significant operational vibration sources are anticipated to impact on the nearest residential areas from operations on the facility.</p>	<ul style="list-style-type: none"> ▪ A noise management plan within the CEMP and OEMP is recommended for the ongoing monitoring and management of potential noise impacts resulting from the Proposal. Noise management measures should include: <ul style="list-style-type: none"> - Selection of quiet plant and equipment, particularly Larger Excavators and Haulage Trucks. - Limiting the times of operation for noisier plant items to the Daytime, or Evening period. - Scheduling noisier activity to regular hours and less noisy activity to non-scheduled hours. - Staff and contractor education and training of road traffic noise and appropriate driving behaviours. ▪ Further noise reduction measures will be considered during the detailed design phase.
<p>4 Traffic and Transport</p>	<p>There are no critical capacity issues arising during the Stage 1 Operation /Stage 2 Construction scenario. The traffic generated by the PK BLT during Stage 3 Operations (full development of site) scenario would result in a negligible increase in traffic generation.</p>	<p><u>Construction</u></p> <ul style="list-style-type: none"> ▪ Develop a detailed Traffic Management Plan for the construction stages of the project in accordance with the Traffic Control at Worksites, version 4.0 (NSW Roads and Maritime Services, June 2010). The Traffic Management Plan would include: <ul style="list-style-type: none"> ▪ Hours of haulage, which do not impose on peak periods and school drop-off and pick-up times. ▪ Haulage routes, in accordance to the RMS restricted access to heavy vehicles. ▪ Designated areas within the site for heavy and light vehicles turning movements, parking, loading and unloading. ▪ Sequence for implementing traffic works and traffic management devices if required.

Parameter	Discussion	Mitigation Measures
		<ul style="list-style-type: none"> ▪ Safety principles for construction activities, such as speed limits around the site and procedures for specific activities. ▪ Assessing the need for oversize/over mass vehicle and management of their movements. ▪ The internal access and parking areas will be designed such that all vehicles, including the largest design vehicle (25m B-Double) are able to easily drive through the sites to ensure safe turning manoeuvres without requiring excessive reversing. ▪ Parking facilities will be provided in accordance with Australian Standards (AS2890 Series). <p><u>Operations</u></p> <ul style="list-style-type: none"> ▪ Design internal access and parking areas such that all vehicles, including the largest design vehicle (25m B-Double) are able to easily drive through the sites to ensure safe turning manoeuvres without requiring excessive reversing. ▪ The general morning peak traffic in the local area occurs between 8:15 AM and 9:15 AM and between 4:30 PM and 5:30 PM during the afternoon. This traffic impact assessment has demonstrated that the local road network has adequate capacity to cater for PK BLT operational traffic during the morning and evening peak hours. ▪ Any site entry gates installed shall also be setback from the road to accommodate the longest vehicle accessing each site to allow free flow of internal and external vehicles. ▪ TQ will utilise a truck slot booking system to prevent queueing on internal and external roads. ▪ A truck slot booking system will be implemented during peak period. ▪ Provide parking facilities in accordance with Australian Standards (AS2890 Series). ▪ Risk management strategies should be considered when planning for the transportation of hazardous materials. ▪ Risk management strategies have several aspects, including: <ul style="list-style-type: none"> - choice of the best routes - identification of the main risk contributors - identification and implementation of risk reduction measures; - measures to avoid avoidable risk; - adoption of the most cost beneficial safeguards; and - ensuring appropriate and comprehensive emergency plans. -

Parameter	Discussion	Mitigation Measures
5 Surface Water	<p>The Surface Water Assessment concluded that the Site is mostly free from constraints of flooding and stormwater. The Proposal is not likely to impact on the water quality of adjoining waterways and wastewater will be suitably managed to reduce any potential adverse impacts.</p>	<p><u>Construction</u></p> <ul style="list-style-type: none"> ▪ Development of an Erosion and Sediment Control plan (ESCP) with measures to be in place prior to any works commencing at the site. The ESCP will be prepared as part of the CEMP in accordance with the Landcom Managing Urban Stormwater; Soils and Construction Manual 2004. The ESCP would be maintained for the duration of construction, to prevent any polluted water and sediment entering receiving waterbodies. ▪ Installation of erosion and sedimentation control devices prior to commencement of any site works. Erosion controls would remain in place until the bare soils and surfaces are stabilised (by revegetation or other means) and removed when redundant. This needs to include the diversion of 'clean' water around the site in order to avoid treating it and also to avoid potential additional erosion from off-site sources. ▪ Appropriate erosion and sediment control devices would be placed down-slope of all excavation works, spoil stockpiles or works that would disturb the ground surface, down-slope of access roads that are highly utilised as well as in other areas as appropriate. ▪ Sedimentation is likely to be due to sheet flows occurring within the site. This type of sedimentation can be effectively controlled by using vegetated buffers (e.g. turf where appropriate), sediment barriers and sediment fences. ▪ Minimise the extent and duration of disturbance by means of work planning and staging. ▪ Disturbed areas would be restored (sealed or covered with pebbles/gravel or vegetated, as appropriate) upon the completion of the works in that area to ensure that the exposure of soils is minimised. ▪ Embankments and other areas subject to earthworks and grading would be revegetated with an appropriate cover crop or stabilised with other means as soon as possible following achievement of final levels. ▪ Where revegetation is required and where deemed feasible, locally indigenous plant species, including shrubs, grasses and other groundcovers, would be planted in appropriate locations to assist in soil stabilisation following completion of construction. Maintenance of these plantings would include regular watering and appropriate weed control to ensure the plants survive and continue to enhance the site. ▪ Daily visual inspections of erosion and sediment control devices to determine the condition and effectiveness of control measures. Immediate action would be taken to repair any control devices that have failed to work adequately. <p><u>Operations</u></p> <ul style="list-style-type: none"> ▪ All water which has been in contact with potentially hydrocarbon-soiled surfaces within the bunded area is contained and processed to Environmental Protection

Parameter	Discussion	Mitigation Measures
		<p>Agency (EPA) standard by using an Oil Water Separator (OWS) that will be strategically located on Site 3.</p> <ul style="list-style-type: none"> ▪ Sites 1 and 2 will have centralised collection sumps that will include a gravity oil separation and oil recovery system. Before an intermediate bund sump transfers water to the centralised collection sump, the pump must be locally started so that inspection for potential oil spills can take place. If a spill is detected in an intermediate bund sump the spill can be redirected away from the centralised collection sump for recovery. ▪ Bund walls (1.8m high) will be established around the storage tank areas on Site 1 and 2. In addition, separate intermediate bunds (0.6m high) will be constructed to contain most tanks individually. All product spillage and stormwater runoff would be contained inside the bunded area. Each intermediate bund has a sump that can be drained individually into a central bund water collection pit for the site. Free hydrocarbons are recovered in these central sumps and water from the central bund water collection pit on either Site 1 or Site 2 can then be pumped into the two stage gravity settling pit on Site 3, prior to being treated by OWS-3 and then discharged from site in accordance with an EPA license. ▪ Recovered hydrocarbons from the OWS system are directed to the waste oil decanter tank where they can be recovered or transferred to a waste collection vehicle for disposal. ▪ Hydrocarbon and waste collection piping will be designed to run above ground so that any potential leaks are visible and can be detected and repaired, rather than underground where a leak poses a potential ground contamination issue. ▪ Any underground stormwater pipes that may potentially be exposed to hydrocarbon contaminated water will be equipped with hydrocarbon compatible sealed joints to prevent infiltration into ground. ▪ In order to mitigate the impacts, runoff from external catchments will be captured and conveyed into Inner Harbour via upgraded road drainage on Morton Way. This may include upsizing existing pipes and pits as well as installing new stormwater lines. The upgrade works will increase the total inlet capacity on Morton Way and reduce the risk of pit inlets becoming blocked by debris. ▪ Water from the central bund water collection pit on either Site 1 or Site 2 will be pumped into the two stage gravity settling pit on Site 3, prior to being treated by an OWS and then discharged from site in accordance with an EPA license. An underground Gross Pollutant Trap (GPT) will be installed on Site 3 for the treatment of stormwater flows from the existing Tom Thumb Road drainage network prior to discharging the treated stormwater into Gurungaty Waterway (non-licensed discharge point). In addition to gross pollutants and sediments, the treatment system will be designed to capture oil and grease. The GPT treatment system will be sized for the full road catchment including the western extent of Tom Thumb Road connecting to Site 3 across the bridge. Runoff from the PK BLT sites will bypass the GPT and be directed to an OWS on Site 3

Parameter	Discussion	Mitigation Measures
		<p>instead.</p> <ul style="list-style-type: none"> ▪ The access road on the southern and eastern extent of Site 2 will be used as a truck staging area for empty trucks waiting for loading. Runoff from this area will be discharged directly into Inner Harbour via stormwater treatment system consisting of a GPT and oil capture system to collect oil and grease from runoff. In case of spill, a clean-up will also be initiated using spill kits. ▪ A designated overland flow path will be provided at the low point for flows in excess of the drainage system. ▪ Leakage, spillage and wash down water within the bunded truck loading bays will be collected in grated pits at each bay. The bunded area at each truck bay will be sized to contain the contents of a tanker compartment as well as normal wash down water. Any waste collected from the truck loading bay will be pumped to the above ground slops tank. All waste piping from each truck loading bay remains above ground to eliminate the possibility of undetected subsurface contamination. ▪ A detailed Fire Safety Study and fire system design will be undertaken to determine optimal type and methods for collection and dewatering of foams within bunded areas. Consideration for foam selection will include water quality and contamination impacts of the foam solution.
<p>6</p> <p>Green House Gas and Climate Change</p>	<p>The GHG Assessment (Appendix E) concluded that the proposed development would produce a very small portion of GHG. Consequently, the PK BLT design has been developed to address potential Climate Change impacts, with no adverse impacts anticipated.</p>	<ul style="list-style-type: none"> ▪ TQ will implement emission capture and abatement technology throughout the detailed engineering design and equipment procurement processes. This will include specification of floating roof tank designs, vapour recovery units and associated fuel emission capture and abatement technology to ensure the PK BLT is built to standard industry practices. ▪ It is also suggested by TQ that the form of transportation may incorporate rail once new infrastructure is developed to meet the demand criteria, thus reducing future greenhouse emissions from this process.
<p>7</p> <p>Biodiversity</p>	<p>Green and Golden Bell Frog (<i>Litoria aurea</i>) as the only species to have either a 'high' or 'moderate' potential to use the subject site. A Commonwealth Significant Impact Assessment and NSW Assessment of Significance found that there will be no significant impacts to Green and Golden Bell Frogs from the proposal, and a referral to the Commonwealth is therefore not required. An assessment in accordance with the Framework for Biodiversity Assessment (FBA) has been undertaken to determine the biodiversity offset requirements of the project. Mitigation measures are proposed to ensure there will be no significant impact on neighbouring aquatic ecology or habitat.</p>	<p>Construction</p> <ul style="list-style-type: none"> ▪ A frog-exclusion fence should be put in place along the fence line to the rail corridor and around the western boundary of Site 3, limiting access for the frogs during this period. This fence should be consistent with the Green and Golden Bell Frog Best Practice Guidelines and the Green and Golden Bell Frog Survey (BEC 2015). It can be attached to the existing fence lines or the proposed retaining wall and should have a lip to ensure frogs do not jump over it. ▪ Pre-clearance surveys are recommended consistent with the Management Plan for the site (BES 2012). ▪ If extended periods occur between erection of the fence and construction work further pre-clearance survey is advised to clear any stranded frogs. ▪ If extended periods occur between erection of the fence and construction work further pre-clearance survey is advised to clear any stranded frogs.

Parameter	Discussion	Mitigation Measures
		<ul style="list-style-type: none"> ▪ During construction activities at Site 3 construction contractors should be made aware of the position of the mangrove seedling so as to reduce the potential to cause damage. ▪ Sediment control devices including silt curtains should be used during bank stabilisation works at Site 3 to prevent runoff causing increased turbidity within Gurungaty waterway and the greater port area. ▪ Remove and dispose of bitou bushes within the construction area via methods described within the Weeds of national Significance 'Bitou bush Current management and controls options for bitou bush (<i>Chrysanthemoides monilifera</i> spp. <i>rotundata</i>) in Australia' (Winkler et al., 2008). ▪ Appropriate hydrocarbon spill kits should be in the vicinity of construction activities to contain any spills. In the event that the spill kit is unable to control a spill and hydrocarbons enter the waterway an absorbent boom should be available to be deployed to reduce the spread of any such spill. ▪ Machinery and equipment associated with construction activities should be cleaned within a designated wash down area that ensures wastewater does not enter the waterway. ▪ Sediment control devices such as hay bales and geofabrics should be deployed throughout the construction area in the vicinity of storm water drains to reduce mobilised sediments entering the waterway. ▪ Follow the measures to be provided in the Pollution Incident Response Management Plan developed for the project as part of the Construction Environment Management Plan (CEMP). ▪ Ensure training and inductions for all personnel include Green and Golden Bell Frog awareness aspects and response requirements. Green and Golden Bell Frog management and response requirements need to be outlined within the Construction Environment Management Plan (CEMP). <p><u>Operations</u></p> <ul style="list-style-type: none"> ▪ Potential for frog migration through the site is most likely at night-time during the summer months after heavy rain. Staff and contractors should be made aware of the Green and Golden Bell Frog Management Plan prepared by BES (2012), which should be amended to reflect future operational risks and requirements prior to operations commencing. ▪ Bund and sump management procedures should consider the potential for Green and Golden Bell Frog breeding within bunds. ▪ The site manager should be made aware of any discoveries and contact an ecologist or the Wollongong Office of Environment and Heritage so that appropriate relocation of the frog/s can be undertaken if necessary. ▪ Ensure that appropriate hydrocarbon spill kits are placed at various locations throughout the site to contain any spills. In the event that the spill kit is unable to

Parameter	Discussion	Mitigation Measures
		<p>contain a spill and hydrocarbons enter the waterway an absorbent boom should be available to be deployed to reduce the spread of any such spill.</p> <ul style="list-style-type: none"> ▪ Gross pollutant traps and hydrocarbon capture should be a priority for stormwater catchments which service areas accessed by tanker trucks. ▪ Implement a stormwater management plan that incorporates gross pollutant traps prior to waste water discharge. Employee and contractor induction should include a section dealing with the potential for gross pollutants to impact the site. ▪ Clean machinery and equipment associated with construction activities within a designated wash down area that ensures wastewater does not enter the waterway. ▪ Follow the measures to be provided in the Pollution Incident Response Management Plan developed for the project as part of the Operation Environment Management Plan (OEMP). ▪ Ensure training and inductions for all personnel include Green and Golden Bell Frog awareness aspects and response requirements. Green and Golden Bell Frog management and response requirements need to be outlined within the OEMP. ▪ Ensure that all vessels comply when appropriate with the International Maritime Organisation (IMO) Ballast Water Convention to reduce the potential of harmful aquatic organisms being discharged into Australian waters. The IMO Ballast Water Convention requires that all vessels must have and comply with a 'Ballast Water Management Plan'
8	<p>Waste Management</p> <p>The proposed PK BLT facility will generate both solid and liquid waste during operation. With the implementation of the identified mitigation and management measures, the waste generated by the proposed PK BLT will not have a significant adverse impact on the environment.</p> <p>To minimise waste generation and promote recycling, a Waste Management Strategy (WMS) has been prepared in accordance with the aims, objectives and guidelines in the <i>NSW Waste Avoidance and Resource Recovery Strategy 2007</i> and <i>NSW Waste Avoidance and Resource Recovery Strategy 2014-2021</i>.</p>	<p><u>Construction</u></p> <ul style="list-style-type: none"> ▪ No contaminated soil has been identified. If any is discovered during construction, it will be disposed of in accordance with the Unexpected Finds Protocol to be incorporated into the CEMP. ▪ All sewerage waste will be collected in a septic tank and trucked off site by licensed contractor until connection to existing rising main and agreement with Sydney Water has been established ▪ Timber formwork will be reused where possible. Any damaged or unusable timber will be recycled, or disposed at a licensed receiving facility. ▪ Steel will be collected and recycled. ▪ Standard timber pallets will be reused where possible. Any damaged or unusable timber will be recycled, or disposed at a licensed receiving facility. ▪ Plastics will be recycled where possible ▪ Excess cable will be collected and reused or recycled by the electrical installation contractor. <p><u>Operations</u></p> <ul style="list-style-type: none"> ▪ TQ will adopt a paperless document management system and actively seeks to

Parameter	Discussion	Mitigation Measures
		<p>reduce the need to print paper copies where possible</p> <ul style="list-style-type: none"> ▪ Paper and cardboard materials will be separated and stockpiled in appropriate areas on site for collection and recycling ▪ Metals, plastic and timber will be separated and stockpiled in appropriate areas on site for collection and recycling ▪ All steel and metal strapping will be recycled ▪ Waste oil will be stored in appropriate container on site and removed from site by licensed contractor for re-processing, recycling or appropriate disposal. ▪ Fuel spills will be contained and collected in bunded areas or drip trays and transferred to slops tanks for product recovery. ▪ Remaining slops tank contents will be pumped to oily water separator for final treatment prior to clean water discharge. ▪ Slops will be tested and blended with product stored on site if product specifications can still be maintained. Otherwise slops to be removed from site by licensed contractor. ▪ Waste water will be pumped from slops tank to oily water tank on each site.
9	Visual Amenity	<p>The proposed PK BLT is located in an existing industrial area of Port Kembla's Inner Harbour that operates 24 hours per day, seven days a week. The existing industrial development surrounding the proposal provides a visual environment which is not sensitive to change. Consequently, the proposed PK BLT will have minimal visual impact on the amenity of the surrounding areas</p> <ul style="list-style-type: none"> ▪ Use of materials and paints to mimic the existing industrial development as far as reasonably practical. ▪ Design and implementation of lighting in accordance with: <ul style="list-style-type: none"> - AS 4282 - 1997 Control of the obtrusive effects of outdoor lighting - AS 1940 The storage and handling of flammable and combustible liquids - AS/NZS 1680.5:2012 Australian and New Zealand Interior and workplace lighting, Part 5: outdoor workplace lighting
10	Heritage	<p>The PK BLT site is identified as a highly disturbed and highly modified environment. There are no sites of local, state or commonwealth heritage significance identified at the site or within three kilometres of the site. Due to this lack of sites and object of historic heritage a Statement of Heritage Impact is not required for the project as the project has a low potential to impact on objects or places of European heritage.</p> <p>Include the following mitigation measures in the CEMP and OEMP:</p> <ul style="list-style-type: none"> ▪ In the event that potential Aboriginal or European artefacts are discovered during the works, all works are to cease immediately within the direct area. TQ is to immediately inform NSW Ports, the NSW Office of Environment and Heritage and a member of the Illawarra Aboriginal Land Council (if in relation to an Aboriginal place or object). Coordinate appropriate management of the site with the relevant agencies.
11	Soils and Groundwater	<p>During construction, the risk of onsite soil erosion will increase due to the works resulting in exposure of soils through earthworks. There is a potential for ASS to occur in material greater than 5m below the surface. Potential impacts to groundwater are unlikely given that the bulk of the works are above ground.</p> <p>Construction</p> <ul style="list-style-type: none"> ▪ Development of a CEMP including a Soil and Water Management Sub-plan to manage potential erosion and sediment impacts during construction. ▪ Sediment and erosion control devices should be installed to minimise transport of sediment in accordance with <i>Managing Urban Stormwater, Soils & Construction, Volume 1</i> (Landcom, 2004). These devices should be inspected regularly and immediately after rainfall to ensure effectiveness over the duration of works. Any damage to erosion and sediment controls should be rectified

Parameter	Discussion	Mitigation Measures
		<p>immediately,</p> <ul style="list-style-type: none"> ▪ Risks associated with the disturbance of any ASS encountered during construction would be managed through an expected finds protocol outlined in the CEMP. ▪ Construction of hardstand areas with appropriately sized bunding around fuel storage and refuelling areas. ▪ Construction of appropriate enclosed and separated clean and oily water drainage systems which shall include the installation and operation of an oil/water separator. ▪ If groundwater is encountered during excavation, a groundwater assessment will be undertaken to determine the volume and quality of the water to determine if appropriate permits are required. <p><u>Operations</u></p> <ul style="list-style-type: none"> ▪ Development of an OEMP to manage and monitor potential operational phase soil and groundwater impacts, such as spills and leakages. ▪ Maintenance of hardstand areas with appropriately sized bunding around fuel storage and refuelling areas. ▪ Operation of appropriate enclosed and separated clean and oily water drainage systems which shall include the installation and operation of an oil/water separator. ▪ Implementation of regular maintenance inspections/audits during operation.
<p>12 Utilities</p>	<p>The utility supply requirements for the PK BLT development will be designed to appropriate Australian Standards and relevant authority guidelines to consider the existing capacity and future performance of all utility servicing. The connection and augmentation of all utility works requirements will be designed, planned and carried out in a manner that will minimise impacts on the existing neighbouring operations.</p>	<p><u>General</u></p> <ul style="list-style-type: none"> ▪ Continue consultation with NSW Ports and relevant service providers to discuss design, supply and access for the PK BLT utility connection requirements. ▪ Ensure all utilities are to be designed in accordance with appropriate standards and guidelines to consider the existing capacity and future performance of all utility servicing. <p><u>Construction</u></p> <ul style="list-style-type: none"> ▪ Prior to construction, all existing utilities and their locations will be confirmed to avoid any conflicts or damage during construction. ▪ Any associated servicing augmentation approvals and requirements will be arranged by TQ with the appropriate servicing authorities prior to construction commencing. ▪ The connection and augmentation of all utility works requirements will be designed, planned and carried out in a manner that will minimise impacts on the existing neighbouring operations. ▪ TQ will operate the PK BLT in accordance with any utility supply agreements.
<p>13 Socio Economic</p>	<p>The nearest residence is located 1,200m from the proposed PK BLT project site. The surrounding area consists of a range of heavy industrial and port related operations situated within</p>	<p><u>Construction</u></p> <ul style="list-style-type: none"> ▪ A Construction Environmental Management Plan (CEMP) will be prepared prior

Parameter	Discussion	Mitigation Measures
	<p>A number of potential impacts associated with the social amenity of the area were identified. However, subject to the mitigation measures listed throughout Section 9 of this document, these impacts will not be significant.</p>	<p>to construction commencing to ensure all environmental aspects associated with construction activities are appropriately managed to minimize impacts to neighbouring operators, sensitive receptors in the vicinity of the site as well as the broader community.</p> <p>Operations</p> <ul style="list-style-type: none"> An Operational Environmental Management Plan (OEMP) will be prepared to ensure environmental aspects are appropriately managed to minimize impacts to neighbouring operators, sensitive receptors in the vicinity of the site as well as the broader community.
<p>14 Ecologically Sustainable Development</p>	<p>The proposed development incorporates the principles of ESD through the implementation of the recommended mitigation measures detailed within the specific environmental assessments. Consequently, the proposal aligns with the ESD requirements identified within Clause 7(4) of Schedule 2 of the EP&A Regulation and would not create a significant environmental impact. The project does not present any significant impact on the local community.</p>	<p>Construction</p> <ul style="list-style-type: none"> A CEMP will be prepared prior to construction and will contain procedures to address risks and incidents during construction, as well as operation. Procedures would be developed for incidents including product spills, flooding, excavation of contaminated material uncovering of heritage items or relics. <p>Operations</p> <ul style="list-style-type: none"> An OEMP, storm water drainage plan and WMS will be prepared to ensure environmental aspects associated with the capture and management of runoff and waste, air quality and noise are appropriately managed to minimize impacts to neighbouring operators, sensitive receptors in the vicinity of the site as well as the broader community. Where access to property is to be blocked temporarily, the contractor would advise the affected parties in advance of the work.
<p>15 Cumulative Impact Assessment</p>	<p>The individual impact assessments demonstrate that the Proposal, in conjunction with existing and known future developments, would not have a significant level of impact. Based on the assessment provided, the works will have minor cumulative impacts on the existing environment during the course of construction.</p>	<ul style="list-style-type: none"> Works will be undertaken in accordance with the mitigation measures outlined in the EIS and the contractors CEMP and OEMP.

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NOISE AND VIBRATION ASSESSMENT
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PLANNING FOCUS GROUP MINUTES

About Cardno

Cardno is an ASX200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

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