

# Air, Hazard/Risk and Visual Assessment for Facility Changes

Port Kembla Soybean Processing and Biodiesel Project

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Prepared for  
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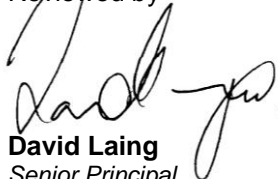
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## Executive Summary

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National Biodiesel Limited (NBL) are proposing a modification to the Project Approval (MP08\_0083) granted on 5 May 2009, under Part 3A of the *Environmental Planning and Assessment Act 1979*. The Project Approval is for the development of a Soybean Crushing Facility and Biodiesel Refinery, divided onto four land plots totalling 7.36ha at the Port Kembla Coal Terminal. For reasons beyond the control of NBL, the Plot 3 location (1.55ha in area) included in the Project Approval can no longer be utilised by NBL and as part of repatriations, Port Kembla Port Corporation (PKPC) has substituted some nearby land. The shift in the location of Plot 3 approximately 250m east of the approved location has necessitated NBL to seek several changes to the Project Approval.

Cardno (NSW/ACT) Pty Ltd (Cardno) was commissioned by NBL to prepare an assessment of the air quality, hazard/risk and visual amenity impacts associated with the proposed changes. This assessment will then be incorporated by NBL into the modification Environmental Assessment (EA) report to be prepared by NBL.

The proposed changes assessed are:

- > A shift in the location of Plot 3 to an alternative site (1.80ha in area), approximately 250m to the east of the original location (1.55ha). This shift would include the relocation of the biodiesel and glycerine refinery.
- > Additional soy oil and biodiesel storage on Plot 3, through the construction of:
  - 2 x 6,000m<sup>3</sup> Soy Oil above ground storage tanks.
  - 3 x 6,000m<sup>3</sup> Biodiesel above ground storage tanks.
  - A truck loading bay.
- > Construction of the following soybean silos to replace the storage of soybeans on the GrainCorp site:
  - 4 x 20,000 tonnes Soybean silos.
- > Construction of a liquid bulk unloading facility at Berth 104 and associated pipeline to bulk storage tanks.
- > Construction of a soybean truck dump station, to replace the use of the GrainCorp truck dump facility by NBL. The previously approved use of the existing GrainCorp facilities would not be required. This would also require a change to the soybean crushing plant layout.
- > Re-orientation of the administration building and parking.
- > Construction of the project in two stages instead of one. The first stage would involve the construction of the bulk storage and loading facility for the plant. This will allow for the temporary importation and distribution of biodiesel while the main Soybean Crushing Facility and Biodiesel Refinery are constructed during stage 2.

To assess the air quality, hazard/risk and visual amenity impacts associated with the construction and operation of the proposed changes, Cardno undertook a qualitative assessment. A qualitative assessment is considered appropriate given the nature of the proposed changes and the data available in the Maunsell-AECOM (2008) *Soybean Processing and Biodiesel Production Facility Environmental Assessment* (EA).

Air quality impacts resulting from the proposed changes are considered to be consistent with those detailed in the Maunsell-AECOM (2008) EA. The process and capacity of the plant remains the same, hence the type and amount of emission generating activities is not considered to increase. Therefore, the emissions generated by the changes are expected to be below the adopted criteria as modelled in the Maunsell-AECOM (2008) EA and not significant to the nearest sensitive receptors.

Due to the additional storage capacity and soybean dump truck station, there is the potential for a minor increase in the generation of dust and vehicle emissions. However, the mitigation measures detailed in the materials handling system are expected to control dust generation and the risk of combustion to an acceptable level. Noting also that the location of potential dust generating activities will be further away from

sensitive receptors. Furthermore to reduce potential vehicle emission impacts, where practicable, vehicle emissions will be mitigated through the use of rail and sea for transportation.

The proposed changes are not considered to alter the Preliminary Hazard Analysis (PHA) or the permissibility of the project under the current land use zoning. The relocation of Plot 3 including the Biodiesel and Glycerine Refinery, shifts the plant further away from sensitive receivers. Re-modelling of radiant heat impacts based on the new location of the refinery, has shown the risk of radiant heat impacts to meet the risk criteria. Other risks such as the risk of explosion from soybean dust, flammable liquid storage and tank failures are considered to be mitigated as per the Project Approval.

The extension of the pipeline to link from the crushing plant to the new location of the refinery, requires the crossing of Gurungaty waterway via a new small pipe bridge adjacent to the existing road bridge. The waterway crossing presents an additional risk to the environment through product loss via a leaking pipe, however the risk of such an environmental incident is considered to be mitigated through the design of the pipeline to relevant standards, testing prior to operation and regular inspections during operation.

The visual amenity impacts of the proposed modification are considered to be consistent with the Project Approval, as the changes are considered to integrate into the existing industrial setting. Although some of the changes will be visible from surrounding locations, the proposed structures are similar in bulk and character to the existing industrial development. Accordingly the proposed changes are considered to be consistent with the character of the port and its heavy industrial operations. Landscaping, vegetative screening, non-reflective materials, recessive colours and the minimisation of light spill have been incorporated into the project design to minimise the visual amenity impacts.

In summary, the air quality, hazard/risk and visual amenity impacts of the proposed changes are considered to be consistent with the Project Approval.

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## Glossary& Abbreviations

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### Abbreviations

AHD	Australian Height Datum	PM <sub>10</sub>	particulate matter less than 10 microns in size
CO <sub>2</sub> -e	carbon dioxide equivalent	RMS	NSW Roads and Maritime Services (previously RTA)
Cardno	Cardno (NSW/ACT) Pty Ltd	SCA	Sydney Catchment Authority
DP&I	NSW Department of Planning and Infrastructure	SEPP	State Environmental Planning Policy
EA	Environmental Assessment	SPBP	Soybean Processing and Biodiesel Production
EP&A Act	Environmental Planning and Assessment Act, 1979	%	percent
EP&A Reg.	Environmental Planning and Assessment Regulation, 2000	°	degree
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act, 1999		
EPL	Environment Protection Licence		
LEP	Local Environment Plan		
LGA	Local Government Area		
km	kilometre		
m	metre		
NBL	National Biodiesel Limited		
NGER	National Greenhouse and Energy Reporting		
NSW	New South Wales		
OEH	Office of Environment and Heritage		
PHA	Preliminary Hazard Analysis		
PKCT	Port Kembla Coal Terminal		

# 1 Introduction

---

Cardno (NSW/ACT) Pty Ltd (Cardno) was commissioned by National Biodiesel Limited (NBL) to prepare an assessment of the air quality, hazard/risk and visual amenity impacts associated with the proposed changes to the Soybean Crushing Facility and Biodiesel Refinery at Port Kembla. This assessment will then be incorporated by NBL into the modification Environmental Assessment (EA) report to be prepared by NBL.

NBL are proposing a modification to the Project Approval (MP08\_0083) granted on 5 May 2009, under Part 3A of the *Environmental Planning and Assessment Act 1979*. The Project Approval is for the development of a Soybean Crushing Facility and Biodiesel Refinery, divided onto four land plots totaling 7.36ha at the Port Kembla Coal Terminal (PKCT). Refer to **Figure 1** for a plan of the existing site. For reasons beyond the control of NBL, the Plot 3 location (1.55ha in area) included in the Project Approval can no longer be utilised by NBL and as part of repatriations, Port Kembla Port Corporation (PKPC) has substituted some nearby land, approximately 250m to the east of the original location.

The following sections detail the project background, scope and impact assessment from an air quality, hazard/risk and visual amenity perspective for the proposed changes.

## 1.1 Background

NBL obtained a Project Approval (MP08\_0083) under Part 3A of the EP&A Act for the construction and operation of a Soybean Processing and Biodiesel Processing Production facility (SPBP facility) in the Inner Harbour of Port Kembla, close to Wollongong. The purpose of the SPBP facility is to extract oil from the soybeans to refine into biodiesel and glycerine, as well as producing soy protein meal for animal feed. The Project Approval was based on the Maunsell-AECOM (2008) *Soybean Processing and Biodiesel Production Facility Environmental Assessment (EA)*.

As shown on **Figure 1**, the existing Project Approval (MP08\_0083) covers separate allotments within the subject site and associated activities, which consist of:

- > Construction of:
  - Soybean preparation and extraction plant;
  - Biodiesel and glycerine refining plant;
  - Administration and training offices; and
  - Vehicle manoeuvring and parking areas.
- > Installation of:
  - Ship unloading facilities on Berth 104; and
  - Conveyor belts and a bucket elevator to facilitate the transfer of raw material on the existing GrainCorp site.
- > Use of:
  - Seven (7) silos with a ten tonne capacity, two (2) with a five (5) tonne capacity and Berth 104 on the GrainCorp site.

NBL proposes the following changes to the current Project Approval, as shown on **Figure 2 and Figure 3**:

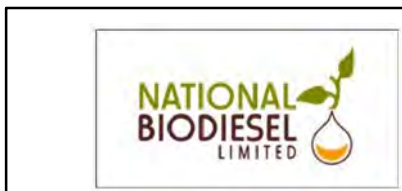
- > A shift in the location of Plot 3 to an alternative site (1.80ha in area), approximately 250m to the east of the original location (1.55ha). This shift would include the relocation of the biodiesel and glycerine refinery.
- > Additional soy oil and biodiesel storage on Plot 3, through the construction of:
  - 2 x 6,000m<sup>3</sup> Soy Oil above ground storage tanks.

- 3 x 6,000m<sup>3</sup> Biodiesel above ground storage tanks.
- A truck loading bay.
- > Construction of the following soybean silos to replace the storage of soybeans on the GrainCorp site:
  - 4 x 20,000 tonnes Soybean silos.
- > Construction of a liquid bulk unloading facility at Berth 104 and associated pipeline to bulk storage tanks.
- > Construction of a soybean truck dump station, to replace the use of the GrainCorp truck dump facility by NBL. The previously approved use of the existing GrainCorp facilities would not be required. This would also require a change to the soybean crushing plant layout.
- > Re-orientation of the administration building and parking.
- > Construction of the project in two stages instead of one. The first stage will involve the construction of the bulk storage and loading facility for the plant. This will allow for the temporary importation and distribution of biodiesel while the main Soybean Crushing Facility and Biodiesel Refinery are constructed during stage 2.



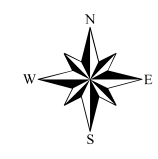
**Legend**

- Indicative Plot Boundary
- Berth 104
- Cadastre (LPI, 2011)



## Existing Site Plan

SECTION 75W MODIFICATION TO MAJOR PROJECT APPROVAL 08\_0083



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
 Date: 2012-09-05  
 Coordinate System: GCS GDA 1994  
 Project: 82013003  
 Map: G1006\_ExistingSitePlan.mxd 01

Aerial Imagery supplied by NearMap Imagery and associated third party suppliers (July 2012)

1:2,700 Scale at A3

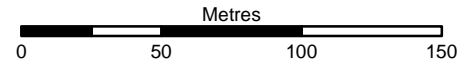
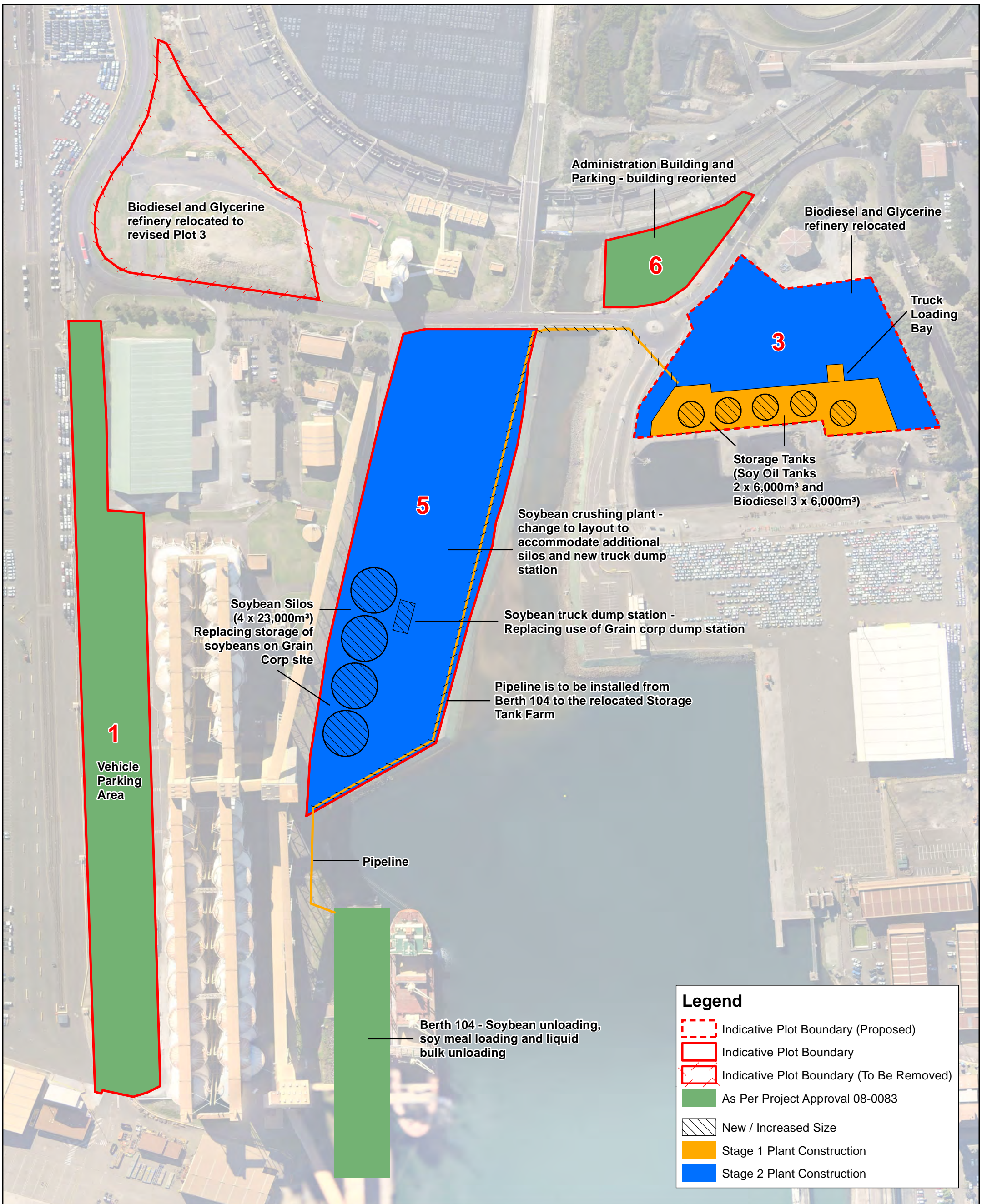
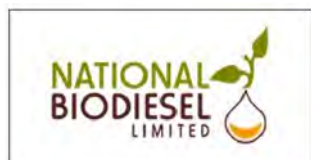
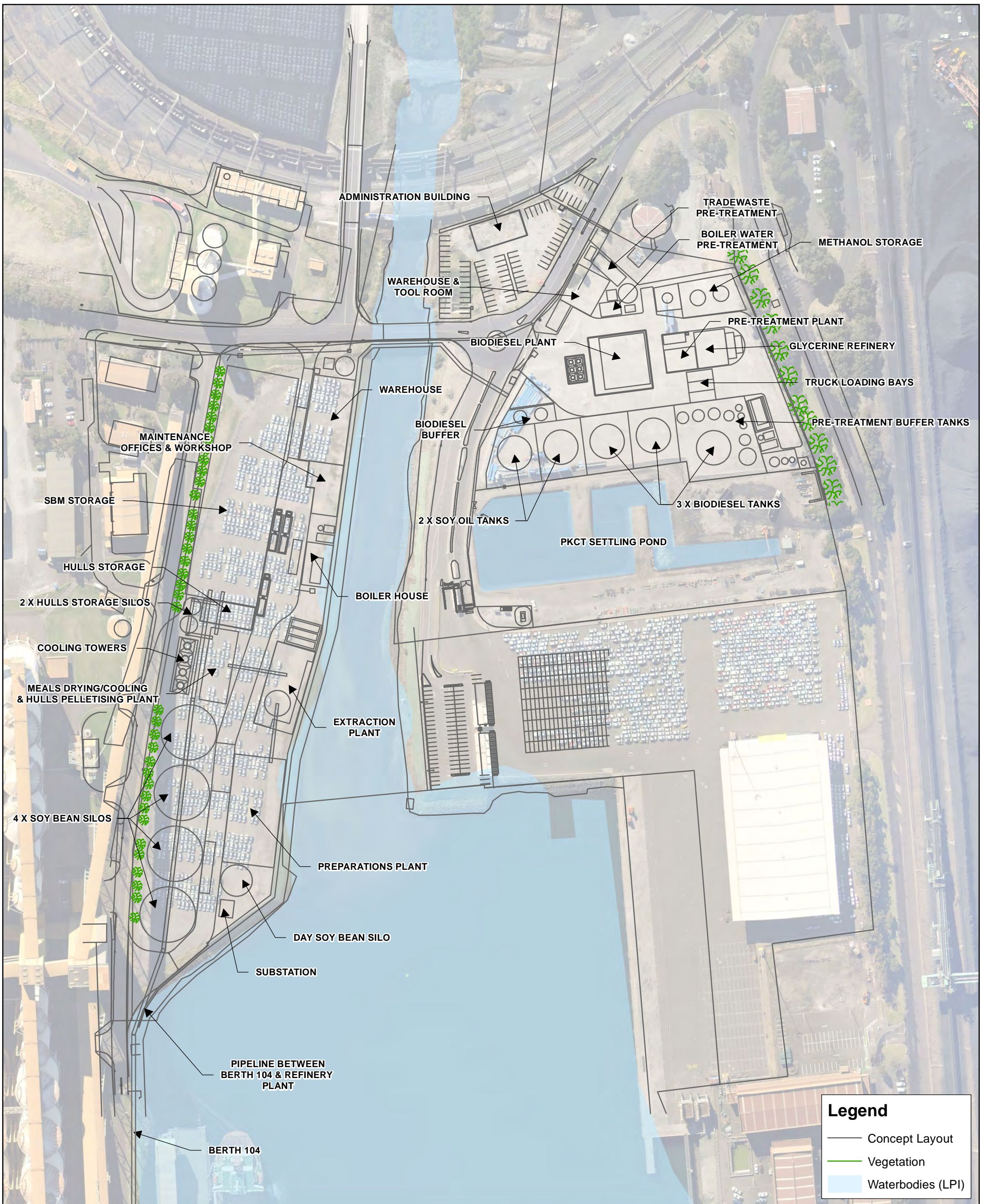


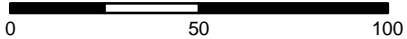
FIGURE 1





1:2,000 Scale at A3

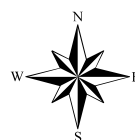
Metres



# Plant Layout Plan

SECTION 75W MODIFICATION TO  
MAJOR PROJECT APPROVAL 08\_0083

FIGURE 3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
Date: 2012-09-05  
Coordinate System: GDA 1994 MGA Zone 56  
Project: 82013003-01  
Map: G1008\_PlantLayout.mxd 01

Aerial imagery supplied by Near Map and associated third party suppliers (July 2012)

## **1.2 Objectives of the Assessment**

The primary objective of the assessment is to assess the potential air quality, hazard/risk and visual amenity impacts resulting from the construction and operation of the proposed changes.

## **1.3 Scope of Assessment**

To assess the air quality, hazard/risk and visual amenity impacts associated with the construction and operation of the proposed changes, Cardno undertook the following scope of work:

- > a qualitative assessment of the existing information, including:
  - review of existing dispersion modelling and consideration of dust control.
  - hazard identification and assessment of risk resulting from amendments to layouts of the plant at Berth 104, the Biodiesel Refinery and soy silos. This included the revision of heat flux models.
  - review of existing visual assessment data including the preparation of a 3D model / photomontage for the new plant locations.
- > report preparation.

## 2 Impact Assessment Review

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### 2.1 Issue Identification

This section reviews the air quality, hazard/risk and visual amenity impacts with respect to the proposed changes.

### 2.2 Air Quality

#### 2.2.1 Introduction

This section of the report provides a qualitative assessment of the potential impacts on air quality from the proposed changes to the SPBP facility Project Approval. The potential for air quality impacts is affected by many factors, including weather conditions, topography, existing air quality and land uses as detailed in Section 7.2 of the Maunsell-AECOM (2008) EA.

#### 2.2.2 Relevant Legislation & Guidelines

As described in the Maunsell AECOM (2008) EA the following pieces of legislation and guidelines are relevant to the assessment and management of air quality:

- > *Protection of the Environmental Operations Act 1997 – POEO Act.*
- > *National Environment Protection Measure for ambient air quality – AAQ NEPM.*

#### 2.2.3 Existing Environment

Details of the existing meteorological conditions are provided in Section 7.2.3 of the Maunsell-AECOM (2008) EA. In summary, the predominant wind direction is westerly with relatively low general wind speeds (less than 3m/s). The escarpment to the west of Wollongong and the ocean to the east, are two key influences on air quality within the Illawarra region. Historically the concentrations of carbon monoxide, nitrogen dioxide and sulphur dioxide within the Illawarra region have achieved compliance with the AAQ NEPM, however compliance with guidelines for fine particles and ozone could not be demonstrated.

The existing potential sources of air pollutants within the Illawarra include motor vehicles, industry (in particular ferrous metal manufacturing) and domestic activities, which result in ozone, photochemical smog and brown haze.

The SPBP facility is surrounded by industrial premises including:

- > Fabricated metal product manufacturing, metal coating and finishing facilities.
- > Industrial gas/chemical manufacturing facilities.
- > A sulphuric acid recovery plant.
- > Cement product manufacturing facilities.
- > Sewage Treatment Plant.

The nearest residential receivers are located within the suburb of Coniston, approximately 1.2k north of the site.

#### **2.2.4 Methodology**

Cardno undertook a qualitative assessment of the potential air quality impacts associated with the proposed changes, using the existing data included in the Section 7.2 of the Maunsell AECOM (2008) EA.

#### **2.2.5 Impact Assessment**

##### **Point Sources**

The nature of the proposed changes are not considered to change point source emissions from the SPBP facility in either pollutant type or volume from the following specified in the Maunsell AECOM (2008) EA:

- > Hexane emissions from the soybean-oil extraction plant.
- > Methane emissions from the biodiesel plant.
- > Oxides of nitrogen emissions from gas-fired boilers.

Accordingly the estimated air pollutant concentrations (annual average, maximum hourly and 95<sup>th</sup> percentile) for hexane, methanol and nitrogen oxides at the 10 receivers specified in Tables 27, 28 and 29 of the Maunsell-AECOM (2008) EA, are considered to remain unchanged from those modelled in the Maunsell-AECOM (2008) EA. The concentrations of hexane and methanol are expected to remain an order of magnitude below the adopted criteria at each of the receptor locations.

The NO<sub>x</sub> predictions are also considered to remain consistent with those modelled in the Maunsell-AECOM EA, with a possible minor exceedance of the background readings at Receptor 8.

##### **Fugitive Emissions**

The handling and storage of soybeans has the potential to result in dust emissions. However, consistent with the Project Approval, integrated dust suppression technology which is required from a hazard reduction and quarantine perspective will be implemented and maintained. Hence the increase in the storage volume of the soybean silos is unlikely to result in a measurable increase in fugitive emissions.

Minor additional emissions during filling from the importation of biodiesel may occur, whilst the main production facility is being constructed. The quantity of biodiesel to be imported will not exceed the final plant capacity, so there will be no change in emissions associated with distribution. Emissions from tank filling will be managed by desiccant breathers.

##### **Dust**

Soybean cargos can contain dust of varying nature such as coarse and/or fine sand, grain dust and other coarse materials including sticks, leaves and branches. Handling of the soybeans can lead to the generation of dust. The proposed changes include a truck dump station which is likely to increase dust generation. The potential for dust to cause a significant impact to local air quality and sensitive receivers is considered to be low, given the location of the truck dump facility, the orientation of the plant, the distance to sensitive receivers, the predominant wind direction and the mitigation measures proposed in **Section 2.2.6**.

##### **Odour**

The heating and processing of oilseeds can produce offensive odours in some industrial applications, while methanol is described as an "odorous air pollutant" by the NSW EPA. As the production process and volumes are not changing, the proposed changes are not considered to increase or alter the production of offensive odours as assessed in the Maunsell-AECOM (2008) EA. Hence, the proposed changes are not considered to alter the impacts to sensitive receivers from odour.

### **Volatile Organic Compounds (VOCs)**

The proposed changes do not include a modification to the production methodology or volumes assessed in the Maunsell-AECOM (2008) EA. Hence, the potential VOC air quality impacts associated with the proposed changes are considered to be consistent with the Project Approval.

### **Distributed / Off-Site Emissions**

Other potential sources of air pollution arise from the increased transportation requirements necessary for the proposed SPBP facility. Where possible the bulk of the transport requirements would be via rail and sea. Section 7.2.5 of the Maunsell-AECOM (2008) EA, demonstrates that the potential for local air quality impacts given the number of vehicle movements proposed, is low. The annual volume of soybeans and associated truck movements remains the same as assessed for the Project Approval.

Hence the significance of the potential for local air quality impacts is likely to be low, as the number of vehicle movements is low relative to the traffic movements on the wider road network.

#### **2.2.6 Mitigation Measures**

Consistent with the Project Approval, the proposed changes to the SPBP facility will include an emission control system integrated into each stage. Furthermore the need to reduce harmful emissions correlates with the need to minimise the loss of raw materials during the extraction process.

An Air Quality Management Plan would be prepared for the project, which would include but not be limited to the following mitigation measures:

- > An extensive cleaning program to minimise the build-up of combustible dusts.
- > Dust collection systems at all transfer points including small self-containing dust extraction units.
- > Regular plant inspections.
- > Placing emphasis on efficiency during detailed design.
- > Maximising the use of rail and sea transport.
- > The use of desiccant breathers to control emissions during tank filling.

#### **2.2.7 Conclusion**

The emissions generated by the proposed changes are expected to be below the adopted assessment criteria and are unlikely to result in a significant impact to the nearest sensitive receivers.

The mitigation measures detailed in Section 7.2.6 of the Maunsell-AECOM (2008) EA are considered to be appropriate to mitigate the potential air quality impacts to meet adopted assessment criteria.

## **2.3 Hazards and risks**

### **2.3.1 Introduction**

Section 7.4 of the Maunsell-AECOM (2008) EA included a Preliminary Hazard Analysis (PHA) for the proposed SPBP facility. The PHA assessed the hazards and corresponding risk with the proposed SPBP facility and associated facilities such as marine unloading and soybean storage.

The works associated with the proposed changes are generally consistent with the hazards and risks assessed as part of the Maunsell-AECOM (2008) EA, with the exception of the following:

- > Shifting the location of soybean oil storage site
- > Construction of the project in two stages
- > Construction of a truck soybean dump station
- > Temporary importation of biodiesel.

Accordingly the assessment of hazards and risk focuses on these proposed changes.

### **2.3.2 Relevant Legislation & Guidelines**

The previous PHA was prepared in accordance with the Department of Planning Hazardous Industry Planning Advisory Paper Numbers 4 and 6.

### **2.3.3 Methodology**

Following the key steps in the PHA methodology, the steps in the hazard and risk assessment for the proposed changes includes:

- > Establishing the nature of the proposed changes in particular the quantity, storage and handling of dangerous goods and combustible dusts that may give rise to major fires and explosions.
- > Review of the proposed general arrangement of the proposed changes and development of possible major hazard events, their causes and consequences.
- > Review of the consequences of the identified hazardous events by considering onsite and possible offsite impacts, including the risk of propagation of a hazardous event to nearby processing facilities.
- > Review of the likelihood and hence the risk of the potential hazardous events with the possibility for offsite harm using qualitative techniques.
- > Comparison to the existing local landuses including consideration of cumulative risk factors.
- > General consideration proposed safeguards.

### **2.3.4 Hazard Identification**

The primary hazards identified as part of the Maunsell-AECOM (2008) EA were due to flammable liquids and combustible dusts that are present on site in sufficient quantities to cause a major fire or explosion risk. Accordingly the hazard identification in the Maunsell-AECOM (2008) EA was directed at bulk quantities of material and not minor quantities as may be found as small additives, cleaners, waste storage and like situations.

The proposed changes do not alter the type of hazard that may be presented or the type of hazardous material to be used. However, there is a minor increase in the storage volume for soybeans and a shift in the location of the storage facility, albeit further away from sensitive receivers. The shift in the location of the storage tanks facilitates the need for a pipeline over the Garungaty waterway. Accordingly, this hazard identification and risk assessment focuses on these aspects.

### **Soybeans**

Although soybeans are not dangerous goods, the dry dust produced during handling has the potential to be combustible depending on the particle size. In the event of a dust explosion, the slight increase in the storage capacity for soybeans marginally increases the size of the impact footprint. However, the consequences of an explosion (i.e. destruction of materials and beings) do not materially change from the existing land use as detailed in Table 41 of the Maunsell-AECOM (2008) EA.

### **Flammable Liquids**

The chemical tank farm will remain on Plot3; however the location of Plot 3 will shift further away from sensitive receivers. The volume of flammable liquids (methanol and sodium methyllate) will not change, hence the risk associated with this hazard is not considered to change.

### **Pipeline Waterway Crossing**

The shift in the location of Plot 3 and the associated refining plant necessitates the need for a pipeline across Garungaty waterway. The waterway crossing increases the risk of potential leaks entering the waterway, hence the pipeline design, manufacture and construction will be required to meet relevant standards with regular monitoring implemented during operation to mitigate the risk of significant impacts during operation.

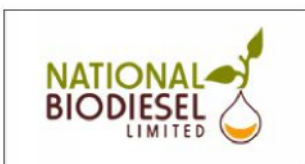
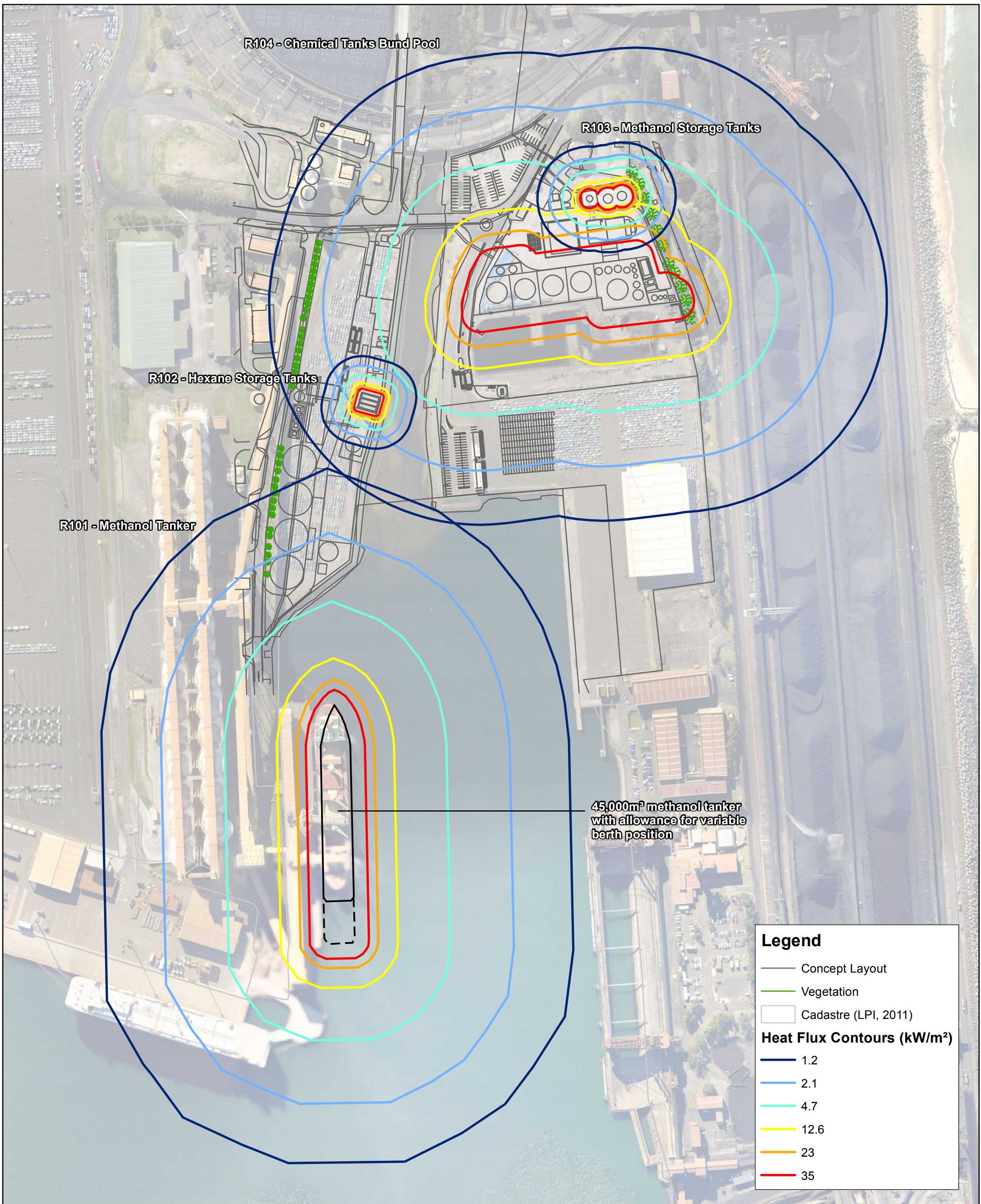
Construction hazards and risks associated with the pipeline are expected to minimal as the pipeline will be attached to a new pipe bridge adjacent to the existing road bridge that spans the waterway.

### **2.3.5 Risk Analysis**

The risk analysis methodology adopted in the Maunsell-AECOM (2008) EA, used a scenario based risk assessment approach, as opposed to an incident based approach, for the following reasons:

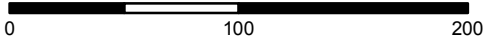
1. Distance to sensitive land users including residences.
2. Distance between onsite tanks and other equipment to the neighbouring facilities.

The proposed modification does not alter the key risk criteria as detailed in Table 43 of the Maunsell-AECOM (2008) EA, however, the extent of potential radiant heat impacts will change with the shift in location of Allotment 3. The radiant heat impacts such as heat flux, tolerant radiant heat levels and effects of explosion overpressure as detailed in Tables 43, 44 and 45 of the Maunsell-AECOM (2008) EA do not change, however, the modelling of heat flux contours has been updated to reflect the shift in location of Allotment 3, as shown in **Figure 4** below:



1:3,300 Scale at A3

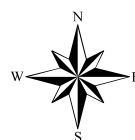
Metres



## Heat Flux Diagram

SECTION 75W MODIFICATION TO  
MAJOR PROJECT APPROVAL 08\_0083

FIGURE 4



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
Date: 2012-08-27  
Coordinate System: GDA 1994 MGA Zone 56  
Project: 82013003-01  
Map: G1009\_HeatFlux.mxd 01

Aerial Imagery supplied by Near Map and associated third party suppliers (July 2012)

### **Products of Combustion**

The proposed changes are not considered to alter the products of combustion as detailed in the Section 7.4.8 of the Maunsell-AECOM (2008) EA.

### **Explosion Pressures**

The explosion pressures are not considered to change based on the data included in the Section 7.4.8 of Maunsell-AECOM (2008) EA.

### **On-site Risks**

The onsite risks are considered to be consistent with those stated in Section 7.4.8 of the Maunsell-AECOM (2008) EA.

### **Products Stored In Bunded Areas**

The proposed bunding approach as detailed in the Maunsell-AECOM (2008) EA will be adopted for the proposed changes, with the extent of bunding to be consistent with the increase in storage volumes.

### **Tank Failure Rates**

The tank failure rates are considered to be as per Table 48 of the Maunsell-AECOM (2008) EA.

### **Drainage Systems & Site Grades**

The modified designs have been developed so that in the event of fire, fire water run off containing any materials is held onsite.

### **Gaseous Emissions**

The gaseous emissions are as per those detailed in the Maunsell-AECOM (2008) EA.

### **Offsite Risks**

As per the Maunsell-AECOM (2008) EA, a quantitative risk assessment has not been carried out as the event consequences do not exceed minimum threshold values to cause damage or injury. The proposed changes result in the source of heat flux, explosion pressures and potential toxic concentrations being located further away from potential sensitive receivers.

#### **2.3.6 Mitigation Measures**

The Maunsell-AECOM (2008) EA sets out a series of mitigation measures grouped into two (2) broad areas:

- > Prevention controls – including the design and layout of the facilities, operation and maintenance procedures and training.
- > Mitigation controls - fire protection systems, alarms, spill response procedures and emergency shutdown.

A key change to the proposed mitigation measures is that the soybeans will no longer be stored and handled via the GrainCorp silos at Port Kembla; rather the soybeans will be stored in silos dedicated to the NBL operations. Accordingly these silos will incorporate a series of design and operational features to manage the risk of dust explosions, as follows:

- > An extensive cleaning program to minimise the build-up of combustible dusts;
- > Dust collection systems at all transfer points for conveyors and silos.
- > Use of equipment that is certified for safe use in dust hazard conditions.
- > Staff trained in dust hazards and compliance requirements.
- > Regular plant inspections.
- > Comprehensive plant monitoring and alarm systems.

The waterway crossing also facilitates the need for the following additional mitigation measures:

- > Pipeline design, manufacture and installation in accordance with relevant standards.
- > Regular inspections and maintenance during operation.

### **2.3.7 Conclusion**

The risks posed by the proposed changes to the SPBP facility are considered to be consistent with those assessed in the Maunsell-AECOM (2008) EA and are accordingly manageable. The additional risks associated with the waterway crossing are considered manageable subject to the implementation of the mitigation measures listed above.

## **2.4 Visual**

### **2.4.1 Introduction**

The proposed changes in general have the same character as assessed from a visual perspective in the Maunsell-AECOM (2008) EA. Accordingly only the following key changes have been assessed as part of the assessment of visual amenity impacts:

- > the shift in the location of Plot 3 including the increase in the bulk of the soy oil and biodiesel tanks; and
- > the erection of additional silos for the soybean storage.

As detailed in the Maunsell-AECOM (2008) EA, built form impacts will be incremental during the construction phase.

### **2.4.2 Methodology**

Consistent with the approach adopted in the Maunsell-AECOM (2008) EA, a qualitative assessment has been undertaken for the site based on visual modification and visual exposure. The viewpoints and potentially sensitive visual receptors assessed are as per the Maunsell-AECOM (2008) EA. Site photographs and 3D models are included in **Appendix A**.

### **2.4.3 Existing Environment**

The existing environment is detailed in Section 7.11.3 of the Maunsell-AECOM (2008) EA and is generally described as a regionally significant industrial precinct on the coastal plain which is characterised by foreshore port facilities and operations. The visual landscape within the vicinity is dominated by the BlueScope Steel Works and Port Kembla Coal Terminal, with existing items of high public exposure including the GrainCorp silos, cranes, coal stockpiles, ship loading facilities and the 198m chimney located in the Outer Harbour precinct.

### **Viewpoints**

The viewpoints for the proposed changes are as per the Maunsell-AECOM (2008) EA:

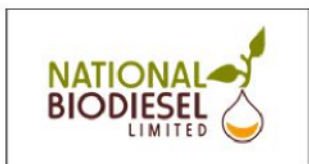
1. Swan Street, Port Kembla.
2. Robwald Avenue.
3. Outer Harbour.
4. Port Kembla Coal Terminal.
5. Mount Keira.
6. Tom Thumb Road.

The proposed changes shift the infrastructure away from the nearest residential dwellings with vistas, in the suburbs of Mount St Thomas and Coniston. **Figure 5** shows the location of sensitive receivers.



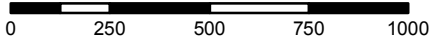
**Legend**

- Sensitive Receivers
- Existing Approved Infrastructure
- Proposed Biodiesel & Glycerine Refinery



1:19,000 Scale at A3

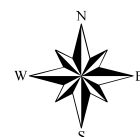
Metres



## Sensitive Receivers

SECTION 75W MODIFICATION TO  
MAJOR PROJECT APPROVAL 08\_0083

FIGURE 5



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
Date: 2012-08-27  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Project: 82013003-01  
Map: G1010\_SensitiveReceivers.mxd 02

Aerial Imagery supplied by Near Map and associated third party suppliers (July 2012)

#### 2.4.4 **Impact Assessment**

The visual impacts were considered based on the following issues, to determine the potential level of impact posed by the proposed changes:

- > Colour;
- > Lighting
- > Bulk and height;
- > Suitability of the development in the locality;
- > Associated structures;
- > Existing site features.

**Table 2-1** below provides the key findings of the visual impact assessment undertaken for each representative viewpoint.

**Table 2-1 Summary of Visual Impacts from key viewpoints**

Viewpoint	Visual Modification	Visual Sensitivity	Visual Impact	Comment
1. Swan Street	No perceived reduction in amenity	Regional	Negligible	Given the relative height of the grain silos, the proposed modifications are not considered to noticeably protrude beyond the extent of the existing structures.
2. Robwald Street	No perceived reduction in amenity	Local	Negligible	The subject site is within close proximity to the existing Grain Terminal and accordingly is not considered to alter this viewpoint.
3. Outer Harbour	No perceived reduction in amenity	Regional	Negligible	In general the proposed modification works are screened from the Outer Harbour by the Grain Terminal and PKCT.
4. PKCT	No perceived reduction in amenity	Regional	Negligible	The photomontage indicates that the character and height of the proposed modification works is consistent with the surrounding environment and therefore does not have a significant impact from this viewpoint.
5. Mount Keira	No perceived reduction in amenity	Regional	Negligible	The proposed modification is not visually obtrusive from this viewpoint.
6. Allotment 3	No perceived reduction in amenity	Regional	Negligible	In the context of the surrounding environment, the proposed modifications are considered to be less obtrusive than the existing Grain Terminal.

The proposed changes include a maximum building height of 30m with a bulk and character consistent with the existing industrial presence. The bulk of the soy oil storage tanks is marginally greater than previously assessed. The shift in location of infrastructure associated with the proposed modification works has resulted in a greater distance from residential receivers. Hence the visual impact is considered to be low as demonstrated in the photomontages included in **Figure 6, 0 and 0**.

**Figure 6. Photomontage from Viewpoint 4 – PKCT**



**Figure 7. Photomontage from Viewpoint 5 – Mount Keira**



**Figure 8. Photomontage from Viewpoint 6 – Tom Thumb Road**



The visual impacts during construction and resulting from lighting and building material/design are considered to be consistent with those assessed in the Maunsell-AECOM (2008) EA, however, the construction activities will take place over two stages.

#### **2.4.5 Mitigation Measures**

The proposed mitigation measures are as per Section 7.11.5 of the Maunsell-AECOM (2008) EA and in general include:

- > Conducting works in an orderly manner.
- > Storing construction equipment within the work site.
- > Provision of some landscaping with native species.
- > Design of exterior lightning in accordance with relevant standards.
- > The use of non-reflective roof and wall materials.

#### **2.4.6 Conclusion**

The proposed changes are considered to have a low visual impact as their character, form and bulk is consistent with the existing industrial setting. Hence the proposed changes are considered to integrate well with the existing port and heavy industrial operations.

### 3 Conclusion

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Cardno has prepared an assessment of the air quality, hazard/risk and visual amenity impacts associated with the proposed changes to the Port Kembla Soybean Processing and Biodiesel project.

Air quality impacts resulting from the proposed modifications are considered to be consistent with those detailed in the Maunsell-AECOM (2008) EA. The process and capacity of the plant remains the same, hence the type and amount of emission generating activities is not considered to increase. Therefore, the emissions generated by the modified proposal are expected to be below the adopted criteria as modelled in the Maunsell-AECOM (2008) EA and not significant to the nearest sensitive receptors.

Due to the additional storage capacity and soybean dump truck station, there is the potential for a minor increase in the generation of dust and vehicle emissions. However, the mitigation measures detailed in the materials handling system are expected to control dust generation and the risk of combustion to an acceptable level. Noting also that the location of potential dust generating activities will be further away from sensitive receptors. Furthermore to reduce potential vehicle emission impacts, where practicable, vehicle emissions will be mitigated through the use of rail and sea for transportation.

The proposed modification is not considered to alter the Preliminary Hazard Analysis (PHA) or the permissibility of the project under the current land use zoning. Re-modelling of radiant heat impacts based on the new location of the refinery, has shown the risk of radiant heat impacts to meet the risk criteria. Other risks such as the risk of explosion from soybean dust, flammable liquid storage and tank failures are considered to be mitigated as per the Project Approval.

The extension of the pipeline to link from the soybean silos to the new location of the refinery, requires the crossing of Gurungaty Waterway via a new pipe bridge adjacent to the existing road bridge. The waterway crossing presents an additional risk to the environment through product loss via a leaking pipe directly to the waterway. The risk of such an environmental incident is considered to be mitigated through the design, manufacture and installation of the pipeline to relevant standards, testing prior to operation and regular inspections during operation.

The visual amenity impacts of the proposed modification are considered to be consistent with the Project Approval, as the changes are considered to integrate into the existing industrial setting. Although parts of the modification will be somewhat visible from surrounding locations, the proposed structures are similar in bulk and character to the existing industrial development. Accordingly the proposed modification is considered to be consistent with the character of the port and its heavy industrial operations. Landscaping, vegetative screening, non-reflective materials, recessive colours and the minimisation of light spill have been incorporated into the project design to minimise the visual amenity impacts.

In summary, the air quality, hazard/risk and visual amenity impacts of the proposed modification are considered to be consistent with the Project Approval.

## 4 References

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*Maunsell-AECOM (2008) Soybean Processing and Biodiesel Production Facility – Environmental Assessment.*

Port Kembla Soybean Processing  
and Biodiesel Project

APPENDIX

A

Site Photographs & Model Images

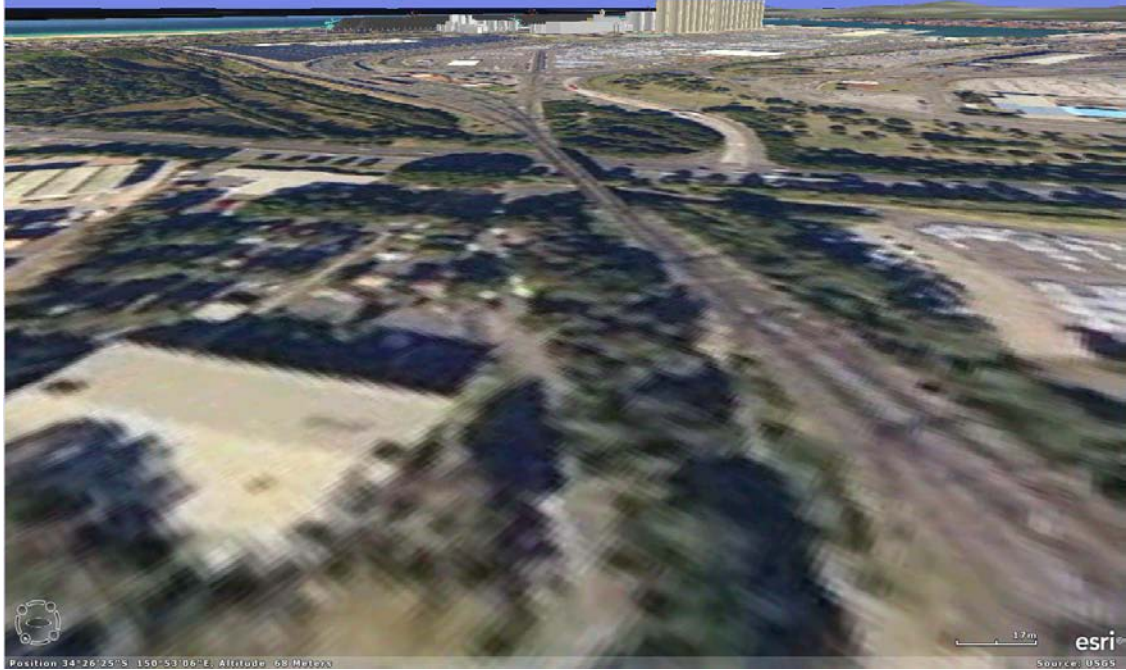


### Viewpoint 1 - Swan Street (Looking South)

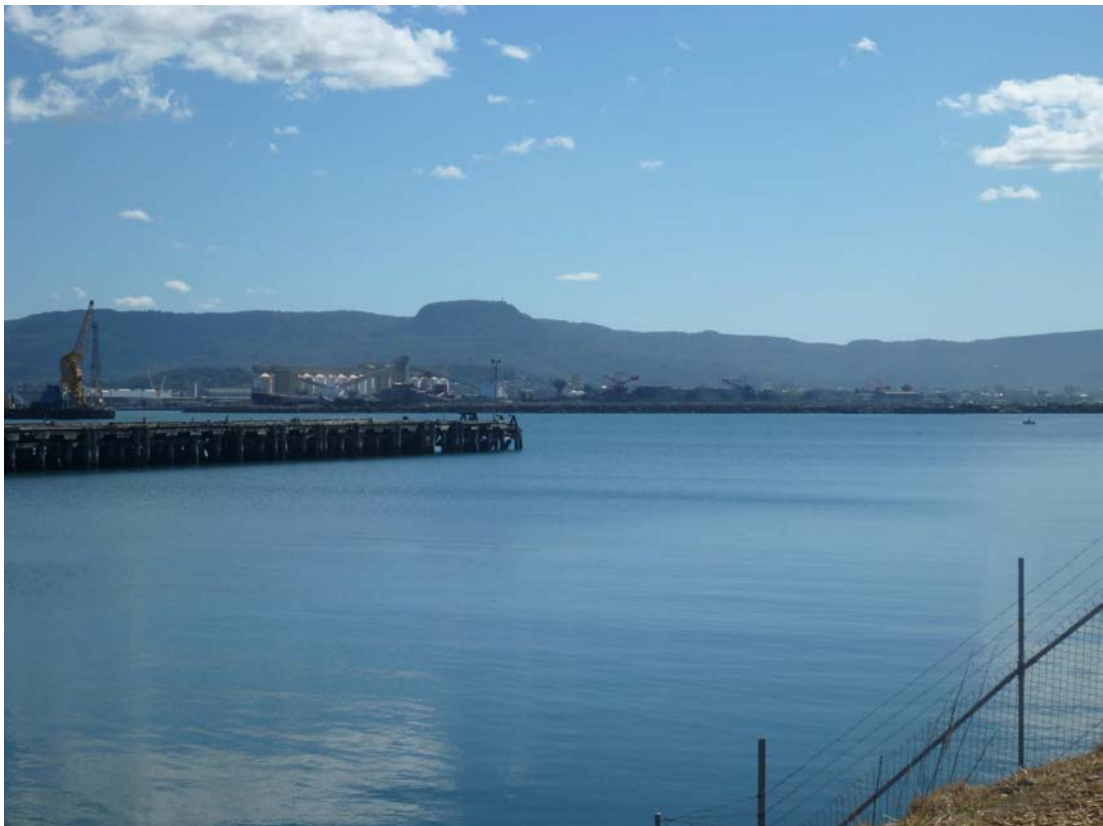
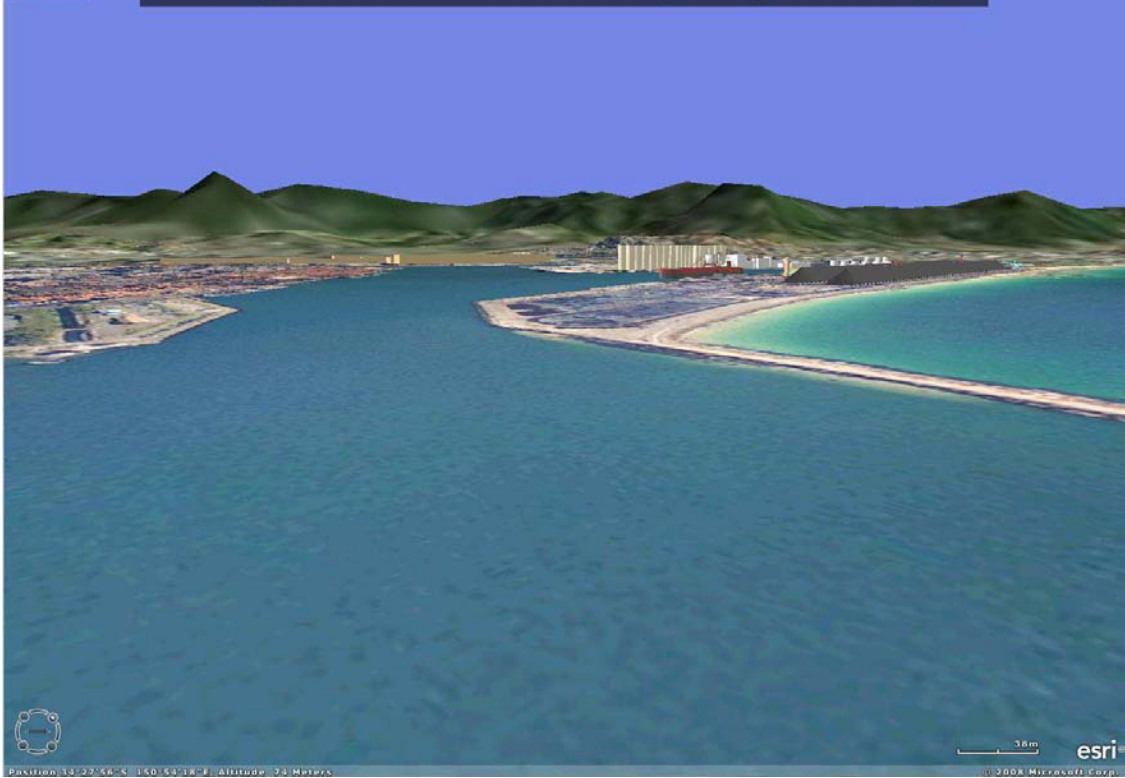




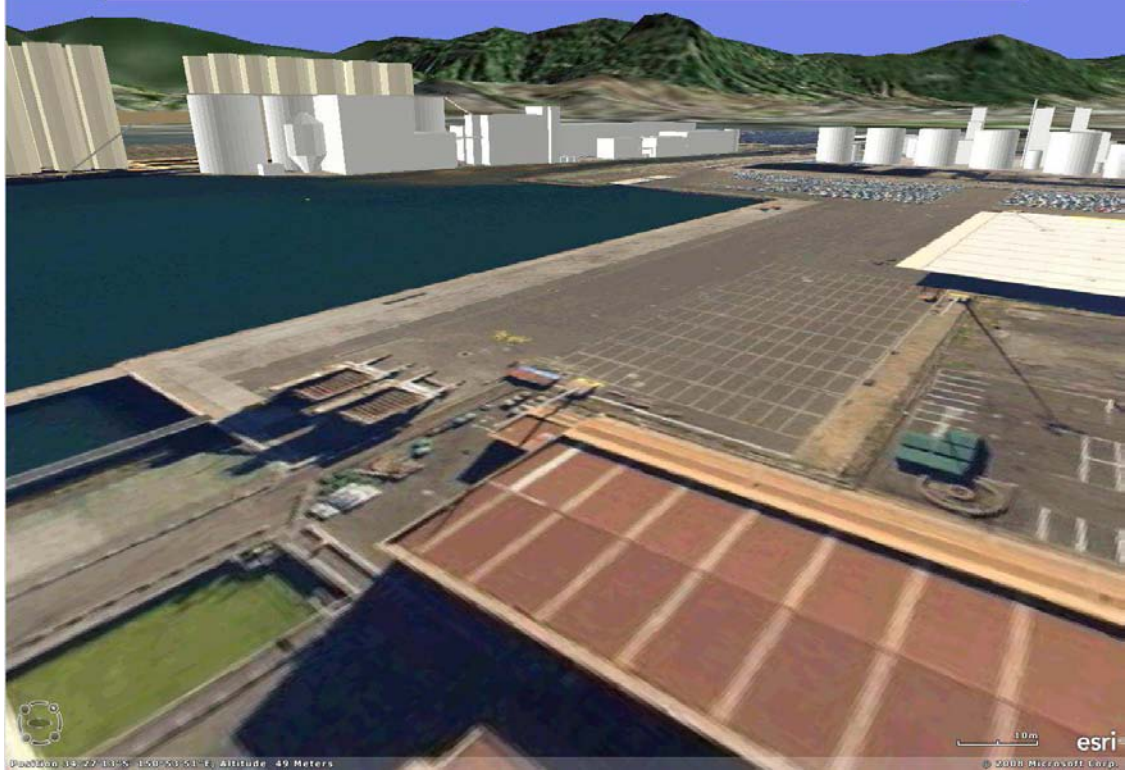
**Viewpoint 2 - Bridge Street (Looking South West)**



### Viewpoint 3 - NSW Maritime Wharf (Looking North West)



Viewpoint 4 - Port Kembla Coal Terminal (Looking North West)

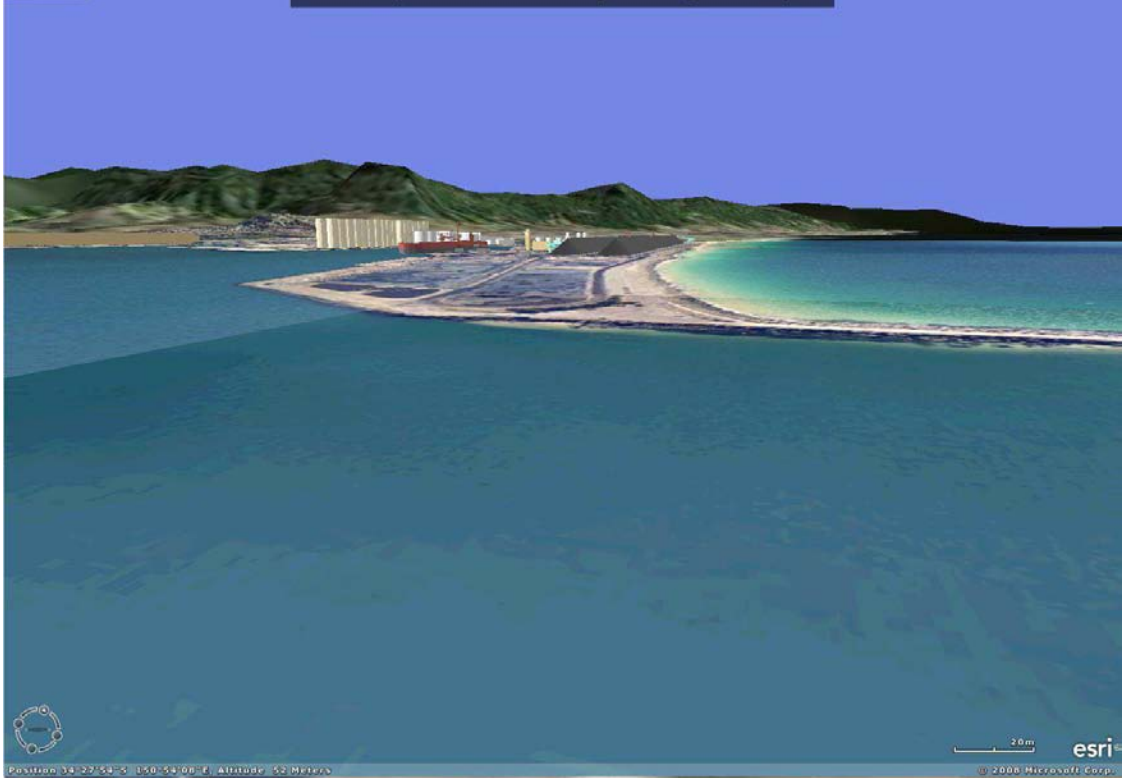


Viewpoint 5 - Mount Keira (Looking South East)





### Viewpoint 7 - Hill 60 (Looking North)





### Viewpoint 8 - Flagstaff Hill (Looking South)

