

7.4.11 Conclusion

The risks associated with the proposed SPBP facility and their associated operations have been assessed and compared against the Department of Planning risk criteria.

In summary:

- Fires
 - No risk of injury or fatality at residential areas or other sensitive land uses as the separation distance is large, i.e. 1 km or larger
 - Fire events have the potential to cause fatality in neighbouring industrial areas, however, their likelihood is acceptably low and there exists a high probability of escape
 - Fire events have the potential to cause propagation on-site and at neighbouring industrial facilities; however, the combined likelihood is less than the acceptable criterion of 50 pmpy.
- Explosions
 - No risk of injury or fatality at residential areas or other sensitive land uses as the separation distance is large, i.e. 1 km or larger
 - Internal tank explosion events have the potential to cause fatality or propagation damage on-site and in neighbouring industrial areas; however, the combined likelihood (approximately 20 pmpy) is less than the acceptable criterion of 50 pmpy
 - Dusts explosions are possible but worst case events are restricted to existing plant (GrainCorp silos). Minimal increase in risk results from the proposed operations. Dusts explosion pressures will not impact on residential areas.
- Societal risk is qualitatively concluded to be acceptable given:
 - Few events analysed in the study have the potential for off-site impact and, for the ones that do, their likelihood is acceptably low
 - The risk of off-site individual fatality is low and acceptable
 - The population density in the area is low.

Therefore, the results of this PHA show that the risks associated with the proposed changes comply with the Department of Planning guidelines for tolerable fatality, injury, irritation and societal risk.

The primary reason for the low risk levels from proposed changes is that significant consequential impacts from potential hazardous events (mainly radiant heat from fires) do not extend far from the relevant processing areas.

It is assumed that the proposed changes will be reviewed via a HAZOP as part of detailed design development. An updated fire safety study will also be performed and that safety management systems and emergency response plans will be developed for the proposed Facility.

A specific recommendation is made from this PHA to review bunding arrangements at the chemical tank bund to separate reactive liquids.

7.5 Traffic and transport

7.5.1 Introduction

The proposed SPBP facility is located in the Inner Harbour of Port Kembla, NSW. Port Kembla is located in the Wollongong Local Government Area and is approximately 80km south of Sydney's CBD and 3km south of Wollongong. The site in its regional context identifying key road links is shown in **Figure 46**.

Figure 46 Regional context of proposed SPBP facility



Source: Google Maps, 2008

The report includes the following:

- an assessment of the existing traffic and transport conditions in the vicinity of the proposed development
- the proposed operation of the development
- the traffic generation and impact of the development proposal including three different scenarios associated with the transportation of materials.

7.5.2 Existing conditions and transport network

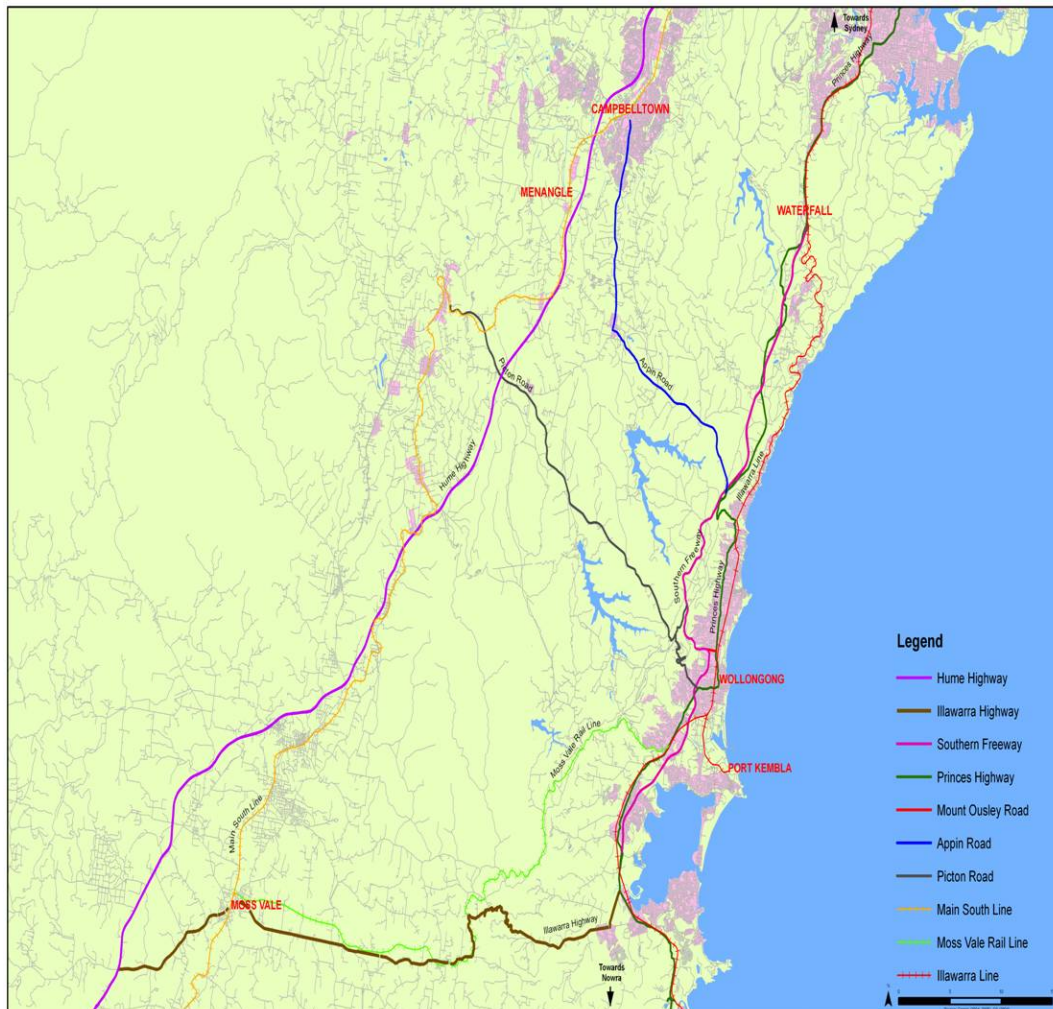
Site description

The SPBP facility will be located on four separate allotments along Tom Thumb Road adjoining and surrounding the existing Grain Terminal in Port Kembla's Inner Harbour.

Regional transport context

The Southern Freeway and the Illawarra Rail Line provide the primary road and rail links between Sydney and Wollongong. Heavy vehicle access to the Inner Harbour of Port Kembla is gained via Springhill Road and Masters Road from the Southern Freeway. For the Outer Harbour, Five Islands Road provides the most direct link between the Port and the southern harbour. **Figure 47** shows the primary road and rail links in the Illawarra Region.

Figure 47 Primary road and rail links in the Illawarra region



Source: Port Kembla Freight Access Study, Maunsell, 2007

Key road links

The Southern Freeway (F6 Freeway)

The Southern Freeway (F6 Freeway) is the primary road link between Sydney and Wollongong and is an authorised B-double route. It is a four lane road with two lanes in each direction and a maximum speed of 110km/hr.

The multiple roles the Freeway plays in facilitating long distance through movements, providing access to Port Kembla for heavy vehicles and local access to the city results in traffic conflicts at different times of the day. These conflicts are most evident on the section of the Freeway between Mount Ousley Road and the Unanderra Junction, where the relatively short distances between junctions result in traffic weaving patterns that can create safety issues in this area.

Mount Ousley Road

Mount Ousley Road is the major route up and down the Illawarra Escarpment and serves as the gateway to Wollongong as well as providing a connecting link between the two sections of the Southern Freeway. The northern section of the road has three lanes in each direction and the southern section has two lanes in each direction. Two lanes northbound (ascending) and one lane southbound (descending) are marked as truck and bus lanes. Heavy vehicles are required to operate

in low gear as they ascend or descend the escarpment. Light vehicles are also permitted to use the truck and bus lanes.

The southern end of Mount Ousley Road is characterised by a gradient (ranging from 6-9%) and the incline near Mount Keira reduces the speed of heavy vehicle traffic. There are also safety issues relating to the at-grade intersection of Mount Ousley Road and the Southern Freeway near the University of Wollongong. These constraints combine to create a potential pinch-point in the corridor between Sydney and Wollongong. The speed limit varies between 80 and 100 km/h for general traffic and 40 km/h for heavy vehicles.

Princes Highway

The Princes Highway runs parallel to the Southern Freeway between Waterfall and Bulli Tops, where it deviates through Bulli Pass and follows the coastline to Wollongong.

Historically, the Princes Highway was the major link between Sydney and Wollongong. The development of the Southern Freeway in the 1970s saw the highway's role diminish, as the Freeway provided a quicker and arguably superior route. Between Waterfall and Thirroul, the highway is a two-lane undivided carriageway, which is below the standard required to cater for efficient and safe motoring given the current levels of demand in the corridor. Only south of Yallah does the Princes Highway re-establish itself as the primary north-south road link. South of Port Kembla, the highway predominantly consists of one lane in each direction with limited overtaking opportunities.

Picton Road and Appin Road

Picton Road and Appin Road provide a key connection between Western Sydney and Wollongong by connecting the Southern Freeway/Mount Ousley Road and the Hume Highway. As congestion on the Sydney road network increases, and as significant population and employment centres become established in Western Sydney, both of these routes have increased in importance as an alternative inland corridor for freight traffic between Sydney and Wollongong.

Picton Road is an authorised B-double route and given that B-doubles cannot operate between Wollongong and Moss Vale on the Illawarra Highway, it represents the logical route for east-west truck traffic. Significant volumes of trucks use both routes with approximately 15-25% of total traffic being heavy vehicles.

Springhill Road

Springhill Road provides a southern arterial link into the centre of Wollongong as well as passing through the Port Kembla industrial area. It currently forms the western boundary of the Inner Harbour and the majority of freight accessing the Inner Harbour must use or cross this road. The road also connects to Corrimal Road which travels through the periphery of the CBD. Springhill Road comprises a divided carriageway with three lanes in each direction and has a speed limit of 80km/hr. In addition, there are additional flare lanes available for right turning vehicles at the majority of intersections.

Masters Road

Masters Road connects Springhill Road to the Southern Freeway and is the main access route between Port Kembla and all destinations both north and south. The route runs along the northern boundary of the BlueScope Steel Spring Hill site. It consists of a divided carriageway with three lanes in each direction and additional flares are available for left and right turning vehicles at the intersection with Springhill Road. Masters Road experiences a speed limit of 80km/hr. Heavy vehicles are estimated to comprise 15% of total traffic.⁹³

⁹³ SKM, *Port Kembla Port Corporation Proposed Expansion of General Cargo Handling Facility*, Environmental Assessment Report, December 2005

Tom Thumb Road and Port Kembla Road

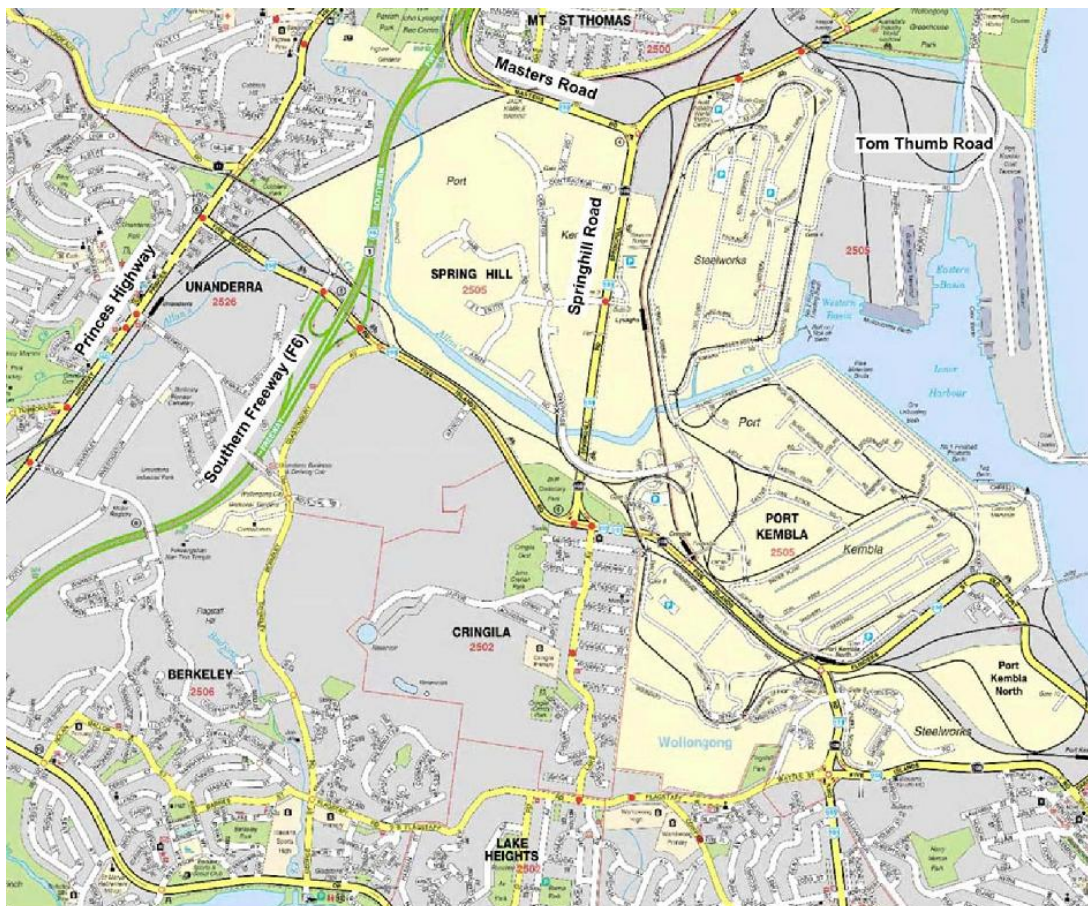
Tom Thumb Road and Port Kembla Road provide a loop from Springhill Road and form the main access routes into the Inner Harbour within the port boundary and consequently will provide vehicular access to the proposed SPBP facility allotments. Both routes are single carriageway roads with one lane in each direction and a speed limit of 50km/h.

Tom Thumb Road provides access to Berth 107 as well as the Grain Handling Terminal via Farrer Road. The route is currently undergoing re-alignment as part of the proposed expansion of the Inner Harbour (AAT site) and will provide access to the extended Multipurpose Berth as well as the car handling facility. The route currently has a two way flow of 1,200 vehicles per day of which 35% are heavy vehicles.¹

Port Kembla Road provides access to the Port Kembla Coal Terminal as well as to Eastern Basin 4. The route joins the local road network at a signalised junction between Springhill Road and Corrimal Road at the northern perimeter of the Port Kembla site.

An overview of the local road network surrounding Port Kembla is shown in **Figure 48**.

Figure 48 Local road and rail links in the vicinity of Port Kembla



Source: UBD 2007

Key rail links

Illawarra South Coast line

The Illawarra South Coast Rail Line provides the principal rail link between Sydney and Wollongong. The rail line between Sydney and Unanderra is a double track and becomes a single track south of Unanderra. The Port Kembla branch line connects with the Illawarra Line at Coniston, south of Wollongong. A number of coal loops also connect onto the line at various points.

As is typically the case across the Sydney metropolitan rail network, freight trains share line capacity with passenger services and are restricted from operating during peak periods.

The current patronage at selected stations in the Wollongong area are summarised in **Table 49**. It is evident that there is significant commuting activity from Wollongong and North Wollongong stations during the morning peak period. Much of this passenger traffic is commuters travelling to Sydney to access employment activities. The stations to the south of Wollongong, in the vicinity of the Port Kembla port precinct, are less well-used. The low usage of these stations is probably attributable to the low service frequencies; for example, during the morning peak train services from Port Kembla stations to Sydney are two per hour, whereas service frequencies from Wollongong to Sydney are four trains per hour. Additional factors such as availability of car parking and poor public transport connections may also contribute.

Table 49 Rail passenger flows in Wollongong stations

Station	06:00 to 09:30		24 Hours	
	In	Out	In	Out
North Wollongong	220	870	1500	1500
Wollongong	820	420	2100	2100
Coniston	220	110	590	590
Lysaghts	<5	10	20	20
Cringila	10	30	60	60
Port Kembla North	10	20	60	60

Source: A Compendium of City Rail Travel Statistics, 5th Edition, April 2006, City Rail

Rail freight movements on the Illawarra Line focus upon Port Kembla as the ultimate destination or the origin. It primarily caters for coal traffic from the Western Coalfields and from collieries located along the line. A number of other commodities are also handled by rail including:

- stone and ballast from Dunmore (Shellharbour) to Enfield
- steel products from Port Kembla to Sydney (for domestic and export via Port Botany) and interstate destinations
- flour and grain services from regional NSW and Port Kembla for export, and Bomaderry for domestic production
- containerised freight between Bomaderry and Cooks River.

Based on information from RailCorp, an average of 12 freight train paths are utilised on the Illawarra Line in each direction on an average weekday.

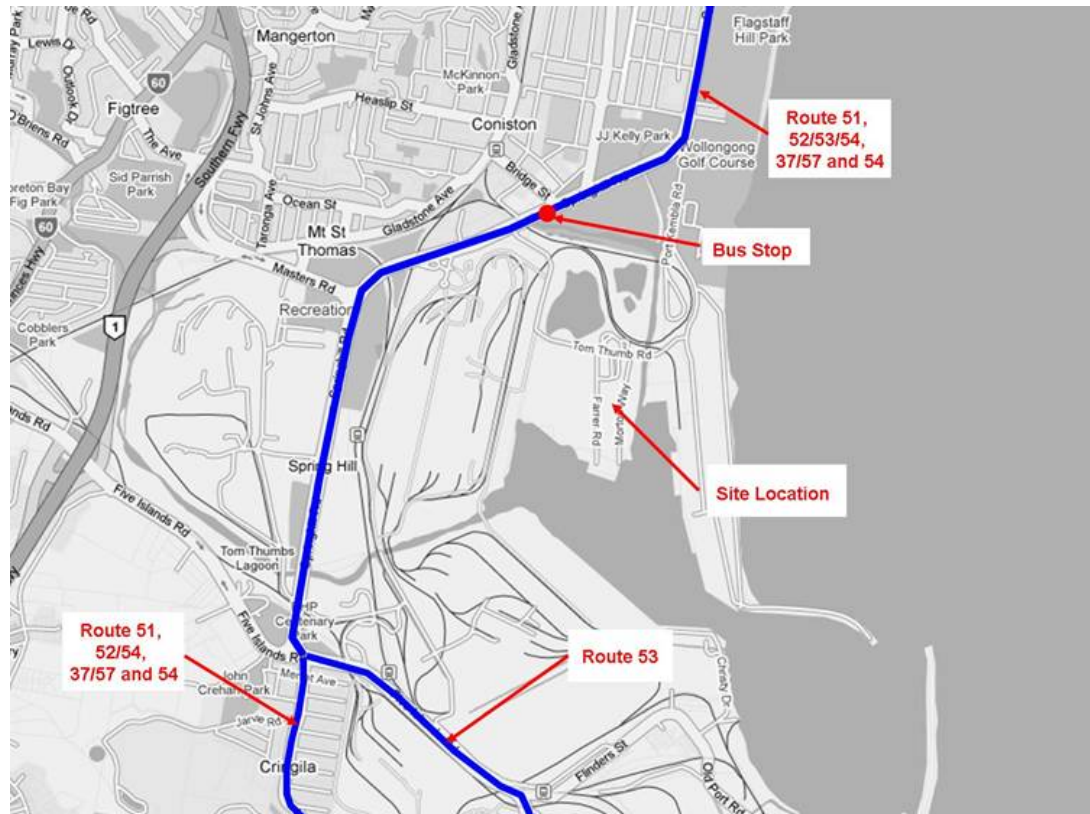
Moss Vale – Unanderra line

The Moss Vale – Unanderra Line provides an east-west connection between the Main South Line and the Illawarra Line. The line is currently dedicated to freight train operations and provides a potential alternative route for freight traffic between Sydney and Wollongong, although the line allows Wollongong – Melbourne freight to bypass Sydney.

Bus facilities

Premier Illawarra operates six bus services in the vicinity of Port Kembla. Routes 37, 51, 52, 53, 54 and 57 currently travel along Springhill Road that connects University of Wollongong, Wollongong City and the suburbs south of Port Kembla. The nearest bus stop to Tom Thumb Road is located on Springhill Road, approximately 1km away from the proposed site. The bus routes and nearest bus stop are shown in **Figure 49**. There are no bus services that travel along Tom Thumb Road to service the site nor are there pedestrian linkages. The details and service frequencies of each bus route are summarised in **Table 50**.

Figure 49 Bus routes and bus stop location



Source: Maunsell, 2008

Table 50 Bus routes and frequencies

Route	Direction	Weekday Services				Weekend Services	
		AM peak (7-10am)	Off peak (10am – 4pm)	PM peak (4pm to 7pm)	After peak	Sat	Sun
51	Albion Park to University via Wollongong	2	3	1	-	-	-
	University to Albion Park via Wollongong	-	4	2	-	-	-
52/53/54	Shellharbour District to Wollongong	5	3	2	2	17	9
	Wollongong to Shellharbour District	-	5	1	3	17	8
37	University link via Wollongong, Unanderra, Dapto, Shellharbour Square, Warrawong and Wollongong	1	6	4	2	12	7
57	University link via Wollongong, Warrawong, Shellharbour Square, Dapto, Unanderra and Wollongong	2	2	3	2	11	6

Source: www.premierillawarra.com.au

During the morning and evening peaks 10 and 13 bus services operate respectively. In addition, limited bus services operate along Springhill Road on weekends.

Port operations

Port Kembla is currently primarily a bulk commodities port servicing the coal mining industry and the adjacent steel works. Total trade through the Port reached 25.9 million tonnes for the year 2005/06. The major cargoes handled comprised 10.9 million tonnes of export coal, 11.3 million tonnes of steel related products (iron ore imports and steel product exports) and 1.6 million tonnes of grain exports.

In 2005/06 the total volume of imports was 9.5 million tonnes of which more than 80% were comprised of iron ore which is utilised in the local BlueScope steel-making plant. The next most imported cargo was limestone-based products which are also used in the same process.

Traffic volumes

Daily traffic counts

Daily traffic volumes, including the proportion of heavy goods vehicles, have been obtained from the *Port Kembla Freight Accessibility Strategy Study* (Maunsell 2007). Where possible, daily traffic volumes have been updated from the RTA Traffic Volume Data 2005 and are shown in **Table 51**.

Table 51 Daily traffic volume data

Road	Daily traffic volume (2005)	% Heavy Vehicles
Tom Thumb Road	1,200	35%
Springhill Road	40,500 *	15%
Masters Road	25,000 *	15%
Five Islands Road	36,000 *	-

Source: Port Kembla Freight Accessibility Strategy Study (Maunsell 2007)

* Source: RTA Traffic Volume Data 2005

The traffic flow at Tom Thumb Road is very low and has significant spare capacity for a two-lane road.

Local traffic counts

The *Port Kembla Freight Accessibility Strategy Study* (Maunsell 2007) has been used to provide intersection counts (2006) at the intersections of Tom Thumb Road and Springhill Road and Springhill Road and Masters Road. The intersection counts in the report are based on the Wollongong City Council Tracks Model. The morning peak traffic data are shown in **Figure 50** and **Figure 51**.

Figure 50 2006 intersection count Tom Thumb Road / Springhill Road

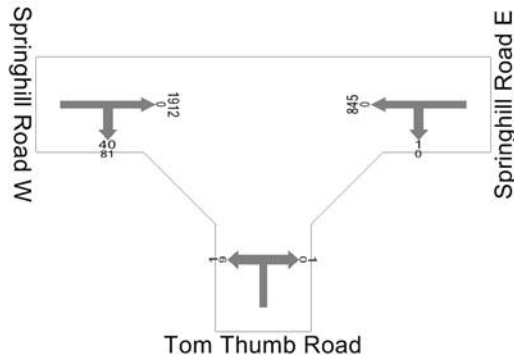
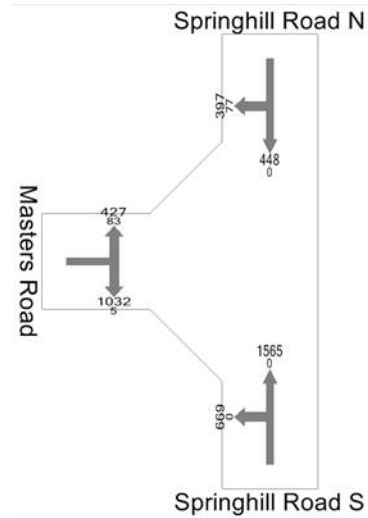


Figure 51 2006 intersection count Springhill Road / Masters Road



Source: Maunsell, 2008

The intersection count shows that Springhill Road has approximately 1,900 vehicles per hour in the northbound (peak) direction during the morning peak. As Springhill Road has three lanes in each direction, there is enough capacity to accommodate these flows. The other heavy movement is right turn at Masters Road into Springhill Road, for which three dedicated right turn lanes are provided to accommodate the high right turn traffic movement.

Intersection assessment based on the surveyed traffic data has been carried out using SIDRA 3.2, a computer-based modelling package which calculates isolated intersection performance.

The main performance indicators for SIDRA 3.2 include:

- degree of saturation (DoS) – a measure of the ratio between traffic volumes and the capacity of the intersection
- average delay – the average waiting period per vehicle at the intersection in seconds
- level of service (LoS) – a measure of the overall performance of the intersection (**Table 52**).

Table 52 Performance criteria for intersections

Level of service	Average delay (secs/veh)	Traffic signals and roundabouts	Give way and stop signs
A	Less than 14	Good Operation	Good Operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays	At capacity; requires other control mode
F	>70	Roundabouts require other control mode	At capacity; requires other control mode

Source: Guide to Traffic Generating Developments, RTA, 2002

The existing (2006) morning peak hour performance of the following intersections has been assessed:

- Tom Thumb Road / Springhill Road
- Springhill Road / Masters Road.

Table 53 summarises the existing intersection operation in the morning peak period.

Table 53 Morning peak intersection performance

Intersection	Intersection type	LoS	DoS	Ave delay (s)	95% back of queue (m)
Tom Thumb Road / Springhill Road	Signals	A	0.422	8.6	69
Springhill Road / Masters Road	Signals	C	0.748	31.6	157

Source: Maunsell, 2008

The morning peak results show that the intersection of Tom Thumb Road and Springhill Road is operating well at a Level of Service A. There is a large amount of reserve capacity for this intersection, in particular on the Tom Thumb Road approach.

The intersection of Springhill Road and Masters Road is also operating at a satisfactory LoSC C, with all approaches experiencing spare capacity (DoS < 0.8) and with acceptable average delays.

Future regional development and infrastructure

Proposed expansion of general cargo handling facility

The *State Infrastructure Strategy* (2006) has confirmed that funding, in the order of \$86 million, is available for the redevelopment and revitalisation of Port Kembla's Inner Harbour. Key changes occurring at Port Kembla include the development of the multi-purpose berth to accommodate the relocated car trade and other non-containerised freight from Glebe Island. The relocation of containerised freight from East Darling Harbour to Port Kembla will also be accommodated by the new berth. Access to the new berth for vehicles will be from Tom Thumb Road. Consequently significant works are already underway to realign Tom Thumb Road to accommodate new port operations. Plans also include the development of Berth 103 for general and break bulk cargo.

Future changes to the Inner Harbour Development will result in an additional 400 ship visits, 15,000-20,000 containers, 240,000 motor vehicles and 120,000 tonnes of break bulk cargo (timber, machinery, steel, paper, and the like) to Port Kembla each year.

The proposed development will generate approximately 24 trucks per hour and 230 employee trips per day under the long-term worst case scenario.

The increased road receipt hours for Port Kembla coal terminal

The Port Kembla Coal Terminal is responsible for receiving, assembling and loading coal from the Southern and Western New South Wales coal fields. Currently, the terminal is only permitted to receive coal deliveries on a specific section of public road between 7am and 6pm on Monday to Saturday, which results in a restricted maximum capacity to receive coal by public road to 5.2 million tonnes per year. Port Kembla Coal Terminal is proposing to increase the road receipts to 24 hours a day, 7 days a week which would result in a maximum of 10 million tonnes per year being able to be received by public road.

The *Existing Operations & Increased Road Receiving Hours for Port Kembla Coal Terminal Traffic Study* (Cardo Eppell Olson 2008) suggested that the increase in road receiving hours and the additional amount of coal able to be received by the Port will result in an average increase of 28 trucks (in both directions) per hour when the receivals are allowed to 24 hours a day, 7 days a week. However, before 24 hours a day, 7 days a week operation is in place, it is estimated that there will be an average increase of 70 trucks per hour (in both directions) as a result of the increase to 10 million tonnes per year being received but with the road receiving hours remaining at 11 hours a day, 6 days a week.

Future infrastructure upgrade

Maldon – Dumbarton proposed rail line

The Maldon – Dumbarton rail corridor is a proposed corridor that would provide a more direct connection between Port Kembla and Western Sydney via the Main South Line. The line has been viewed as a potential solution to supporting increased economic activity within the Illawarra.

The justification for developing the Maldon – Dumbarton line was based on catering for anticipated increases in coal volumes from the Western Coalfields. Construction of the line commenced in 1983. Progress went as far as providing 25 kilometres of formation between Maldon and Dumbarton, constructing half a bridge across the Nepean River and two portals of the Avon tunnel. However, as forecasts of higher coal volumes failed to materialise, construction on the line was halted in 1988. Subsequent planning studies to implement the remainder of the route have not indicated that the project is economically justifiable and it is unlikely to be completed based on current traffic volumes. However, potential increases in future rail volumes and congestion on the Sydney metropolitan freight network could improve the business case of the line.

There is currently interest in undertaking a feasibility study for the completion of this rail line which can be associated with the expansion of the Outer Harbour and Infrastructure Australia's concern regarding improving strategic transport access to Ports. The NB proposal would assist feasibility investigations in providing freight traffic potentially for this line.

The proposed SPBP facility intends to utilise the freight system available to the site. It is envisaged that the operation will require up to two movements per day.

Princes Highway upgrade

The Princes Highway is the main link from Sydney and the Illawarra region to the Shoalhaven, south and far south coast of New South Wales and north eastern Victoria. The existing Princes Highway between South Kiama and Nowra is primarily one lane in each direction and has a number of winding sections with limiting overtaking opportunities. The NSW government is therefore committed to upgrading the section of the Princes Highway between Gerringong and Bomaderry to four lanes. In addition to improving road safety, some of the main objectives of the upgrade are to improve efficiency between Gerringong and Bomaderry, to support regional and local economic development and to enhance potential beneficial environmental effects and manage potential adverse environmental impacts. The upgrade of this road will improve the connectivity of the heavy vehicles generated by the proposed SPBP facility travelling south towards the Southern Highlands, Canberra and Melbourne.

Future traffic conditions

This section reviews the likely impacts of changes to the traffic flows and the road network for the future year before any proposed development occurs. The 2010 morning peak flows have been extracted from the *Port Kembla Freight Accessibility Strategy Study* (Maunsell 2007) which have accounted for the proposed increase in traffic generated by the General Cargo Handling Facility.

Traffic generated by the proposed increase in receival hours at the Port Kembla Coal Terminal have also been added to the 2010 morning peak flows. An additional 70 truck movements have been assumed to be generated by the proposed operation of Port Kembla Coal Terminal as a worst case scenario in 2010. The total 2010 morning peak turning flows are shown in **Figure 52** and **Figure 53**.

Figure 52 2010 intersection count Tom Thumb Road / Springhill Road

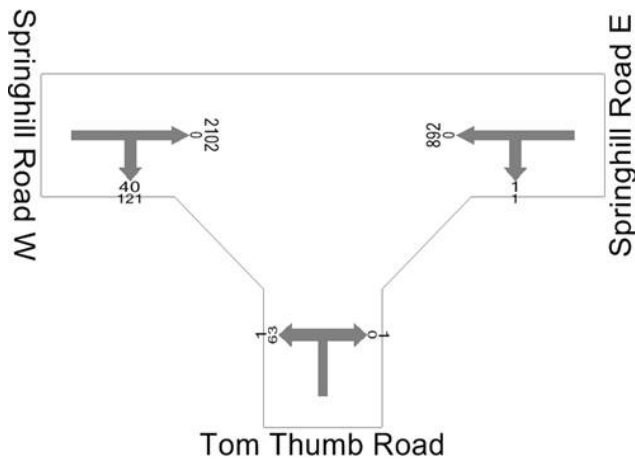
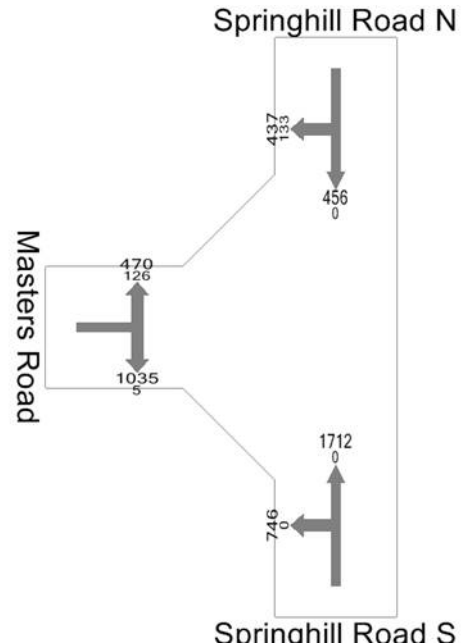


Figure 53 2010 intersection count Springhill Road / Masters Road



Source: Maunsell, 2008

The flows have been modelled in SIDRA 3.2 to determine the future intersection performance in 2010 and the results are shown in **Table 54**.

Table 54 2010 AM peak intersection performance

Intersection	Intersection Type	LoS	DoS	Ave Delay (s)	95% back of queue
Tom Thumb Road / Springhill Road	Signals	A	0.484	9.8	78
Springhill Road / Masters Road	Signals	C	0.796	36.3	191

Source: Maunsell, 2008

The intersection analysis results show that by 2010 the increase in port activity will only have minimal impact to both intersections in the vicinity of the Inner Harbour.

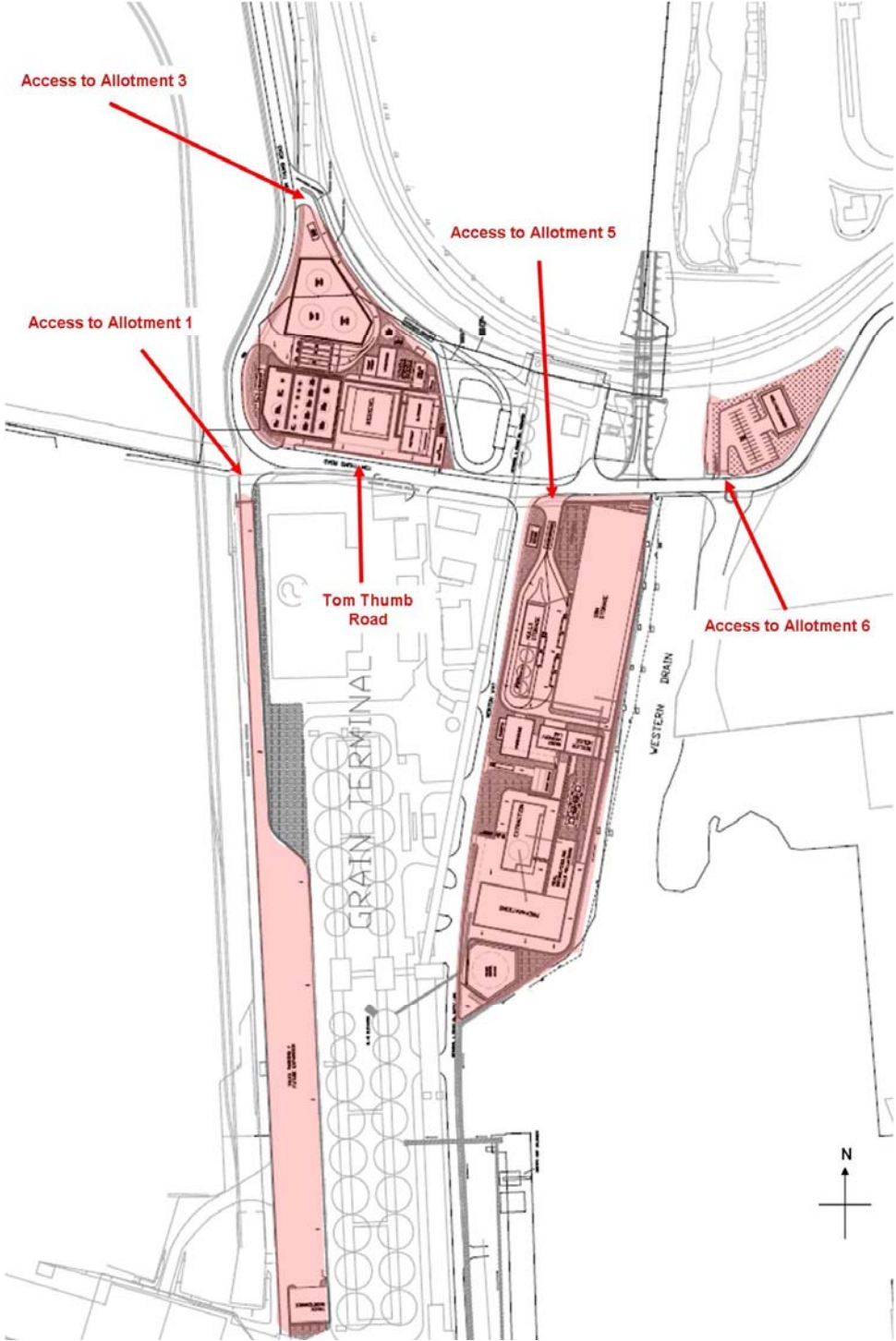
Proposed SPBP facility

Site description in relation to transport routes

The SPBP facility will be located on four separate allotments adjoining and surrounding the existing Grain Terminal. The allotments have a collective area of approximately 7.36 ha. The site is located within Port Kembla's Inner Harbour. Allotment 1 will be located to the west of the Grain Terminal and will occupy most of Farrer Road. It will be used mainly as the parking area for idle trucks.

Allotment 3 is bounded by Tom Thumb Road to its west and south and by the existing railway line to its north. Allotment 5 is bounded by Tom Thumb Road to its north, Moreton Way to its west, Berth 104 to its south and the Garungaty Waterway to its east. Allotment 6 is bounded by Tom Thumb Road to its east and south. **Figure 54** shows the location of the proposed SPBP facility in relation to the key transport routes.

Figure 54 Location of the proposed SPBP facility



Source: National Biodiesel Pty Ltd, 2008

Proposed transportation operations

Raw material transportation

Soybeans and production materials need to be received on-site. These materials will be delivered via ship, rail and road. The main production outputs – soybean meal, biodiesel and glycerine – will be delivered to off-site locations. These products will also be transported from the production site via ship, rail and road.

Shipping

The bulk of the soybeans will be received by means of HandyMax ships. These shipping vessels carry 35,000 – 40,000 tonnes per load. The bulk of the soybean meal will also be moved by ship. These can be to export locations (20,000 – 25,000 tonnes per load) or locations situated on the Australian coast (10,000 – 20,000 tonnes per load).

Rail

The site will be serviced with a dedicated rail line. Soybeans produced locally will be received mainly by rail. It is assumed that one cargo carriage will hold 32 – 40 tonnes. The capacity to move soybean meal by rail will be developed during the first few operational years of the proposed SPBP facility.

Road

Most of the chemical inputs needed for oil extraction, oil treatment and biodiesel production will be received by road. Biodiesel and glycerine will mostly be delivered by truck. It is assumed that one cargo truck carries 30 - 45 tonnes per load.

The DGRs requested the analysis of three scenarios with regards to the transportation of materials to and from the proposed plant. Scenario one (1) consists of the supply of soybeans arriving via road, rail and sea. Scenario two (2) consists of the soybeans (100%) arriving to the site via road/rail (this is a highly unlikely scenario) and Scenario three (3) consists of the soybeans (100%) arriving by sea only. Detailed calculations to produce the total minimum and maximum ship, rail and truck movements are included as **Appendix G**. A summary of total traffic movements by each mode for each scenario is provided below.

Tables 54, 55 and 56 show that in Scenario 1 and 3 the transportation of all materials to and from the facility will produce one truck movement per hour. Scenario 2 produces two truck movements per hour as 100% of the soybean product is transported by road/rail. Therefore Scenario 2 is considered to be the 'worst case' scenario and has been used for the purposes of the Traffic Impact Analysis in **Section 7.5**.

Table 55 Scenario 1 inbound and outbound movements

Rate	Min ship	Max ship	Min rail	Max rail	Min truck	Max truck
Per year	85	121	315	394	7,186	10,779
Per day	0.233	0.333	0.9	1.1	19.7	29.5
Per Hour	0.011	0.015	0.039	0.0	0.895	1.3

Table 56 Scenario 2 inbound and outbound movements

Rate	Min ship	Max ship	Min rail	Max rail	Min truck	Max truck
Per year	53	85	1262	1578	10,238	15,358
Per day	0.146	0.233	3.5	4.3	28.1	42.1
Per Hour	0.007	0.011	0.157	0.2	1.275	1.9

Table 57 Scenario 3 inbound and outbound movements

Rate	Min ship	Max ship	Min rail	Max rail	Min truck	Max truck
Per year	88	124	232	290	7,186	10,779
Per day	0.240	0.340	0.6	0.8	19.7	29.5
Per Hour	0.011	0.015	0.029	0.0	0.895	1.3

The proponent will endeavour, where practically possible and feasible, to maximise the use of sea and rail in order to ensure that the impact on the local road network is minimised:

- under Scenario 1, which represents a likely normal operational scenario, transport by sea/rail accounts for 99% of incoming raw materials and 77% of outgoing products;
- NB will be tapping into GrainCorp’s existing grain receipt and rail network to ensure that rail transport is maximised;
- the bulk (70%) of the soybean meal will be transported by ship in order to maximise sea use, with a further 25% of the soybean meal to be distributed via rail under Scenario 1; and
- where economically viable, outgoing shipments of biodiesel and glycerine will be evaluated.

The Harbour Master has advised that Scenarios 1 and 3 represent an increase in ship movements of 8-12% for the port. PKPC is confident that Port Kembla has suitable infrastructure and service providers to manage this additional shipping. Priorities for vessel movements will be assigned in accordance with PKPC’s Port Berthing Priority Code.

Employee transportation

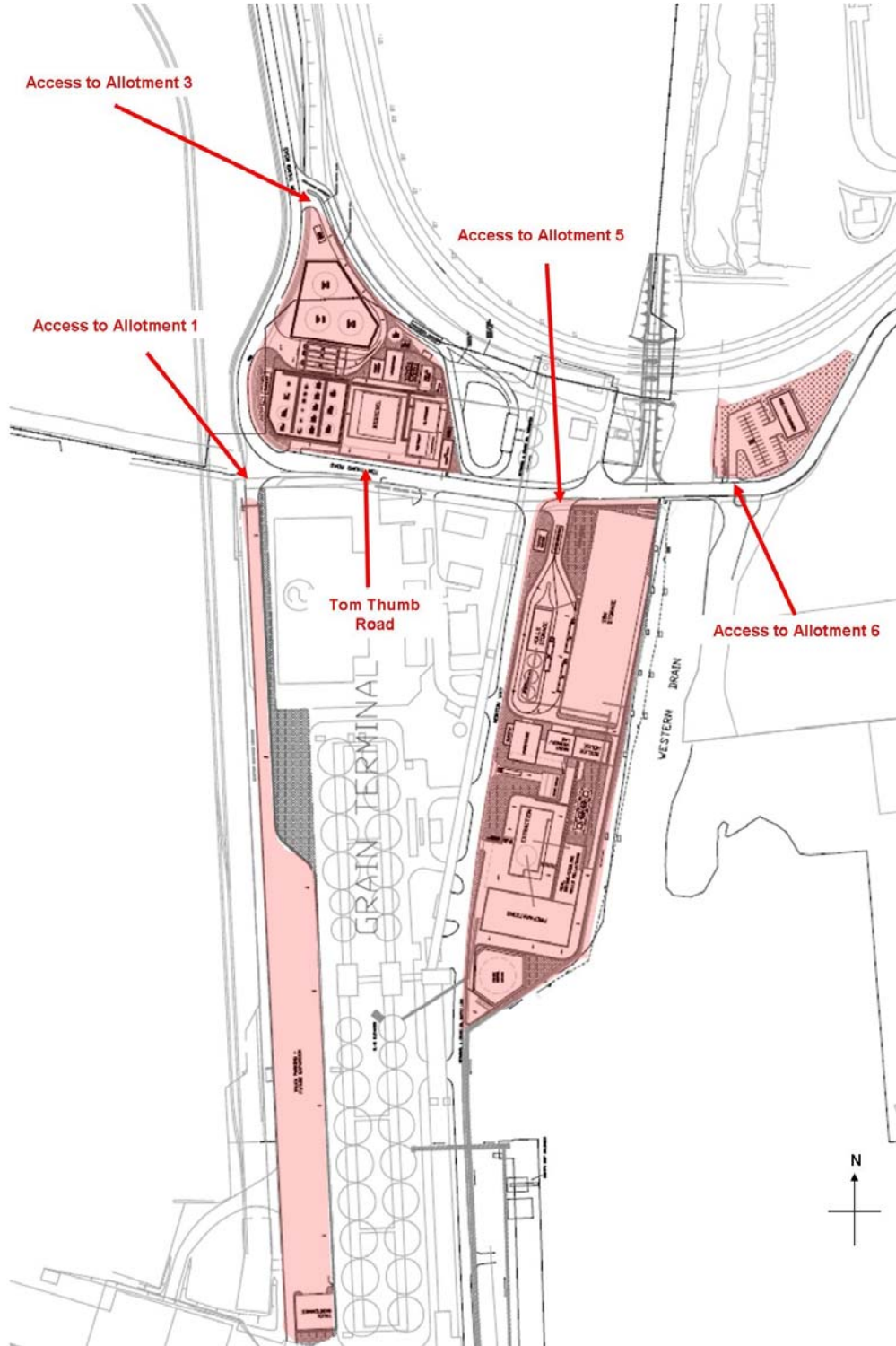
There will be approximately 235 employees working in the various allotments for the proposed SPBP facility. A worst case scenario in which all employees will travel to work by car is assumed.

It is estimated that there will be approximately 40 office staff who will work a shift from 9am to 5pm. The remaining staff (approximately 200) will work in shifts, that being three per day (approximately 50 per shift). For the shift workers, the busiest periods will be during the shift change-over period, i.e. when one shift finishes and the other starts. It is therefore assumed that the maximum number of shift workers entering and leaving the site will be approximately 100. Overall, it is expected that the worst-case maximum number of total employees entering and exiting the site during a typical peak hour will be approximately 140.

Proposed access arrangements

It is proposed that each allotment will be accessed via Tom Thumb Drive with the access points shown in Figure 55.

Figure 55 Proposed access arrangements



Source: Maunsell, 2008

The access to Allotment 1 will be a priority controlled T-intersection with Tom Thumb Road. At present there are no lane markings associated with the intersection. However, additional traffic (light and heavy vehicles) will be using this intersection with the development of Allotment 1. Therefore it is recommended that line markings and signage be implemented to ensure safe access to and from Allotment 1.

Access to Allotment 3 will also be via Tom Thumb Road. The proposed access road for trucks entering the site is adjacent to a current access road for GrainCorp.

Access to Allotment 5 is via Tom Thumb Road and is located adjacent to the existing intersection of Tom Thumb Road/Moreton Way. To avoid conflict of traffic at the close proximity of the two access points, it is recommended that the access point is managed with signage directing trucks into the correct access roads. Safety management measures will also be implemented to eliminate any potential conflicts.

The administration building and employee parking on Allotment 6 located on the eastern side of the Garungaty Waterway, will be accessed via a proposed roundabout on Tom Thumb Drive.

7.5.3 Traffic impact assessment

This section assesses the likely traffic impacts of the proposed development on the local road network and recommends mitigation measures to alleviate any possible impacts.

Impact on local road network

The assessment will focus on the worst-case scenario where all materials to the site will be transported by rail and road (Scenario 2). It must be pointed out that this is a highly unlikely scenario, but it will suffice for the purposes of presenting a worst-case scenario.

Under this scenario, it is expected the proposed SPBP facility will generate a maximum of 42 truck movements per day or alternatively less than 2 truck movements per hour. It is also expected under this worst-case scenario that 140 car movements per peak hour will be generated by employees associated with the site.

The vehicle movements generated by the proposed development have been added to the expected 2010 traffic flows at the intersection of Tom Thumb Road/Springhill Road and Springhill Road/Masters Road. The following assumptions have been made for the morning peak:

- of the two heavy vehicle movements, one will enter and one will leave the site
- of the light vehicle movements 90 will enter the site and 50 will exit the site
- 100% of heavy vehicle traffic will use Springhill Road and Masters Road to access the Southern Freeway
- 90% of the light vehicle traffic will use the Southern Freeway and 10% will use the local road network including Springhill Road to Wollongong.

The results of the SIDRA 3.2 assessment for the morning peak hour in 2010, with the inclusion of the traffic generated by the proposed development are shown in **Table 58**.

Table 58 2010 intersection performance with proposed development traffic

Intersection	Intersection Type	LoS	DoS	Ave Delay (s)	95% back of queue
Tom Thumb Road / Springhill Road	Signals	A	0.561	11.0	79
Springhill Road / Masters Road	Signals	C	0.807	38.0	197

Source: Maunsell, 2008

The results show that the additional traffic generated by the development has a negligible impact on the intersection of Tom Thumb Road and Springhill Road. The intersection will still operate with spare capacity and operates with an acceptable LoS and acceptable average delay in the morning Peak hour with the inclusion of the traffic generated by the proposed SPBP facility.

The intersection of Springhill Road and Masters Road operates at LoS C with the inclusion of the traffic generated by the proposed development which is the same as in the base case scenario. The results also show that the queuing and delays at the intersection are still acceptable during the morning peak hour with the inclusion of the traffic generated by the proposed development.

Currently Tom Thumb Road experiences approximately 1,200 vehicles per day which equates to approximately 120 vehicles per hour. With the additional 140 vehicles per hour attracted to Tom Thumb Road, the total number of vehicles will be approximately 260 vehicles per hour. This level of traffic will be catered for by the two-lane road with significant reserve capacity.

Impact on public transport, walking and cycling networks

As discussed in **Section 5.1**, it is expected most of the employees will be driving to work due to the location of the site and the lack of provision of public transport during off-peak hours for shift workers. Therefore, the proposed development will have minimal impacts on the local public transport (bus) network.

The additional (maximum of four) freight train movements per day will have no impacts on the passenger rail network as no freight movements are allowed during the passenger service peak hours.

An increase in public transport mode split could be achieved by operating shuttle bus services between key public transport nodes including Wollongong City Centre or the nearest train station, to the proposed SPBP facility.

The proposed development will also have negligible impacts on the walking and cycling network in the vicinity of the development due to the low number of employees/visitors that walk/cycle to Port Kembla. However, the pedestrian/cycling connections between the proposed development and the network outside Port Kembla (possibly to the nearest bus stop at Springhill Road) can be improved.

It is also recommended that pedestrian connectivity between allotments be provided. In particular, pedestrian connectivity must be formalised between the subject allotments and will need to be provided between the proposed employee parking on Allotment 1 and Tom Thumb Road to access the other allotments.

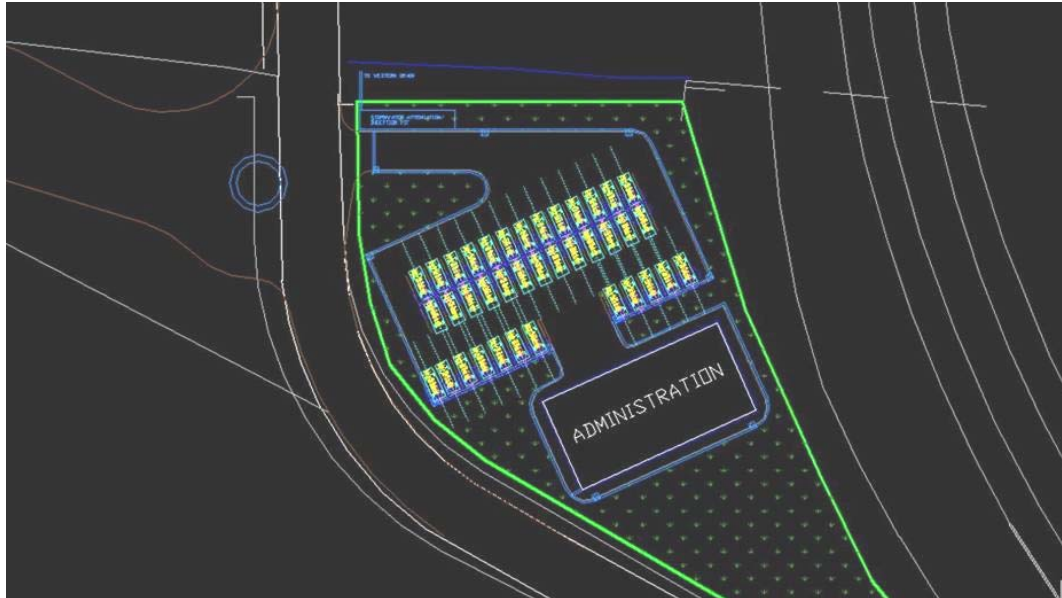
Provision of parking and loading/unloading facilities

Articulated and heavy vehicle parking facilities have been allocated on Allotments 1, 3 and 5, with employee parking provided on Allotments 1 and 6.

Employee parking

Based on the travel demand, it is estimated that approximately 90 car spaces should be provided to cater for proposed development. It is proposed that 38 car spaces will be located in Allotment 6 outside the Administration Building. NB has negotiated with GrainCorp that 15 spaces will be provided on the GrainCorp site, west of Allotment 5. The remaining car parking spaces will be accommodated for on Allotment 1 as shown in **Figure 56** and **Figure 57**.

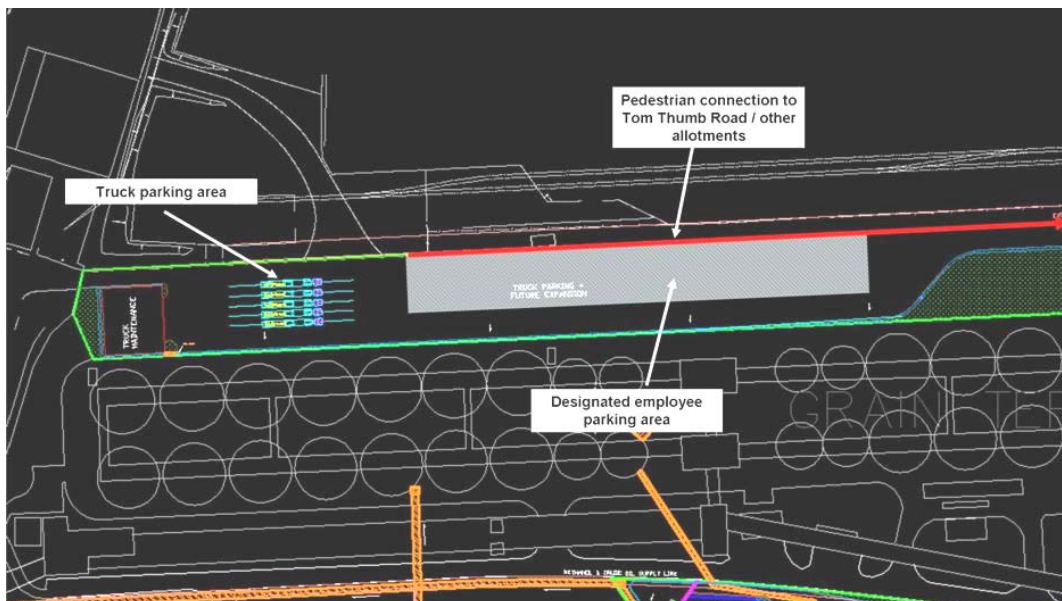
Figure 56 Employee parking on Allotment 6



Heavy vehicle parking

Heavy vehicle (truck) parking is provided at Allotment 1, 3 and 5. Allotment 1 is able to accommodate at a minimum five articulated trucks (25.0m B-Doubles) at any one time in the format shown in **Figure 57**. Truck parking in Allotment 1 will be demarcated from employee parking, including necessary pedestrian walkways and access.

Figure 57 Layout of truck and employee parking on Allotment 1



Source: Maunsell, 2008

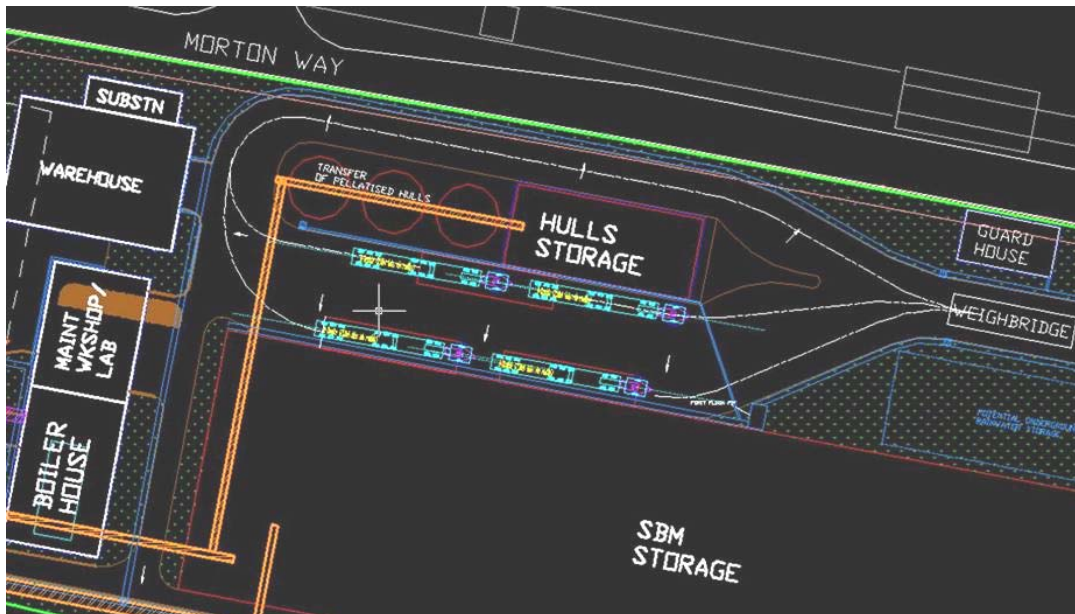
Allotments 3 and 5 have been designed such that three and four trucks will be able to load/unload materials into/from the SPBP facility respectively. The layout of the proposed loading/unloading areas in Allotment 3 and Allotment 5 is shown in **Figure 58** and **Figure 59** respectively.

Figure 58 Layout of truck loading/unloading on Allotment 3



Source: Maunsell, 2008

Figure 59 Layout of truck loading/unloading on Allotment 5



Source: Maunsell, 2008

Swept path analysis has been undertaken on the proposed heavy vehicle parking and loading/unloading areas to assess clearance and manoeuvrability. The parking areas for heavy vehicles have been assessed with Austroads Restricted Access Vehicle for 25m B-Doubles.

Swept paths for 25m B-Doubles work adequately within Allotments 1 and 3.

However, B-Doubles exiting Allotment 5 will have a swept path that extends onto the opposite side of the road on Tom Thumb Road. This is considered to be a worst-case scenario as it is expected that smaller trucks will be entering and exiting this allotment. Safety management procedures (such as ensuring that a safety officer is on-site when B-Doubles leave this site) will be implemented to mitigate any possible impacts.

7.5.4 Conclusion

Maunsell has prepared a Traffic Impact Assessment for the proposed SPBP facility in the Inner Harbour of Port Kembla. The proposed SPBP facility will be located on four separate allotments adjoining and surrounding the existing Grain Terminal and will be individually accessed from Tom Thumb Drive. It is considered that operation of the proposed SPBP facility will not have an adverse traffic impact on the surrounding road network.

It is, however, expected that construction traffic associated with the proposed development will cause traffic impacts to the operations of the road network within and in the vicinity of the Inner Harbour. At this stage, it is difficult to estimate the amount of traffic that will be generated and the duration of the construction period. Therefore, it is recommended that a Construction Traffic Management Plan be prepared prior to the commencement of construction of the proposed SPBP facility.

Access arrangements

Access roads are proposed for each allotment via Tom Thumb Road. At all access points safety management measures are recommended, including signage and road markings and in some cases guarded safety officers. These measures will ensure safe access to all proposed allotments as well as minimise conflicts with other road users.

It is also recommended that pedestrian connectivity between allotments be provided. In particular, pedestrian connectivity must be formalised between the subject allotments and will need to be provided between the proposed employee parking on Allotment 1 and Tom Thumb Road to access the other allotments.

Traffic impacts

The proposed SPBP facility will generate approximately two truck movements and a maximum of 140 car movements during a typical peak hour, assuming a worst-case scenario.

The intersections of Tom Thumb Road/Springhill Road and Springhill Road/Masters Road have been assessed in the morning peak of future year 2010 with, and without, traffic generated by the proposed development.

The 2010 flows take into consideration the growth of the port and the future increase in port activities. The difference in performance of the intersections without development traffic in 2010, compared to the existing conditions, is negligible as the LoS for both intersections remain at acceptable levels (LoS A and C respectively).

SIDRA 3.2 analyses also show that additional development traffic will not add significant amount of delays and queuing to the intersection of Tom Thumb Road/Springhill Road and Springhill Road/Masters Road during the peak hours in 2010.

Therefore, it is concluded that the additional (heavy and light) vehicle movements generated by the proposed Facility will not have an adverse impact on the intersections of Tom Thumb Road/Springhill Road and Springhill Road/Masters Road.

Currently Tom Thumb Road experiences approximately 1200 vehicles per day which equates to approximately 120 vehicles per hour. With the additional worst-case of 140 vehicles per hour attracted to Tom Thumb Road, the total number of vehicles will be approximately 260 vehicles per hour. This

level of traffic will be catered by the two-lane road with significant reserve capacity. It must also be pointed out that the 140 vehicles refer to all permanent staff leaving the proposed SPBP facility at the same time together with a complete shift change, all occurring in one hour.

Public and active transport impacts

The assessment suggests that the proposed development will have negligible impacts to the public transport (bus and passenger rail) network as well as the pedestrian and cycling network in the vicinity of the Inner Harbour of Port Kembla.

7.6 Ecological impacts

7.6.1 Terrestrial Ecology

7.6.1.1 Introduction

The study area is located within an area that has a long history of industrial land use which continues today. As a result, the terrestrial ecology of the subject site has been highly modified and no natural vegetation or naturally-occurring fauna habitat remains. The subject site is thus not considered to contain any habitat for threatened flora. The only fauna species observed or considered likely to occur on the subject site are those species that are capable of using such highly modified environments. Of these, the only threatened species is the Green and Golden Bell Frog *Litoria aurea*, which has been recorded nearby and is known to occupy highly modified environments under some circumstances. Accordingly, only this species is considered here in detail.

All field investigations and assessments were undertaken by a suitably qualified ecologist.

7.6.1.2 Methodology

The assessment of terrestrial ecology was undertaken in accordance with the *Draft Guidelines for Threatened Species Assessment*⁹⁴.

The following methods were used in determining the potential impact on terrestrial flora and fauna:

- a search of the NPWS Atlas of NSW Wildlife for threatened species records within 5 kilometres of the subject site
- a review of the report entitled *Assessment of Habitat, Dispersal Corridors and Management Actions to Conserve the Port Kembla Key Population of Green and Golden Bell Frog 2007-2008*
- a three hour flora survey and description of the vegetation of the entire subject site
- a field investigation to determine the habitat characteristics of the entire subject site
- a three hour search of potential shelter habitat (surface rocks, concrete rubble, rubbish, overgrown grass) for terrestrial fauna throughout the subject site
- recording of day-active fauna apparent on and adjacent to the subject site
- a qualitative evaluation of the potential of the subject site as habitat for threatened species based on comparison of the habitat characteristics of the site with the habitat descriptions in the relevant DECC threatened species profiles,
- definition of a study area encompassing the subject site and a three kilometre radius
- examination of aerial photography of the study area to determine the context of the subject site
- an evaluation of the proposed development to assess the potential impacts, both direct and indirect, on local terrestrial flora and fauna during the construction and operation phases.

⁹⁴ Department of Environment and Conservation and the Department of Primary Industries, *Draft Guidelines for Threatened Species Assessment*, 2005

It should be noted that the ability of habitat searches to detect fauna using the site was limited due to the following:

- variation in the use of habitat by fauna species at different times of year and in different weather conditions
- the inability to detect fauna at inaccessible shelter sites such as between imbedded rocks and rubble
- the limited amount of field survey undertaken.

DECC have advised that clarification was required as to the methodology used to survey the likelihood of a Green and Golden Bell Frog (GGBF) *Litoria aurea* population in the area. In response to this it is noted by the consulting ecologists that there is some potential for the GGBF to occur on the site. The results of initial site investigations showed that potential GGBF habitat is limited to areas of low to moderate potential as foraging, overwintering and corridor habitat with no potential breeding habitat present.

Due to the lack of potential breeding habitat, techniques typically used for the survey of breeding habitat such as spotlighting around water bodies, call playback and listening surveys were not considered appropriate for the assessment of the site.

Field survey for GGBF was thus limited to an assessment of the site and immediate surrounds as potential habitat for the species and a search of potential overwintering sites (i.e. lifting concrete debris, rubbish, rocks etc).

Due to the variety of habitat types used by the species, a conservative approach was taken to the assessment of the potential of the site as habitat.

A list of measures designed to avoid or minimise potential impacts is provided in **Section 7.5**.

7.6.1.3 Existing environment

The terrestrial ecosystems on the subject site are highly degraded. Minimal vegetation exists over much of the subject site which is largely covered in fill material, concrete and asphalt. The vegetated areas of the subject site are chiefly mown areas of Kikuyu Grass turf, with some areas of overgrown Kikuyu Grass and weed species.

The interface of the subject site with the Garungaty Waterway adjacent to Allotment 5 (**Figure 7** and **Figure 8**) contains a narrow strip (2 to 5 metres wide) of predominantly exotic vegetation. The dominant grass species here is Kikuyu Grass *Pennisetum clandestinum*, an invasive exotic species. Other exotic grasses, vines and herbaceous plants are also found here. Several species of native grass, Beach Spinifex *Spinifex sericeus* and Native Reed *Phragmites australis* occur as small isolated patches. Scattered specimens of the shrubs Sydney Golden Wattle *Acacia longifolia* (native) and Bitou Bush *Chrysanthemoides monilifera ssp. rotundata* (noxious weed) also occur. All of this vegetation would be removed during reconstruction of the sea wall which would take place prior to the construction of the proposed facility. The sea wall construction and its potential impacts are beyond the scope of this assessment and are being assessed in a Review of Environmental Factors (REF) which is currently being prepared by PKPC.

Several patches of mown grass (Kikuyu Grass) exist adjacent to the roads and other hard surface areas and within Allotment 3. The only native fauna species likely to use these areas are common bird species such as Magpie Larks and Crested Pigeons that are adapted to open grassland environments.

The proposed biodiesel plant site (Allotment 3) is dominated by overgrown Kikuyu Grass and assorted other low-growing weeds. This area could potentially provide shelter for terrestrial fauna species such as disturbance-tolerant species of lizards and frogs, however the isolation of the location from nearby

areas of suitable habitat, no native terrestrial vertebrate fauna species are considered likely to occur on this allotment (**Figure 5**).

The proposed location of the administration and training building (Allotment 6, **Figure 10**) is currently dominated by a large stockpile of non-vegetated fill material. A stormwater detention basin is also present in this location. This basin is fringed by exotic grasses (chiefly Kikuyu Grass) and does not contain water at present. Patches of rock and concrete rubble exist around the walls of the basin that could in theory provide shelter for terrestrial fauna. The detention basin has previously been used as a location to dispose of acid-sulfate soils which were covered with sandy soil to achieve the current level. Due to the composition of the substrate of the detention basin, standing water is present for no more than a few days following heavy rainfall (pers comm. Trevor Brown, PKPC). Given the short retention time of the basin, it is not considered likely to provide breeding habitat for frogs.

Twelve bird species and one exotic mammal (Brown Hare *Lepus capensis*) were observed on the site. Of the birds, three are exotic species and the remaining nine are common native species which are capable of utilising highly modified habitats.

Due to the condition of the habitats on the site and the lack of suitable habitat, no species listed as threatened or migratory under the EPBC Act or TSC Act are considered likely to occur on the site.

The only threatened species considered to have any potential to occur on the site is *Litoria aurea*, commonly known as the Green and Golden Bell Frog (GGBF). GGBF breeding habitat typically consists of four functional types:

- breeding habitat: shallow, sunlit water bodies, either permanent or temporary, natural or artificial, particularly those with emergent vegetation (typically *Typha* and *Elaeocharis* spp.),
- foraging habitat: areas of low vegetation, typically dominated by grasses and other grass-like plants usually within one kilometre of breeding habitat,
- overwintering habitat: features such as rocks, logs and other debris, including non-natural materials that provide moist conditions and a relatively stable temperature range during winter when the frogs are inactive,
- corridor habitat: areas with appropriate environmental conditions (e.g. moisture, temperature) that act as movement corridors between breeding, foraging and overwintering habitat where these are not adjacent to one another – typically streams, ditches and drainage depressions⁹⁵.

A significant population of this species exists within the greater Port Kembla area⁹⁶. The main breeding areas and dispersal corridors of this species in the Port Kembla area have been well documented⁹⁷. The key GGBF breeding sites identified in the report are all located south of the entrance to the Inner Harbour (**Figure 60**) and at least at least two kilometres from the subject site.

Some sites in which GGBF were not recorded have, however, been identified as potential movement corridors. Several of these sites exist more than 1.5 kilometres to the west and south-west of the subject site.

In May 2008, 14 GGBF were found in the Port Kembla Coal Terminal to the east of the Eastern Basin, approximately 650 metres from the subject site (DECC notification to NB, May 2008). This area is on the opposite (eastern) side of the Eastern Basin and is separated from most of the subject site by this estuary. This appears to be a new breeding location for GGBF. One allotment of the subject site (Allotment 6) is located on the eastern side of the estuary. A road and rail bridge cross the estuary and

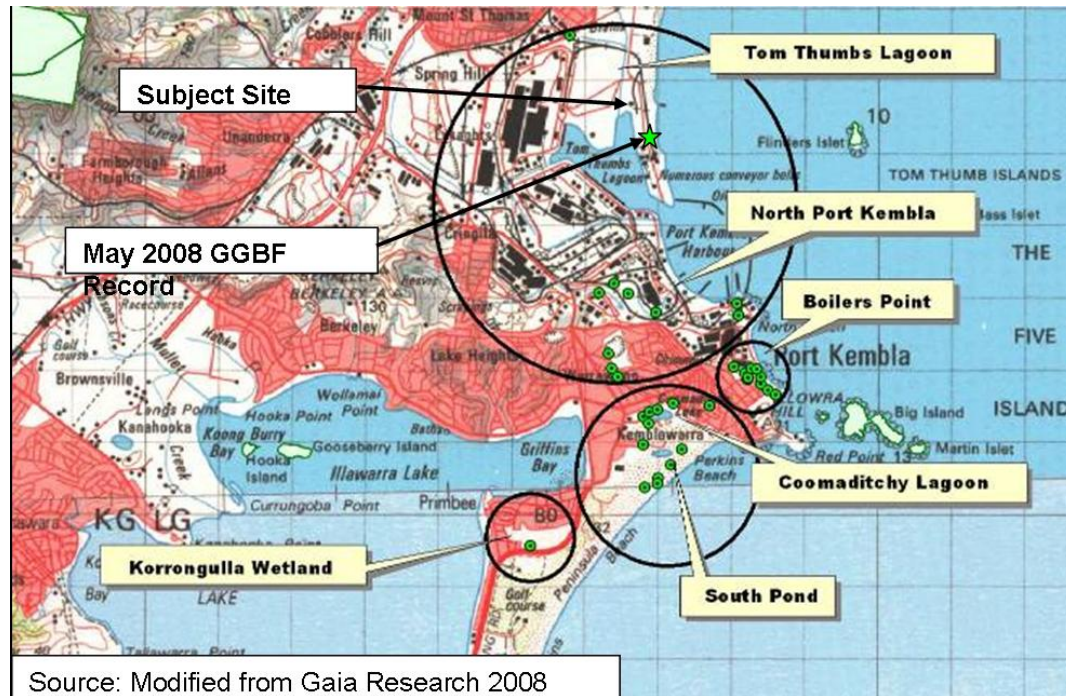
⁹⁵ Department of Environment and Conservation, *Green and Golden Bell Frog Litoria aurea (Lesson 1829) Recovery Plan draft for public comment February 2005, 2005*

⁹⁶ Department of Environment and Conservation, *Green and Golden Bell Frog Litoria aurea (Lesson 1829) Recovery Plan draft for public comment February 2005, 2005*

⁹⁷ Gaia Research Pty Ltd, *Assessment of Habitat, Dispersal Corridors and Management Actions to Conserve the Port Kembla Key Population of Green and Golden Bell Frog 2007-2008*, Report prepared for the Department of Environment and Climate Change 2008

provide some potential for GGBF to cross to the remainder of the subject site. These bridges are considered to have poor potential as movement corridors for GGBF as they are exposed and entirely lacking in vegetation cover.

Figure 60 Historic and May 2008 GGBF records



7.6.1.4 Impact assessment

Potential construction impacts

All of the areas that would be occupied by the SPBP facility are highly modified and provide very limited habitat for native flora and fauna species. A variety of common native bird species occupy the site and some common reptile and frog species may also be found on the proposed site. However, due to their adaptability and regional abundance, these species would not be seriously affected by the proposal.

The only threatened species that may use these habitats is the GGBF. This species is listed as endangered under the *Threatened Species Conservation Act 1995* (TSC Act) and as vulnerable under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

No permanent or temporary water bodies are located on or adjacent to the subject site and hence breeding habitat for GGBF is absent. No impact on GGBF breeding habitat is thus likely to occur.

Given its location, Allotment 6 is considered to have moderate potential to form part of a movement corridor linking the habitat in the Port Kembla Coal Terminal to any potential habitat that may be located further north in, for instance, the Wollongong Golf Course. Allotment 6 is the proposed site of the administration buildings and car parking. At the completion of construction approximately 22% of the area of the allotment would remain free of buildings and car parking. This part of the allotment would be vegetated and hence the area would retain its existing potential as a movement corridor.

The remainder of the site is considered to have little value as a GGBF movement corridor due to its isolation from areas containing potential breeding habitat and drainage channels. In theory, the overgrown grass area of Allotment 6 could be considered potential foraging habitat and piles of rocks and concrete rubble could provide overwintering sites for GGBF. However, the limited extent of these features, and their distance from breeding areas, reduce their potential in this regard and they are not considered likely to be utilised by GGBF.

Construction of the SPBP facility, including increased construction traffic, is thus considered to have only a minor potential impact on potential GGBF movement corridors.

In this regard, the subject site is not considered likely to contain habitat of significance to the conservation of GGBF at Port Kembla and significant impacts on this species are considered unlikely to occur as a result of the construction of the proposed SPBP facility. A formal test of impact significance (7-part test) has not been conducted for the GGBF, since the habitat for the species is not considered likely to be impacted by the proposed works.

Potential operation impacts

Increased vehicular traffic during the operation of the proposed SPBP facility would increase the potential for GGBF to be killed on roads. As a result of the relatively low potential of the subject site as a movement corridor for GGBF, no significant impact is likely as a result of increased traffic.

A potential indirect impact from the importation of soybeans is the risk of introducing exotic species. Some potential may exist for the introduction of exotic plants, animals or pathogens (disease-causing organisms from imported goods) that could spread from the site and cause damage to native ecosystems and agricultural production. The presence of soy beans on the site also has the potential to attract pest animals, particularly rodents which could have detrimental impacts on local ecological values.

The potential impact of chemical spills and other risks to the environment are assessed in **Section 7.4** (Hazards and Risks). **Section 7.8** (Waste Management) addresses potential impacts associated with waste management on the site. With the implementation of the measures to minimise the likelihood and potential severity of environmental impacts described in these Sections, the potential for degradation of GGBF habitat as a result of the operation of the proposed SPBP facility is considered to be low.

7.6.1.5 Mitigation measures

In all areas within the subject site where excess land is available for landscaping and planting (green areas of **Figure 60**), exotic plant species should be removed and native grass and understorey vegetation should be planted. The vegetation installed should be appropriate for use by GGBF for foraging, overwintering and shelter (e.g. *Dianella* spp, *Lomandra longifolia*, *Themeda australis* and *Imperata cylindrica*). This measure is recommended for all allotments as there is the potential that changes to the surrounding environment in the future may result in the construction of potential breeding habitat (e.g. stormwater detention basins or purpose-built GGBF ponds) that may increase the potential of the subject site as foraging or dispersal habitat. Potential overwintering habitat in the form of small piles of large rocks (or large pieces of clean concrete debris) should be installed within the vegetated patches.

Importation of soybeans will be done in accordance with AQIS guidelines. The GrainCorp grain terminal is a Quarantine Approved Premises (QAP) and the proposed SPBP facility will be issued with an appropriate QAP-licence after AQIS inspection of the completed SPBP facility upon commissioning. These measures are considered sufficient to minimise the risk of introducing exotic species.

An integrated pest management approach should be implemented for the control of feral animals to ensure that there is no additional impact from these species on the ecological values of the site and surrounds. The pest management approach employed should minimise the use of chemicals (e.g. pesticides) in order to prevent off-target impacts on native species.

7.6.1.6 Conclusion

With the implementation of the measures described herein, the likelihood of significant impacts on terrestrial ecology as a result of the construction and operation of the proposed SPBP facility is considered to be low.

Referral of the proposed development to DEWHA on the basis of potential impacts on terrestrial ecosystems is not considered necessary.

7.6.2 Aquatic ecology

7.6.2.1 Introduction

Water quality in Port Kembla Inner Harbour is affected by urban and industrial runoff with elevated levels of metals, organic pollutants and moderate turbidity⁹⁸. A variety of plant and animal species are known to occur in the inner harbour including a number of introduced species. As of 2004, no threatened aquatic flora or fauna species had been recorded here⁹⁹

7.6.2.2 Methodology

The following methods were used in determining the potential impact on aquatic flora and fauna:

- a search of the DECC Atlas of NSW Wildlife for threatened species records within 5 kilometres of the subject site
- a review of reports of relevance to the aquatic ecology of Port Kembla
- a visual assessment of aquatic (marine) vegetation adjacent to the subject site and in the tributaries of the Inner Harbour, including Tom Thumbs Lagoon
- a qualitative evaluation of the area of the Garungaty Waterway adjacent to the subject site as habitat for threatened species based on comparison of the habitat characteristics of the site with the habitat descriptions in the relevant DECC and Department of Primary Industries (DPI) threatened species profiles
- an evaluation of the proposed development to determine the potential impacts both direct and indirect on local aquatic flora and fauna during the construction and operation phases.

It should be noted that the assessment of the aquatic flora and fauna of the site was limited due to the limited amount of field investigation undertaken. Field investigations were limited due to safety considerations and environmental conditions (i.e. turbidity limiting visual inspection).

A list of measures designed to avoid or minimise potential impacts is provided. All field investigations and assessment was undertaken by Maunsell AECOM suitably qualified ecologist.

7.6.2.3 Existing environment

A database search conducted for this assessment did not reveal any records of threatened aquatic species in Port Kembla. Inspection of the edge of Tom Thumb Lagoon adjacent to the subject site did not reveal the presence of any macroscopic marine vegetation. Visual assessment of the water quality revealed moderate turbidity and floating rubbish as factors affecting water quality. The substrate of the Garungaty Waterway is not considered likely to support marine vegetation due to the turbidity which would inhibit photosynthesis in conjunction with historical and ongoing disturbance of the substrate of the estuary.

The narrow-tidal tributaries that feed into the northern end of Tom Thumb Lagoon contain patches of coastal salt marsh vegetation. Coastal salt marsh in the NSW North Coast, Sydney Basin and South East Corner bioregions is listed under the TSC Act but is not listed under the EPBC Act.

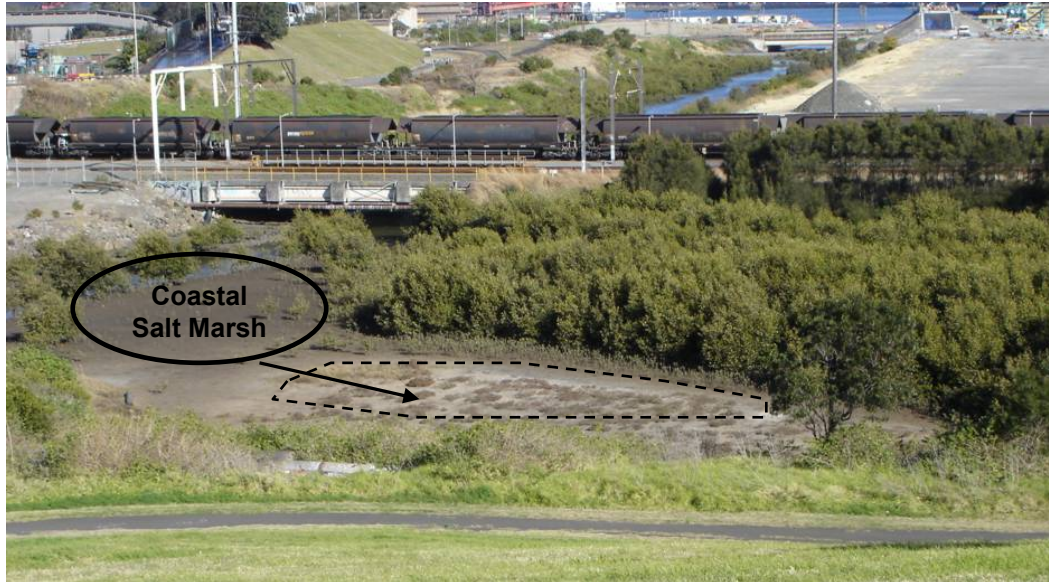
Within JJ Kelly Park, approximately 1.5 kilometres to the north of the subject site, small patches of salt marsh consisting of a combination of *Suaeda australis* (Seablite), *Bolboschoenus* sp. (Bulbrush), *Samolus repens* (Creeping Brookweed), Samphire (*Sarcornia quinqueflora*) and Common Reed

⁹⁸ Sinclair Knight Merz (SKM) 2005. *Proposed Expansion of General Cargo Handling facility Environmental Assessment Report*. Final Report December 2005 prepared for Port Kembla Port Corporation.

⁹⁹ EcoLogical Australia (ECA) 2004. *Ecological Assessment for Proposed Berth - WB1* (Project No. 48-02). Report prepared for Port Kembla Port Corporation July 2004

(*Phragmites australis*) occur near the stream bed while exotic and non-indigenous native species dominate the stream bank¹⁰⁰. Coastal salt marsh also exists in Tom Thumb Lagoon immediately south of Wollongong Greenhouse Park. The salt marsh areas here are more extensive and in better condition than those in JJ Kelly Park. The nearest patch of coastal salt marsh to the subject site is approximately 650 metres to the north at the entrance to Tom Thumb Lagoon (refer to **Figure 61**). Larger expanses of salt marsh occur within the lagoon, further upstream (west) beyond the mangroves that dominate the entrance.

Figure 61 Coastal salt marsh at the entrance to Tom Thumb Lagoon



The main factors likely to be affecting the conservation of coastal salt marsh in the study area are pollutants entering the salt marsh areas from the catchment of Tom Thumb Lagoon and weed invasion. Encroachment of native species such as mangroves and Native Reed (*Phragmites australis*) on the salt marsh may also have a negative impact. Water-borne pollutants, sediments and floating rubbish carried downstream are considered likely to be having a detrimental impact on the salt marsh through smothering and changing the chemistry of the substrate in which the plants are rooted¹⁰¹ (Woods 2006).

7.6.2.4 Impact assessment

Potential construction impacts

Runoff from hard surfaces may potentially impact water quality within the Garungaty Waterway during the construction of the proposed SPBP facility. The potential for this to occur and mitigation measures are described under water quality section (**Section 7.13**).

The construction of the proposed SPBP facility is not considered likely to have a significant effect on coastal salt marsh. The subject site is located more than 500 metres downstream of the nearest patch of salt marsh. The only probable impact on coastal salt marsh is from suspended or floating pollutants carried upstream. Movement of pollutants from the subject site far enough upstream to affect coastal salt marsh is only considered possible during the highest tides of the year or when strong winds blow parallel with the Garungaty Waterway. Even under these conditions, and without appropriate measures to prevent water pollution, the likelihood and potential magnitude of this impact is considered to be low.

¹⁰⁰ Illawarra Bushlands Restoration Report, 2005

¹⁰¹ Woods, J., *An investigation into the Environmental Status of Tom Thumb Lagoon and Lower Garungaty Waterway*, 2006.

Water quality within the Garungaty Waterway may be affected by the rectification of the sea wall, but this is outside the scope of this assessment as the sea wall rectification is being assessed in the Review of Environmental Factors (REF) which is being prepared by PKPC.

Potential operation impacts

Runoff may potentially impact water quality during the operation of the SPBP facility. The potential for this to occur and mitigation measures are described under the water quality section (**Section 7.13**).

The potential impact of chemical spills and other risks to the environment during the operation of the SPBP facility are assessed in Hazards and Risks (**Section 7.4**). Waste Management (**Section 7.8**) addresses potential impacts associated with waste management on the site. With the implementation of the measures to minimise the likelihood and potential severity of environmental impacts described in these Sections of the report, the potential for degradation of aquatic ecosystems as a result of the operation of the proposed SPBP facility is considered to be low.

The operation of the proposed SPBP facility is not considered likely to have a significant effect on coastal salt marsh. As described above for construction impacts, the location of the subject site downstream of areas of coastal salt marsh results in a low risk of adverse impacts. Given that the impact of the operation of the proposed SPBP facility on air quality is expected to be low (refer to **Section 7.2**) and the distance of the proposed SPBP facility from salt marsh areas, the deposition of any airborne pollutants is considered to be negligible.

The operation of the SPBP facility would require ships to transport soybeans from overseas ports to Port Kembla. Ballast water carried by ships is a potential source of exotic marine species that may impact aquatic ecosystems, fisheries, aquaculture and human health. Fouling in the form of marine growth on the hulls of ships is also a potential source of exotic species.

7.6.2.5 Mitigation measures

An Erosion and Sediment Control Plan (ESCP) would be prepared in accordance with the Landcom *Managing Urban Stormwater; Soils and Construction Manual 2004* as detailed in Water Quality **Section 7.13**.

All ballast water would be managed in accordance with Australian Ballast Water Management Requirements AQIS March 2008.¹⁰²

Appropriate mitigation measures would be implemented during the construction and operation of the SPBP facility to minimise the likelihood of spills that could impact water quality. These measures are described in **Sections 7.4** and **7.8**.

7.6.2.6 Conclusion

With the implementation of the measures described below and in **Sections 7.2, 7.4, and 7.8**, the likelihood of significant impacts on aquatic ecosystems as a result of the construction and operation of the proposed SPBP facility is considered to be low.

Referral of the proposed development to DEWHA on the basis of potential impacts on terrestrial ecosystems under the EPBC Act is not considered to be required.

7.7 Noise emissions

7.7.1 Introduction

Bassett, part of AECOM, was commissioned by Maunsell Australia, to undertake an environmental noise assessment for the proposed SPBP facility.

¹⁰² http://www.daffa.gov.au/__data/assets/pdf_file/0004/713884/bw-requirements.pdf, 12082008

This noise assessment:

- establishes construction noise and operational noise criteria in accordance with current legislation and guidelines
- identifies sensitive receptors and assesses the noise impact of construction and operational activities with regard to the established criteria
- considers the impacts that may result from the construction activities and operation and recommends mitigation measures where necessary.

7.7.2 Methodology

7.7.2.1 Noise Criteria

Road traffic noise criteria

The proposed SPBP facility will generate truck and light vehicle movements on Springhill Road and Masters Road.

The impact of noise from the proposed movements has been assessed using the Department of Environment and Climate Change (DECC) document 'Environmental Criteria for Road Traffic Noise' (ECRTN).

The two primary roads in the study area that the development may impact are Springhill Road and Masters Road. Roads are classified depending on how they function within the surrounding road network. Both roads in this case would be classified as 'arterial roads'.

Table 59 Road traffic noise criteria – arterial, collector and local roads

Period	Parameter	Criterion
Arterial Roads / Sub-Arterial		
Day (7.00 am – 10.00pm)	$L_{Aeq, 15hr}$	60
Night (10.00 pm – 7.00am)	$L_{Aeq, 9hr}$	55

In cases where noise from an existing road already exceeds the above criteria, the DECC recommends that “*Where feasible and reasonable the existing noise levels should be mitigated to meet the noise criteria for occupants by judicious design and construction of the development. Locations, internal layouts, building materials and construction should be chosen so as to minimise noise impacts.*”

Rail traffic noise criteria

The conditions for airborne rail noise emissions in RailCorp’s Environmental Operating License are presented in **Table 60**.

These criteria generally apply to airborne noise emissions from train operations in NSW.

Table 60 Noise criteria in RailCorp's Environmental Operating License

Planning Criteria: New buildings affected by existing rail, or new rail affecting existing buildings	
$L_{Aeq, 24 hr}$	55
L_{Amax}	80
Mitigation Criteria: Existing rail infrastructure affecting existing buildings	
$L_{Aeq, 24 hr}$	60
L_{Amax}	85

Construction Noise Criteria

Under the existing DECC policy, noise criteria are established in accordance with chapter 171 of the Environmental Noise Control Manual (ENCM) (construction site noise). This is reproduced below for convenience.

Construction Site Noise:

“Where there is a likelihood of annoyance due to noise from construction sites, conditions such as the following may be specified in a development consent or building application. This applies particularly to non-scheduled premises such as commercial buildings where a long construction time is not likely. The criteria may not be applicable to long term constructions such as coal mines which may take several years. Variations should be made according to local conditions”

Level Restrictions

- (i) *Construction period of 4 weeks and under*
The L_{10} level measured over a period of not less than 15 minutes when the construction site is in operation must not exceed the background level by more than 20 dB(A).
- (ii) *Construction period greater than 4 weeks and not exceeding 26 weeks*
The L_{10} level measured over a period of not less than 15 minutes when the construction site is in operation must not exceed the background level by more than 10 dB(A).

Table 61 Recommended standard hours for construction work

Work Day	Recommended Standard Hours of Work*
Monday – Friday	7:00am – 6:00pm
Saturday	7:00am – 1:00pm (if inaudible on residential premises) 8:00am – 1:00pm (if audible on residential premises)
Sundays or Public Holidays	No construction work to take place

Although not specifically stated, it is understood that when the construction noise activities exceed 26 weeks, the L_{A10} level should not exceed the background level by more than 5 dB(A).

Silencing

All possible steps should be taken to silence construction site equipment. It is particularly important that silenced equipment should be used on road or rail works where 24 hr operation is necessary.

The objective noise levels for construction noise recommended by Chapter 171 of the ENCM are presented in **Table 62**.

Table 62 Daytime Objective Noise Levels dB(A)

Construction Period	L_{Aeq} Daytime Objective Noise Levels dB(A)
< 4 weeks	$L_{A90} + 20$
4-26 weeks	$L_{A90} + 10$
> 26 weeks	$L_{A90} + 5$

Construction Noise Management Levels

It is assumed that construction activities will take place during recommended standard working hours (7.00 am – 6.00 pm Monday to Friday and 8.00 am – 1.00 pm Saturday).

It is considered likely that the construction period will be longer than 26 weeks, which results in an L_{Aeq} construction noise management level of $L_{A90}+5$ for residential receivers during the day. For the closest commercial receivers, located on Bridge Street, the $L_{A90} +10$ was used to establish criteria. For the adjacent industrial receivers the operational 'in use' criteria of L_{Aeq} 70 dB(A) was assumed to apply to construction activities.

The daytime L_{A90} from the Milne Crescent logger data was used as the basis for the construction noise management level at residential receivers. This location is considered representative of the identified residential receivers.

Construction noise management levels for the identified sensitive receivers are presented in **Table 63**.

Table 63 Construction noise management levels

Logger Location Description	Day	
	Existing Background Noise Level, L_{A90} Day dB(A)	Daytime Noise Management Levels L_{Aeq} dB(A)
Milne Crescent	Residential Noise Assessment Locations	
	42	47
	Commercial Noise Assessment locations	
	42	52
	Industrial Noise Assessment Locations	
	70 dB(A)	

7.7.2.2 Qualitative assessment

The qualitative method for assessing construction noise impact aims to avoid complex prediction by using a checklist to assess and manage noise. The guideline states that the qualitative method is generally suited to:

- *“Projects that are likely to have a low noise impact (where there are no residences or other sensitive land uses in close proximity)”*

The nearest residential receiver is located approximately 1,200m from the proposed SPBP facility construction works at the closest point.

Assuming construction works take place within the recommended standard hours and given the scale of the proposed development and location of the sensitive receivers, a qualitative assessment is considered to be most applicable in this case.

The guidelines may require a construction noise management plan to be compiled by the contractor. Where residences or other sensitive land uses may be affected by noise, a checklist for work practices should be used to assist in producing a noise management plan.

The noise management plan should detail the best practice construction methods to be used, considering a reasonable and feasible approach. The plan should detail any community relation programs which are planned e.g. prior notification for particularly noisy activities, letter box drop regarding out of hours construction work to be undertaken, etc and a 24 hour contact phone number for residents to call should they have any complaints or questions.

The locations of the sensitive receivers are shown on **Figure 62**.

7.7.2.3 Environmental noise emission criteria

Industrial noise policy

The DECC provides guidelines for external noise emissions from industrial premises in the New South Wales Industrial Noise Policy 1999 (INP).

The assessment procedure for industrial noise sources has two components:

- controlling intrusive noise impacts in the short term for residences
- maintaining noise level amenity for residences and other land uses.

The lowest of the intrusive or amenity limits are set as the criterion for the receiver.

Intrusive noise impacts

The INP states that the noise from any single source should not intrude greatly above the prevailing background noise level. Industrial noises are generally considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source (L_{Aeq}), measured over a 15 minute period, does not exceed the background noise level measured in the absence of the source by more than 5 dB(A). Adjustments are applied to the level of noise produced by the source that is received at the assessment point where the noise source contains annoying characteristics such as tonality or impulsiveness. This criterion is often termed the 'Intrusiveness Criterion'.

The 'Rating Background Level' (RBL) is the background noise level to be used for assessment purposes and is determined by the methods given in the INP. Using the rating background noise level approach results in the intrusiveness criterion being met for 90% of the time.

Protecting noise amenity

To limit continuing increase in noise levels, the ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.1 of the INP. That is, the ambient L_{Aeq} noise level should not exceed the level appropriate for the particular locality and land use. This criterion is called the 'Amenity Criterion'. The recommended noise criteria are shown in **Table 64**.

Table 64 Recommended L_{Aeq} noise levels from industrial noise sources

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level, dB(A)	
			Acceptable	Recommended Maximum
Residence	Urban	Day	60	65
		Evening	50	55
		Night	45	50

When the existing noise level from *industrial noise sources* is close to the "Acceptable Noise Level" (ANL) given above, noise from the new source must be controlled to preserve the amenity of the area in line with the requirements of the INP. There is a significant industrial component to the existing noise environment from the steelworks and coal jetty.

In May 2006 Bridges Acoustics carried out a noise impact assessment of proposed modifications to the existing Ore Preparation Area at the BlueScope Steelworks, Port Kembla. The report presents background noise levels that were measured in August 2003 during preparation of the EIS for the Hot Strip Mill Upgrade at the same site.

The noise impact assessment produced by Bridges Acoustics states that traffic noise is dominant during the day time and noise from the steelworks is dominant during the night at Mount St Thomas,

which is the location of the closest residential receivers. It goes on to state that, based on observation at the time of measurement, the contribution to background noise from the existing steel works is 2dB above the monitored background level (L_{A90}), and that higher ambient noise levels (L_{Aeq}) are the result of other noise sources in the area, principally traffic on public roads. This conclusion has not been verified by Bassett Acoustics.

Table 2.2 in the INP provides modification factors to the acceptable noise level to account for the existing level of industrial noise. These modifications have been applied and the resulting amenity criteria are shown in **Table 65**.

Table 65 Summary of amenity criteria

Period	Recommended Acceptable Amenity Limit (dB(A))	Existing Industrial Noise, L_{Aeq} *	Amenity Criteria
Day	60	46	60
Evening	50	47	47
Night	45	44	39

7.7.2.4 Resultant environmental noise criteria

The RBL and resulting intrusiveness criterion, which have been calculated from the background monitoring results presented in the Bridges Acoustics report, are presented in **Table 66**.

The final criteria for day, evening and night time are the lowest of the intrusive and amenity criteria for each of the respective periods.

Table 66 Summary of environmental noise criteria, dB(A)

Period	RBL (L_{A90})	Intrusive Criterion = RBL + 5	Amenity Criteria (dB(A))	Final Environmental Criteria
Day	44	49	60	49
Evening	45	50	44	44
Night	42	47	38	38

The INP also states recommended criteria for commercial and industrial premises when in use. These are shown in **Table 67**.

Table 67 Recommended criteria for commercial and Industrial receivers

Type of Receiver	Time Period	Recommended L_{Aeq} Noise Level dB(A)
Commercial Premises	When In Use	65
Industrial Premises	When In Use	70

A summary of all environmental noise criteria is presented in **Table 68**.

Table 68 Summary of environmental noise criteria, dB(A)

Receiver	Time Period	Criteria
Residential	Day	49
	Evening	44
	Night	38
Commercial Premises	When In Use	65
Industrial Premises	When In Use	70

7.7.3 Existing noise environment

The site of the proposed development and nearby noise sensitive receivers (labelled 1, 2 and 3) are shown in **Figure 62**.

Figure 62 Sensitive receiver and noise logger locations



Source: Google Earth 2008

The results of previous noise logging at noise sensitive receivers near the site have been taken directly from the publically available Bridges Acoustics report (May 2006) titled 'BlueScope Steel Limited Port Kembla Steelworks – Ore Preparation Area Upgrade Noise Impact Statement'. In this study two noise loggers were used to monitor background noise from 12 to 22 August 2003, during preparation of the EIS for the BlueScope Steel Hot Strip Mill Upgrade.

The monitoring locations, labelled as Hill Street and Milne Crescent, are shown in **Figure 62**.

A noise logger measures the noise level over the sample period and then determines L_{A1} , L_{A10} , L_{A90} , L_{Amax} and L_{Aeq} levels of the noise environment. The L_{A1} , L_{A10} and L_{A90} levels are the levels exceeded for 1%, 10% and 90% of the sample period respectively. The L_{Amax} is indicative of maximum noise levels due to individual noise events. The L_{A90} is taken as the background noise level.

The background level (ABL) is established by determining the lowest tenth-percentile level of the L_{A90} noise data acquired over each period of interest. The background noise level or rating background level (RBL) representing the day, evening and night-time assessment periods is based on the median of individual ABLs determined over the entire monitoring duration.

Table 69 Environmental noise monitoring summary, dB(A)

Logger Location	Day		Evening		Night	
	L_{A90}	L_{Aeq}	L_{A90}	L_{Aeq}	L_{A90}	L_{Aeq}
Hill Street, Mt St Thomas, 2003	46	59	48	55	44	53
Milne Crescent, Mt St Thomas, 2003	42	51	41	50	39	47

7.7.4 Noise impact assessment

Assumptions

In determining the noise impact assessment for construction and operational noise the following assumptions have been made:

- operational noise levels are representative and not site specific
- any acoustic effects of the existing site topography/infrastructure were excluded from the calculation
- wind has been modelled as blowing toward the receivers from the source at 2.5m/s.

Road traffic noise assessment

The traffic assessment included as part of this EA has provided data on the number of vehicle movements associated with the site.

Springhill Road is a six lane road connecting the centre of Wollongong with the Port Kembla Industrial Area. It carries approximately 30,000-35,000 vehicles per day towards Five Islands Road and 15,000 vehicles per day towards Wollongong CBD. Heavy vehicles are estimated to comprise 15% of total traffic.

Masters Road provides a critical connection between the Southern Freeway and Springhill Road and is also a six lane road. It carries approximately 25,000 vehicles per day comprising 15% of heavy vehicles.

Tom Thumb Road, which will provide access to the site, currently has a two way traffic flow of 1,200 vehicles a day of which 35% (420) are heavy vehicles. The proposed development is predicted to add a maximum of 42 heavy vehicle movements per day. This results in a total of 462 heavy vehicle movements per day.

$$\text{Increase in Noise Level} = 10\log_{10} (\text{Future Vehicles}/\text{Existing Vehicles})$$

Application of the above formula produces an increased noise level of less than 2 dB and is considered to be insignificant.

Rail traffic noise assessment

Normal operations at the proposed facility will add roughly one train movement to the existing rail network.

Existing industrial activity at Port Kembla generates approximately 25 to 30 freight train movements per day. There are approximately 30 passenger train movements on the existing line.

Previous experience suggests that, given the existing traffic levels, the advised maximum increase of approximately one additional train movement per day will produce an increase in noise levels of less than 1 dB.

Assuming that similar rolling stock is used to service the increased traffic demand, the L_{Amax} is unlikely to increase above its existing maximum level.

Construction noise assessment

The noise impact resulting from construction of the proposed facility has been assessed.

Typical sound power levels and the associated sound pressure levels at 7m for the facilities construction plant outlined above are included in Table 70. These sound power and sound pressure levels are taken from various sources including BS5228 and Bassett Acoustics in house noise source database.

Table 70 Facilities Construction Plant

Equipment	Sound Power Levels dB(A)	Time On (%)	Sound Pressure Levels L_{A10} at 7m, dB(A)
Excavator (20 Tonne)	103	90	78
Mobile Crane	112	90	87
Dump Truck x2 (~15 Tonne)	110	90	85
Delivery Trucks x2	110	90	85
Small Hand Tools x5	105	90	80
Diesel Generator	108	100	83

Predicted Construction Noise Levels

The construction noise levels at each receiver have been predicted based upon the information provided in **Table 70**. The assessment is considered to be conservative in each case as all equipment is assumed to be running for 90% of the time available and it does not take into account any mitigation provided by screening. Use of plant other than that specified in **Table 70** may change the outcome of the assessment.

Construction noise has been predicted at each of the sensitive receivers. The results are presented in **Table 71**. The construction noise objective levels have been given in **Table 62** and are repeated in **Table 71**.

Table 71 Predicted Construction Noise Levels

Receiver	Distance From Works	Construction Noise Management Level	Predicted Construction Noise Level	Predicted Exceedance
Residential Receivers				
Gladstone Avenue	1270	47	44	-
Residences between Evans street and Kembla street	1400	47	43	-
Residences between Swan Street and Ross Street	1430	47	43	-
Commercial Receivers				
Bridge Street	870	52	48	-
Industrial Receiver				
Adjacent Industrial Site	90	70	70	-

It is predicted that the construction noise objectives will not be exceeded at any of the sensitive receivers.

It is assumed that construction activities will take place during recommended standard working hours (07.00 am – 6.00 pm Monday to Friday and 8.00 am – 1.00 pm Saturday)

Construction activities are not expected to generate significant ground borne noise.

Operational noise assessment

Model Description

Operational noise levels were modelled using SoundPLAN 6.5 modelling software. The environmental noise impact at the sensitive receivers was assessed using the CONCAWE parameters and assuming a source to receiver wind speed of 3m/s.

The distance to the receivers from the source are shown in **Table 74** Operational Noise Limit to Meet Criteria

Buildings that have been included in the model are detailed in **Table 72**.

Table 72 Modelled Buildings

Building	Assumed Building Height (m)
Raw Materials Processing	
Warehouse	3.5
Maintenance Workshop/Lab	3.5
Boiler House	3.5
Biodiesel Production	
Warehouse/Maintenance Workshop	3.5
Pre-treatment Building	5
Biodiesel Storage Building	5

Operational plant noise levels

Noise levels for plant that is representative of the type of equipment expected to be installed on site have been used to calculate the impact at the identified receivers based upon the environmental criteria recommended for the sensitive receivers in **Table 66**. Plant noise levels were obtained from the SoundPlan software noise database and the Bassett noise source database.

In accordance with the INP, noise objectives have also been set to comply with recommended noise levels at the boundary of industrial premises.

The layout of the site is shown in Appendix D.

The site contains four principle areas:

- car parking and administration
- soybean processing plant
- biodiesel plant
- truck parking and maintenance area.

The soybean processing plant and the biodiesel plant are likely to generate the most noise with the truck parking and maintenance area having a lesser impact. The car parking and administration building are expected to produce comparatively low noise emissions.

The noise sources considered for the raw materials processing area and the biodiesel production area are detailed in **Table 73**.

Table 73 Assumed plant and sound power data for operational noise assessment

Plant	Assumed Number of Units	Assumed Sound Power Level dB(A)
Raw Materials Processing		
Ship Unloading	1	105
Conveyor	800 m	110
Cooling Towers	4	94
Fan	2	95
Compressor	1	104
Biodiesel Production		
Cooling Tower	6	94
Fan	2	95
Compressor	1	104

The noise sources in **Table 73** are expected to be dominant in the overall noise emission of the plant. If additional noise sources or sources with higher sound power are introduced, the overall noise impact may increase. Also, if fewer noise sources or sources with lower sound power are introduced, the overall impact may decrease.

Operational noise objectives/assessment

The overall sound power level of the plant on site must be controlled to ensure compliance with environmental noise criteria in **Error! Reference source not found..**

Table 74 provides predicted noise levels at the closest residential receiver (Gladstone Avenue – 1) and the closest commercial receiver (Bridge Street - 2).

Table 74 Operational Noise Limit to Meet Criteria

Predicted Operational Noise Levels at Receivers		
Period	Receiver Noise Objective (L_{Aeq})	Predicted Noise Level at Receiver dB(a)
Day	49	32
Evening	44	32
Night	38	32
Residences between Evans Street and Kembla Street (1400m)		
Day	49	31
Evening	44	31
Night	38	31
Residences between Swan Street and Ross Street (1450 m)		
Day	49	30
Evening	44	30
Night	38	30
Commercial Premises on Bridge Street (870 m)		
When In Use	65	36
Closest Industrial Site Boundary (110 m)		
When In Use	70	51

This is considered to be a worst case assessment and does not account for the full extent of shielding provided by existing infrastructure, which would likely further reduce the noise levels at the receivers.

Noise produced by the plant can be mitigated in a variety of ways, including;

- Use of barriers to screen the source from the receiver
- Maximise the offset distance between noisy plant items and nearby sensitive receivers
- Orientation of equipment away from noise sensitive areas.

7.7.5 Mitigation measures

7.7.5.1 Construction

The predicted construction noise impact at the identified receivers has been assessed. The noise impact at all receivers is predicted to comply with the criteria in **Table 63**.

The draft construction noise guidelines suggest that where residences and other sensitive receivers may be affected by noise, work practices described below should be used to minimise the impact at those receivers.

Community notification

- Contact potentially noise-affected neighbours at the earliest possible time before any site work begins.
- Inform potentially noise-affected neighbours about the nature of the construction stages and the noisier activities – for example excavation and rock-breaking.
- Give clear indication to potentially noise-affected neighbours of how long noisy activities will take.
- Describe any noise controls, such as walls to be built first that will reduce noise, temporary noise walls, or use of silenced equipment.
- Keep potentially noise-affected neighbours up to date on progress.

- Provide contact details on a site board at the front of the site and keep a complaint register suited to the scale of works.
- Ask about any concerns that potentially noise-affected neighbours may have and discuss possible solutions.
- Provide a copy of the noise management plan, if available, to potentially noise-affected neighbours.

Operate plant in a quiet and efficient manner

- Turn off plant that is not being used.
- Examine, and implement where feasible and reasonable, alternative work practices which generate less noise – for example use hydraulic rock splitters instead of rock breakers, or electric equipment instead of diesel or petrol powered equipment.
- Examine, and implement where feasible and reasonable, the option of using silenced equipment.
- Ensure plant is regularly maintained.
- Locate noisy plant away from potentially noise-affected neighbours or behind barriers, such as sheds or walls.
- Where reasonable, provide respite periods for noise intensive activities.

Involve workers in minimising noise

- Avoid dropping materials from a height.
- Talk to workers about noise from the works and how it can be reduced.
- Use radios and stereos indoors rather than outdoors.

Handle complaints

- Review, and implement where feasible and reasonable, work practices to minimise noise from construction that is the subject of noise complaints.

It is recommended that the contractor demonstrate best practicable means and include noise mitigation measures in the construction management plan.

7.7.5.2 Operational Noise

The predicted operational noise level at the identified receivers has been assessed. The noise impact at the receivers resulting from operation of the facility is predicted to comply with criteria given in **Table 73**.

A noise assessment report undertaken by Bridges Acoustics for the Bluescope Steel Port Kembla Steel Works Upgrade, states that thermal inversions occurred for 14.6% of the time during Winter 2002. The INP suggests that the effects of temperature inversions on noise levels be assessed in locations where occurrence approaches or is in excess of 30%. The effect of temperature inversions has therefore not been assessed as part of this study.

Operational noise produced by the plant can be mitigated in a variety of ways, including:

- use of barriers to screen the source from the receiver,
- maximise the offset distance between noisy plant items and nearby sensitive receivers,
- orientation of equipment away from noise sensitive areas.

7.7.6 Conclusion

The impacts of construction noise on noise sensitive receivers have been assessed and shown to comply with the applicable noise criteria. These impacts include emissions from plant and equipment at the proposed facility, as well as traffic movements generated by the facility on the surrounding road and rail networks.

A qualitative assessment of the construction methodology for the new access road and operational facilities is recommended. The guidelines set out in the DECC Environmental Noise Control Manual should be implemented to ensure that the impact at receivers from construction noise is minimised as far as is reasonable and feasible. The draft guidance document 'New South Wales – Construction Noise Guidelines' should also be considered.

It is recommended that noise impacts at the site boundaries are re-assessed when detailed site specific data has been obtained to ensure compliance with the recommended limit of 70 dB(A). It is expected that compliance at the site boundary is achievable through careful plant selection and the application of appropriate mitigation measures.

7.8 Waste management

7.8.1 Introduction

The following section details types of solid and liquid waste expected to be generated during the construction and operation of the SPBP facility. A Waste Management Plan (WMP) is also provided to suitably store and dispose of solid and liquid waste.

The NSW Waste and Resource Recovery Strategy 2007 (NSW WARR) aims to maximise the conservation of natural resources and to minimise environmental harm from waste management and disposal of waste. This need is exacerbated by the growing population in NSW and a healthy economy that is increasing production of more goods and services. The broad targets for the NSW WARR are highlighted in **Table 75**.

Table 75 NSW WARR Strategy 2007

Key Result Area	Target
Preventing and avoiding waste	To hold level the total waste generated for 5 years from the release of <i>Waste Strategy 2003</i> .
Increased recovery and use of secondary materials	By 2014, to: <ul style="list-style-type: none"> • Increase recovery and use of materials from the municipal waste stream, from 26% (in 2000) to 66% • Increase recovery and use of materials from the commercial and industrial waste stream, from 28% (in 2000) to 63% • Increase recovery and use of materials from the construction and demolition sector, from 65% (in 2000) to 76%.
Reducing toxic substances in products and materials	By 2014 or earlier: <ul style="list-style-type: none"> • To phase out priority substances in identified products as a first choice or, if not possible, to achieve maximum recovery for re-use.
Reduce litter and illegal dumping	<ul style="list-style-type: none"> • Reduce total amount of litter reported annually • Reduction in total tonnages of illegally dumped material reported by regulatory agencies and Regional Illegal Dumping (RID) squads annually.

Source: DECC, NSW Waste Avoidance and Resource Recovery Strategy 2007

7.8.2 Impact assessment

7.8.2.1 Construction phase

Table 76 and **Table 77** list the waste generated during the construction and operation of the proposed SPBP facility, respectively. The solid waste generated is classified as in accordance with the *NSW DECC Waste Classification Guidelines (April 2008)*¹⁰³.

Table 76 Waste generated during construction

Waste source	Composition	Classification per DECC Waste Classification Guidelines
Site clearing and ground preparation	Foliage, excess fill materials and/or excavated material	General Solid Waste (Non Putrescible)
<ul style="list-style-type: none"> Construction of storage facilities installation of modular structures of the plant Erection of security fencing along the working width and the installation of safety measures 	<ul style="list-style-type: none"> Scrap wood and metals and concrete spills Packaging from materials received at a facility, such as foam, strapping and lumber 	General Solid Waste (Non Putrescible)
Office	Used paper, boxes, cartridges, toners, etc	General Solid Waste (Non Putrescible)
Kitchen waste	Food waste	General Solid Waste (Putrescible)

Construction waste management

A Construction Environmental Management Plan (CEMP) will be prepared prior to the commencement of construction. It will address appropriate waste identification, handling, storage and disposal to be followed on-site during construction.

7.8.2.2 Operation phase

Solid waste

Solid waste would be generated from the soybean crushing plant, soybean oil refining plant and sludge from the liquid waste treatment plant. All solid waste will be either:

- taken for recycling/recovery
- reused
- taken to an appropriately licensed permitted solid waste facility for proper disposal.

It is envisaged that Commercial or Government Waste Contractors will be hired for collection and disposal of waste. NBG will have all required permits, certifications, and approvals, from applicable government authorities for the temporary storage of waste on-site. A detailed Operation Environmental Management Plan (OEMP) will be prepared prior to the commencement of operation of the SPBP facility. This plan will address handling, storage and disposal of waste. The following sections briefly describe waste management at the proposed subject site.

Table 77 lists the solid waste generated during the operation of the proposed SPBP facility. The waste generated is classified in accordance with the *NSW DECC Waste Classification Guidelines (April 2008)*.

¹⁰³NSW DECC, 'Waste Classification Guidelines', April 2008

Table 77 Waste generated during operation of the proposed SPBP facility

Waste	Composition	Quantity (t/d)	Classification per DECC Waste Classification Guidelines	Potential Recovery/Reuse	Disposal
Exhaust cake from soy-oil pre-treatment	Used bleaching earth with 30-35% oil	22.059	General Solid Waste (Non Putrescible)	The spent bleaching earth is treated with steam to strip it of oil. The steam stripping prior to discharge lowers the oil content to between 30% and 35% and effectively eliminates the likelihood of spontaneous combustion.	Refer Section 7.8.4
Pitches from glycerine distillation	Composition: NaCl, M.O.N.G., poli(glycerol) and residual glycerol	6.618	This waste stream will be further reviewed for exact composition to determine if it is hazardous or non-hazardous prior to operation and the proper management will be stated in the OEMP.	<ul style="list-style-type: none"> Reuse of pitches will be explored, including their use in road construction due to their water-repellent properties, and energy recovery through combustion in boilers. 	<p>Two options are available for disposal:</p> <ul style="list-style-type: none"> Depending on composition, the waste could be suitably immobilized and disposed to landfill; or The waste could be treated as a hazardous waste and sent to a hazardous waste treatment facility.
Exhaust activated carbon from glycerine distillation	Contains glycerol	0.221	This waste stream will be further reviewed for exact composition to determine if it is hazardous or non-hazardous prior to operation and the proper management will be stated in the EMP.	<ul style="list-style-type: none"> Spent filter panels that are not contaminated by heavy metals and solvents should be considered for recycling as animal feed or fertilizer, especially if they contain salts produced by the neutralization of potassium hydroxide with phosphoric acid Contaminated filter panels should be segregated and managed according to the waste management guidance. 	<p>Two options are available for disposal:</p> <ul style="list-style-type: none"> Depending on its composition, the waste could be suitably immobilized and disposed to landfill; or The waste could be treated as a hazardous waste and sent to a hazardous waste treatment facility.

Waste	Composition	Quantity (t/d)	Classification per DECC Waste Classification Guidelines	Potential Recovery/Reuse	Disposal
General Waste	<ul style="list-style-type: none"> Office paper, cardboard, plastic, metal and glass food and beverage containers. Food waste from cafeteria or break room operations. Office equipment and appliances, such as computer monitors and hard drives, printers and copy machines, televisions and microwave ovens. Wastes associated with heating and air conditioning systems and building maintenance. 	80 kg/per/yr	General Solid Waste (Non Putrescible)	<ul style="list-style-type: none"> Segregate recyclable office waste like paper and cardboard boxes from organic waste and send to recycling facilities Recycle computers and florescent bulbs, unless they are managed as a hazardous waste. 	<ul style="list-style-type: none"> Refer Section 7.8.4
Small Quantities of Hazardous Waste from equipment and building maintenance activities.	<ul style="list-style-type: none"> Spent solvents and oily rags Empty paint cans, chemical containers; used lubricating oil; Used batteries (such as nickel-cadmium or lead acid) and lighting equipment, such as lamps or lamp 		Hazardous	<ul style="list-style-type: none"> Minimise usage or reuse of chemicals/materials where possible in order to reduce waste generated. 	<ul style="list-style-type: none"> Refer Section 7.8.4

Waste	Composition	Quantity (t/d)	Classification per DECC Waste Classification Guidelines	Potential Recovery/Reuse	Disposal
	ballasts. <ul style="list-style-type: none"> • Used chemicals, sludge from process tank clean-outs, and other wastes generated from production. • Used engine oil, antifreeze, batteries and similar waste generated from fork lifts, cars and trucks. 				

In all cases, a licensed waste contractor will be made responsible for collection and appropriate disposal of waste.

Liquid waste

A number of liquid waste streams will be produced from the proposed SPBP facility and will include domestic and industrial wastewaters. Domestic wastewater will be generated from the proposed SPBP facility's amenities with industrial wastewater (i.e. tradewaste) produced from areas and processes of the proposed SPBP facility, such as the cooling towers, soy-oil extraction, trans-esterification and glycerine distillation. A zero effluent system will be employed for the crushing section and a reduced effluent barometric chilling unit will be employed in the biodiesel, pre-treatment and glycerine sections. Generally two options exist for the management of tradewaste:

- discharge untreated tradewaste to sewer and pay tradewaste fees to Sydney Water
- pre-treat tradewaste on-site and reduced tradewaste fees paid to Sydney Water.

In both circumstances a Tradewaste Agreement with Sydney Water is required. Actual conditions of this agreement are based on the characteristics of the sewer system being discharged into and the characteristics (i.e. flows and loads) of the tradewaste itself.

In most circumstances the lowest cost approach is provided by the introduction of a Tradewaste Treatment Plant (TWTP) to pre-treat tradewaste before it is discharged into the local sewer system.

Three tradewaste streams will be produced from the proposed SPBP facility with two benefiting from treatment. The streams include blow down water from the cooling towers which would be discharged directly to sewer and tradewaste flows from Allotment 3 for which tradewaste pre-treatment would likely be implemented.

- **Allotment 3** – Includes transesterification and glycerine distillation processes, which generates around 220 kL per day of tradewaste.
- **Allotment 5** – The proposed SPBP facility's processes generating tradewaste flows from Allotment 5 is mainly the cooling tower and boiler blowdown due to the implementation of the zero effluent system. These flows contribute approximately 96 kL per day.

The distances between the two allotments suggest that it may be more financially viable to utilise a TWTP at each site, however a more detailed investigation would have to be undertaken to confirm this. For the purposes of this discussion it has been assumed that a single TWTP may be feasible to pre-treat tradewastes before discharge to sewer.

7.8.3 Mitigation measures

Solid waste storage

General waste

General waste (putrescibles and non-putrescibles) will be stored in separate bins depending on the waste disposal method and waste collection contractor requirements.

Bins/skips will be emptied on a regular basis such to prevent overflow of materials.

Hazardous waste

Hazardous waste will be stored so as to prevent or control accidental releases to air, soil, and water resources in the area. The following measures will be implemented:

- sufficient space between incompatibles or physical separation such as walls or containment curbs
- 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 and adequate to prevent loss to the environment
- the available volume of secondary containment will be at least 110 percent of the largest storage container, or 25 percent of the total storage capacity (whichever is greater), 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, conducted by employees who have received specific training in handling and storage of hazardous wastes. Management actions will include:

- provision of readily available information on chemical compatibility to employees, including labelling containers to identify its contents
- limiting access to hazardous waste storage areas to employees who have received proper training
- clearly identifying (label) and demarcating the waste storage areas, including documentation of storage locations on a facility map or site plan
- 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 authorised contractor to an approved site. Further details of the disposal of hazardous waste will be provided in the OEMP.

Liquid waste management

Liquid waste from the pre-treatment and refining sections of the proposed SPBP facility will blend with liquid waste streams from other areas on the subject site. It is envisaged that the maximum permissible tradewaste volumes and quality will conform to requirements set forth by Sydney Water's Trade Waste Agreement. Due to the likely high quality of the blow-down, it is expected that once blended, concentrations of pollutants (e.g. BOD and COD) of the final effluent stream will be at acceptable levels for tradewaste discharge. If however, some pre-treatment is required, a number of pre-treatment facilities are available in the market place to treat liquid wastes of this nature. Generally biological treatment processes are utilised to reduce the high concentrations of BOD/COD to acceptable limits (e.g. 500 mg/L and 250 mg/L respectively). Tradewaste pre-treatment facilities can also involve chemical dosing for pH adjustment, coagulation/flocculation and heavy metal removal.

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. Monitoring activities should include:
 - 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.
- regular audits of waste segregation and collection practices
 - tracking of waste generation trends by type and amount of waste generated, preferably by facility departments
 - 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 manifests or other records that document the amount of waste generated and its destination
 - periodic auditing of third party treatment and disposal services including re-use and recycling facilities when significant quantities of hazardous wastes are managed by third parties. Whenever possible, audits will include site visits to the treatment storage and disposal location
 - monitoring records for hazardous waste collected, stored, or shipped would 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 SPBP facility, cross-referenced to specific manifest document numbers applicable to the hazardous waste
 - location of each hazardous waste within the proposed SPBP facility, and the quantity at each location.

7.8.4 Conclusion

The proposed SPBP 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 SPBP facility prior to commissioning of the plant. Based on the information supplied (e.g. BOD and COD) the tradewaste is considered suitable for discharge to sewer however, this will be confirmed with Sydney Water's tradewaste officer. With the implementation of the identified mitigation and management measures, the waste generated by the proposed SPBP facility will not have a significant adverse impact on the environment.

7.9 Heritage

7.9.1 Introduction

Maunsell undertook a qualitative assessment of indigenous and non-indigenous heritage as it relates to the subject site and surrounding lands. The assessment involves the identification of heritage items, places and sites as well as the identification of the potential impacts on the heritage values of the subject site and surrounding lands arising from the construction and operation of the SPBP facility.

Where considered appropriate, mitigation measures to minimise any such potential impact have been recommended.

7.9.2 Methodology

This heritage assessment was comprised of a qualitative investigation and a site inspection.

In addition to the registers listed under the non-indigenous searches, this investigation also included a search of the DECC Aboriginal Heritage Information Management System (AHIMS) for land within a one square kilometre radius of the subject site as well as formally liaising with the Illawarra Local Aboriginal Land Council (ILALC).

In order to identify all known non-indigenous items and places of significance the following registers and lists were searched as part of this assessment:

- statutory lists;
 - Australian Heritage Database – (AHD) – Department of the Environment, Water, Heritage and the Arts
 - State Heritage Register (SHR) – NSW Heritage Office
 - *Wollongong Local Environmental Plan 1990* (WLEP 1990)
- non-statutory lists;
 - Australian Heritage Places Inventory (AHPI) – Australian Heritage Council
 - National Trust Register (NTR) – National Trust of Australia.

7.9.3 Existing environment

History

Port Kembla is situated on the coastal headland of Red Point, which was named by Captain Cook as he passed there on April 27th 1770. The log book of HMS *Endeavour* contains the following entry:

*“there lies a point which, from the colour of the lands about it, I called Red Point and a little way inland stands a round hill, the top of which looks like the crown of a hat”.*¹⁰⁴

Prior to European settlement, Aboriginal occupation in the Illawarra and Wollongong coastal regions has been dated as being many thousands of years, which is indicated by the large middens found at Red Point and in other locations along the Illawarra Coast. The Aboriginal people in the region are part of the Koori tribe, which also covers the Sydney region.

Following European settlement and until the mid 1840's, the dominant activities in the Illawarra region were sheep, beef and dairy cattle farming, agricultural farming and cedar cutting. During 1883 Mount Kembla Coal and Oil Company completed construction of a jetty and the railway to facilitate the operations of the first industrial activity to be introduced in the port. Whilst predominantly characterised by industrial and agricultural production, Port Kembla was also recognised for its harbour foreshore and township.

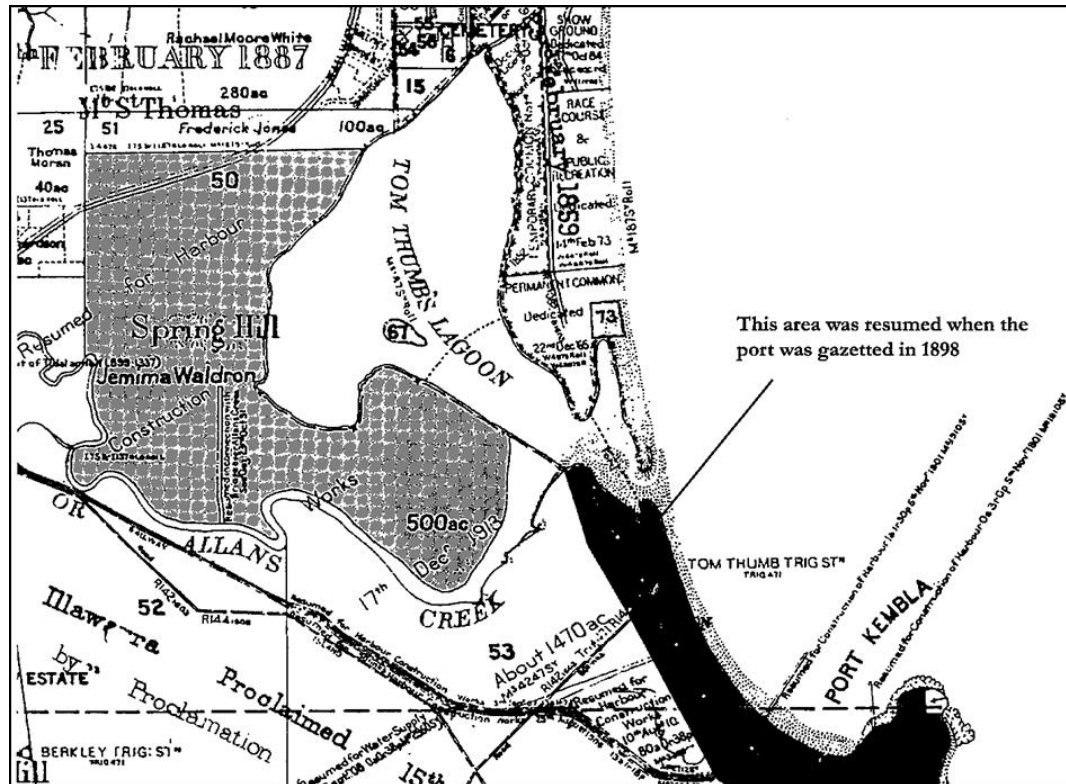
The concept of developing the Inner Harbour was based on the utilisation of Tom Thumb Lagoon, which was first proposed by the Lord Major of Wollongong, William Wiley in 1887¹⁰⁵. The NSW Government protected the potential for future development of an Inner Harbour by resuming all available portions of land between the Main South Coast rail line at Unanderra and Wollongong.

¹⁰⁴ Hoogendoorn, W (of the Port Centenary Committee), *Port of Port Kembla 1898 – 1998 Roadstead to World Class Port*, 1999.

¹⁰⁵ Hoogendoorn, W (of the Port Centenary Committee), *Port of Port Kembla 1898 – 1998 Roadstead to World Class Port*, 1999.

In 1898, the NSW Government proclaimed the *Port Kembla Harbour Act of 1898* (PKH Act), which included provisions for the resumption of land, jetties and other like works for the construction of a deep water harbour. The area covered by the land resumptions, as depicted in the blackened area in **Figure 63**, is an early parish map, which covers the area south to west of the bay and portrays Tom Thumb Lagoon area before the extensive land reclamation of the Port area.

Figure 63 Parish map



Source: *Port of Port Kembla 1898 – 1998 Roadstead to World Class Port*

Under the PKH Act, the entire foreshore area of the harbour was resumed in 1900 and over the next 14 year period various portions of land were sold off to industry. In addition, the PKH Act made possible the extension of the Northern Breakwater in 1912, which for its construction required the resumption of further land. This was essentially the catalyst for the future development of this area of the Port.

Figure 64 circa 1928 shows the railway between Port Kembla and Wollongong in the southern portion of the image and Tom Thumb Lagoon. The approximate location, of where the subject site would be situated today, is indicated on **Figure 64** by a red dot.

Figure 64 An aerial photograph looking north toward Tom Thumb Lagoon 1928



Source: *Port of Port Kembla 1898 – 1998 Roadstead to World Class Port*

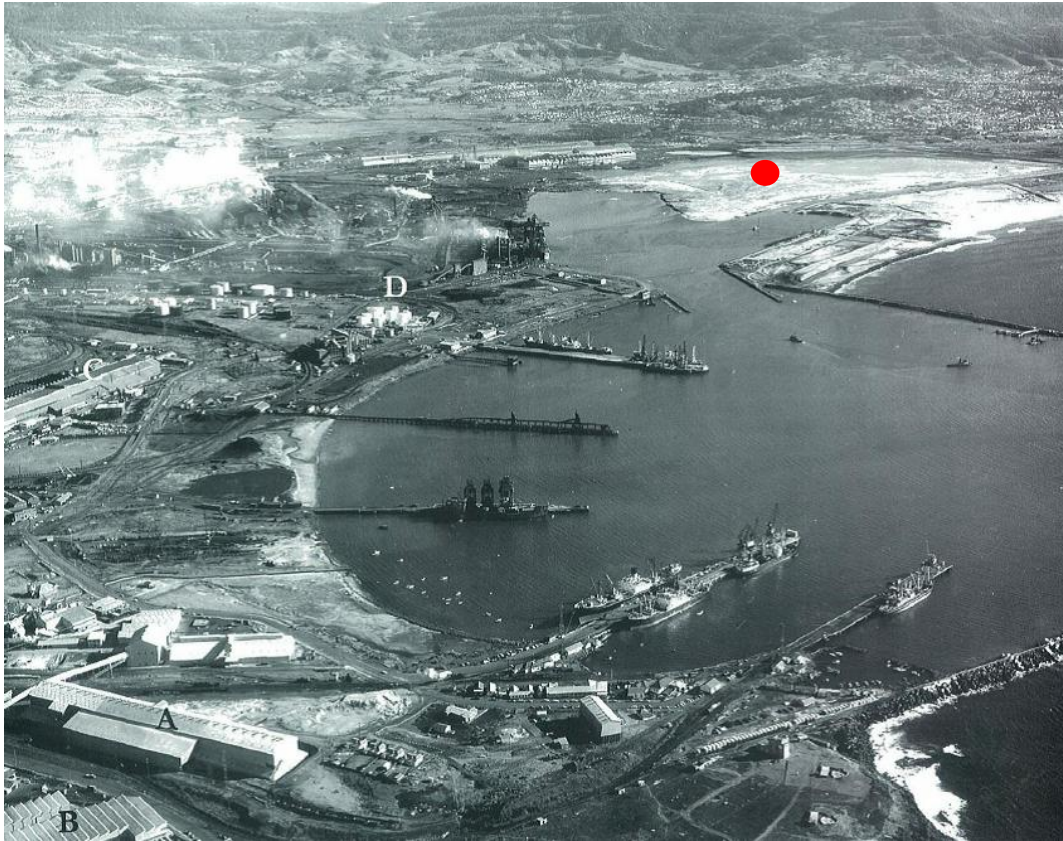
As a result of intensification in trade post WWII (Second World War), the idea of further developing the Inner Harbour was re-examined in 1950. Subsequent to an intense review, it was recommended that an Inner Harbour be constructed in Tom Thumb Lagoon, which was sanctioned and facilitated by the *Port Kembla Inner Harbour Construction and Agreement Ratification Act 1955*¹⁰⁶.

During the 1960's the Outer Harbour was still the central point of shipping activity and cargo within the Port. However, the Inner Harbour was earmarked as a future industrial focal point of Port Kembla. **Figure 65** provides a visual representation of the new Inner Harbour in January 1962. The site, the subject of this report, is indicated by a red dot on the figure below. In 1962 dredging of the Inner Harbour was completed and in December 1963 No. 1 Coal Berth commenced operations¹⁰⁷.

¹⁰⁶ Hoogendoorn, W (of the Port Centenary Committee), *Port of Port Kembla 1898 – 1998 Roadstead to World Class Port*, 1999.

¹⁰⁷ Hoogendoorn, W (of the Port Centenary Committee), *Port of Port Kembla 1898 – 1998 Roadstead to World Class Port*, 1999.

Figure 65 Looking west over the Outer Harbour toward the new Inner Harbour January 1962



Source: *Port of Port Kembla 1898 – 1998 Roadstead to World Class Port*

The site is located within the Inner Harbour of Port Kembla, with one allotment providing the interface between reclaimed land, Garungaty Waterway and the port. The remaining allotments are setback from the port's foreshore. The surrounds of the subject site are characterised by industrial development and the continued industrialisation of Port Kembla Harbour has led to the significant adaptation of the natural environment. As a result of the landscape manipulation activities the terrestrial ecology of the subject site has also been highly modified and no natural vegetation or naturally-occurring fauna habitat remains. The geology of the site consists of fill material, clay, silty clay and sand¹⁰⁸.

¹⁰⁸ URS Australia Pty Ltd, *National Biodiesel Production Facility: Contamination Assessment, Inner harbour, Port Kembla NSW*, September 2008.

As can be seen in **Figure 66**, Port Kembla Harbour has been subject to steady industrial development since the late 1880's and subsequently, this development has progressively and extensively modified the natural environment.

Figure 66 Looking north-west from the Outer Harbour to the Inner Harbour June 2008



Source: Port Kembla Port Corporation

Site inspection

A site inspection was undertaken on 13 August 2008. The site investigation revealed that the subject site has been highly modified and no natural vegetation or naturally-occurring fauna habitat remains. Further, the site is currently unimproved and contains no buildings or structures (refer to **Section 2.0** of this report for photographs of the site). In this regard, it became evident that there were no known items of non-indigenous heritage on site. However, the allotments that create the subject site are adjacent and in close proximity to the harbour.

Historically, Aboriginal occupation and land use was typically adjacent to or in the vicinity of water sources. It is highly unlikely that any such artefacts would have survived the European settlement and industrialisation of the Port or the land reclamation activities.

Indigenous items of significance

The search of the DECC's AHIMS established that there are no known Aboriginal objects or places recorded on or in close proximity to the subject site, which was confirmed in writing by the DECC (refer to **Appendix H**). Further, liaison with the ILALC has confirmed that there are no known sites of indigenous significance affecting the subject site and subsequently raised no objection to the proposed works on indigenous cultural grounds (refer to **Appendix H**).

Notwithstanding, the investigations revealed that the closest known site of indigenous significance is that of Hill 60 site and its environs (Hill 60). This site is located approximately five (5) km south of the proposed development site, in close proximity to the Outer Harbour. Hill 60, also known as Illowra

Battery, includes MM Beach, Boilers Point, Fisherman’s Beach and Hill 60 Park and contains a rare suite of Indigenous sites that demonstrate the evolving pattern of Aboriginal cultural history and the Aboriginal land rights struggle. WLEP 1990 and the State Heritage Register (SHR) prepared under the *Heritage Act 1977* both recognise and list Hill 60 as a place of heritage significance.

The following excerpt is extracted from the SHR Statement of Significance:

‘The quality, extent and diversity of the prehistoric archaeological remains at this place are rare on the NSW coast particularly in the local region. These include extensive shell midden deposits rich in stone artefacts and burials.’

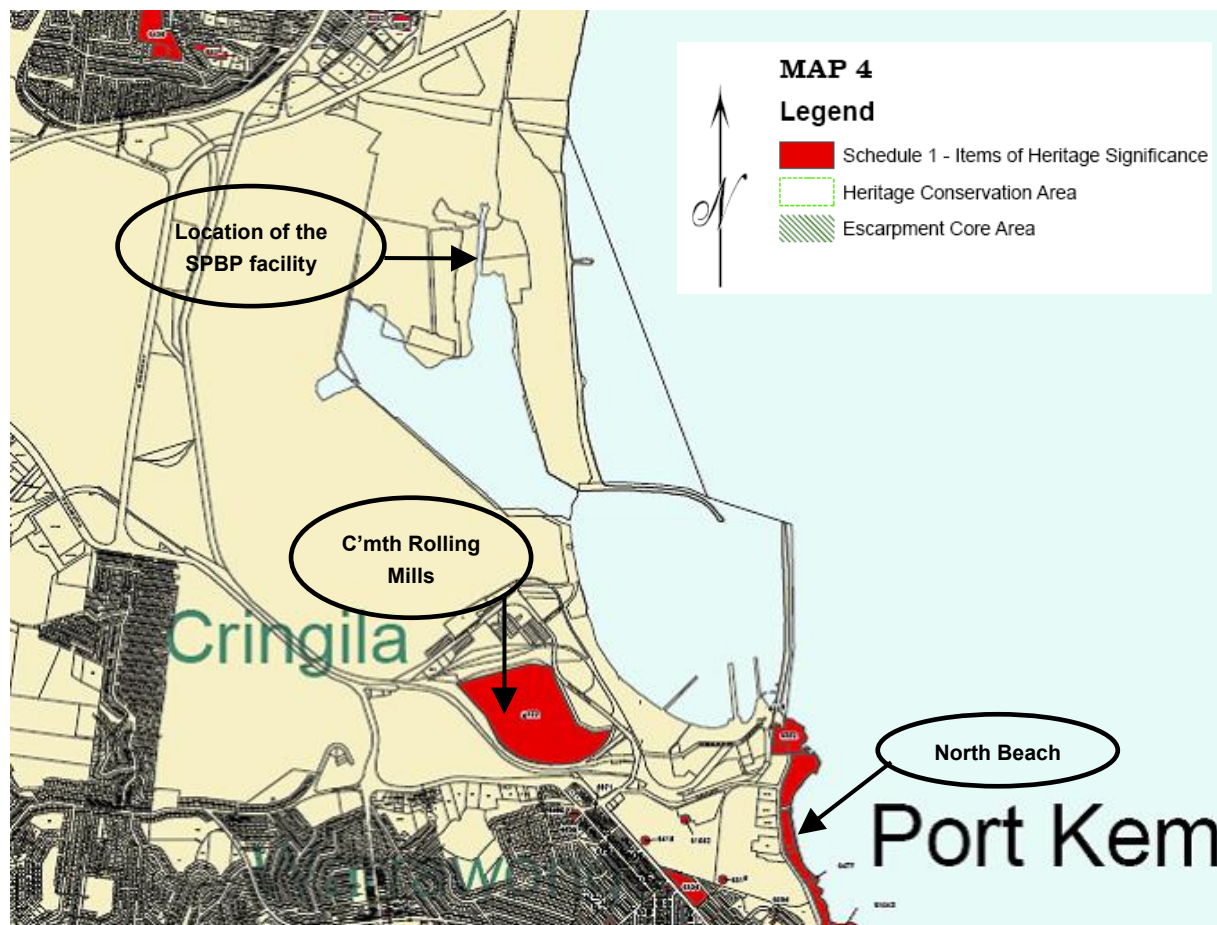
Table 78 Identified site containing items of Indigenous significance

Indigenous Items of Significance			
Item type	Item	Listings	Address & location in relation to site
Built, Archaeological & Landscape (LEP 1990), Landscape (SHR)	Hill 60 / Hill 60 Landscape / Red Point – (part of the Heritage Park)	LEP 1990 (State significance), State Heritage Register (listed under the <i>Heritage Act 1977</i>)	The primary address of this site is Military Road, Port Kembla (5 km south of the subject site). The site is a suite of archaeological, landscape and built heritage, which has been provided protection under the <i>NSW Heritage Act 1977</i> . This listing includes Indigenous heritage.

Non-indigenous items of significance

The WLEP 1990 Heritage Map 4 is presented in **Figure 67** below. The map indicates that within the Inner Harbour there are no listed heritage items under LEP 1990. The closest non-indigenous item identified is the Commonwealth Rolling Mills within the Outer Harbour area and located directly south of the subject site. The other items are located along North Beach foreshore further south-east. These items are described in more detail below in **Table 79**.

Figure 67 Wollongong LEP 1990 Heritage Map 4



Source: Wollongong LEP 1990

As outlined, the search concluded that there are no items of non-Indigenous heritage within the proposed SPBP facility site.

The items in closest proximity to the subject site within the port are outlined in **Table 79** and are located approximately 2.3 km south of the subject site.

Table 79 Schedule of heritage items within the Port Kembla Outer Harbour area

Items of Non-Indigenous Significance			
Item type	Item	Listing	Address & location in relation to site
Architectural (LEP 1990), Archaeological – Terrestrial (SHR)	Mobile Block Setting Steam Crane	LEP 1990 (State significance), State Heritage Register, National Trust of Australia	Eastern Breakwater Harbour (Lot 100 DP 1013971). This item covers the circular area at the mouth of the harbour, approximately 2 km from the site. This item is identified as state significant in the Maritime Industry Group, on the SHR.
Built (LEP 1990), Built (SHR)	Commonwealth Rolling Mills and Gardens	LEP 1990 (State significance), State Heritage Register	Old Port Road (Lot 1 DP 190251), located 2.3 km south of the Inner Harbour, adjacent to the Outer Harbour foreshore. This item is identified as state significant in the Manufacturing and Processing Group, on the SHR.

Items of Non-Indigenous Significance			
Item type	Item	Listing	Address & location in relation to site
Built (SHR)	Lysaghts (Port Kembla) Footbridge	State Heritage Register	At Port Kembla Station and includes extension into Steel Yard, located south of the subject site. This item is identified as locally significant in the Transport – Rail Group, on the SHR.
Built (SHR)	Port Kembla Station	State Heritage Register	Port Kembla Station is located adjacent to the steel works, south of the subject site. This item is locally significant in the Transport – Rail Group on the SHR.

Source: State Heritage Register, Wollongong LEP 1990

Table 80 demonstrates the listed heritage items that are within the vicinity of Port Kembla, but which are located outside the area of the Port. These items have associations with the Port of Port Kembla and its founding and they assist to demonstrate early settlement and land use in the area and the significant environmental features of the area. The proposed SPBP facility will not have an impact on the heritage significance of these items as the closest item is located approximately three (3) km from the subject site.

Table 80 Schedule of heritage items in the vicinity of the Port Kembla site outside Port Kembla

Items of Non-Indigenous Significance			
Item type	Item	Listings	Address & location in relation to site
Built (LEP 1990), Built (SHR)	Concrete Tank Barriers	LEP 1990 (local significance), State Heritage Register	Northern end of North Beach on Gloucester Boulevard. The Concrete Tank Barriers are located approximately 3km south-east of the subject site and are located within the Port Kembla Heritage Park. This item is identified as locally significant in the Defence Group, on the SHR.
Built (LEP 1990), Built (SHR)	Break Water Battery	LEP 1990 (regional significance), State Heritage Register	Northern end of North Beach on Gloucester Boulevard. The Break Water Battery is located approximately 3 km south-east of the subject site (adjacent to the Concrete Tank Barriers) within the Port Kembla Heritage Park. This item is identified as locally significant in the Defence Group, on the SHR.
Built (LEP 1990), Built (SHR)	Historical Military Museum	LEP 1990 (regional significance), State Heritage Register	This item is located between Eastern Breakwater and North Beach on Gloucester Boulevard within the Port Kembla Heritage Park. This item is located approximately 3 km south-east of the subject site. This item is identified as locally significant in the Defence Group, on the SHR.
Built, Archaeological & Landscape (LEP 1990), Landscape (SHR)	Hill 60 / Hill 60 Landscape / Red Point – (part of the Heritage Park)	LEP 1990 (State significance), State Heritage Register (listed under the <i>Heritage Act 1977</i>)	The primary address of this site is Military Road, Port Kembla. The site is a suite of archaeological, landscape and built heritage, which has been provided protection under the <i>NSW Heritage Act 1977</i> . This listing includes Indigenous heritage as outlined above.

Items of Non-Indigenous Significance			
Item type	Item	Listings	Address & location in relation to site
Built (LEP 1990), Built (SHR)	Gun Emplacement connected & isolated concrete bunkers.	LEP 1990 (regional significance), State Heritage Register	This item is located within the Illowra Battery Hill site, on Military Road, Port Kembla. The item is within the Port Kembla Heritage Park and is part of the site listed above under the <i>Heritage Act 1977</i> . This item is identified as locally significant in the Defence Group, on the SHR.
Landscape (LEP 1990), Landscape (SHR)	Garden (around existing house and adjacent driveway)	LEP 1990 (local significance), State Heritage Register	Located at 2 Electrolytic Street, Port Kembla. This item is located south-east of the subject site and is identified as locally significant in the Parks, Trees and Gardens Group, on the SHR.
Built (LEP 1990)	Remains of original Ocean Baths	LEP 1990 (local significance)	Gloucester Boulevard, Port Kembla. This item is located on Port Kembla beach and is approximately 3.5 km south-east of the subject site. This item is identified as locally significant under LEP 1990.
Landscape (LEP 1990)	Rainforest Remnants	LEP 1990 (local significance)	Berkeley Hills, both sides of Berkeley Road. This item is located south-west of Port Kembla Port and the subject site. This item is identified as locally significant under LEP 1990.
Built (LEP 1990), Built (SHR)	ER & S Assay Office – Office & House	LEP 1990 (regional significance), State Heritage Register	This item is located on Military Road, Port Kembla. This item is located south-east of the subject site. The Assay office of the first industry in to be built in Port Kembla. This item is identified as locally significant in the Manufacturing and Processing Group, on the SHR.
Built (LEP 1990), Built (SHR)	Brick Chimney	LEP 1990 (regional significance)	This item is located within Port Kembla Copper on Military Road, Port Kembla. This item is located south-east of the subject site and is identified as regionally significant under LEP 1990.

Source: State Heritage Register & Wollongong LEP 1990

A search of the Australian Heritage Database¹⁰⁹ and the Australian Heritage Places Inventory¹¹⁰ did not reveal any items located on or within the immediate vicinity of the subject site.

Non-statutory recognition - Port Kembla heritage park

In 2001, PKPC modified its operating practices leaving the Pilots Station, located south-east of the subject site on the Military Reserve headland, as a back-up facility, thereby providing the opportunity to establish the Port Kembla Heritage Park (Heritage Park). The Heritage Park adjoins the Eastern Breakwater of Port Kembla Harbour and contains views over the Five Islands and the Harbour, the industry of the Port and the escarpment to the west. The Heritage Park contains:

- Aboriginal middens
- the Breakwater Battery Museum
- World War II gun emplacements and artefacts
- 1890's steam crane used in the construction of the breakwater
- the former Pilots Station.

¹⁰⁹ Department of Environment, Water, Heritage and the Arts, *Australian Heritage Database*, 20082008

¹¹⁰ Australian Heritage Council, *Australian Heritage Places Inventory*, 20082008

Port Kembla Port Corporation advocated the development of the Heritage Park as a community initiative and assisted in attracting funding from government and private sector for the establishment of the park. The Heritage Park reiterates the heritage significance of the Port in general and provides a platform for celebrating the historical themes of the area and the greater Illawarra region.¹¹¹

Notwithstanding, the Heritage Park is located within the Outer Harbour and will not be impacted upon by the construction and operation of the SPBP facility.

7.9.4 Impact assessment

Whilst an archaeological site investigation has not been conducted, the subject site represents an area of low archaeological and cultural sensitivity due to high level of previous disturbance and landscape modification. This is supported by the heritage searches that were undertaken, which confirmed there are no listed items on or within the immediate vicinity of the subject site. Having regard to the above, it is considered there is little potential for any submerged artefacts or relics to be uncovered during earthworks, due to previous land reclamation activities and resulting landscape modification.

The identified item of Indigenous heritage significance, Hill 60 site and its environs is located approximately five (5) km south of the proposed development site. The closest non-Indigenous item to the subject site is approximately two (2) km south and located in the Outer Harbour area, which is the Eastern Breakwater Harbour. Accordingly, having regard to the geographical separation of the subject site and the identified items of significance, the construction and operation of the SPBP facility will not have either a direct or indirect adverse impact of the cultural significance of the area.

Accordingly, given that there are no items of Indigenous or non-Indigenous heritage on or within the immediate vicinity of the subject site, the potential for either direct or indirect impacts on the items listed in **Table 78** and **Table 79** is unlikely. However, in the unlikely event that an Indigenous relic is discovered during site preparation and construction earthworks, appropriate management procedures are outlined below to avoid unnecessary disturbance of any potential items of significance.

7.9.5 Mitigation measures

Prior to the commencement of works, all personnel working on site (including contractors) are to receive appropriate training regarding their responsibilities under the *National Parks and Wildlife Act 1974*. Further, all personnel working on site are to be adequately informed of the following recommendations.

Should, during the construction, any indigenous or potentially indigenous relic of significance be discovered, the following measures are recommended for implementation to minimise any potential adverse impact to that relic.

- Work shall cease immediately within the direct area, in order to avoid damage or disturbance to the relic of interest, potential or otherwise.
- NB will immediately inform PKPC and an officer from the Department of Environment and Climate Change and a member of the Illawarra Aboriginal Land Council. Appropriate arrangements shall be made with these two agencies to manage the potential relic.

7.9.6 Conclusion

The subject site represents an area of low archaeological and cultural sensitivity based on site history, reclamation works and extensive site disturbance in conjunction with current land use. In addition, a search of the relevant data bases also revealed that there are no items of European significance on or within close proximity to the subject site. Notwithstanding, standard conditions relating to the unearthing of indigenous relics during construction have been recommended.

¹¹¹ Port Kembla Heritage Park Brochure. Sourced: <http://www.kemblaport.com.au/index.pl?page=22>, 20082008

7.10 Economic and social impact

7.10.1 Introduction

Maunsell was commissioned by NB to provide a Social Impact Assessment as part of the Environmental Assessment for the proposed SPBP facility in the Inner Harbour of Port Kembla.

An assessment has been undertaken to gain an understanding of the social impacts of the development and operation of the SPBP facility. In assessing the social impact of the proposed development, background research has been conducted to examine and profile the social characteristics of the existing community in and surrounding the study area.

The assessment of social impacts was done through consideration of the existing social environment and potential changes associated with the proposed development during construction and operation. The socio-economic impact of the project has also been assessed with reference to the employment opportunities (both direct and indirect) associated with the construction and operational phase and the overall economic impact of the construction activities. Social impacts have also been considered in the context of other technical studies completed as part of this environmental assessment including noise, air, hazard and risks, water quality, heritage, visual assessment and traffic studies.

Potential impacts were identified and assessed against impacts to the immediate locality as well as impacts to the broader region. The findings of these assessments are detailed in the following sections.

7.10.2 Existing socio-economic environment

The nearest residential suburbs are Mount Saint Thomas which is located approximately 2km west of the site and Coniston located 1.2 km north of the site.

The demographic profiles of the region and areas immediately surrounding the proposed development are detailed below.

South Coast

The South Coast has a total population of 166,000 persons, which is expected to increase by 60,300 persons by 2031. The future of the region will be dominated by single and childless couples (77% of new households) and strongly influenced by the 65 plus age group which may possibly be attributed to the 'Sea Change' phenomenon.

The South Coast strongly relies on tourism to strengthen the economy and has a very high service role with tourism and visitors being an important part of local economies.

South Coast averages for relative socio-economic advantages / disadvantages were compared to those of NSW and across all relative socio-economic advantage / disadvantage indexes. The South Coast displays a lower level of advantage than the NSW average. This is an indication that within the South Coast there are a lower proportion of people with higher incomes, lower levels of employment in a skilled workforce, and more people living in smaller households.

Wollongong is Australia's ninth largest city with an estimated population of 192,402. Located 80 km south of Sydney, Wollongong covers 714 square kilometres and occupies a narrow coastal plain bordered by the Royal National Park to the north, Lake Illawarra to the south, the Tasman Sea to the east and the Illawarra escarpment to the west.

The profile of the working population including gross average incomes of workers within Wollongong is described in **Table 81**.

Table 81 Profile of working population of Wollongong

Working population Occupation, income and qualifications for Wollongong City's workers*, 2006	2006 number	2006 percent (%)
Occupations		
Managers	6,977	10.0
Professionals	14,536	20.8
Technicians and Trades Workers	10,942	15.6
Community and Personal Service Workers	6,550	9.4
Clerical and Administrative Workers	11,095	15.9
Sales Workers	6,623	9.5
Machinery Operators And Drivers	6,040	8.6
Labourers	6,512	9.3
Not Stated/Inadequately Described	685	1.0
Total	69,960	100.0
Weekly individual income		
Negative income	118	0.2
\$1-\$149	3,433	4.9
\$150-\$249	3,736	5.3
\$250-\$399	7,431	10.6
\$400-\$599	12,013	17.2
\$600-\$799	10,420	14.9
\$800-\$999	8,410	12.0
\$1,000-\$1,299	8,955	12.8
\$1,300-\$1,599	6,868	9.8
\$1,600-\$1,999	3,795	5.4
\$2,000 or more	3,404	4.9
Not stated	991	1.4
Total	69,961	100.0
Highest qualification achieved		
Postgraduate Degree Level	3,116	4.5
Graduate Diploma and Graduate Certificate Level	1,309	1.9
Bachelor Degree Level	9,771	14.0
Advanced Diploma and Diploma Level	6,750	9.6
Certificate Level	16,172	23.1
No post-school qualification	28,686	41.0
Inadequately Described/Not Stated	4,158	5.9
Total	69,962	100.0

Source: Australian Bureau of Statistics, Working Population Community profile, 2006 (Catalogue number: 2006.0).

As discussed in earlier in this chapter the nearest residential communities proximate to the proposed development are Port Kembla, Coniston and Mount Saint Thomas. Accordingly, a profile of these communities is included below.

Port Kembla

Port Kembla - Spring Hill is an established industrial and residential area, with residential areas located mainly in the south-east. Port Kembla - Spring Hill is bounded by Gladstone Avenue, Springhill Road and Wollongong in the north, the Tasman Sea in the east, the suburb of Primbee, Shellharbour Road, Northcliffe Drive, Shellharbour Road, First Avenue and Flagstaff Road in the south and the Port Kembla Steelworks, Five Islands Road and the Southern Freeway in the west.

Rapid growth took place during the 1950s and 1960s, aided by immigration. The population has declined since the early 1990s, a result of a decline in dwelling stock and the average number of persons living in each dwelling.

Major features of the area include Port Kembla Steelworks, Port Kembla Harbour, Australia's Industry World Visitor Centre, Fishermans Beach, North Beach, Port Kembla Beach, BHP Centenary Park, Coomaditchy Lagoon, Coomaditchy Lagoon Reserve, Harry Morton Park, Hill 60 Park, King George V Park, Military Reserve, Port Kembla Heritage Park, Breakwater Battery Museum and a number of schools.

The total population of Port Kembla – Spring Hill as defined by the 2006 census was 4,452, which represents a decrease in population from the 2001 census figure of 4,733¹¹².

Coniston and Mount Saint Thomas

Coniston and Mount Saint Thomas are predominantly residential areas. Coniston and Mount Saint Thomas is bounded by The Avenue, the WIN TV Station & Radio Station 200, Iris Avenue, the suburb of Mangerton, Gregory Street, McKenzie Avenue and Union Street in the north, Auburn Street, Miller Street and Tate Street in the east, Springhill Road and Gladstone Avenue in the south and the Southern Freeway in the west.

Settlement of the area dates from the 1820s, with land used mainly for farming. Population was minimal until the 1920s. Significant development occurred during the post-war years, aided by immigration. The population has been relatively stable since the early 1990s, a result of some new dwellings being added, but a decline in the average number of persons living in each dwelling. Major features of the area include WIN TV Station & Radio Station 200, Coniston Community Centre and one school.

The total population of Coniston and Mount Saint Thomas as defined by the 2006 census was 3,473, which represents a decrease in population from the 2001 census figure of 3,547¹¹³.

7.10.3 Impact assessment

A review of amenity impacts associated with the proposed development of the SPBP facility indicates that only neutral or positive impacts will be experienced in the long term. There is also the potential for the proposal to create some adverse social amenity impacts however these are associated with the construction phase. As such, these will be of short term duration and largely offset by mitigation management measures.

Potential impacts have been consolidated into the following categories:

- air quality

¹¹² Australian Bureau of Statistics, *Census of Population and Housing, 2006, 2001*

¹¹³ Australian Bureau of Statistics, *Census of Population and Housing, 2006, 2001*

- greenhouse gas emissions and energy efficiency
- hazards and risks
- traffic and transport
- ecological impacts
- noise emissions
- waste management
- visual impact
- soils
- water.

A description of types of relevant impacts during both the construction and operational phases, are detailed in the following sections.

7.10.3.1 Construction phase

The proposed SPBP facility will require a construction period of approximately 16 months. This has taken into consideration the preparation of a Construction and Environmental Management Plan, site establishment, earthworks and grading, installation of amenities, construction of the SPBP facility and the associated ancillary structures, car parking, delivery raw materials and final site clean-up.

The construction phase of the proposal is expected to have the greatest level of social impact on local communities. However the majority of these impacts, such as increased traffic and noise, are short term directly associated with the physical construction process and will be largely addressed through the implementation of mitigation management measures as summarised in the Statement of Commitments in **Section 8.3**.

Air quality

The proposed development is not considered to have an adverse impact on sensitive receptors as a result of air emissions during the construction phase (refer to **Section 7.2** of this report).

Greenhouse gas emissions and energy efficiency

Transport of materials and waste, site preparation, construction work, plant and people cause GHG emissions through burning fossil fuels, primarily diesel and petrol. GHG emissions attributed to construction of the proposed SPBP facility would be generated when:

- construction materials are produced
- when materials, plant and people travel to the work-site
- when site preparation and construction work are undertaken
- when waste is transported away from the work-site.

Hazards and risks

The risks associated with the proposed SPBP facility and their associated operations have been assessed as part of this Environmental Assessment in **Section 7.4**.

Significantly, this assessment found there was no risk of injury or fatality at residential areas or other sensitive land uses as a result of fires or explosions. It also concluded that few events have the potential for off-site impact and the societal risk is qualitatively concluded to be acceptable given:

- few events analysed in the study have the potential for off-site impact and, for the ones that do, their likelihood is acceptably low

- the risk of off-site individual fatality is low and acceptable
- the population density in the area is low.

Traffic and transport

The proposed SPBP facility will potentially impact on traffic flows during the construction phase. Prior to the commencement of works, NB will prepare a Construction Traffic Management Plan to ensure that other port users are not adversely impacted and that traffic flows are appropriately managed. This is detailed in **Section 7.5** of this report as well as detailed the Statement of Commitments in **Section 8.3**.

Ecological impacts

Flora and fauna impacts during the construction are expected to be minimal. All of the areas that would be occupied by the proposed SPBP facility are highly modified and provide very limited habitat for native flora and fauna species. The only threatened species that may use these habitats is the Green and Golden Bell frog (GGBF) as they have been identified within close proximity to the subject site.

No permanent or temporary water bodies are located on or adjacent to the subject site and consequently breeding habitat for GGBF is absent. Construction of the proposed SPBP facility, including increased construction traffic, is considered to have only a minor potential impact on potential GGBF movement corridors.

The subject site is not considered to contain habitat of significance to the conservation of GGBF at Port Kembla and significant impacts on this species are considered unlikely to occur as a result of the construction of the proposed SPBP facility.

Noise emissions

It is assumed that construction activities will take place during recommended standard working hours (7:00 am – 6:00 pm Monday to Friday and 8:00 am – 1:00 pm Saturday).

The nearest residential receiver will be approximately 1,200 m from the road construction works and 1200 m from the proposed SPBP facility construction works at the closest point. As a result it is assumed that there will be a minimal degree of noise impact to the local community during the construction phase.

The noise level emissions from site plant and the potential annoyance to sensitive receptors will depend on the selection of equipment, the type of operation, the activity duration and the time of day it is conducted. The proposed SPBP facility will generate truck and light vehicle movements on Springhill Road and Masters Road.

The draft construction noise guideline suggests that where residences and other sensitive receivers may be affected by noise, a series of work practices should be used to minimise the impact at those receivers. These work practices are detailed in **Section 7.7.5** of this EA. A qualitative assessment of the construction methodology for the new access road and operational facilities is recommended. The guidelines set out in the DECC draft guidance document '*New South Wales – Construction Noise Guidelines*' should be implemented to ensure that the impact at receivers from construction noise is minimised as far as is reasonable and feasible. However, it is expected that compliance at the site boundary will be achievable through careful plant selection and the application of appropriate mitigation measures.

It is also recommended that noise mitigation measures be incorporated in the construction environmental management plan.

Waste management

The solid waste generated during the construction of the proposed SPBP facility is listed in **Section 7.8** of this EA. It is not anticipated that this will result in any adverse amenity impact as a Construction Environmental Management Plan (CEMP) will be prepared prior to the commencement of construction. It will address appropriate waste identification, handling, storage and disposal to be followed on-site during construction.

Visual impact

Built form impacts will be incremental during the construction phase with the full impact upon completion. The visual modification of the port environment is considered to be neutral to minor as detailed in **Section 7.11** of the Environmental Assessment.

Potential impacts from construction of the proposal would be:

- water based construction activities associated with Berth 104, including barges, small boats and cranes
- land based construction activities including pipeline installation, canes, stockpiling and excavation
- construction vehicle movements and the transportation of materials and construction equipment.

Given the relative distance of sensitive environmental receptors, such as residential development, from the site and the larger scale of surrounding industrial development, it is unlikely that the construction of the proposed SPBP facility will significantly affect any sensitive environmental receptors.

Neighbouring industries are unlikely to be affected due to the relative distance from the proposal and the existing operational amenity of neighbouring industries which reduces the potential for any further visually intrusive impacts.

Soils

The presence, albeit limited, of soil and groundwater contamination will require the establishment of a range of appropriate site management measures. Such measures would primarily involve erosion, sediment and dust control, best practice materials handling and reinforced worker hygiene practices during construction or during subsequent excavations.

Water

Pollutants via overland flow and stormwater runoff have the potential to affect water quality during the construction of the proposed SPBP facility. Fuel and oil spills could occur during construction and litter may be generated during the construction process. However, mitigation measures have been designed to prevent impacts to water quality during the construction phase. These are described in **Section 7.13** of the Environmental Assessment as well as detailed in the Statement of Commitments in **Section 8**.

Economic

Only positive economic impacts can be expected during the construction phase of the SPBP facility with construction expected to employ up to 500 people in a range of construction related occupations.

The construction phase of the project is not anticipated to have any long-term impact on demographic change as it is expected that the majority of the 500 construction workers will be sourced locally given the availability of this type of labour within the region.

The construction of the proposed SPBP facility has the potential to generate significant local economic activity during the construction period through the procurement of equipment and services related to

the proposed SPBP facility construction, supply of fuel and other supplies to support the workers and the use of local facilities and infrastructure.

As a result there will be a short term positive impact on local employment coupled with increased demand for materials, goods and services associated with construction of the proposed SPBP facility.

7.10.3.2 Operational phase

The development will maximise use of currently under-utilised and unimproved land as well as existing infrastructure. This facility will also contribute to the diversification of the trade base within the port. The operation of the proposed SPBP facility is not anticipated to introduce any negative social impacts to the amenity of the local communities and generally speaking will impact positively by improving the amenity of the area. This is expected to occur through the implementation of mitigation measures and improvements to the visual amenity of the area.

Air quality

The site is surrounded by industrial uses with residential areas to the north, west and south of the industrial area. The nearest residential area is that of Coniston, approximately 1.2 km north of the site. The emissions generated by the proposed development have been assessed as part of this Environmental Assessment and the impact on the nearest sensitive receptors is not expected to be significant.

The potential dust emissions are proposed to be controlled using a series of measures through the materials handling system. These controls are focussed on mitigating the potential for health and on-site safety issues on-site and quarantine requirements, but equally provide a level of protection to the local Port Kembla users and local surrounding residential community. As such, it is expected the potential for impacts to local amenity will not be significant.

The proposal utilises a suite of controls to reduce the potential air quality emissions and as a whole is considered unlikely to cause a significant impact to the local air quality or amenity.

Greenhouse gas emissions and energy efficiency

The assessment of the proposed development found that the emissions of GHG from the proposed development would have an insignificant incremental impact relative to the global scale of climate change. Furthermore, displacement of petroleum diesel fuel by the biodiesel produced by the proposed SPBP facility is expected to produce a net reduction of approximately 6 million tonnes of GHG emissions over its life-time. Therefore, it is concluded that the net impacts of GHG emissions from the proposed SPBP facility are positive compared to reliance on petroleum based diesel.

Hazard and risks

The risks associated with the proposed SPBP facility and their associated operations have been assessed as part of this EA in **Section 7.4**.

Significantly, this assessment found there was no risk of injury or fatality at residential areas or other sensitive land uses as a result of fires or explosions. It also concluded that few events have the potential for off-site impact given the large distance to the nearest residential area and the estimated radiant heat levels from the potential fire events.

Traffic and access impacts

An assessment of the existing road network surround the site and the current traffic volumes has been undertaken for this Environmental Assessment and the proposed facility is not considered to have a permanent adverse traffic impact on the surrounding road network.

It is acknowledged that the SPBP facility will generate additional traffic movements however, as a result of maximising the use of alternative modes of transport available, such as sea and rail, the

impact of the additional road movements is considered to be negligible and consequently will not alter the existing level of service at the intersection of Tom Thumb Road and Springhill Road.

Furthermore, the assessment suggests that the proposed development will have negligible impacts to the public transport (bus and passenger rail) network as well as the pedestrian and cycling network in the vicinity of Inner Harbour of Port Kembla.

While the proposed SPBP facility will not have any permanent adverse traffic impacts, construction of the SPBP facility will generate some impacts. Intersection upgrade works, such as line markings and improved pedestrian connectivity between each allotment is required. It is recommended that these impacts be managed in a Construction Traffic Management Plan (refer to **Section 8.0**).

Ecological impacts

All of the areas that would be occupied by the SPBP facility are highly modified and provide very limited habitat for native flora and fauna species. A variety of common native bird species occupy the site and some common reptile and frog species may also be found on the proposed site. However, due to their adaptability and regional abundance, these species would not be seriously affected by the proposal.

No permanent or temporary water bodies are located on or adjacent to the subject site and with the implementation of the measures described in Chapter 7, the likelihood of significant impacts on terrestrial ecology as a result of the construction and operation of the proposed SPBP facility is considered to be low.

Noise emissions

Operational environmental noise emission impacts on noise sensitive receptors, such as nearby residential areas, have been assessed. The proposed SPBP facility will generate truck and light vehicle movements on Springhill Road and Masters Road.

The impacts of noise emissions from plant and equipment at the proposed SPBP facility, and from traffic movements generated by the proposed SPBP facility on the surrounding road and rail networks, on noise sensitive receivers have been assessed. The results of this assessment show compliance with the applicable noise criteria.

Waste management

Solid waste would be generated from the soybean crushing plant, soybean oil refining plant and sludge from the liquid waste treatment plant. All solid waste will be either:

- taken for recycling/recovery;
- reused; or
- taken to an appropriately licensed permitted solid waste facility for proper disposal.

It is envisaged that Commercial or Government Waste Contractors will be hired for collection and disposal of waste. NBG will have all required permits, certifications, and approvals, from applicable government authorities for the temporary storage of waste on-site. A detailed Operation Environmental Management Plan (OEMP) will be prepared prior to the commencement of operation of the SPBP facility. This plan will address handling, storage and disposal of waste. Accordingly, it is not anticipated that the proposed development will result in any adverse amenity impact as a result of waste management during the operational phase.

Visual impact

Although the SPBP facility will be partially visible from various surrounding locations, it is considered that the proposed SPBP facility would integrate relatively well into the existing landscape without being visually intrusive. Given the height and density of existing screening and the presence of other

industrial operations within the port, the SPBP facility would be entirely consistent in character with the port and its current heavy industrial operations.

Mitigation measures such as landscaping, vegetative screening, use of non-reflective materials and minimisation of light spill will be implemented to ensure the proposed SPBP facility does not detract significantly from the visual amenity of the area.

Soils

The analysis of soil conditions as detailed in **Section 7.12** has concluded that the limited soil and groundwater contamination present on the development site does not exceed concentration criteria for industrial land use and therefore the site is suitable for development for the purposes of the proposed SPBP facility.

Water quality

Runoff may potentially impact water quality during the operation of the SPBP facility. Dust from the handling of soybeans, residues from exhaust fumes and vehicles tyres, fuel and oil spills may all affect water quality during the operation of the SPBP facility.

There is not expected to be any adverse impact to water quality during the operational phase of the proposed SPBP facility. The procedures and equipment for the handling and storage of chemicals would minimise the likelihood of spills. The emergency procedures will mitigate the impact of any spills that may occur and facilitate their rapid and effective cleanup. The design of the proposed SPBP facility includes bunded areas around all chemical handling and storage areas. The bunding would be constructed such that any material spilled would not be able to escape into the Garungaty Waterway.

Economic

In operation, it is estimated that the proposed SPBP facility will employ up to 235 people. These jobs will be created in the areas of operation and maintenance and will include such activities as administration, technical and labouring positions as detailed in **Table 82**.

Table 82 Estimated employment generation

Functional Area	Estimated Employee No's
Business Management / Administration	13
Commercial/ marking	14
Factory Management	8
Preparation / De-hulling	13
Extraction	13
Biodiesel / Pre-treatment	17
Grain Receipt / Load-out	20
Laboratory	13
Boiler / Utilities / Wastewater	13
Maintenance	29
Transport	73
Security	9
TOTAL	235

The location of the site, and the infancy of this technology in Australia, will allow the proposed SPBP facility to become a significant regional asset that will provide employment opportunities, both direct (500 during construction, 235 in operation) and indirect (725) both up and downstream. The SPBP facility represents a capital investment value of A\$243 million. This is consistent with the aims

of the Illawarra Regional Strategy, which identifies Port Kembla as a key employment precinct and represents 3.2% of the Illawarra's job creation target for 2031¹¹⁴ (excluding construction employment).

Due to the diversified skill base within the Wollongong region, as detailed in the Australian Bureau of Statistics, Working Population Community Profile¹¹⁵ and contained in **Table 81**, it is anticipated that the many of the employment opportunities will be able to be filled by workers within the local region.

These new jobs will have major social and economic benefits for the Wollongong area. Expenditure associated with the new jobs could be approximately \$43 million per year on goods and services. Many of the new jobs will be in new technology and research in soybean processing and biodiesel development. This will benefit the area from diffusion through skill, innovation and image in emerging business sectors of high protein animal feed and renewable energy.

The proposed SPBP facility will have a significant impact from its contribution, operational expenditure, product and technological innovation at a local, regional and national level.

The proposed SPBP facility will have other benefits for the port in surplus silo storage, berth capacity and support transport, services and infrastructure. It will also assist the business case for completion of the Maldon-Dombarton rail line. Importantly, the proposed SPBP facility will help diversify the existing trade base in the Port by moving away from bulk minerals and steel manufacture and instead.

A significant proportion of the proposed SPBP facility's capital investment value of \$243 million will be spent in the Wollongong and surrounding district on metal fabrication, service, building trades and the like. The proposed SPBP facility will also utilise surplus capacity of the existing silos and in support services such as recycled water from the Wollongong Sewage Treatment Plant.

The proposed SPBP facility will stimulate the Australian regional agricultural sector, particularly in NSW, to grow more soybeans. The current Australian soybean crop is able to meet a maximum of 3-5% of the proposed SPBP facility's demand. This will have many economic and social benefits for rural and regional areas including:

- investment and diversification of an emerging and dynamic market
- response to growing a new Australian market for soybean meal and biodiesel and a strong demand in Asia for soybean product
- lowering agricultural input costs for fertiliser, pesticides and herbicides due to soybean nitrogen fixation and genetic properties compared to wheat and maize
- improving soil productivity due to soybean aeration effects and environmental performance through fewer chemicals required for fertiliser, weed and pest control.

7.10.4 Mitigation measures

Proposed mitigation and management measures relating to potential socio-economic construction and operational impacts are addressed in **Section 7.10** and **Section 8.0** of the EA. It is considered that the potential socio-economic environmental impacts can be appropriately managed provided the mitigation measures outlined in **Section 7.10** and **Section 8.0** are implemented.

7.10.5 Conclusion

A review of the social impacts associated with the potential proposal indicates that construction and operation of the proposed SPBP facility will not have a significant adverse impact on the local community proximate to the proposed development. It is further anticipated that the proposed development will result in a beneficial social impact for the local community through local business investment and employment generation.

¹¹⁴ NSW Department of Planning, *Illawarra Regional Strategy 2006-2031, 2007*

¹¹⁵ Australian Bureau of Statistics, *Working Population Community Profile, 2006*

The plant will require a diverse range of skills to operate including business management, administration, marketing, factory management, maintenance, transport and logistics, security, labourers. In addition, the proposal will be a catalyst for significant expenditure on the local economy.

It is unlikely that the construction phase would have significant impacts (either positive or negative) and the long term operational impacts will only be positive.

The proposed development will be a major employer, provide income to the NSW regional economy and diversify the local skill and innovation base. This will occur through:

- Providing up to 235 direct jobs and 725 indirect jobs in service and support industries (total 960 jobs, excluding the 500 jobs during the construction phase). The plant will strengthen the regional employment base and assist in addressing unemployment.
- Local businesses and communities will benefit from the annual injection of up to \$43 million into the economy from wages.
- The capital investment value is estimated at \$243 million will contain a significant expenditure on local metal supply, fabrication, building trades and professional services.
- The plant in operation will have an extensive skills base in soybean processing, laboratory research and market development. This will be of positive benefit to innovation and image within the Wollongong community and its projection as a regional centre.
- Improved fuel security.
- The plant will provide for an interesting visual improvement to this section of the Inner Harbour.

7.11 Visual impact assessment

7.11.1 Introduction

The proposal involves the erection of a number of separate buildings, storage tanks and ancillary structures. As the subject site currently contains no improvements the proposal will alter the existing character and appearance of the site. This section assesses the potential visual impact of the proposed SPBP facility. A visual assessment has therefore been undertaken in respect of the proposal to determine the extent of visual impact and to establish appropriate mitigation measures to minimise identified impacts should they be deemed necessary.

7.11.2 Methodology

The area in which the proposed SPBP facility is to be located may be described as lying within the coastal plain visual catchment. A qualitative visual assessment has been undertaken for the site and has been primarily evaluated on visual modification and visual exposure. In selecting the key viewpoints, potentially sensitive visual receptors were identified and then the existing views and the potential impacts on these views were assessed. In assessing the impact on the existing views consideration was given to topography, degree of exposure, screening and distance. On this basis, five (5) key viewpoints were selected and evaluated.

7.11.3 Existing environment

Port environs

The proposal is located within a regionally significant industrial precinct on the coastal plain which is characterised by foreshore port facilities and operations. The visual landscape, within close proximity to the subject site is dominated by the BlueScope Steel Works and Port Kembla Coal Terminal (PKCT) but is also characterised by facilities such as docking services, industrial machinery, storage containers, workshops, chimneys and shipping traffic. The items that have a high public visual exposure are the existing silos within the Grain Terminal site, the cranes associated with the BlueScope Steel site, the stockpiles of coal on the PKCT site and the 198 m chimney located in the Outer Harbour precinct. Key features in the broader visual environment include the Illawarra

escarpment, sprawling urban development, Five Islands Nature Reserves, public reserves and the Illawarra South Coast Rail Line.

On a local scale, the site of the proposed SPBP facility is generally flat, cleared of vegetation and contains no significant built form. While the subject site has a neutral existing visual amenity, it is dominated by the silos and other existing infrastructure on the adjacent Grain Terminal site. The Grain Terminal silos and associated infrastructure have an approximate maximum height of 60 m and dominate the local visual landscape.

The surrounding port-related industrial infrastructure within Port Kembla Harbour provides a framework upon which the proposal can be assessed.

Viewpoints to the site

The port and its associated infrastructure are visible from each of the five viewpoints to varying degrees. The level of exposure is dependent on the topography, distance and screening and as such the level of visual impact is expected to vary.

Figure 68 identifies the five viewpoints surrounding the subject site that have been assessed for potential visual impacts. These viewpoints were selected because they are representative of the key vantage points to the subject site. They include:

- 1) Swan Street, Port Kembla (**Figure 69** Wollongong Golf Course in the foreground)
- 2) Robwald Avenue (**Figure 70** residential street)
- 3) Outer Harbour (**Figure 71** from the south-eastern tip of the Breakwater Battery)
- 4) Port Kembla Coal Terminal (**Figure 72**)
- 5) Mount Keira (**Figure 73** from public lookout)
- 6) Allotment 3 from Tom Thumb Road (**Figure 74** looking east).

Generally, the Port's operations are set back from residential areas and other sensitive environmental receptors, reducing direct views from those vistas. The nearest residential suburbs to the subject site are Mount St Thomas and Coniston. A group of residential dwellings within the suburb of Mt Saint Thomas are located approximately 1.3 km north-west of the subject site, beyond Springhill Road and on the opposite side of the South Coast Passenger Line. The proposed development site is not visible from this location.

The nearest residential street, from which the site can be viewed, is located approximately 1.2 km north of the site and is within the suburb of Coniston. Separating Coniston from the proposed site is the AAT cargo handling site, the Wollongong Golf Course and the Sewage Treatment Plan. The proposed SPBP facility development site will be visible from this location albeit partially obscured by vegetative screening (refer to **Figure 69**).

Figure 68 Visual impact assessment viewpoints



SOYBEAN PROCESSING AND BIODIESEL PRODUCTION FACILITY

SEPT 2008

VIEWPOINTS

600402651

Source: Google Earth 2008

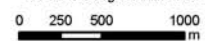


Fig 1

Figure 69 Viewpoint (1) from Swan Street looking south toward the subject site



Source: Maunsell 2008

Viewpoint (1) from Swan Street provides a vista toward Port Kembla Inner Harbour with Wollongong Golf Course in the foreground, as demonstrated in **Figure 69**. Wollongong City Beach is located to the east of this viewpoint and the heavily industrialised area of the Inner Harbour is pictured in the background. **Figure 69** further demonstrates the dominance of the Grain Terminal from the Swan Street viewpoint.

Viewpoint (2) as demonstrated in **Figure 70** shows the view from Robwald Avenue, a residential street approximately 2.3 km north-west of the subject site upper portions of the Grain Terminal are visible between land and water from this viewpoint with the remainder of the site being obscured by existing vegetation.

Figure 70 Viewpoint (2) from Robwald Avenue looking south-east toward the subject site



Source: Maunsell 2008

Figure 71 Viewpoint (3) from Breakwater Battery looking north-west toward subject site



Source: Maunsell 2008

Viewpoint (3) from Breakwater Battery in the Outer Harbour is shown in **Figure 71**, which demonstrates the visual dominance of the Grain Terminal in the background and the industrial nature of land in the foreground. The proposed SPBP facility site is located in between these sites.

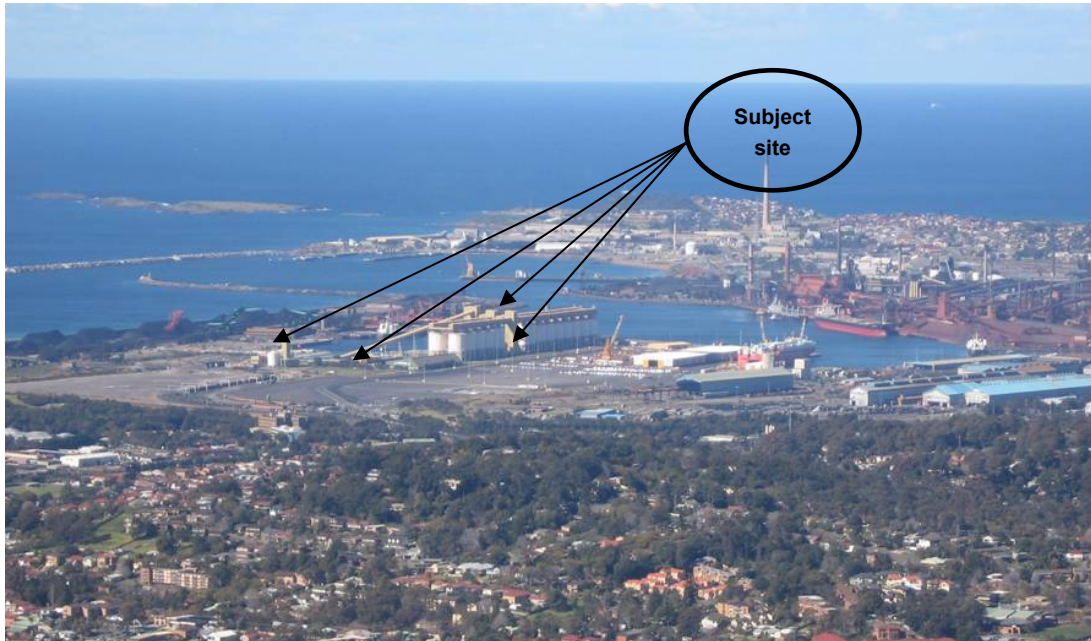
Viewpoint (4) demonstrates the view from the Port Kembla Coal Terminal as shown in **Figure 72**.

Figure 72 Viewpoint (4) from Port Kembla Coal Terminal looking west toward the subject site



Source: National Biodiesel Pty Ltd 2008

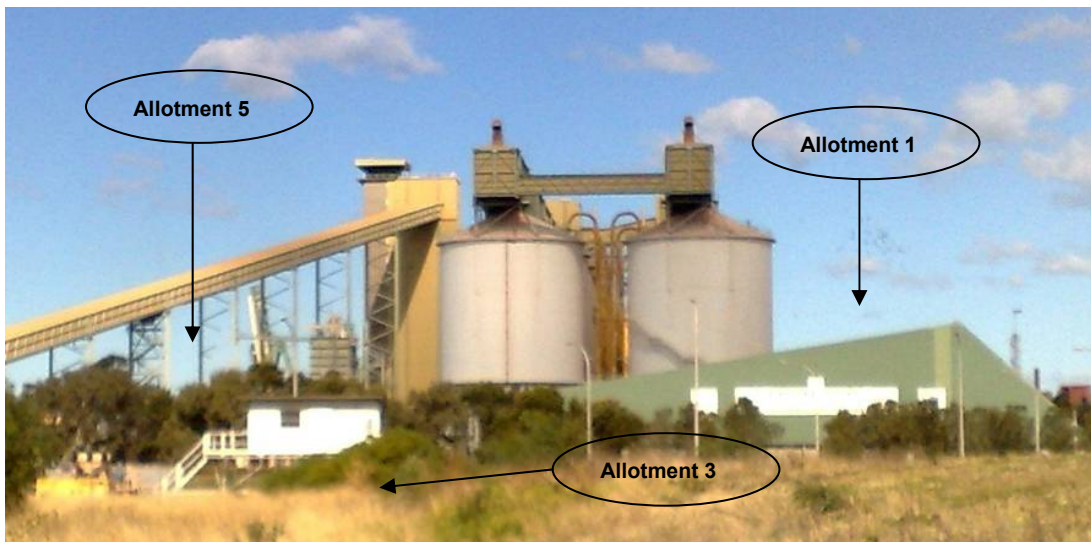
Figure 73 Viewpoint (5) Mount Keira looking south-east toward the subject site



Source: Maunsell 2008

Viewpoint (5) shows the viewpoint from Mount Keira toward Port Kembla Harbour in **Figure 73**, from a public lookout. The existing silos associated with the Grain Terminal are clearly visible, with the subject site being partially obscured by the silos.

Figure 74 Viewpoint (6) from Allotment 3 looking south toward Allotments 1 and 5



Source: National Biodiesel Pty Ltd 2008

Viewpoint (6) in **Figure 75** shows the view of Allotment 3 from Tom Thumb Road, with the Grain Terminal infrastructure located in the background.

The following sections outline the findings of the visual impact assessment and outlines potential impacts of the proposed SPBP facility during the construction and operation phases.

7.11.4 Impact assessment

The following issues are considered for the purpose of determining the level of potential impact on the proposed SPBP facility:

- colour
- lighting
- bulk and height
- suitability of development in the locality
- associated structures
- existing site features.

The visual impact of the proposed project has been assessed based on a combination of visual modification, which represents the change in the visual appearance of the subject site and visual sensitivity, which relates to assessment of the potential impact on sensitive visual receptors surrounding the subject site.

Regional viewpoints

Table 83 provides the findings for the visual impact assessment undertaken for each representative viewpoint. The level of visual impact is applied on the basis of the combination of visual modification and visual sensitivity in accordance with the significance criteria. The significance criteria are:

- **Adverse** – noticeable reduction in the amenity of a view of local and regional sensitivity
- **Negligible** – no perceived reduction or improvement in the amenity of a view (although development may be visible)
- **Minor** – considerable improvement in the amenity of the view of local and regional sensitivity.

Table 83 Regional viewpoint impact assessment

Viewpoint	Visual Modification	Visual Sensitivity	Visual Impact	Comment
(1) From Swan St, Port Kembla (Figure 69)	No perceived reduction in amenity	Regional	Negligible	Considering the relative height of the Grain Terminal (60 m) and the proposed height of the SPBP facility, the tallest component of which will be 36 m, the proposed structures will generally not protrude beyond the extent of the Grain Terminal.
(2) From Robwald Ave (Figure 70)	No perceived reduction in amenity	Local	Negligible	The subject site is located in foreground of the Grain Terminal and the proposed SPBP facility will not significantly alter this viewpoint.
(3) From the Outer Harbour (Figure 71)	No perceived reduction in amenity	Regional	Negligible	The subject site is located between the Grain Terminal and the Port Kembla Coal Terminal, which will screen the bulk of the SPBP site from the Outer Harbour viewpoint.

Table 84 presents the findings of the impact on key viewpoints to the site. For each of the key viewpoints presented in **Table 84**, photomontages have been prepared to represent the relative height of the proposed SPBP facility with respect to the existing port-related infrastructure and particularly the Grain Terminal.

Table 84 Key viewpoints impact assessment

Viewpoint	Visual Modification	Visual Sensitivity	Visual Impact	Comment
(4) From Port Kembla Coal Terminal (Figure 72 & Figure 75)	No perceived reduction in amenity	Regional	Negligible	The Garungaty Waterway divides the proposed SPBP facility site with the Coal Terminal and Figure 75 provides a photomontage of the placement of buildings and structures on Allotment 5. The height of the proposed structures will not exceed the height of the Grain Terminal and will therefore not have a significant visual impact from this viewpoint.
(5) From Mount Keira, Port Kembla (Figure 73 & Figure 76)	No perceived reduction in amenity	Regional	Negligible	As can be observed by the Figure 73 and Figure 76 , the SPBP facility is not visually obtrusive from this viewpoint. The proposed structures would be of a nature, scale and height consistent with other surrounding industrial development.
(6) From Allotment 3 of subject site (Figure 74 & Figure 77)	No perceived reduction in amenity	Regional	Negligible	Figure 77 demonstrates the view of Allotment 3 from Tom Thumb Road. Similarly, the image in Figure 75 demonstrates the relative height of the proposed SPBP facility alongside the Grain Terminal. The proposed structures will be less visually intrusive than the existing Grain Terminal.

The photomontages for each of the key viewpoints are as follows.

Figure 75 Photomontage of proposed structures for Allotment 5 from Port Kembla Coal Terminal



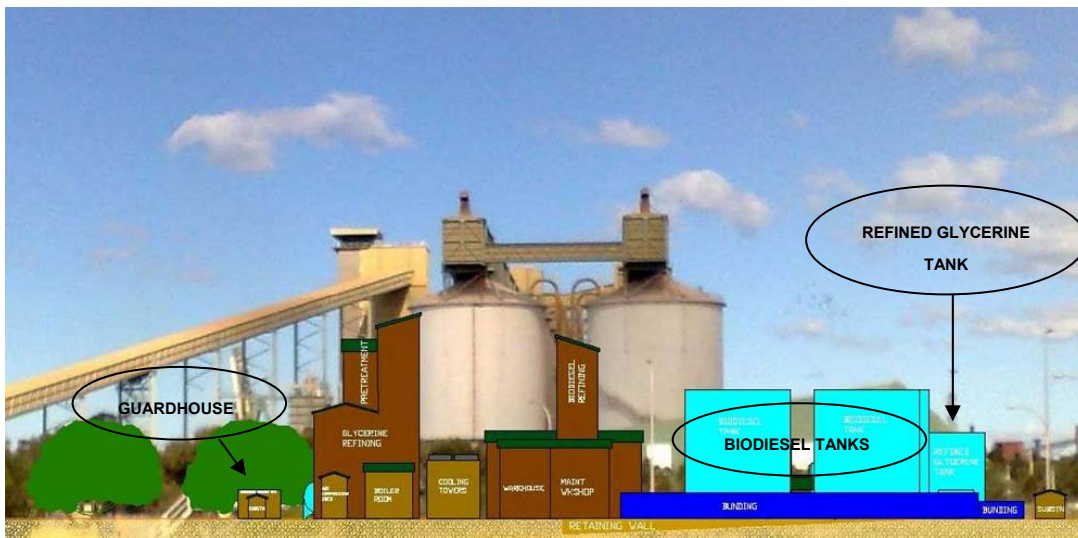
Source: National Biodiesel Pty Ltd (full drawing provided in **Appendix I**) – not to scale

Figure 76 Photomontage of the proposed SPBP facility from Mount Keira



Source: National Biodiesel Pty Ltd (full drawing provided in **Appendix I**)

Figure 77 Photomontage of Allotment 3 from Tom Thumb Road



Source: National Biodiesel Pty Ltd (full drawing provided in **Appendix I**) – not to scale

The proposed maximum building height on this allotment is 34.5m (refer to **Table 3**). Visual impacts generated from the SPBP facility will be low as a result of the strong industrial presence of the Port Kembla Harbour precinct and the relative distance between residential areas and the proposed SPBP facility.

The visual impact table demonstrates that the proposed SPBP facility will have a negligible impact on the visual amenity of the areas assessed. This is due to the existing industrial nature of the port and the relative distance between the proposed SPBP facility and any sensitive environmental receptors.

Once construction of the plant is complete, the appearance of the site will alter due to the presence of various large buildings and structures as described in **Section 4.0**. **Figure 75** shows an indicative site elevation plan of Allotment 5 with indicative positioning of the structures on this allotment. Allotment 5 will contain the extraction and preparation buildings, the later will be the tallest and most prominent building at 36 m.

Figure 77 demonstrates an indicative site elevation plan of Allotment 3 with indicative positioning of each structure, from Tom Thumb Road, with the Grain Terminal and associated silos directly in the background. The most prominent structures on Allotment 3 will be the biodiesel refinery, pre-treatment infrastructure and the glycerine refinery. The tallest structure will be the glycerine refinery at a height of 34.5 m.

The proposed development on this allotment will be consistent with the adjoining sites, in terms of height and scale and will not have a significant impact from any of the aforementioned viewpoints in **Table 83** and **Table 84**.

The following sections outline the potential construction, operational and lighting impacts, as well as detailing the design and building materials of the proposed facility.

Construction

Potential impacts from construction of the proposal would be:

- water based construction activities associated with Berth 104, including barges, small boats and cranes
- land based construction activities including pipeline installation, canes, stockpiling and excavation
- construction vehicle movements and the transportation of materials and construction equipment.

Given the relative distance of sensitive environmental receptors, such as residential development (1,200 m), from the site and the larger scale of surrounding industrial development, it is unlikely that the construction of the proposed SPBP facility will significantly affect any sensitive environmental receptors.

While GrainCorp is adjacent to the subject site and a number of other operators are within 500 m of the proposed site (PKTC, WSTP, BlueScope Steel, AAT) these neighbouring industries are unlikely to be affected due to this distance and the existing operational amenity of neighbouring industries which reduces the potential for any further visually intrusive impacts.

Lighting

The proposed SPBP facility will be operational 24 hours a day. The site will require lighting during evening hours to ensure a safe working environment. There is potential for light spill from the site to create illumination, which will be visible outside the SPBP facility boundary and be visible from public places. All industries operating within the Port of Port Kembla function 24 hours a day, 7 days a week, which results in significant levels of illumination at night. The location of the SPBP facility within the port precinct indicates that the lighting generated from the SPBP facility when combined and viewed in context with surrounding lighting from other industries will not have a significant impact.

Building materials and design

The maximum height of infrastructure on Allotment 3 is 34.5 m and 36 m on Allotment 5. The main processing sections, including extraction, biodiesel refining, pre-treatment and glycerine refining, will consist of proprietary equipment, piping, ducting, and the like and will be supported by structural members with concrete foundations at ground level. Access to equipment will be via gangways at ascending levels, with external stairwells connecting each level. The sections will be roofed, but exposed on each side. A small control room will be located on the first level of the biodiesel and glycerine refining sections and will be isolated from the other sections.

Individual pieces of equipment will be of a polished metal finish, as will any ducting. Structural members will generally be coated in a non-reflective colour. The roof will consist of coloured sheet metal sections, which will be either flat or gabled.

The preparation section of the SPBP facility will be identical to the other main process sections but the sides of the structure will be clad to prevent fugitive dust emissions. The cladding will most likely consist of coated sheet metal, such as Colorbond®, in a colour that is non-reflective.

The significant buildings on the site will be used mainly for storage and maintenance, such as warehouse, soybean meal storage and truck maintenance. These buildings will consist of a concrete foundation with primary structural members enclosed by four main walls and either a flat or gabled roof. The walls and roof sections will be composed of coated sheet metal, and will be of a non-reflective colour, with the exception of meal storage facilities which will have concrete walls on three of its sides up to a height of 14 m. The administration building will have two levels, concrete foundations and will most likely have brick or concrete clad walls. The roof will be either coated sheet metal (Colorbond®) or tiled. Both wall and roof exterior will be a non-reflective colour.

7.11.5 Mitigation measures

The construction areas will be managed to minimise any potential visual impacts. This will include implementing measures such as maintaining the site in an orderly manner and storing work equipment and materials within the work site.

There is an opportunity to provide landscaping on the boundary periphery of each site in order to soften the visual impact of the industrial built form, which may be provided for in the following form. Landscaping would be undertaken in the following locations:

- Allotment 3, at the boundary fronting Tom Thumb Road on the western and southern boundaries
- Allotment 5, along eastern and northern site boundaries
- Allotment 6, along the southern and eastern boundaries.

As detailed in **Section 7.6** it is recommended that this landscaping be native grass and understorey. In addition, it is recommended that a Landscape Management Plan be prepared to appropriately manage the selection of native species and the planting of such species for the site.

Notwithstanding functional and safety requirements, exterior lighting would be designed in accordance with relevant standards, including *Australian Standards 4282-1997 Control of Obtrusive Effects of Outdoor Lighting*.

Further, a commitment will be made to use non-reflective roof and wall materials and to use colours that harmonise with existing built structures in the immediate area (refer to **Section 8.0**).

7.11.6 Conclusion

As outlined, the industrial items that characterise Port Kembla Harbour can be observed from areas outside of the port precinct. Although the SPBP facility will be partially visible from various surrounding locations, it is considered that the proposed SPBP facility would integrate relatively well into the existing landscape without being visually intrusive. Given the height and density of existing screening and the presence of other industrial operations, the SPBP facility would be entirely consistent in character with the port and its current heavy industrial operations.

Mitigation measures such as landscaping, vegetative screening, use of non-reflective materials and minimisation of light spill will be implemented to ensure the proposed SPBP facility does not detract significantly from the visual amenity of the area.

7.12 Soils

7.12.1 Introduction

URS Australia Pty Ltd (URS) was engaged by Maunsell on behalf of NB to assess the potential for contamination of the land upon which the proposed SPBP facility is to be constructed. The following section provides a summary of the assessment undertaken by URS and addresses the state of the subject site having regard to potential for soil and groundwater contamination, soil salinity and the potential presence of Acid Sulfate Soils (ASS). This is followed by a summary of the results of the investigations which culminated in the documented recommendation.

7.12.2 Methodology

The URS contamination assessment was based on a qualitative assessment of historical reports and data, a site inspection and documentation of the investigation results.

7.12.3 Existing environment

The Port Kembla area has been characterised by industrial activity for a substantial period of time. The Port Kembla Inner Harbour was originally part of Tom Thumb Lagoon. It was filled/reclaimed using blast furnace slag, gravel, concrete and sand. A casting basin was established in the filled area in the late 1980s for the purpose of constructing immersed tube segments for the Sydney Harbour Tunnel. This area was subsequently filled in, using approximately 2 million tonnes of blast furnace slag derived from local steelmaking operations¹¹⁶.

The subject site has substrata of Quaternary alluvium including estuarine muds, sand and silts as well as fill material. The fill material is comprised of slag and gravel, with some concrete and sand. The groundwater flows in an easterly direction and is encountered at varying levels over the site, ranging from 0.480 to 8.740 m above Australian Height Datum (AHD) within the sand layer. The hydraulic gradient ranges between 0.001 and 0.005¹¹⁷.

7.12.4 Impact assessment

Excavation works will be required to facilitate the construction of the proposed SPBP facility however, it is expected that the excavation will be of a minor nature. In addition, earthworks may potentially result in sediment disturbance and runoff into the nearby receiving waters (Garungaty Waterway and the Inner Harbour). Provided appropriate mitigation measures are implemented (as detailed in the CEMP) these impacts can be appropriately managed.

7.12.5 Mitigation Measures

The presence, albeit limited, of soil and groundwater contamination will require the establishment of a range of appropriate site management measures. Such measures would primarily involve erosion, sediment and dust control, best practice materials handling and reinforced worker hygiene practices during construction or during subsequent excavations, for example during renovation of underground services. The management measures will be set out in a Construction Environment Management Plan (CEMP) and an Occupational Health and Safety Plan (OH&S Plan), based on risk assessment.

With respect to construction work involving cut-and-fill:

- In the event that site formation results in an excess of spoil, that excess material should be characterised in accordance with NSW DECC (2008) *Waste Classification Guidelines* prior to

¹¹⁶ URS Australia Pty Ltd, *National Biodiesel Production Facility: Contamination Assessment, Inner Harbour, Port Kembla, NSW*, 25 September 2008

¹¹⁷ URS Australia Pty Ltd, *National Biodiesel Production Facility: Contamination Assessment, Inner Harbour, Port Kembla, NSW*, 25 September 2008

disposal at a landfill licensed to receive such material. Proper records of the disposal operations should be maintained.

- If the materials balance requires the importation of fill, that fill should only be clean inert material, also in accordance with criteria set out in DECC 2008.

The Soils Assessment Report concluded that the subject site is suitable for the proposed industrial land use. However, there was a lack of data available with respect to the presence or otherwise of acid sulfate soil or soil salinity at the site. URS states that, subject to the location of the development site in the vicinity of marine waters, it is likely, albeit not confirmed, that saline soils or acid sulphate soils may be present on/below the site. Consequently, soil sampling and analysis for ASS and salinity should be undertaken prior to the commencement of site work and, if such soils are detected, an acid sulphate soil management plan and/or a salinity management plan should be prepared in order to establish management measures for the construction and subsequent operational phase of site operations.

Accordingly, URS recommend that:

“Prior to the commencement of site work and in areas were [sic] soil disturbance is likely, soil sampling and analysis is required to further establish the presence of ASS and saline soil. Should testing reveal that either ASS or saline soil is present, then an Acid Sulfate Management Plan and / or a Salinity Management Plan shall be prepared prior to the commencement of site work, and the management measures detailed in that Plan shall be implemented”.

Management measures detailed in the respective plans would be implemented as required to mitigate any potential impacts of these soils on the SPBP facility.

An assessment of soil and groundwater conditions at Allotments 1, 3, 5, and 6 (the development site) was undertaken by URS to determine the presence of soil and/or groundwater contamination. The potential for the presence of saline soils and acid sulphate soils within the development site was also assessed.

The assessment was undertaken based on a:

- site inspection
- review of reports and data generated as a result of soil investigation works undertaken by URS at, and in the vicinity of, the development site in 2005.

After analysing both the visual condition of the site and results of the 2005 soil investigation works, URS concluded that the limited soil and groundwater contamination present on the development site does not exceed concentration criteria for industrial land use and therefore the site is suitable for development for the purposes of the proposed SPBP facility.

7.12.6 Conclusion

The Soils Assessment Report concluded that the subject site is suitable in its current state for the proposed industrial land use. However, there was a lack of data available with respect to the presence or otherwise of acid sulfate soil or soil salinity at the site. Given the proximity to marine waters further soil sampling and analysis for ASS and salinity will need to be undertaken prior to the commencement of site work to establish whether ASS or saline soil needs to be managed during the construction phase.

7.13 Water issues

This section deals with a range of water issues related to the proposed SPBP facility including:

- receiving water quality
- site Stormwater management – quantity and quality
- site water use, including water recycling and efficiency measures
- flooding and sea level rise.

This section also provides a Conceptual Stormwater Management Plan for the site which details a list of design tasks, which will be undertaken as part of the detailed design of the proposed SPBP facility.

7.13.1 Receiving water quality

Existing environment

Water quality in Port Kembla Inner Harbour is affected by urban and industrial runoff with elevated levels of metals, organic pollutants and moderate turbidity as a result of historic and ongoing industrial land use¹¹⁸.

Minimal stormwater treatment is evident on the subject site, with surface water being discharged directly into the Garungaty Waterway from stormwater pipes or reaching the estuary as overland flow (refer to **Figure 78**).

Figure 78 Stormwater outlet into the Garungaty Waterway



Source: Maunsell 2008

¹¹⁸ Sinclair Knight Merz (SKM) 2005. *Proposed Expansion of General Cargo Handling facility Environmental Assessment Report*. Final Report December 2005 (prepared for Port Kembla Port Corporation).

The grassed areas of the subject site currently act as filters for stormwater before it enters the Garungaty Waterway, reducing to some extent the amount of sediment and other pollutants entering the estuary.

Potential construction impacts

Pollutants contained in site runoff have the potential to affect receiving water quality during the construction of the SPBP facility. Fuel and oil spills could occur during construction and litter, fine particles from eroding soils and associated heavy metal and organic contaminants may be generated and mobilised during the construction process.

Water quality may be affected by the rectification of the sea wall, but this is outside the scope of this assessment as the sea wall rectification is being assessed in the Review of Environmental Factors (REF) which is being prepared by PKPC.

Potential operation impacts

Runoff may potentially impact receiving water quality during the operation of the SPBP facility. Dust from the handling of soybeans, residues from exhaust fumes and vehicles tyres, fuel and oil spills may all affect water quality during the operation of the SPBP facility.

In the event of a spill of any of the chemicals used in the biodiesel production process, water quality could be affected if these chemicals are able to enter the Garungaty Waterway. Some of these chemicals are water-soluble and would mix with the water column, resulting in alteration to the water chemistry thus having the potential to affect aquatic ecosystems in the vicinity. Other chemicals used in the operation of the SPBP facility are water-insoluble and would float on the water surface.

Mitigation measures

As part of the Construction Environmental Management Plan (CEMP), an Erosion and Sediment Control Plan (ESCP) would be prepared in accordance with the Landcom *Managing Urban Stormwater; Soils and Construction Manual 2004* prior to any works commencing at the site. The ESCP would be maintained for the duration of the construction process to prevent any sediment and polluted water entering any waterway. It would also contain emergency procedures for high rainfall events that could increase soil erosion during construction.

The ESCP would include the following mitigation measures as a minimum.

- Installation of erosion and sedimentation control devices prior to excavation of the site. 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 and in other areas as appropriate.
- The area to be disturbed by construction activities would be minimised as far as possible.
- Embankments and other areas subject to earthworks and grading would be revegetated with an appropriate cover crop as soon as possible following achievement of final levels. Where 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.

- 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 soils are exposed for as short a time as possible.
- Earthworks would be avoided or minimised during wet weather, in order to minimise water-induced soil erosion and increased sedimentation to the surrounding environment.

The following measures would also be included in the CEMP in order to minimise the potential of spills to affect water quality during construction.

- Handling of oils and fuels and the washing of all equipment, including all concreting equipment, would be undertaken within bunded areas or containers in accordance with the DECC Bunding and Spill Management Guidelines: *Storing and Handling Liquids: Environmental Protection - Participants Manual* and *Environmental Compliance Report: Liquid Chemical Storage, Handling and Spill Management - Part B Review of Best Practice and Regulation*.
- Any pollutants trapped in bunded areas would be disposed of in accordance with the waste management section of the CEMP and DECC waste guidelines.
- Onsite refuelling if required will be conducted in accordance with a Refuelling Management Plan (RMP) developed with consideration to the environment. The RMP will include a risk assessment for fuelling of all plant including consideration of the following as appropriate:
 - appropriate refuelling locations
 - proximity to infrastructure
 - hoses
 - couplings
 - bunding
 - track matting
 - spill kits
 - monitoring
 - fill volumes
- The CEMP would include work methods to safeguard against hazards such as spills. Any fuel spillage would be reported, documented and immediately remediated. Collected contaminated material would be disposed of as per management section of the CEMP and in accordance with the *NSW DECC Waste Classification Guidelines 2008*.

An Operation Environmental Management Plan (OEMP) would be implemented during the operation of the SPBP facility. The OEMP would include as a minimum, the following measures to prevent and respond to spills, thereby protecting water quality:

- a system to ensure that all staff involved in the handling of chemicals are suitably qualified and trained in emergency spill response procedures
- diagrams and descriptions of access and unloading locations and procedures for drivers of vehicles delivering chemicals
- a program of regular monitoring and maintenance of equipment used in the transportation and handling of chemicals
- a register of equipment, responsibilities and procedures for responding to spills
- a program of monitoring of the condition of bunding.

The proposed procedures and equipment for the handling and storage of chemicals would minimise the likelihood of spills. The emergency procedures described in **Section 7.4** would mitigate the impact of any spills that may occur and facilitate their rapid and effective cleanup. The design of the SPBP facility includes bunded areas around all chemical handling and storage areas. The bunding would be constructed such that any material spilled would not be able to escape into the Garungaty Waterway.

Appropriate water quality control measures will be implemented on site, in non-bunded areas, to minimise the transportation of contaminants to the receiving waters. These measures are outlined in the Conceptual Stormwater Management Plan.

Conclusion

With the implementation of the measures described above and in **Section 7.8** the likelihood of significant impacts on water quality as a result of the construction and operation of the proposed SPBP facility is considered to be low.

7.13.2 Conceptual stormwater management plan

This section addresses the management of the quantity and quality of stormwater runoff from the SPBP facility.

Proposed drainage layout

Currently there is no topographic survey information available for the proposed SPBP facility site and there is limited information available for existing drainage in the surrounding area. Therefore, it is currently not possible to prepare an accurate drainage layout for the site or size drainage infrastructure. In this regard the Conceptual Stormwater Management Plan for the site consists mainly of a list of design tasks which will be undertaken as part of the detailed design stage.

Water quality control

Water quality in Port Kembla Inner Harbour is affected by urban and industrial runoff with elevated levels of metals and organic pollutants and moderate turbidity.¹¹⁹

Any pollutant-laden runoff from the proposed SPBP facility could potentially impact water quality during the construction and operational phases of the proposed SPBP facility. Pollutants may include dust from the handling of soybeans, process by-products, residues from exhaust fumes and vehicles tyres, fuel and oil spills.

Construction phase mitigation measures have been described in **Section 8.0**.

Operational phase measures will include bunding, roofing and isolation of the areas with the highest risk of pollutant generation. These measures will ensure spill containment and separate treatment of any runoff captures from these areas, minimising the availability of pollutants to be entrained by stormwater runoff. The remainder of the site is largely access roads, plant buildings and administration areas. On this basis, first flush containment from the remaining areas of the site has not been provided. This will avoid the need to provide large storages on site and any discharge to the sewer. Alternatively, water quality control measures have been proposed to treat low, frequent flows from these areas.

Proposed permanent stormwater quality control measures are discussed in the following sections. Best Practice environmental management of urban stormwater will be adopted. Stormwater treatment objectives will be adopted in regard to mean annual reductions of pollutants loads based on typical pollutant generation rates for similar land use. Proposed grassed swales, bio-retention and gross pollutant traps will be sized accordingly at detailed design stage using the MUSIC program or the like.

¹¹⁹ Sinclair Knight Merz (SKM) 2005. *Proposed Expansion of General Cargo Handling facility Environmental Assessment Report*. Final Report December 2005 (prepared for Port Kembla Port Corporation).

Stormwater management philosophy

The design philosophy for stormwater management on the site includes:

- control of erosion and sediment during the construction phase to prevent any sediment and polluted water entering any waterway
- bunding at all tank farms and the trunk loading/discharge bay to provide spill containment and minimise pollutant transport during operations
- rainwater tanks to some large roofed structures if possible (SBM Storage and Administration building) for reuse and peak flow reduction
- retention and revegetation of as much pervious area on site as possible for peak flow reduction
- treating urban runoff from the site to meet water quality objectives for discharge to Port Kembla and the Garungaty Waterway
- the site is located within Wollongong Council's On-Site Detention Concession Zone 2 as it is in close proximity to Port Kembla Harbour where increased peak flows would not impact on local flood levels. Therefore no on site detention storage will be required on this site.

Detailed design phase considerations

At detailed design stage, a drainage system layout will be developed in accordance with Wollongong City Council's Urban Drainage Design Manual. This will include:

- a review of site contours and any proposed site re-grading
- design of a piped drainage network to convey the 10 year ARI runoff from each of the sites to either the receiving water or existing drainage system
- design of the major drainage system i.e. overland flow paths to convey up to the 100 year ARI runoff off the site
- confirmation of the capacity of the existing drainage networks along Farrer Road and Tom Thumb Road for future connection of site drainage
- design of stormwater quality control measures for each of the separate zones of the development to capture contaminants – this is discussed further in the following subsection
- sizing of rainwater tanks where practicable
- as discussed in **Section 7.6.2** and **7.13.1** an Erosion and Sediment Control Plan (ESCP) would be prepared in accordance with the Landcom *Managing Urban Stormwater; Soils and Construction Manual 2004* prior to any works commencing at the site and would be maintained for the duration of the construction process to prevent any sediment and polluted water entering any waterway.

The surrounding area generally drains to the east towards the Garungaty Waterway. It is understood that the existing drainage infrastructure in the surrounding area consists of:

- a 525 mm diameter stormwater pipeline running along Tom Thumb Road discharging into the Garungaty Waterway
- a short length of 375 mm diameter stormwater pipeline at the northern end of Farrer Road connecting into the Tom Thumb Road pipeline, draining part of the existing AAT site
- a 450 - 525 mm diameter stormwater pipeline running south along Farrer Road and discharging directly to the Bay at the southern end of the site, draining part of the existing AAT site.

The SPBP facility is over four separate allotments. The catchment details of each allotment is summarised in **Table 85**.

Table 85 Catchment summary for each zone

Allotment	Breakdown of subcatchment areas (m ²)				
	Buildings/ structures	Paved	Bunded	Pervious	Total
Allotment 1 – Truck Parking and Future Expansion	700	14,071	0	4,382	19,153
Allotment 3 – Refining Processes	5,060	3,270	3,968	2,414	14,712
Allotment 5 – Extraction and storage processes	13,513	9,543	726	7,280	31,062
Allotment 6 – Administration	477	1,792	0	2,018	4,287
TOTAL	19,750	28,676	4,694	16,094	69,214
Percentage (%)	28.5	41.4	6.8	23.3	

Allotment 1 comprises the Truck parking and future expansion area. This is a long strip of land running north-south just to the west of Farrer Road and adjoining the existing AAT site. It is possible that this allotment may need to be drained in both a northerly and southerly direction based on the existing drainage for the AAT site immediately to the west of this zone. This may also be dependent on the available capacity of the existing drainage system in Tom Thumb Road. The proposed Truck Maintenance facility at the southern end of the zone will be drained via an oil separator to capture any hydrocarbons. For drainage to the north, the proposed pervious area could be utilised for either grassed swales or bio-retention for pollutant removal. For any required drainage to the south a GPT would be required at the downstream end of site drainage to intercept sediment and reduce other pollutant loads as there is inadequate space for swales or bio-retention.

Allotment 3 (previously Allotments 3 and 4) comprises the main refining process and tanked storage areas. This area is located to the north and east of Tom Thumb Road. This allotment contains two large bunded tank farm areas to provide potential spill containment and isolate runoff from the rest of the drainage system. Similarly, the covered truck loading/discharge bay will be isolated by speed humps, which form a bund, and drained via oil/grit separators. It is assumed that the remainder of this area would be drained to the south east and discharged to the existing Tom Thumb Road drainage system. However, the capacity of the existing drainage system will need to be confirmed. There may be the some opportunity of utilising grassed swales along the eastern side of this area for pollutant removal in addition to a gross pollutant trap (GPT) at the outlet to the Tom Thumb Road drainage system.

Allotment 5 comprises the extraction and storage processes. This area lies immediately to the west of the Garungaty Waterway. There are a number of proposed vegetated areas which could be utilised for either grassed swales or bio-retention prior to discharge to the Garungaty Waterway. It is envisaged that this zone may have multiple drainage outlets to the Garungaty Waterway due to its location and to minimise depths of pipelines. The truck loading/discharging area between the Hulls Storage and the SBM storage warehouse will have its own dedicated GPT to intercept grain and fine sediment, as this is anticipated to be a location where contaminant loads are likely to be highest due to the volume of materials handling. At the northern end of this zone it is likely that an underground rainwater tank will be installed to collect roof runoff from the soybean meal storage building. The use of this will depend on the proximity of amenities for reuse, and will be considered further at detailed design stage.

Allotment 6 comprises the administration and training building as well as associated car parking. It is assumed that this area would either drain to Tom Thumb Road or towards the Garungaty Waterway. This area currently contains a stormwater retention lagoon which drains into the Garungaty Waterway. Site runoff would be diverted to an oil and sediment trap such as a Humeceptor™ or Filternator® prior to discharge. Where possible the available pervious area would also be utilised for grassed swales and bio-retention. If possible an underground rainwater tank will be included to collect roof runoff from the administration building.

7.13.3 Conclusion

With the implementation of the measures to minimise the likelihood and potential severity of environmental impacts described in these chapters, the potential for degradation of aquatic ecosystems as a result of the operation of the proposed SPBP facility is considered to be low.

The proposed pervious area of some 23% of the total site area will be planted with native species and will represent a significant benefit compared to the existing situation in terms of water quality and biodiversity.

7.13.4 Site water usage

Process flow water balance and demand analysis

The process flow diagrams for the SPBP facility were used to derive an end use model of average daily water demands. Since the process is a closed circuit, external water demand is low and is primarily make-up water for the boiler systems and process cooling towers due to the losses to condensation and evaporation. On this basis, recycled water is considered a suitable source for approximately 98.6% of the sites total water demand (excluding any irrigation). **Table 86** provides a summary of the water demands and waste streams of the various processes/end uses.

Table 86 Process flow water balance

Process/ End Use	Supply Source		Waste Stream/losses		
	Potable Water Demand (kL/d)	Recycled Water Demand (kL/d)	Trade waste and sewage (kL/d)	Vented steam/ moisture (kL/d)	Evaporation/ windage loss (kL/d)
Stage 1 Crushing					
Boiler System		248	15		
Cooling Towers		810	62		748
Processes				242.6	
Plant amenities	17.3		17.3		
Administration	2		2		
Stage 2 Refining					
Boiler System		87.3	5.2		
Cooling Towers		764.9	58.1		706.8
Processes		22.5	147		
Plant amenities	8.1		8.1		
Total Demands	27.4	1,932.7	314.7	242.6	1,454.8

Water recycling and efficiency measures

Within the crushing section of the SPBP facility, the normally generated 240 kL/d of wastewater will be recovered and recycled to produce a “zero effluent” plant.

The refining section of the SPBP facility (oil pre-treatment, transesterification, and glycerine refining) will utilise a barometric chilling system. This additional capital expense to the plant will reduce the water demand to that section of the proposed SPBP facility by almost half or 67.5 kL/d.

NB is currently working to further reduce demands and water loss through the Every Drop Counts program with Sydney Water. A number of measures to reduce water loss in the cooling towers are being considered by NB for the SPBP facility. These operational and maintenance measures may include:

- reducing uncontrolled water losses:
 - preventing water overflows – incorrectly set ball float valves
 - fixing water overflows – incorrect piping configuration
 - fixing water overflows – incorrect water balance
 - reducing water splashing – during operation
 - preventing leakage from pipes, joints and pump glands
 - minimising drift losses – through correct drift eliminator (drift rate of not more than 0.002% water loss)
- reducing controlled water losses:
 - controlling bleed (management over)
 - managing cycles of concentration
- other ways to reduce water consumption through better operation and management
 - monitoring water use
 - use of by-pass valves
 - minimising cooling tower cleans through performance based maintenance
 - monthly maintenance activities
 - side stream filters.

Further, during EPCM phase consideration will be given to the potential of sea water cooling; however it must be noted that such water is much more corrosive, and is also much more likely to cause fouling. Further, cognisance must be given to the impact of discharging such water back into the sea.

Sydney Water currently supplies BlueScope Steel and BOC Gases Australia with Reverse Osmosis (RO) quality recycled water from the nearby Wollongong STP. An arrangement is currently being agreed upon with Sydney Water for the supply of recycled water to the SPBP facility as part of its Stage III STP works to increase the capacity of its RO water supply. **Table 87** provides a summary of the typical water quality expected for this recycled water, as provided by Sydney Water's Recycled Water Market Development Group. This recycled water is generally considered to be of a suitable quality to be used as make-up water for the cooling towers, and may require some further pre-treatment prior to use as boiler feedwater. At detailed design stage, an assessment of the available capacity of the recycled water supply will be undertaken. This will determine whether additional infrastructure such as recycled water balance tanks and a pump station will be required on-site to ensure adequate flow and pressure, plus security of supply to the site. Further, back-up potable supply will be made available to the site in cases of RO supply disruptions.

Table 87 Wollongong STP recycled water typical quality

Parameters	Sample analyses shall be between or below the following maximum concentration or range (95 percentile)
Total Hardness (as Ca CO ₃)	20 mg/L
Chloride (Cl)	20 mg/L
Ammonia Nitrogen (NH ₃ -N)	1 mg/L
Biochemical Oxygen Demand (BOD ₅)	1 mg/L
Nitrate Nitrogen (NO ₃ -N)	4 mg/L
Total Nitrogen (TN)	5 mg/L
pH	6.5 – 8.5
Suspended Solids (SS)	1 mg/L
Total Phosphorus (TP)	85 mg/L
Parasites	1 per 50 L
Viruses	1 per 50 L
Coliforms	1 per 100mL

Where possible NB will also seek to collect water from roof runoff to reduce the reliance on potable water for the plant and administration amenities and reduce peak stormwater flows. This rainwater would most likely be used for toilet flushing in adjacent buildings. This may also enable irrigation of proposed vegetated areas. Several proposed buildings have large roof areas such as the administration building and the SBM Storage Warehouse. However, the potential to incorporate rainwater tanks on these sites will be assessed at the detailed design phase and would most likely comprise underground storage solutions such as Rain Vault™, Rainstore or WATERPOINT INGROUND® system.

7.13.5 Flooding and sea level rise

The site has been incrementally reclaimed as part of the inner harbour port reclamation works. It does not have a flood history due to these landfill works and the associated finished ground levels. The site abuts strategic infrastructure that needs to be above flood levels including rail, road and bridge crossing, the silos and associated berths.

The site is generally all located above RL 4.05 m AHD and is downstream of the existing causeway on the Garungaty Waterway. The Garungaty Waterway, which is adjacent to the site, is a main waterway serving the hinterland catchment. The high tide recently adopted for the assessment of the removal of the Garungaty Waterway Causeway was RL 1.8 m AHD (Cardno Forbes Rigby, 2006). The 100 year Average Recurrence Interval (ARI) flood level at the southern rail bridge, just downstream of the causeway was estimated to be RL 1.83m AHD and this was not impacted on by the removal of the causeway. Therefore the final site levels are more than 2 m above the estimated 100 year ARI flood level.

The IPCC 2007 projections of global average sea level rise ranged from 0.18 m to 0.59 m by 2090-2100 relative to 1980-1999 levels. It shows the upper ranges of projected sea level rise possibly increasing by 0.1-0.2m due to an additional contribution from a future rapid dynamical response of the ice sheets. The upper estimates were lower than those in IPCC (2001). Recent CSIRO modelling has indicated that in NSW a further 0.1 m should be added to the global averaged eustatic increases. It also recommends that the ranges of local sea level rise (relative to the global average) given above be used in conjunction with a range of global average sea level rise of 0.18 m to 0.79 m by 2090-2100 relative to 1980-1999 levels. Taking account of isostatic rebound, the range of the 100 year postulated changes for the NSW coast become 0.15 m to 0.75 m, with a best estimate of 0.45 m.

On this basis, having regard to the most recent predictions relating to sea level rise as a result of climate change, the proposed site will remain unaffected.

7.13.6 Conclusion

With the implementation of the measures to minimise the likelihood and potential severity of environmental impacts described in these chapters, the potential for degradation of aquatic ecosystems as a result of the operation of facility is considered to be low.

The proposed pervious area of some 23% of the total site area will be planted with native species and will represent a significant benefit compared to the existing situation in terms of water quality and biodiversity.

8.0 Statement of Commitments

8.1 Introduction

This section provides the Statement of Commitments (SoC) in accordance with Section 75F(6) of the EP&A Act. The inclusion of appropriate environmental management measures into the detailed design and construction of the proposed SPBP facility would minimise adverse impacts on the environment.

The proposed adoption of the relevant measures identified in the draft SoC into an Environmental Management Plan (EMP) would be an important component of the proposal and reiterate the commitment of the proponent and any contractors to mitigation of environmental impacts identified in the assessment.

The draft SoC describes the environmental management and monitoring to be undertaken during the construction and operation of the SPBP facility.

8.2 Environmental management

8.2.1 Environmental management plan

An Environmental Management Plan (EMP) will be developed to address specific environmental issues associated with the construction and operation of the SPBP facility. This would likely be in the form of separate Construction and Operational EMPs. The EMP is an administrative tool outlining environmental management practices, safeguard measures to be implemented, timing of their implementation and management as well as monitoring of the process and procedures for the life of the project.

The EMP will be prepared prior to any construction work being undertaken and will provide a detailed description of the construction staging, tasks and management measures. The EMP would include appropriate strategies and management measures to control and manage environmental risks, assess environmental performance and comply with relevant statutory requirements during the construction of the proposed SPBP facility.

The key principles for the EMP comprise:

- ensuring that works are carried out in accordance with appropriate environmental statutory requirements, the conditions of approval for the project and relevant guidelines
- ensuring that works are carried out in accordance with the goals and commitments presented in this Environmental Assessment
- ensuring that works are carried out in such a way as to minimise the likelihood of environmental degradation occurring
- ensuring that works are carried out in such a way as to manage the impact of the works on neighbouring land uses
- ensuring that all employees engaged in the works comply with the terms and conditions of the EMP
- providing clear procedures for management of environmental impact, including corrective actions
- identifying management responsibilities and reporting requirements to demonstrate compliance with the EMP.

The CEMP would be structured to include as a minimum:

- site and project specific objectives and targets
- description of relevant statutory requirements and compliance to standards and codes of practice
- hazards and risks associated with the construction of the SPBP facility
- potential constraints to the construction
- details of environmental control works
- timing of environmental control activities
- clear definition of roles and responsibilities for staff engaged in the proposed activities
- details of induction and training for construction personnel working on the project
- procedures and instructions for implementing, maintaining, assessing and monitoring environmental controls
- reporting procedures (incident, complaint and non-compliance)
- procedures and schedules for undertaking and recording environmental inspections and auditing
- emergency procedures
- corrective action requirements and verification
- assignment of authorised personnel and procedure for changing and issuing the CEMP
- details of how the changes to the environmental management documentation and data are to be identified and communicated to relevant project personnel
- mechanisms for regular evaluation of environmental performance
- a GGBF management plan will be developed in conjunction with NSW DECC to establish a protocol in case the species is encountered during construction
- a walk-over of the proposed site will be conducted by a suitably qualified ecological consultant to ensure that no GGBFs are present immediately prior to construction.

8.3 Statement of Commitments

This section describes the general commitments made as part of this Environmental Assessment. The Statement of Commitments identifies a combination of matters that will be dealt with in the next stage of the proposed project (detailed design) and matters that must be dealt with at subsequent stages, based on current knowledge and design resolution.

Table 88 below describes the commitments identified by this Environmental Assessment to avoid or minimise adverse impacts on the environment.

Table 88 Statement of Commitments

Issue	Commitment
<p>General</p>	<p>The proposed SPBP facility will be constructed and operated generally as described in the <i>Soybean Processing and Biodiesel Production Facility, Environmental Assessment</i>, prepared by Maunsell AECOM and dated October 2008.</p> <p>The proponent shall prepare and implement the following management plans for the project:</p> <ul style="list-style-type: none"> - A Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (OEMP) will be prepared for the site. - A Traffic Management Plan (TMP) shall be prepared for construction prior to construction. The TMP shall incorporate a Transport Code of Conduct which would outline and manage the transportation routes to the site for heavy vehicles during construction of the proposed SPBP facility. The TMP would also include: <ul style="list-style-type: none"> ▪ heavy vehicle access to the site; ▪ deliveries and dispatch of products; ▪ use of truck turnaround areas. - A Soil and Water Management Plan shall be prepared prior to commencement of construction. This shall include Erosion and Sediment Control Plan in accordance with Landcom's <i>Managing Urban Stormwater; Soils and Construction Manual 2004</i> - Energy Savings Action Plan in accordance with the requirements of Department of Water and Energy (DWE) and the Guidelines for Energy Savings Action Plans (DEUS 2005), to include details of greenhouse gas abatement measures and energy efficiency measures for the operation of the proposed SPBP facility - A Procurement Plan (PP) for imported soybeans shall be developed. This plan will ensure that feedstock originates from responsible, sustainable and legal agricultural operations. The PP will be developed prior to commencement of operation and will: <ul style="list-style-type: none"> ▪ identify environmentally and socially responsible feedstock materials ▪ include procedures for the sourcing of such feedstock ▪ contain procedures for regular review of suppliers.
<p>Air Quality</p>	<ul style="list-style-type: none"> • Air Quality Management Plan including monitoring and inspections to confirm emissions comply with manufacturers guarantees, legislative requirements to confirm all controls are working appropriately and to ensure impacts to the community are minimised, as recommended in Section 7.2. • The proponent will take all practicable measures to ensure that air emissions during the construction and operation of the project are within relevant air quality and odour criteria and guidelines. • The proponent will undertake all practicable measures to minimise dust generation from the site during both construction and operation. These measures shall be incorporated in the Erosion and Sediment Plan. • The proponent will ensure that no plant-generated offensive odours will exist at detectable levels at the closest sensitive receivers. If any offensive odours are detected at the closest sensitive receivers and proven to originate from the proposed development once in operation, feasible odour-treatment technology will be evaluated and installed. • The proponent will ensure that industry best practices are followed to prevent fugitive emissions and that a Leak Detection and Repair Program is implemented and followed during normal operations to control the potential for fugitive emissions.

Issue	Commitment
	<ul style="list-style-type: none"> The proponent will ensure that all emission sources that form part of the proposed SPBP facility comply with emission limits as specified in the Protection of the Environment Operations (Clean Air) Regulation.
Greenhouse Gas Emissions and Energy Efficiency	<ul style="list-style-type: none"> The proponent shall prepare and implement an Energy Savings Action Plan for the proposed project, which would be prepared in accordance with the requirements of DWE and the Guidelines for Energy Savings Action Plans (DEUS 2005), in order to maximise energy efficiency associated with the SPBP facility. Energy Savings Action Plan will include details of greenhouse gas abatement measures and energy efficiency measures for the operation of the proposed SPBP facility. A Procurement Plan (PP) for imported soybeans shall be developed. This plan will ensure that feedstock originates from responsible, sustainable and legal agricultural operations.
Hazard and Risk	<ul style="list-style-type: none"> A review will be undertaken at detailed design stage of the bunding arrangements of the chemical tank bund to separate re-active liquids. A Site Emergency Response Plan will be prepared and all staff appropriately briefed. Spill response procedures prepared and placed in a readily accessible location and all staff trained in such procedures. Relevant staff will be informed of the requisite Emergency Shutdown Systems. The proponent will ensure that the buildings are generally free from dust accumulation. Compliance with AS Applicable standards to cover the following aspects of the safety management requirements: <ul style="list-style-type: none"> Handling of Combustible dusts (AS/NZS 4745) Handling and storage of flammable and combustible liquids (AS/NZS 1940) Tank design (API 650 / AS 1692 / AS 1170) Classification of Hazardous Areas (AS/NZS 60079-10) Application of HAZOPs (AS IEC 61882).
Traffic and Transport	<ul style="list-style-type: none"> The proponent will prepare a Construction Traffic Management Plan (CTMP) prior to the commencement of construction. The proponent will ensure that the construction and operational traffic is managed in accordance with the CTMP.
Ecology	<ul style="list-style-type: none"> In all areas within the subject site where excess land is available for landscaping and planting, the proponent shall, within reason, remove exotic plant species and plant native grass understorey vegetation in appropriate locations. The vegetation installed shall be suitable for use by the Green and Golden Bell Frog (GGBF) for foraging, overwintering and shelter (e.g. <i>Dianella</i> spp., <i>Lomandra longifolia</i>, <i>Themeda australis</i> and <i>Imperata cylindrica</i>). All operations will be performed in accordance with appropriate AQIS requirements. All appropriate AQIS licences will be obtained after AQIS inspection upon commissioning of the SPBP facility. The proponent will be responsible for the preparation of an Erosion and Sediment Control Plan (ESCP) in accordance with the Landcom <i>Managing Urban Storm Water; Soils and Construction Manual 2004</i>. The ESCP shall contain measures to protect receiving waters from all runoff (including chemical spills) that may impact on water quality and/or aquatic species and/or ecosystems. Measures that take the conservation and protection of the GGBF into consideration will form part of the CEMP, OEMP and Landscape Management

Issue	Commitment
	Plan. These measures will be developed in conjunction with NSW DECC.
Noise	<ul style="list-style-type: none"> • CEMP is to include suitable noise attenuation measures for construction. • The guidelines set out in the DECC draft guidance document <i>'New South Wales – Construction Noise Guidelines'</i> are to be implemented to ensure that the impact at receivers from construction noise is minimised as far as reasonable and feasible. • Regular noise monitoring, including attended monitoring, will be undertaken during operations at surrounding receivers to determine noise levels generated by the project. If exceedances are detected during monitoring, amelioration measures will be investigated to ensure that noise criteria are met. • A Noise Management Plan shall form part of the CEMP and will detail best practice construction methods.
Waste Management	<ul style="list-style-type: none"> • The proponent shall implement all practicable and reasonable measures to minimise the generation of waste and maximise reuse from the proposed SPBP facility. • The proponent will enter into a Tradewaste Agreement with Sydney Water prior to commencement of works. • Wastes requiring removal from the site shall be collected and disposed of by an appropriately licensed waste contractor. • The proponent will investigate the feasibility of providing an onsite liquid waste pre-treatment facility during the detailed design phase. • Monitoring activities shall be carried out in accordance with those detailed in Section 7.8. • CEMP in relation to waste will be prepared in accordance with NSW DECC Waste Classification Guidelines 2008.
Heritage	<ul style="list-style-type: none"> • Should, during construction, any Indigenous or potentially Indigenous relic of significance be discovered work shall cease immediately within an agreed distance from the potential relic. An officer from the Department of Environment and Climate Change and a member of the Illawarra Aboriginal Land Council will be informed and appropriate arrangements shall be made with these two agencies to manage the potential relic as promptly as practicably possible.
Social & Economic	<ul style="list-style-type: none"> • The proponent will, where reasonable and practicable, draw upon the skills available to it from the local workforce.
Visual	<ul style="list-style-type: none"> • The proponent will prepare a Landscape Management Plan, which will include local native species and will ensure lines of sight are not compromised. • The proponent will ensure that landscaping is undertaken in accordance with the Landscape Management Plan. • Exterior lighting would be designed to minimise light spill and would generally be in accordance with <i>Australian Standard – 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting</i>, notwithstanding functional and safety requirements. • The proponent will employ the use of recessive colours for external materials and finishes wherever practicable.
Soils	<ul style="list-style-type: none"> • Prior to the commencement of construction and in areas where soil disturbance is likely, testing shall be undertaken to establish the presence of acid sulfate soils and saline soil. Should testing reveal that either acid sulfate soil or saline soil is present, then an Acid Sulphate Management Plan and/or a Salinity Management Plan shall be prepared prior to the commencement of work and that the management measures detailed in that Plan shall be implemented.
Water issues	<ul style="list-style-type: none"> • As part of the Construction Environmental Management Plan (CEMP), an Erosion and Sediment Control Plan (ESCP) shall be prepared in accordance

Issue	Commitment
	<p>with the Landcom <i>Managing Urban Stormwater; Soils and Construction Manual 2004</i> and will be maintained for the duration of the construction process to prevent, within reason, any sediment and polluted water entering any waterway. The ESCP shall contain emergency procedures for high rainfall events that could increase soil erosion during construction.</p> <ul style="list-style-type: none"> • During EPCM phase consideration will be given to the potential of sea water cooling. However it must be noted that such water is much more corrosive, and is also much more likely to cause fouling. Cognisance must be given to the impact of discharging such water back into the sea and should be addressed in the OEMP.

9.0 Conclusion

NB proposes to develop land and structures that have been made available by GrainCorp and the Port Kembla Port Corporation for the purposes of a SPBP facility. The proposed SPBP facility constitutes a 'Major Project' in accordance with *State Environmental Planning Policy (Major Projects) 2005*, and therefore requires approval from the Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This Environmental Assessment constitutes a formal response to the DGRs, which were issued by the Department of Planning for this proposal, and assesses environmental issues identified in these requirements. Key issues assessed include:

- air quality
- energy and sustainability
- hazards and risks
- traffic and transport
- ecology
- noise
- waste
- heritage
- economic and social
- visual
- soils
- water quality.

The key matters for consideration include the following.

- Fossil fuels are a non-renewable resource, and their on-going use is not sustainable. It is in the public interest to facilitate the development and use of alternative and renewable fuels which will reduce the reliance on fossil fuels for energy.
- Food security has gained importance due to the rising prices of agricultural commodities and Australia currently imports most of its soybean requirements. The proposed SPBP facility will indirectly strengthen Australia's food security by ensuring a domestic supply of high-protein soybean meal for feed for livestock which ultimately ends up in the human food chain.
- The proposed SPBP facility is an innovative development that has the potential to both make renewable fuel available to the Australian and broader markets and to act as a catalyst for research and development into alternative fuel technology. This would serve to reduce Australia's reliance on diminishing fossil fuels. Displacement of petroleum diesel fuel by the biodiesel produced by the proposed SPBP facility is expected to produce a net reduction of approximately 6 million tonnes of greenhouse gas emissions over its life-time.
- It is anticipated that the proposed development will result in a beneficial social impact for the local community through local business investment and employment generation.
- The project will not generate unreasonable air quality, traffic or noise impacts on the environment or the surrounding locality. All potential impacts can be managed through management measures outlined in the Statement of Commitments incorporated into this report.
- The likelihood of significant impacts on terrestrial or aquatic ecology as a result of the construction and operation of the proposed SPBP facility is considered to be low. The implementation of the mitigation measures outlined in this report will further reduce this risk.
- Potential impacts relating to saline soils, acid sulphate soils, unknown items of heritage significance, waste, hazard and risk, are demonstrated to be manageable subject to the implementation of the mitigation measures outlined in this report.

- The proposal has been sited on reclaimed land which is zoned for port use. The proposed development is consistent in character with the port and the industrial nature of the area and would not have an adverse impact on the visual amenity of the area.

This assessment demonstrates that the proposed project, in conjunction with relevant management strategies and mitigation measures, will not result in significant impact on the environment and will generate significant environmental, social and economic benefits. As discussed in **Chapter 3.0** of this report, the proposal is considered justifiable on biophysical, economic and social grounds and is considered to be consistent with the principles of ecologically sustainable development as discussed in **Section 5.3.2**.

In light of the assessment presented in this report and accompanying specialist studies, the proposed SPBP facility is considered to be suitable for approval under Part 3A of the EP&A Act.

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