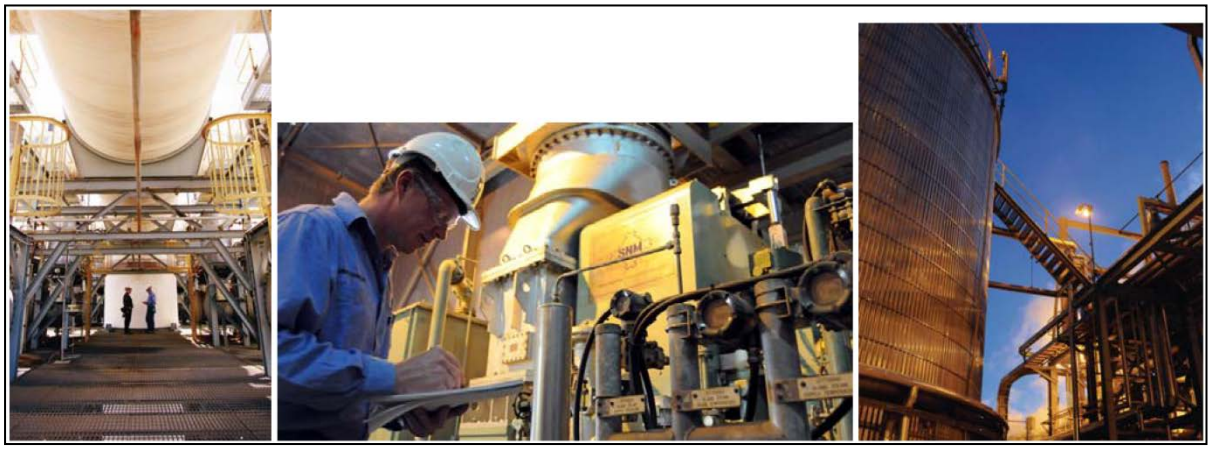
# *STATE SIGNIFICANT DEVELOPMENT ASSESSMENT REPORT: Incitec Pivot Ammonium Nitrate Facility Kooragang Island (SSD-4986)*



Assessment Report
Section 89E of the
*Environmental Planning and Assessment Act 1979*

September 2014

# ABBREVIATIONS

| | |
|---|---|
| AN | Ammonium Nitrate |
| ANSOL | Ammonium Nitrate Solution |
| Applicant | Incitec Pivot Limited |
| BCA | Building Code of Australia |
| Council | The City of Newcastle Council |
| CTB | Custom Transportable Buildings Pty Ltd |
| DA | Development Application |
| Department | Department of Planning and Environment |
| Development | The existing operation and the project |
| EARs | Environmental Assessment Requirements |
| EIS | Environmental Impact Statement titled *'Proposed Ammonium Nitrate Facility, Heron Road, Kooragang Island, Volume 1, Main Report'* and accompanying appendices, dated September 2011 and prepared by URS Australia Pty Ltd on behalf of IPL Pivot Limited |
| EPA | Environment Protection Authority |
| EP&A Act | *Environmental Planning and Assessment Act 1979* |
| EP&A Regulation | *Environmental Planning and Assessment Regulation 2000* |
| EPI | Environmental Planning Instrument |
| EPL | Environment Protection Licence |
| Existing Operation | The existing fertiliser and chemicals storage and distribution operation, as described in the EIS and RTS and as shown in Figures 1 to 3 |
| FIBC's | Flexible Intermediate Bulk Containers |
| IPL | Incitec Pivot Ltd |
| HWC | Hunter Water Corporation |
| LGA | Local Government Area |
| Minister | Minister for Planning and Environment |
| NA | Nitric Acid |
| NOW | NSW Office of Water – Department of Primary Industries cluster |
| NPC | Newcastle Port Corporation or its successor |
| Project | The construction and operation of an ammonia import and ammonium nitrate manufacturing facility and associated plants and equipment, as described in the EIS and RTS and as shown in Figures 4 to 6 |
| RM | Roads and Maritime |
| RTS | Response to Submissions titled *'Proposed Ammonium Nitrate Manufacturing Facility, Heron Road, Kooragang Island – Response to Submissions'* and accompanying appendices, dated October 2013 and prepared by URS Australia Pty Ltd |
| SA | Sulphuric Acid |
| Secretary | Secretary of the Department |
| SEPP | State Environmental Planning Policy |
| SEPP 33 | *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* |
| SRD SEPP | *State Environmental Planning Policy (State and Regional Development) 2011* |
| SSD | State Significant Development |
| TGAN | Technical Grade Ammonium Nitrate |
| TPA | Tonnes per annum |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*NSW Government*
*Department of Planning and Environment*

# EXECUTIVE SUMMARY

Incitec Pivot Ltd (IPL) is an Australian-based multinational company which manufactures and supplies fertilisers and industrial explosives. IPL currently runs a primary distribution facility for its solid and liquid fertiliser products on the western part of a company-owned site on Kooragang Island within the Port of Newcastle.

IPL is now proposing to build a state of the art ammonium nitrate manufacturing facility which can be accommodated on a currently vacant area of the same site. The primary components of the proposed facility would include:

- a storage tank for liquid ammonia;
- a plant producing nitric acid;
- a plant producing ammonium nitrate;
- bulk and bagged storage of technical grade ammonium nitrate; and
- bulk storage of ammonium nitrate solution and associated infrastructure and dispatch facilities.

The facility would continuously operate with inputs of imported ammonia and manufactured nitric acid and a production output of ammonium nitrate, which would be produced and stored onsite in solid prill or liquid form and supplied by IPL directly to its customers in the mining, quarrying, seismic and construction industries.

A small proportion of imported liquid ammonia would not be used in the manufacturing process and would instead be distributed to IPL's agricultural customers during peak fertiliser season.

On 27 September 2012, IPL publicly announced that it had deferred the decision on whether to go ahead with the project due to unfavorable economic conditions and a fall in ammonium nitrate demand. Despite this, IPL has maintained its position that it will continue to seek the necessary regulatory approvals for the project so that if these factors change for the better, the company is in a favorable position to act expediently.

The proposed development is classified as State significant development under the *Environmental Planning and Assessment Act* as it involves development for the purpose of the manufacture, storage or use of dangerous goods in such quantities that constitute the development as a Major Hazard Facility within the meaning of Chapter 6B of the *Occupational Health and Safety Regulation 2001* under Clause 10(3) of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011*. Consequently, the Minister for Planning is the consent authority for the application.

However, the NSW Planning Assessment Commission (PAC) will determine the application under the Minister's delegation of 14 September 2011 due to the number of public objections and because reportable political donations were made by IPL in respect of the application.

The Environmental Impact Assessment for the application was exhibited from 12 September 2012 until 29 October 2012, and attracted 375 submissions: 8 from public authorities, 7 from special interest groups and 360 from the general public. None of the public authorities objected to the project. However, almost all of the submissions from special interest groups and the general public objected to the proposal.

These objections principally focussed around the hazardous nature of the new facility and the potential associated risk increase to the surrounding communities of Stockton, Fern Bay and Mayfield, together with a series of other potential impacts including air quality, noise and traffic.

The Department has carried out a detailed assessment of the merits of the proposal, in accordance with its statutory obligations, and considered the material submitted both in support and against the proposal.

In summary, the Department's assessment concludes that the construction and operation of the new facility would have socio-economic benefits, in the form of:

- 340 temporary construction jobs and 60 permanent operational jobs, most of which would be sourced from the Newcastle local labour supply;
- $600m in capital investment over the 25 plus years that the facility would be operational;

- $319m in capital investment in Australian sourced inputs - $96m for materials and equipment (50% of which would be obtained from local suppliers) and $223m for labour costs (75% from the local area); and
- flow on local and regional benefits from this capital investment, including an overall increase in Gross Regional Product of $386m from the construction phase and a further $35m each year the facility is operational.

These socio-economic benefits are consistent with and would contribute to the NSW Government's main priorities of restoring economic growth, creating new jobs and further enhancing the future growth of the Port of Newcastle, as set out in *NSW 2021*, the *Lower Hunter Regional Strategy 2010* and other NSW Government strategic policy documents.

The critical issue is the extent to which the introduction of the chemical manufacturing facility of the nature proposed would result in unacceptable impacts on surrounding communities.

In recognition of this and to ensure a robust an assessment process, the Department engaged an independent risk consultancy, Scott Lister, to provide a technical peer review of the risk assessment documents (in addition to the assessment carried out by the Department's technical hazards and risks specialists), and appointed Todoroski Air Sciences to provide an independent, technical review of the air quality impact assessment.

Taking into account the findings of these independent experts and the technical advice provided by Council and relevant Government agencies, most notably WorkCover and the Environment Protection Authority, the Department's assessment has found that the potential incremental and cumulative impacts of the development proposal are unlikely to result in exceedances of the relevant risk, air and noise criteria in the surrounding area given that:

- risk levels would comply with fatality, injury, irritation and societal risk criteria set out in *Hazardous Industry Planning Advisory Paper No 4*;
- noise levels would meet the noise criteria developed in accordance with the *NSW Industrial Noise Policy*; and
- levels of oxides of nitrogen, particulate matter and ammonia would remain well below the relevant ambient air quality criteria set by the *Approved Methods for Modelling and Assessment of Air Pollutants in NSW*.

The findings of the Department's visual assessment generally concurred with the conclusions reached in the EIS. These were that the introduction of the new facility into the existing visual landscape and industrial context of Kooragang Island would be of low visual significance for the majority of people living or travelling through the area surrounding the site and from public open spaces as well as recreational users of the Hunter River.

In terms of traffic generation, the Department concluded that the additional construction and operational traffic generated by the new facility is unlikely to have a major impact on the safety and efficiency of the local road network in the vicinity of the site and that no associated upgrades would be required. Further, it was recognised that the development of the new facility would have a limited impact on other local services so the Department has required IPL to pay Council a development contribution towards the provision, extension or augmentation of public amenities or services in the Newcastle area.

Finally, the Department's assessment in relation to other residual impacts of the proposed development (soil and water, greenhouse gas, biodiversity, heritage, waste and aviation safety) concluded that these impacts can be suitably mitigated, managed and/or offset.

Overall, the Department considers that development application is in the public interest and should be approved, subject to the recommended conditions.

# 1. BACKGROUND

## 1.1 Background

IPL operates a fertiliser and chemicals storage and distribution facility on a site that it owns at 39 Heron Road on Kooragang Island within the Port of Newcastle in the City of Newcastle (Figure 1).


*Figure 1: Regional and Local Context*

The Port of Newcastle is one of Australia's largest ports and is an economic and trading centre for the region and for much of northern NSW.

Based on throughput, it is the largest coal export port in the world and forms a critical part of a supply chain interface for coal which is produced in the Hunter Valley and railed to the port for export. In addition, it handles more than 40 other bulk commodities such as grains, vegetable oils and steel.

Kooragang Island was originally a series of low lying deltaic islands in the Hunter River estuary. During the late 1800's and early 1900's, some land reclamation activities took place to facilitate additional industrial development. In the 1950's, extensive land reclamation activities were carried out through the enactment of the *NSW Newcastle Harbour Improvements Act 1953* and the Hunter River Islands Reclamation Scheme.

These activities resulted in the joining of the original islands into a single land mass to accommodate further industrial development and port-related activities on the southern portion of Kooragang Island. The northern portion of the Island was dedicated as a nature reserve and today forms part of the Hunter Wetlands National Park which has been on the Ramsar List of Wetland of International Importance since 1984.

Since then, the southern portion of Kooragang Island has steadily grown and now supports a range of major industrial development, including heavy and light industries, transport and distribution infrastructure, waste emplacement and port facilities. IPL's existing operation is located on the Island's south eastern tip, approximately 3km north of the Newcastle CBD with road access provided by Teal Street.

Teal Street transects Kooragang Island and forms part of a main transport corridor connecting the Island to the southern section of the Port and the wider NSW road network via Cormorant Road and Tourle Street Bridge which crosses the south arm of the Hunter River. In the opposite direction, Teal Street joins Nelson Bay Road, which crosses the river's north arm over Stockton Bridge, providing access to Newcastle Airport, the communities of Fern Bay, Stockton and Port Stephens LGA.

Across the north arm of the Hunter River is Stockton, which is the closest residential area to the site, lying around 800m to the south-east. Fern Bay lies 2km to the north-east. Across the south arm of the River lie several other residential areas, including Carrington, 1.5km to the south-west and Mayfield, 2km to the south-west.

## 1.2 The Site and Surrounding Land Uses

The topography of the site is mostly flat with no notable gradient and is approximately 33ha in area. A range of industrial and port-related uses surround the site, including (see Figure 2):

- to the north, a mostly vacant parcel of land (aside from a small area adjacent to Heron Road which is used by South Spur Rail Services Pty Ltd for P&O);
- to the east, a transport depot used by Chemtrans and CTB Wharf;
- to the south, Orica's existing AN manufacturing facility (Air Liquide also operate from a small area adjacent to the site's southern boundary); and
- to the west, several other industrial operators, including Cargill, Cement Australia and Graincorp, and port infrastructure including Kooragang Berths K1 to K6.


*Figure 2: The Site and Existing Infrastructure*

Road access to IPL's existing operation on the site is provided via a security gate located on Heron Road. Heron Road runs north to south on the western side of the Walsh Point part of Kooragang Island and connects to Cormorant Road in the north and Greenleaf Road in the south. Greenleaf Road runs up the eastern side of Walsh Point and is largely parallel to Heron Road and connects to Teal Street. The western part of the Island is also accessible by ship through a number of NPC managed berths. Greenleaf Road and Heron Road form the site's eastern and western boundaries.

Since the completion of land reclamation in 1961, Kooragang Island has been used for industrial purposes. Australian Fertilizers Ltd was the first company to take up a lease on this part of the Island. In 1964, Greenleaf Pty Ltd began to use the site commercially. In 1966 rock grinding operations and sulphuric and phosphoric acid plants were commissioned on the site. The company built and commissioned a high analysis phosphorus fertiliser plant in 1969, which used ammonia from the adjacent Eastern Nitrogen Ltd plant to produce ammonium phosphate fertilisers. The site continued to be used in this manner until 1989 when fertiliser production ceased. In September 2009 the Rock Mill was decommissioned.

In 1992, ownership of the site was transferred to Incitec Ltd, which was at that time a subsidiary of ICI Australia Pty Ltd. The site became part of the IPL Group in 2003 when Pivot Ltd and Incitec Fertilizers Ltd merged. In, 2006 the Lot was transferred to TOP Australia Ltd, a wholly owned subsidiary of IPL, when Orica Ltd (previously ICI Australia) divested IPL. The western portion of the Lot is currently used as a primary distribution facility for IPL's solid and liquid fertiliser product range. The facility is also used to distribute relatively low volumes of certain industrial chemicals.

Aside from the smaller-scale operations of Chemtrans and Air Liquide, the eastern portion of the site is currently vacant and does not currently serve any specific purpose.

### 1.3 Existing Site Operations

Fertiliser is imported by ship from overseas or from interstate from the IPL's operations in Queensland and Victoria. Once stockpiled on site, the fertilisers are stored in a series of large sheds and some are blended with certain additives before being dispatched and distributed to IPL's agricultural customers as bulk and bagged fertiliser products in 25kg bags and flexible IBC's.

Fertiliser demand is largely dependent on seasonal weather conditions across a range of crops and pastures that are present in NSW. As such, the volumes of different fertilisers handled at the facility can vary fairly significantly. Over the last three years, the facility handled between around 270,000tpa and 300,000tpa of fertilisers and is expected to have handled almost another 300,000 tonnes before the end of the company's twelve month current reporting period in September 2014.

The facility also receives and distributes up to 20,000tpa of Sulphuric Acid, which is imported in bulk by ship, unloaded at the existing shipping berths on Kooragang Island to the west of the site and transferred by pipeline to 3 large storage tanks on-site for dispatch by road tanker. Up to 20,000tpa of TGAN is also imported in break-bulk or shipping containers and distributed in 1-1.2 ton flexible IBC's.

Key built structures at the existing facility include (see Figure 2):

- the bagging and storage warehouse;
- Shed 1 – Bulk storage of 25,000 tonnes (t) bulk high analysis fertiliser;
- Shed 2 – Bulk storage of 20,000t bulk high analysis fertiliser;
- Shed 3 – Bulk storage of 15,000t bulk high analysis fertiliser;
- Shed 4 – Dangerous Goods (DG) Storage of 2,000t of TGAN;
- Shed 5 – DG Storage of 2,060t of TGAN;
- SA storage tanks;
- Central Office – customer service, dispatch and management offices;
- Seminar Centre – management offices and training room.

The facility typically operates on a single shift from 7.00am to 4.30pm, 5 days a week (Monday to Friday) but these hours of operation are sometimes extended to 24 hours, 7 days a week during periods of particularly high market demand.

The facility currently operates under a series of development consents issued by Council, which IPL intends to surrender as part of the current development assessment process, if approved.

The existing operation is also regulated by the EPA under the *Protection of the Environment Operations Act 1997* through EPL No. 11781 and by WorkCover NSW as a Major Hazard Facility (MHF) under the *Work, Health and Safety Regulation 2011*.

## 1.4 Other Major Developments

A number of large-scale developments have been approved and/or are proposed on Kooragang Island and/or the surrounding industrial and port-related land in recent years (see Table 1).

*Table 1: Recently approved and/or proposed major developments*

| Project | Applicant | Status | Description | Consent Authority |
|---|---|---|---|---|
| Dredging and Remediation Project | Newcastle Ports Corporation | Approved (August 2005) | Extension of shipping channels within Port of Newcastle, dredging, treatment and disposal of sediments from the south arm of the Hunter River. | Minister |
| Kooragang Island Coal Loader Project | Newcastle Coal Infrastructure Group | Approved (April 2007) | Construction and operation of a coal export terminal with capacity to export up to 66mtpa of coal. | Minister |
| Terminal 4 (T4) Coal Export Project | Port Waratah Coal Services | PAC Review (July 2014) | Construction and operation of a coal export terminal with capacity to export up to 70mtpa of coal. | Minister |
| Ammonium Nitrate Expansion Project | Orica | Approved (December 2009) | Expansion of existing ammonium nitrate production capacity from 500,000 to 750,000 tpa. | Minister |
| Newcastle Gas Storage Facility (Tomago) | AGL Energy | Approved (May 2012) | Construction and operation of a gas storage facility with associated pipeline. | Minister |
| Mayfield Concept Plan | Newcastle Port Corporation (Concept Plan) | Approved (July 2012) | Concept approval for an industrial subdivision (90 ha) for port related activities, divided into 5 precincts. | Minister |
| Stolthaven Fuel Terminal | Stolthaven Australia (Project Approval) | Approved (June 2012) | Construction and operation of a finished fuel import and distribution terminal. | Minister |

## 1.5 Project Need

The need for the project is driven by the demand for a consistent, secure and reliable supply of ammonium nitrate which is the key raw material input used in the manufacture of industrial explosives and other commercial blasting products.

IPL considers that the coal mining industry would be the company's main customer base since the large-scale nature of these operations are such that they rely on large volumes of ammonium nitrate to operate efficiently and maintain the level of coal output needed to meet Port export demand.

Ammonium nitrate is relied on just as much by the quarrying, seismic and construction industries. In addition to producing ammonium nitrate, the facility would also receive and store some imported ammonia and supply this directly to IPL's agricultural customers, many of which currently purchase solid and liquid fertilisers and chemicals from the company's existing distribution facility located in the western portion of the site.

The EIS identified that due to supply availability, shipping constraints, port access, import volume restrictions and storage constraints, ammonium nitrate product supply was insufficient to meet the current and anticipated future demand of these industry sectors in the region. This is particularly true of the mining industry which is already a high volume user of ammonium nitrate and this industry is set to expand in line with coal output increases in the longer term which are needed to support the expected growth in coal export volumes from the Port in the future.

To meet this identified need, IPL analysed three potentially viable options, firstly to take no action, secondly, to further increase the rate of ammonium nitrate being imported or thirdly, to build a new ammonium nitrate manufacturing facility. The result of this analysis was that the best option was to build a new ammonium nitrate manufacturing facility to meet current and future ammonium nitrate demand.

Potential locations for the new manufacturing facility were then examined by IPL against a number of specific safety, environmental, social, economic and infrastructure constraints identified and analysed, resulting in three potential locations for the facility being evaluated. The outcome of this evaluation was that the most appropriate location for the new facility would be on a vacant portion of the company-owned site on Kooragang Island.

On 27 September 2012, IPL publicly announced that it had deferred the decision on whether to go ahead with the project due to unfavorable economic conditions and a fall in ammonium nitrate demand. Despite this, IPL has maintained its position that it will continue to seek the necessary regulatory approvals for the project so that if these factors change for the better, the company is in a favorable position to act expediently.

# 2. PROPOSED DEVELOPMENT

## 2.1 Development Description

A summary of the proposed development is provided Table 2, and depicted in Figures 3 to 6. A more detailed description is provided in the EIS, which is attached as Appendix C.

*Table 2: Summary of the Proposed Development*

| Aspect | Description | |
|---|---|---|
| ***Development Summary*** | **Continuation of the existing fertiliser and chemicals storage and distribution operation and the construction and operation of an ammonia import and ammonium nitrate manufacturing facility and associated plants and infrastructure.** | |
| *Ammonia Transfer and Storage* | • 2 pipelines to connect the facility to the unloading berths to allow imported anhydrous (liquid) ammonia to be transferred to the site; and<br>• a 30,000t capacity ammonia storage tank (42m high by 45m in diameter) and emergency venting flare. | |
| *Nitric Acid Plant* | • a nitric acid plant (42m by 50m) including air compressor, gas heater, waste heat boiler, steam superheater, air heater, condenser, absorber tower (51m high by 4.6m in diameter), power generator; and various catalysts; and<br>• a nitric acid storage tank (3,000t). | |
| *Ammonium Nitrate Plant* | • an ammonium nitrate plant (27m by 27m) including ammonia vessel, neutraliser, flash drum, evaporator, remelt tank, prill tower (12m by 12m by 61m high), and fluidised bed cooler;<br>• ammonium nitrate solution storage tank (1,650t);<br>• bulk prill (i.e. pellet-sized crystals) ammonium nitrate store (5,000t); and<br>• bagged prill ammonium nitrate store (6,000t). | |
| *Plant Production Levels* | • up to 280,000tpa of nitric acid; and<br>• up to 350,000tpa of ammonium nitrate. | |
| *Supporting Buildings and Infrastructure* | • cooling system including a cooling closed water system, tower and pumps;<br>• additives and coating agent storage;<br>• waste concentrated ammonium nitrate solution storage tanks;<br>• a control room and laboratory, administration building, workshop and stores; and<br>• other ancillary infrastructure including new stormwater and wastewater systems and a wastewater discharge pipeline. | |
| *Road Traffic* | Construction | Operation |
| | • 20 buses;<br>• 4 heavy vehicles;<br>• 30 trucks; and<br>• 80 light vehicles. | • 50 light vehicle movements; and<br>• 45 – 80 heavy vehicle movements. |
| *Sea Traffic* | Construction | Operation |
| | • 9 shipments and 30 barge movements. | • 8 shipments each year. |
| *Parking and Access* | • continued use of the Heron Road entrance for existing operations;<br>• construction of a new site entrance off Greenleaf Road with a single storey gatehouse, security gates and weighbridge;<br>• use of the existing parking area for light vehicles and provision of a new truck parking area; and<br>• relocation of the Chemtrans truck parking area on-site. | |
| *Lifespan* | • 25 years and beyond (subject to AN demand, maintenance and potential future upgrade works). | |
| *Hours of Construction* | • 7.00am to 6.00pm (Monday to Friday);<br>• 8.00am to 1.00pm (Saturday); and<br>• no work on Sundays or public holidays. | |
| *Hours of Operation* | • 24 hours, 7 days a week. | |
| *Capital Value* | • $600 million. | |
| *Employment* | • 340 staff during construction (peak); and | |

| Aspect | Description |
|---|---|
| | • 60 full-time staff during operation. |
| *Existing Operation* | • Continued operation of the existing fertiliser and chemicals storage and distribution operation and consolidation of all applicable development consents into a single, modern planning approval which covers all IPL operations on the site. |

AN Manufacturing Process

The ammonia import and AN manufacturing and distribution process is summarised below and in Figure 5. A more detailed description of this process, including the manufacturing processes used to produce NA and AN, are provided in the EIS, which is attached as Appendix C. The location of the NA and AN Plants and other associated supporting buildings and infrastructure are shown conceptually in Figures 3, 4 and 6.

*Ammonia Receipt and Storage*

Liquid ammonia would be received at the site in the following quantities:
- 20,000tpa by road tanker from IPL's operations in Queensland; and
- 160,000tpa by ship (158,000t for AN manufacture and 2,000t for other local consumers).

Deliveries of ammonia via road tanker would be unloaded at a new tanker loading and unloading facility on the site (see Figure 5). Ammonia deliveries by ship would be received at the Kooragang 2.5 Berth.

A loading arm and two pipelines would be constructed to allow ammonia to be pumped to a 30,000t ammonia storage tank. The pipelines would run from this berth along overhead gantries across Heron Road before lowering to ground level and running along ground level sleepers to the ammonia storage tank.

The ammonia storage tank would be refrigerated; double walled to secure the loss of any ammonia in the unlikely event of a leak and would be designed to comply with the strictest parameters (level 4) of relevant Australian Standards (for earthquake and wind forces). As a further safety measure, the tank would be fitted with an emergency venting flare.

*Nitric Acid Production*

Ammonia from the on-site storage tank would be transferred via pipeline to the NA Plant where NA would be produced using high efficiency dual pressure process technology.

The NA produced would be stored in a 3,000t storage tank designed to comply with relevant Australia Standards.

*Ammonia Nitrate Production*

Ammonia and NA from the on-site storage tanks would be pumped to the AN Plant, which would comprise of two parts:
- AN Liquor Plant – where AN would be produced in a neutralisation process and concentrated in an evaporation process to produce ANSOL; and
- AN Prill Plant – where approximately 80% of ANSOL produced would be transformed into TGAN.

The plant would work on the basis of continuous manufacture with inputs of ammonia and NA and an output of ANSOL and TGAN.

*Product Distribution*

The new facility would store and distribute the following products:
- **ANSOL** – stored in a 1,650t tank and transported by road tanker to IPL's Warkworth site in the Hunter Valley;
- **TGAN (Bulk)** – stored in a bulk 5,000t store, loaded into bulk tippers and dispatched;
- **TGAN (Bagged)** – transferred by conveyor belt to the bagging plant, loaded into 1,000te bags and stored at a bulk bagged store (5,000t) for export or existing bag store (1-1.2te bags) for domestic sale; and
- **Ammonia** – approximately 20,000tpa of ammonia would be transported by road tanker to IPL's agricultural customers during peak fertiliser season (March to August).


*Figure 3: Main Components of the Development (Existing Operation and the Project)*

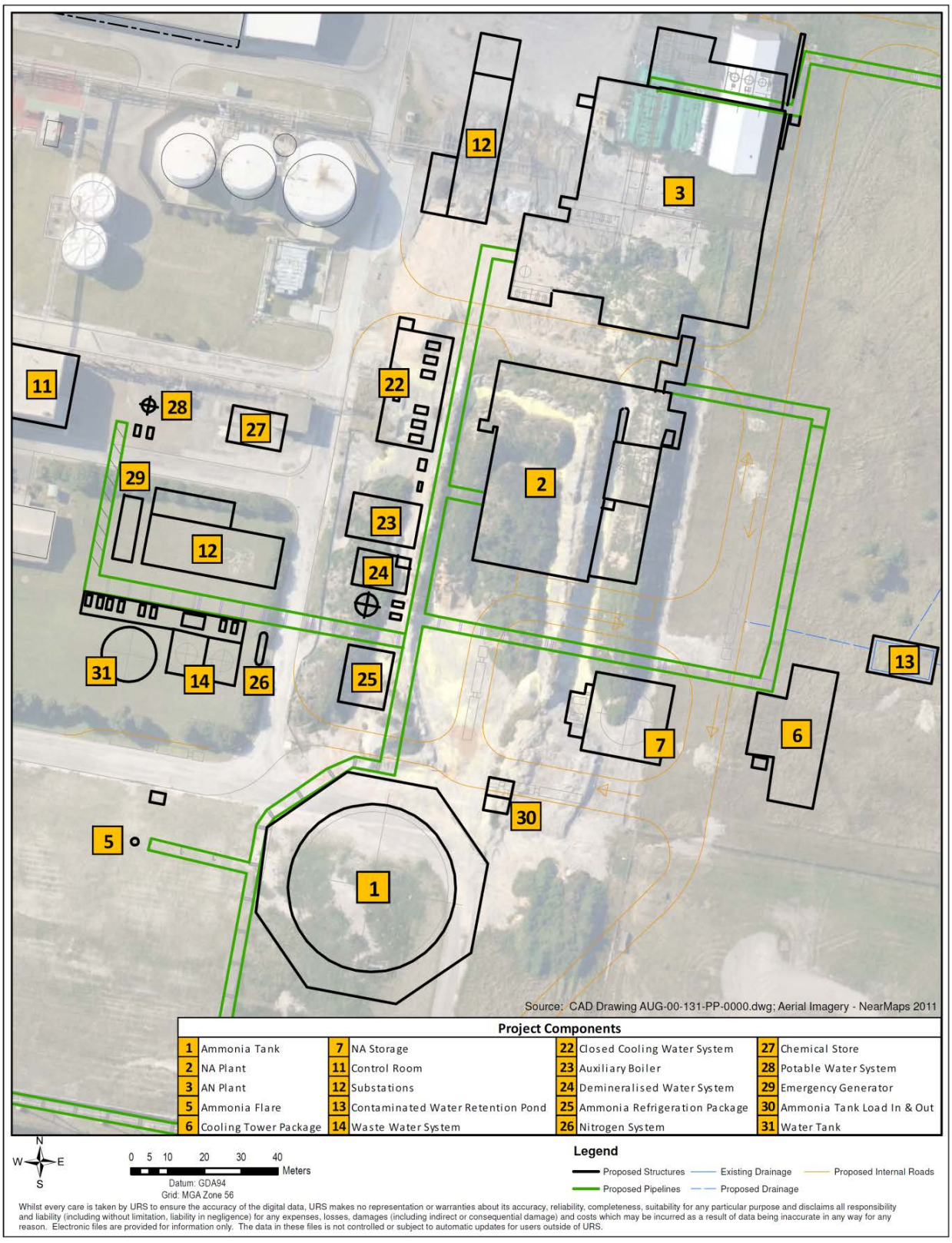



*Figure 4: Main Components of the Project*

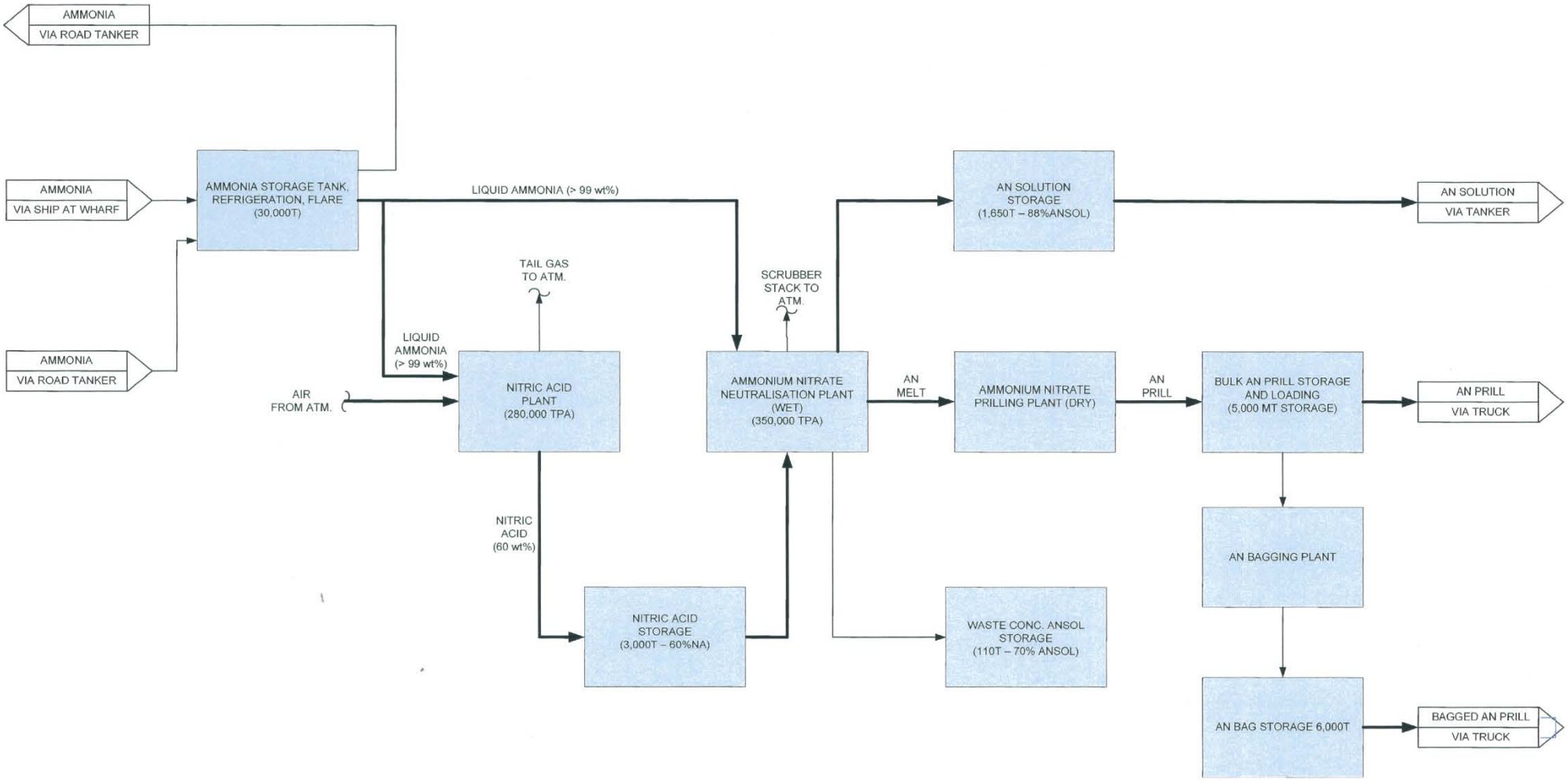



*Figure 5: Project Process Flow Chart*


Photo Location W5 - Existing view south west to west from Stockton Bridge


Photo Location W5 - Proposed view south west to west from Stockton Bridge


*Figure 6: Proposed View South West to West from Stockton Bridge*

## 2.2 Construction Staging

Construction of the new facility is expected to take around 28 months and has been split into 4 stages. Once the site has been prepared and established, the civil and structural works, erection of modules and associated commissioning would be carried out concurrently (see Table 3 and Figure 7).

*Table 3: Construction Program and Stages*

| Stage | | Summary of Works | Duration |
|---|---|---|---|
| 1 | Site Preparation and Establishment | • Land grading, vegetation removal, fenced separation;<br>• Creation of new entrance off Greenleaf Road; and<br>• Establishment of onsite construction facilities (e.g. construction equipment and material laydown areas, internal road system, storage and stockpile areas, construction offices, security fencing and signage). | 6 months (month 1 to 6) |
| 2 | Civil and Structural Works | • Excavations, dewatering (if required), soil stockpiling, ground preparation, piling and foundations, utility installations, concrete slab preparation, stormwater system and internal road network construction;<br>• Erection of steel support structures for various modules, erection of other buildings and structures (eg. storage tanks, pipeline gantries, load out areas, control room and bulk AN store); and<br>• Preparation of bunded areas. | 15 months (month 7 to 21) |
| 3 | Modules Erection and overall activities | • Erection of all pre-constructed modules which are shipped to Newcastle Harbour and transported to the Custom Transportable Buildings Berth (Figure 2, located immediately north-east of the site) by barge and onto the site via Greenleaf Road; and<br>• Pipe work, insulation, painting, completion of fencing, signage, landscaping and security. | 18 months (month 9 to 26) |
| 4 | Commissioning | • Completion of all pre-commissioning and commissioning activities (i.e. testing of all project components). | 11 months (month 18 to 28) |

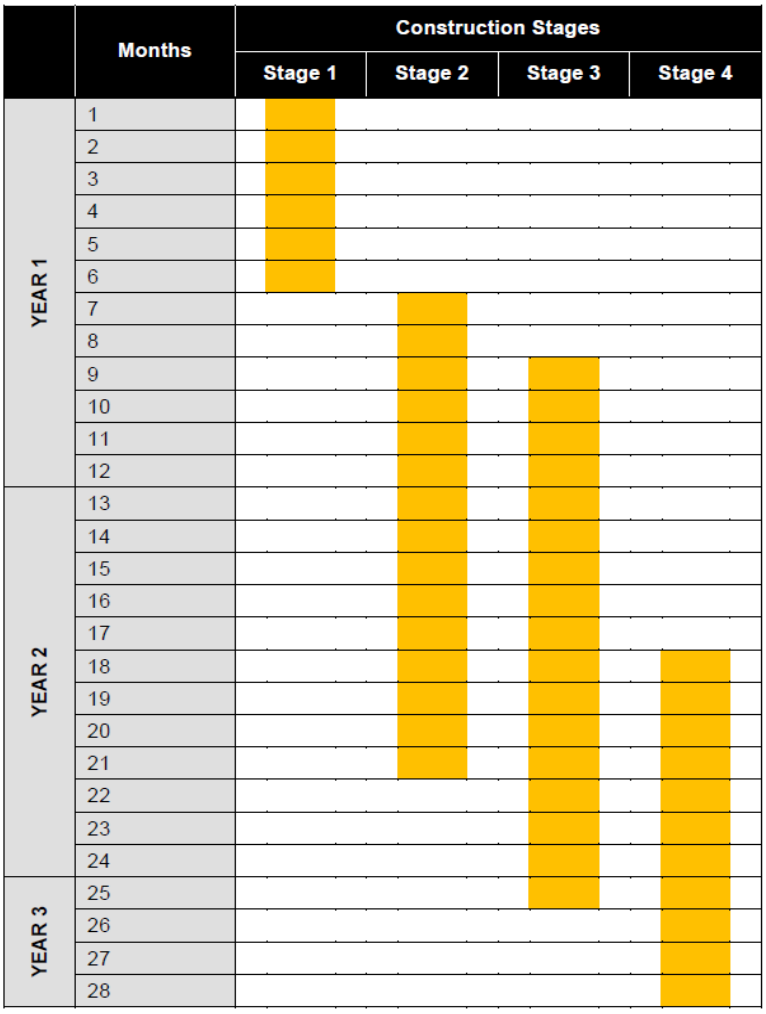



*Figure 7: Construction Program*

# 3. STATUTORY AND STRATEGIC CONTEXT

## 3.1 Strategic Context

The Government's main priority in *NSW 2021* is to restore economic growth by improving the performance of the economy to deliver jobs, opportunities and increased prosperity to the State (Goal 1) through a number of specific targets. These targets include increasing business investment and economic output, growing manufacturing and other critical industries and ensuring that employment growth continues at a steady rate and is shared by all of the community.

The construction and operation of the new facility would contribute towards these targets through a capital investment of $600 million in the project which would have flow on economic benefits in the form of a $386 million contribution to Gross Regional Product (GRP) during construction, together with further increases in GRP of $35 million per annum once the facility becomes operational. The project would also contribute a workforce of 340 during construction with a further 60 full-time employees needed to operate the facility.

Further, the project would contribute to other related *NSW 2021* goals, those being to build State finances (Goal 2), increase the competitiveness of doing business in NSW (Goal 4) and strengthening the skill base (Goal 6).

The *Lower Hunter Regional Strategy 2010* (LHRS) is a land use planning document which outlines the provision of sufficient, appropriately placed housing and employment land to cater for the region's estimated population growth projections over the next two decades. It is the NSW Government's current key strategic planning document for the Lower Hunter region.

Like *NSW 2021*, one of the primary aims of this LHRS is to build on the regions strong economic base and nationally important infrastructure including the Port of Newcastle to enhance the capacity of the region and provide for continued employment growth. The capital investment required for the project, the associated flow on economic benefits, together with the creation of almost 400 new jobs would make a positive contribution to this aim.

The new facility would be located on Kooragang Island which is already a well-established heavy industrial area and can utilise the existing berths and other port infrastructure to import the raw materials that it needs to manufacture ammonium nitrate. The proposed facility would also be co-located with IPL's existing fertiliser and chemicals storage and distribution operation on the same site, which is being utilised during the early construction phases and allows the two operations to be regulated by one development consent in the future. The location of the site also has good transport links to its primary customer base in the Hunter Valley and other customers in the region.

*The Lower Hunter over the next 20 years: A Discussion Paper* was released for community consultation in 2013. The Discussion Paper was the first step in the preparation of a new Regional Growth Plan, which will replace the *Lower Hunter Regional Strategy 2010,* and be implemented in conjunction with the wider *Hunter Transport Plan* and *Hunter Strategic Infrastructure Plan.*

This Discussion Paper outlines the projected growth in population and jobs over the next 20 years and recognises that this growth needs to be accommodated in a sustainable way.

The Discussion Paper recognises that the Lower Hunter region's strong economy is underpinned by a number of sectors, including productive agricultural and manufacturing sectors. The draft Strategy goes on to state that whilst these key sectors should continue to be supported, there should also be growth in other areas, including port-related industries, to help ensure that a diverse range of job and business opportunities are available. The proposal is consistent with the direction of the Discussion Paper.

## 3.2 State Significant Development

The proposed development is State Significant Development (SSD) under Part 4 of the EP&A Act because it involves the manufacture, storage and use of dangerous goods in quantities exceeding the criteria for a Major Hazard Facility, and as such meets the criteria in Clause 10(3) of Schedule 1 in the SRD SEPP. Consequently, the Minister for Planning is the consent authority for the development application.

### 3.3 Consent Authority

Under the EP&A Act, the Minister is the approval authority for SSD. However, as reportable political donations were made by IPL in respect of this application and over 25 public submissions by way of objection were received, the application is to be determined by the Planning Assessment Commission under the Minister's Instrument of Delegation, dated 14 September 2011.

### 3.4 Permissibility

The site is zoned 'SP1 Special Activities' under *State Environmental Planning Policy (Major Development) 2005*. The proposed development is permissible with consent on this site.

### 3.5 Further Approvals

Under Section 89K of the EP&A Act, further approvals are required to be obtained, considered or determined in a manner that is consistent with any Part 4 approval for the SSD under the EP&A Act.

In this case, a varied Environmental Protection Licence (EPL) No. 11781 would need to be issued for the premises under the *Protection of the Environment Operations Act 1997*.

IPL would also need to obtain consent from NPC to construct a new site entrance off Greenleaf Road and to install new ammonia and effluent pipelines over Heron Road.

The Department has consulted with the EPA and NPC and considered the relevant issues relating to these approvals in the assessment of the development application (see Section 5 of this report).

### 3.6 Other Approvals

Whilst the EP&A Act provides the framework for planning and development approvals in NSW, there are a number of other Acts and Regulations that are of relevance to the proposal. In this instance, the proposal may require a separate approval, new license or variation to an existing license under the:

- *Environmentally Hazardous Chemicals Act 1985*;
- *Explosives Act 2003*;
- *Work Health And Safety Act 2011 (as an MHF)*;
- *Dangerous Goods (Road and Rail Transport Act) 2008*;
- *Water Act 1912;* and
- *Port and Maritime Administration Act 1995.*

IPL has committed to ensuring all appropriate approvals, licenses and/or license variations have been obtained, prior to the commencement of the relevant stage of works.

### 3.7 Considerations under Section 79C of the EP&A Act

Under Section 79C of the EP&A Act, in determining a development application, a consent authority is required to take a number of matters into consideration in relation to the proposed development. The Department has given due consideration to the matters prescribed by Section 79C.

The Department's detailed consideration of the proposed development against the provisions of Section 79C of the EP&A Act is contained within Appendix B of this report.

### 3.8 Exhibition and Notification

Under Section 89F(1) of the EP&A Act, the Secretary is required to make the DA and any accompanying information of an SSD proposal publicly available for at least 30 days.

After accepting the EIS for the development, the Department:

- made it publicly available from **Wednesday 12 September 2012** until **Monday 29 October 2012**:
  - on the Department's website;
  - at the Department's Information Centre (Sydney);
  - at the Department's Regional Office (Newcastle);
  - at the Nature Conservation Council's Office (Sydney); and
  - Newcastle City Council customer enquiry centre.
- notified landowners in the vicinity of the site about the exhibition period by letter;

- notified relevant State government authorities and Newcastle City Council by letter; and
- advertised the exhibition in the Newcastle Herald.

### 3.9 Environmental Planning Instruments

Under Section 79C of the EP&A Act, the consent authority, when determining a development application, must take into consideration the provisions of any environmental planning instrument (EPI), draft EPI (that has been subject to public consultation and notified under the EP&A Act) and development control plan/s (DCPs) that apply to the proposal.

Consideration of the provisions of all environmental planning instruments (including draft instruments subject of public consultation under this Act) that apply to the proposed development is provided in Appendix F of this report.

DCPs do not apply to SSD under Clause 11 of the SRD SEPP, but the Department has considered the relevant provisions of the *Newcastle DCP 2012* (Council's DCP) in its assessment of the proposed development (see Section 5).

### 3.10 Objects of the EP&A Act

In determining the application, the consent authority should consider whether the development before it is consistent with the relevant objects of the EP&A Act. The Department considers that objects (ii), (vi) and (vii) are of most relevance to the merit assessment of the application. They are:

*(a) 'to encourage:*
- *(ii) the promotion and co-ordination of the orderly and economic use and development of land,*
- *(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
- *(vii) ecologically sustainable development (ESD).'*

The proposed development would encourage the promotion of orderly and economic use of the land (Object 5(a)(ii)), particularly since it would utilise existing port infrastructure and the surrounding road network and the facility itself would be constructed and operated on an existing parcel of IPL owned land next to the company's existing facility. The project would also bring a number of socio-economic benefits mostly in the form of job creation and capital investment and associated economic benefits.

Consideration of environmental protection (Object 5(a)(vi)) is provided in Section 5 of this report. Following its assessment, the Department considers that the environmental impacts of the project can be satisfactorily addressed through recommended conditions of consent in combination with amended EPL conditions imposed by the EPA and extending existing maintenance and management procedures. All residual issues can be mitigated and/or managed within acceptable levels with the implementation of the recommended conditions of consent.

The Department has considered the encouragement of ecologically sustainable development (ESD) (Object 5(a)(vii)) in its overall assessment of the merits of the development application in Section 5 below, and sought to integrate all economic and environmental considerations and avoid any serious or irreversible damage to the environment, based on an assessment of risk-weighted consequences. IPL's assessment of these matters has also been considered by the Department, including its assessment of the alternatives of not proceeding with the proposed development, increasing AN-imports or constructing the facility on an alternative site elsewhere. Based on the Department's consideration, the development proposal can be carried out in a manner that is consistent with the principles of ESD.

### 3.11 Ecologically Sustainable Development

The EP&A Act adopts the definition of ESD found in the *Protection of the Environment Administration Act 1991*. Section 6(2) of that Act states that ESD requires the effective integration of economic and environmental considerations in decision-making processes and that ESD can be achieved through the implementation of:

*(a) the precautionary principle - namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for*

*postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:*

*(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*

*(ii) an assessment of the risk-weighted consequences of various options,*

*(b) inter-generational equity—namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*

*(c) conservation of biological diversity and ecological integrity—namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*

*(d) improved valuation, pricing and incentive mechanisms—namely, that environmental factors should be included in the valuation of assets and services, such as:*

*(i) polluter pays—that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,*

*(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*

*(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

As the Department's assessment in Section 5 of this report demonstrates, the proposed development would have little impact on native flora or fauna, including threatened species, populations and ecological communities, and their habitats and is therefore consistent with the principles of ESD. Further, the Department's consideration of ESD in the context of Object 5(a)(vii) of the EP&A Act based on its own merit assessment of the application in conjunction with IPL's assessment of the same matter concludes that the development can be carried out in a manner that is consistent with the principles of ESD (Section 3.10).

# 4. CONSULTATION AND SUBMISSIONS

## 4.1 Consultation by the Applicant

IPL has implemented a consultation strategy during the assessment process to identify key stakeholders and ensure that their concerns were addressed in the EIS assessment.

IPL consulted with local, State and Commonwealth Government authorities, service providers, community groups and affected landowners. Key methods of consultation included:

- establishing a community liaison group and conducting various community presentations;
- conducting various pre-lodgement meetings including a Planning Focus Meeting held on 15 November 2011 in which relevant local and State Government agencies attended;
- distributing factsheets, newsletters in local communities and engaging the media;
- establishing a project website and online discussion forum; and
- conducting an independent community perception survey.

Key issues raised by stakeholders in relation to the development proposal included hazards and risk, air quality impacts, noise impacts, surface and wastewater impacts, greenhouse gases, traffic impacts, heritage impacts, socio-economic impacts and cumulative impacts.

## 4.2 Consultation by the Department

The Department exhibited the DA and EIS between **Wednesday 12 September 2012**and **Monday 29 October 2012**. During this period, **375** submissions were received, comprising:

- **8** from public authorities (Newcastle City Council (Council), Environment Protection Authority (EPA), WorkCover NSW (WorkCover), Roads and Maritime Services - Transport (RM), NSW Health, NSW Office of Water (NOW) within the Department of Primary Industries, Hunter Water Corporation (HWC) and Newcastle Port Corporation (NPC);
- **7** from special interest groups (including **5** objections); and
- **360** from the general public (including **358** objections).

A summary of the issues raised in submissions is provided below.

### 4.2.1 Public Authorities

None of the public authorities objected to the project but several of them raised issues and concerns and/or provided recommended conditions.

**Council** requested that further consideration be had of the Department's *Newcastle and Kooragang Island Risk Assessment Study 1993*, visual impact mitigation measures, landscaping/rehabilitation and acid sulphate soils. Council also requested clarification regarding proposed modifications to the on-site Chemtrans facility. Council provided recommended conditions including Section 94A development contributions, rainwater collection tanks to optimise reuse and minimise potable water demand, design of wastewater discharges to meet relevant water quality guidelines, parking to meet NCC's *Development Control Plan 2012* and landscaping/rehabilitation within existing vegetation corridors.

Following consideration of further technical reports relating to water and wastewater quality submitted as an addendum of the RTS, the **EPA** advised that it would be able to issue a new or varied EPL for the facility and provided recommended conditions. The EPA also provided a detailed noise assessment and recommended noise criteria that had been developed in accordance with the *NSW Industrial Noise Policy* (NSW INP) and should be applied at surrounding receiver locations. In relation to air quality, the EPA stated that the assessment had been carried out in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* and that the emission controls proposed represent current best practice.

The EPA's recommended licence conditions stipulate concentration limits and monitoring requirements for air emissions, water discharges and noise. Other recommended conditions include requirements for emergency response, waste management, tank bunding and spill containment, weather monitoring and special conditions for flare operation and post-commissioning monitoring.

**WorkCover** considered there to be no significant matters to preclude development consent being issued provided its recommended conditions are included. WorkCover requested that it be consulted during detailed design, with any matters raised addressed to its satisfaction and that IPL consults with WorkCover prior to the commencement of construction to develop a program for updating its MHF Safety Case to incorporate any design refinements associated with the proposed facility.

**RM** recommended that Traffic Management Plans for construction and operation be prepared and implemented and identified a series of areas for the Department to consider in its assessment relating to car parking, park and ride services for construction workers, vehicular access to Greenleaf Road and provision of adequate access to public transport, and pedestrian and cycle connections.

**NSW Health** (Health Protection, Hunter New England Population Health) stated that the level of impacts should be required to be consistent with those predicted in the EIS and that the management and monitoring measures proposed should be fully implemented. NSW Health requested that cumulative impacts are considered and noted the importance of effective community consultation. It also highlighted to IPL the relevant codes for water cooling and heating systems and its requirements relating to emergency management, including an early warning system for incidents that may affect the local population.

**NOW** provided several comments and recommended conditions including that some of Orica's groundwater monitoring bores be included in IPL's water monitoring plan and that dewatered groundwater is reinjected during construction. NOW's recommended conditions relate to license requirements for groundwater interception and requirements on IPL to prepare and implement a Water Management Plan.

**HWC** informed the Department that it is liaising with IPL regarding the provision of water supply infrastructure required to service the site.

**NPC** was generally supportive of the project and requested that a condition be included reflecting the need for IPL to enter into a commercial agreement with NPC for the construction, operation and maintenance of infrastructure on NPC's land.

### 4.2.2 Special Interest Groups

**Stockton Community Action Group** (SCAG), comprising of approximately 200 members, objected to the development, citing significant and unacceptable risks and impacts on the area surrounding

Kooragang Island. The SCAG submission provided extensive comment on the risk analysis for the development and consideration of worldwide incidents involving ammonium nitrate explosions and fire. SCAG stated that IPL's risk analysis was not conducted in accordance with the Department's Hazardous Industry Planning and Advisory Papers as it did not consider worst-case, cumulative effects. The SCAG submission provided commentary on the risk assessment criteria and standards of European countries and other Australian States, stating that the NSW land use planning criteria was less conservative. SCAG also noted that the risk assessment was not transparent, as components of the analysis had not been made available to the public. SCAG provided an analysis of worst case and cumulative effects from the development, noting that consideration of these components concluded that Kooragang Island was not a viable location due to the catastrophic risk of injury, fatalities and building damage. SCAG also noted that IPL's risk analysis did not adequately consider impacts from natural disasters and there was inadequate consideration of alternative locations and supply options that would eliminate major risks.

Other concerns raised by SCAG included cumulative air quality and health impacts, night-time noise levels at Stockton, inconsistency of the noise assessment with the NSW INP, traffic congestion, risks of traffic accidents involving ammonium nitrate, impacts on the Hunter River, inadequate and ineffective community consultation, inadequate consideration of impacts on property values, lack of emergency response plans for Stockton, the environmental compliance record of IPL and the small number of jobs generated compared with the risk created.

**Presbyterian Aged Care** (PAC Westcott) located at Stockton stated its preferred position that the development did not proceed, however acknowledged that Kooragang Island has supported industry for many years. PAC Westcott requested that if the development does proceed, IPL should be required to develop an emergency protocol in consultation with PAC Westcott to provide early warnings of incidents.

**Orica Australia Pty Ltd** (Orica) raised some issues with the risk assessment documents. Orica noted that the noise assessment and resultant criteria put forward by IPL were not consistent with the NSW INP. Orica also raised some concerns regarding the Preliminary Hazard Analysis (PHA), noting that less conservative risk impairment criteria were used for toxic injury and irritation for ammonia and nitrogen dioxide that are inconsistent with the Department's Hazardous Industry Planning and Advisory Papers. Orica also noted that the assumptions used to underpin IPL's PHA were not consistent with the *Guidelines for Quantitative Risk Assessment* (Purple Book).

**Newcastle Greens** (Greens) objected to the development citing unacceptable hazards and safety risks to the local community and environment. The Greens state that the project is inadequately justified in terms of social and environmental impacts and is not in the public interest given the lack of a strategic development plan for Newcastle Port which has been prepared in consultation with the community. The Greens state that the EIS did not adequately investigate alternatives or consider cumulative impacts in accordance with the EAR's. The Greens state that the development is proposed in the wrong location and it poses unacceptable safety risks.

**Mayfield East Public School P&C Association** (P&C Assoc.) objected to the development citing concerns about catastrophic explosion risk, the potential health impacts from air pollution on the children at Mayfield East Public School and the location of the development being so close to residential areas. The P&C Assoc. requested that cumulative impacts be considered, noted a lack of transparency for the community being unable to view the blast overpressure maps for the development and noted its concern about catastrophic impacts from a worst-case explosion with the location of two ammonium nitrate storage facilities adjacent to one another.

**Correct Planning & Consultation for Mayfield Group** (CPCFM) and the **Islington Village Community Group** (IVCG) raised similar concerns. A summary of both submissions is provided below.

The CPCFM and IVCG objected to the development citing unacceptable explosion risks, noise, air and water pollution and potential impacts on house values. Both groups noted that the cumulative explosion risk presented by the adjacent IPL and Orica facilities is an unacceptable planning outcome given the proximity to residents (800m). Both groups also noted concerns regarding cumulative air quality impacts at Stockton and Mayfield from industries on Kooragang Island, including coal dust, diesel particulates and nitrous oxides. Both groups noted that residents of Stockton, Mayfield, Islington, Tighes Hill and Wickham are already adversely impacted by industrial noise, particularly during the night-time period and disagreed with the noise assessment with respect to the identification of relevant noise criteria for the development.

CPCFM and IVCG also raised concerns that community consultation had been inadequate, impacts on property values had not been considered and traffic congestion not adequately addressed. Both groups indicated that the economic benefits of the proposal do not outweigh its impacts and the proposal would impact on recreational uses of the Hunter River.

### 4.3 General Public

A total of 360 submissions were received from the general public during the exhibition period. Table 4 shows the format of submissions received.

*Table 4: Public Submissions*

| **Submission Type** | **Number** |
|---|---|
| Form Letter 1 | 226 |
| Form Letter 2 | 23 |
| Modified Form Letters | 18 |
| Individual Submissions | 92 |
| Petition | 1 |
| **Total** | **360** |

Of these submissions, 315 were received from the Newcastle area, including 263 from Stockton. The remaining 45 submissions were received from Sydney and the Central Coast and as far afield as Perth and Darwin. All but 2 of these submissions objected to the development.

Form Letters

The majority of submissions were received as form letters, of which there were two different types.

The first form letter (226 submissions) objected to the development for the following reasons:
- cumulative explosion risk from the adjacent IPL and Orica facilities is an unacceptable planning outcome given the proximity to residents (800m);
- cumulative air quality impacts at Stockton from industries on Kooragang Island, including coal dust, diesel particulates and nitrous oxides are detrimental to respiratory health;
- increased impacts of industrial noise, particularly during the night-time period and disagreement with the EIS, with respect to the identification of relevant noise criteria for the development;
- inadequate community consultation;
- impacts on property values not considered;
- traffic congestion not adequately addressed;
- the economic benefits of the proposal do not outweigh its impacts; and
- adverse impacts on recreational uses of the Hunter River.

The second type of form letter (23) raised similar issues, including:
- unacceptable explosion risk from the development and cumulative risk from the adjacent IPL and Orica facilities located within 800m of residents;
- cumulative air quality impacts affecting the health of residents, including fine particles, nitrous oxides and coal dust;
- increased night-time noise considered unacceptable to the community and queried why the EIS had sought to request an increase in noise criteria;
- existing traffic congestion will be exacerbated, including additional emissions of carcinogenic fine particles and nitrous oxides; and
- the small number of additional jobs created is not warranted by the risks that the development would pose to thousands of people.

Modified form letters (18) included the same issues raised in form letters 1 and 2, as well as the following additional comments:
- cited other major incidents in the world involving ammonium nitrate explosion or fire;
- noted that the consequence ranking of multiple fatalities and injuries cannot be devalued in the risk assessment process; and
- cited existing exceedances of particulate ($PM_{10}$ and $PM_{2.5}$) emissions in Stockton being at dangerous levels.

Individual Submissions (non-form letters)

92 individual submissions were received from the public. Again, the majority of these submissions objected to the development, raising a number of similar concerns:

*Hazards and Risks*
- increased risk of explosion;
- cumulative risks associated with two adjacent plants;
- inadequate risk assessment;
- storage of hazardous chemicals and potential for leaks;
- proximity to residential areas is inappropriate;
- the development would not meet the guidelines of other States such as South Australia and Western Australia;
- explosions and fire involving ammonium nitrate in other parts of the world have had catastrophic consequences;
- risks associated with transport of dangerous goods by road and ship; and
- concern over emergency evacuation procedures and limited egress from the Stockton peninsula in the event of an evacuation.

*Project Need and Alternatives*
- alternative locations were not adequately considered;
- questioned the need for the development based on falling international demand for coal; and
- questioned why the decision to delay the development was not included in the EIS.

*EIS and Consultation*
- the EIS was not adequate and presented biased information;
- inadequate community consultation and consideration of concerns, some community groups not identified for stakeholder consultation; and
- questioned the methodology for assessing cumulative impacts.

*Environmental Impacts*
- air quality, including fugitive emissions of ammonia and existing levels of air pollution;
- existing high night-time noise levels and inappropriate noise criteria put forward in the noise assessment;
- water pollution impacts on the Hunter River and Ramsar wetlands;
- proposal would exacerbate existing traffic congestion problems;
- impacts on local ecology and native species; and
- inadequate mitigation for environmental impacts.

*Other Issues*
- socio-economic impacts such as house values, number of jobs generated not offset by developments impacts and risks;
- requested a social and health impact assessment;
- concerns regarding IPL's existing environmental and safety record;
- increased risk of terrorism;
- lack of strategic planning in the Newcastle area with respect to the protection of public safety;
- need to diversify industries on Kooragang Island, including clean industries; and
- no consideration of the use of rail to transport ammonium nitrate.

Petition

One (1) petition was received containing 12 signatures. The petition included a statement, which raised the following concerns:
- unacceptable cumulative explosion risk close to the communities of Stockton, Mayfield and Newcastle; and
- unacceptable increase in pollutants includes nitrous oxides and small particulates ($PM_{10}$ and $PM_{2.5}$).

The Department has considered all issues raised in submissions in its assessment of the application, (see Section 5) and elsewhere in this report.

### 4.4 Response to Submissions

The Applicant has provided a response to the issues raised in submissions, which included revised management and mitigation measures and additional information but did not result in any formal amendments to the development application as submitted. Following a period of technical review by

Council and relevant Government agencies, the response to submissions report was formally accepted and made available on the Department's website on 1 November 2013 (see Appendix E).

# 5. ASSESSMENT

In its assessment of the merits of the development application, the Department has considered the:

- EIS, submissions, response to submissions;
- various additional relevant information required by the Department during the course of the assessment, including the supplementary technical assessment report to demonstrate that the overall findings of the EIS do not change and remain valid when actual production data is taken into account (see also Section 3.1);
- current development consents applying to the existing fertiliser and chemicals storage and distribution operation on the site which are proposed to be surrendered;
- relevant environmental planning instruments, policies and guidelines; and
- relevant provisions of the EP&A Act, including the objects of the Act.

The outcome of this consideration is that the Department's key assessment issues are:

- hazards and risks;
- air quality;
- noise and vibration;
- transport;
- soil and water; and
- visual.

These key issues are assessed in Sections 5.1 to 5.6. All other issues are assessed in Section 5.7.

## 5.1 Hazards and Risk

The Department has developed an integrated assessment process for safety assurance of development proposals, which are potentially hazardous[*]. In summary, the integrated hazards-related assessment and safety management process in the case of the proposed development comprises:

- a preliminary hazard analysis (PHA) which is carried out to support the development application by demonstrating that risk levels do not preclude consent being granted;
- a hazard and operability study, fire safety study, emergency plan and an updated hazard analysis undertaken during the design phase of the project;
- a construction safety study carried out to ensure facility safety during construction and commissioning, particularly when there is interaction with existing operations;
- implementation of a safety management system to give safety assurance during ongoing operation; and
- regular independent hazard audits to verify the integrity of the safety systems and that the facility is being operated in accordance with its hazards-related conditions of consent.

The PHA is required at the time of submission of the EIS. The remaining parts of the process are required under the conditions of consent, if the development application is approved.

As the development proposal is potentially hazardous, a PHA was carried out on behalf of IPL by hazards and risk consultants Lloyds Register. The analysis was carried out in accordance with relevant Departmental policies and guidelines, in particular the *Hazardous Industry Planning Advisory Papers* (HIPAPs), and formed a key component of the EIS (see Appendix D). The PHA comprised a full Quantitative Risk Assessment (QRA). A Transport QRA was also undertaken and formed part of the EIS.

Importantly, the scope of the PHA covered the potential risk issues from all existing and proposed development on the site, this being the existing fertiliser and chemicals storage and distribution operation and the proposed construction and operation of the ammonia import and ammonium nitrate manufacturing facility.

To ensure a robust assessment process, in addition to the Department's assessment of these potential impacts by its technical hazards and risks specialists, an independent risk consultancy, Scott Lister (Scott Lister) was engaged by the Department to provide an independent technical peer

[*] *A more detailed explanation of this process is provided in HIPAP No. 6.*

review of the PHA and the Transport QRA. The final peer review report is attached at Appendix G and is a standalone report which should be read independently of this section of the report. A brief summary of Scott Lister's findings is provided in the conclusion at the end of the section of the assessment report.

Since the PHA contains detailed information about the manufacture of Security Sensitive Ammonium Nitrate (SSAN)[†], four of the appendices in the PHA were treated as confidential. The findings of the Department and Scott Lister are based on their assessment of the public and confidential parts of the PHA and the Transport Risk QRA.

Elements of Risk Analysis and Assessment

Under relevant Departmental policies and guidelines (i.e. HIPAPs), in order to determine whether or not the development proposal would impose an unacceptable level of risk on the surrounding locality, the PHA is required to carry out a risk analysis and assessment in the following sequence:

- identification of the hazard/s;
- an analysis of the potential consequences and likelihood;
- a calculation of the risk;
- an assessment of the risk against Departmental risk criteria; and
- consideration of risk mitigation and management options.

The risk analysis and assessment process is shown diagrammatically in Figure 8. The PHA systematically followed this process and this section of the Department's assessment report has been structured around these key elements.

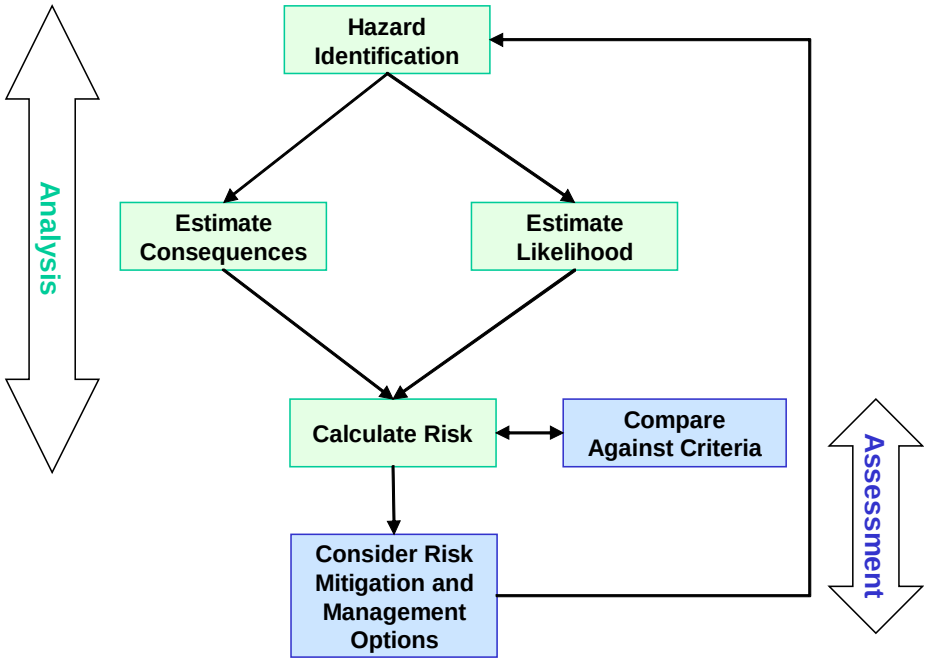



*Figure 8: The Elements of Risk Analysis and Assessment*

Assumptions

The validity of a PHA is dependent on the underlying assumptions used. Technical assumptions were set out in an Assumption Register which was included in the PHA. Following a detailed review of these assumptions, the Department identified two main issues:

- the Assumption Register did not provide sufficient information to demonstrate that the quantity of AN that could be involved in an explosion is applicable to the development. The numbers used in the PHA are those recommended in the *Good Practice Guide: Storage of Solid Technical Grade Ammonium Nitrate* published by SAFEX International (SAFEX Guide), which is the most recent

[†] *Security Sensitive Ammonium Nitrate (abbreviated SSAN), is categorised under the Explosives Regulation 2013 as a security sensitive dangerous substance which is regulated by WorkCover NSW.*

guideline available on the public domain. However, the Department noted that these numbers are only valid if the storage condition and/or arrangements of the AN store are consistent with those suggested in the Guide. IPL was asked to demonstrate that this would be the case; and
- the assumed times of 3 minutes and 10 minutes to isolate an accidental release of ammonia were not well justified and IPL was requested to provide additional information and justification.

In response, IPL confirmed compliance with the SAFEX Guide and committed to implement the control and mitigation measures recommended in the guideline which would be validated through an updated hazard analysis undertaken during the project's detailed design, which is a requirement of the Department's recommended conditions of consent. Further, ongoing periodic Hazard Auditing would check and confirm whether AN storage conditions and arrangements comply with the FHA.

Additional information on the isolation times was also provided. IPL confirmed that the assumed isolation times are based on the experience at other existing IPL-operated AN manufacturing facilities with similar layout and activity. The Department considers the assumption to be reasonable at this early design stage. A recommendation is made in the PHA that the isolation times should be confirmed at the final design stage. This has been included as a recommended condition of consent.

Following and based on the provision of additional information by IPL, the Department found that the assumptions made by IPL are well documented, adequately detailed and justified and represent a "conservative best estimate" and that overall, they are consistent with the principles outlined in HIPAP No. 6.

Hazard Identification

A Hazard Identification Word Diagram (HIWD) was used to identify the site hazards (existing and proposed) which have the potential to have off-site impacts. The HIWD systematically considered initiating events that could lead to the release of hazardous materials. Events considered included equipment failure, loss of control and human error.

Natural events (such as flooding, earthquakes and strong winds) and loss of containment due to shipping incidents at the berth during loading/unloading were also examined in detail. The Department has identified that the most significant potential natural event is an earthquake impacting on the bulk ammonia storage tank. To ensure that all feasible control measures would be implemented to further reduce the risk of this event, a specific condition is recommended requiring IPL to ensure that the design of the ammonia tank complies with the highest, most stringent level of design for earthquake and wind forces set by Australian Standards.

The Department concludes that the hazard identification technique used in the PHA is appropriate and well applied. Based on the information provided, it is concluded that the hazardous materials with the greatest potential offsite safety or environmental effects are anhydrous (liquid) ammonia, ammonium nitrate (AN), ammonium nitrate solution (ANSOL), nitrogen oxide, and natural gas.

Incidents involving these materials could cause fatalities, injuries or damage to property or the biophysical environment as a result of fires, explosions and toxic gas releases.

The approach taken to identify the causes, consequences and control measures for each hazardous incident is considered by the Department to be acceptable. The identified representative hazardous incidents are typical of what would be expected for a facility of the scale and nature proposed.

Consequence and Likelihood Analysis

*Consequence Analysis*

Once all potential hazards have been identified, the assessment then estimated the **consequences** of each hazardous incident with potential offsite impact, either directly or as a result of escalation to other on-site assets.

The consequences of the following types if incident have been estimated:
- fires involving flammable materials;
- release of toxic gases;
- explosion of AN and ANSOL; and
- escalation analysis, whereby the potential of an explosion event can initiate knock-on effects on surrounding vessels and equipment.

Commercial modelling software for risk assessment (PHAST) was used to calculate the consequences of the above scenarios.

During the course of the assessment, the Department raised the issue of the proximity of the Stockton Bridge to the site and the potential impact that an explosion of AN could have on the structural integrity of the bridge. The Stockton Bridge is important because it is one of only two main roads connecting Stockton with the Newcastle CBD. It was found that worst case incident (explosion of the entire bulk volume of AN on the site) would not have a major impact on the structural integrity of the Stockton Bridge.

The Department also requested details on the testing, storage and treatment of off-specification (off-spec) AN at the facility. The Applicant confirmed that this material would be handled in accordance with the requirements set in the SAFEX Guide, which is considered to represent best industry practice. The Department is of the view that the control measures (including but not limited to maximum quantity to be stored, separation distances and disposal of the material) proposed to be implemented is consistent with the SAFEX Guide and would reduce the risk of handling off-spec AN.

A number of submissions questioned the level of conservatism in the irritation and injury criteria used in the assessment. The Department's guidelines (HIPAP 6) do not set specific levels of impact representing injury and irritation but rather require these values to be based on a review of all relevant information in the public domain and to be well justified on a case by case basis. Based on the information included in the assessment and further sensitivity analysis undertaken by IPL, the Department considers that the injury and irritation risk analysis used in the assessment is adequately conservative.

*Likelihood Analysis*

The **likelihood** analysis draws on international frequency data published in the public domain (e.g. the United Kingdom Health and Safety Executive, TNO and SAFEX). Fault tree analysis is used to estimate the likelihood of a number of scenarios.

Following a review of the likelihood analysis, the Department requested additional information and clarification on the frequencies used in the PHA in relation to the control measures to be in place to ensure that the frequency of failure of the ammonia pipeline from the berth to the facility due to corrosion will be minimised. Incitec has confirmed that the preparation of the pipeline for transfer, as well as the transfer itself would be fully supervised by IPL operators and the pipeline will be purged prior to each transfer. The pipeline would also be visually inspected before each shipment. Furthermore, the pipelines would be classified as critical equipment and would be subject to rigorous preventive maintenance, inspection and testing. A relevant recommendation is listed in the PHA to ensure that appropriate control measure would be developed and maintained for all liquid ammonia pipelines.

The Department recommends that the Final Hazards Analysis must report on the implementation of the recommendations of the PHA. Based on the information provided and the control measures to be implemented, the Department considers the failure frequencies of the ammonia pipeline to be appropriate. The additional information submitted by IPL satisfactorily addressed the Department's request.

The second issue raised by the Department related to the frequencies of a potential AN explosion. Whilst it was acknowledged that the frequencies for AN explosion used in the PHA were based on those suggested in the SAFEX guideline, additional analysis was requested to demonstrate that the overall AN explosion frequency used in the analysis would be within the range of values that have been published by reputable agencies (such as TNO) and would fall within the historical incident record. The overall AN explosion frequency for the site was calculated by IPL and the Department is comfortable as it is within the range of internationally recognised frequency values for this type of explosion.

The Department also requested IPL to confirm that the separation distances between the AN piles will be as recommended in the SAFEX Guide or greater. IPL clarified that the AN storage area is sufficient to allow these minimum separation distances to be met. A condition of consent is recommended to ensure that the separation distances will be maintained.

The integrity of the ammonia tank in the event of an AN explosion was also questioned in some of the public submissions and was also raised by the Department in its assessment.

Following a review of additional technical information provided by IPL, it is considered that the likelihood of a projectile impacting on the ammonia tank, resulting in an ammonia leak, is negligible and would not significantly change the overall frequency of ammonia leaks. The following supports the Department's conclusion:

- the layout of the facility including the distance between the ammonia tank and AN storage and the existence of a number of buildings between them;
- the results of additional modelling undertaken by IPL demonstrating that the likelihood of this event, even as a worst case scenario, is very low; and
- the high integrity of the ammonia storage tank such as wall thickness; double wall design and the relatively small tank area exposed to a potential impact by a projectile.

Overall, and based on the above findings, the likelihood and frequency analysis results presented in the assessment are considered by the Department to be suitable for each representative incident and have included an appropriate level of conservatism.

Risk Mitigation and Management Options

A complete list of the proposed control measures to be implemented on the site is included in Appendix C of the PHA and a summary of these measures is also provided in Section 4.4 of the PHA.

A number of control and risk reduction measures have been developed as part of the PHA with associated recommendations made in Chapter 9.2 of the PHA report. The Department recognises the importance of implementing and maintaining these measures and has included a condition requiring IPL to report on the implementation of these measures in the Final Hazard Analysis.

Risk Analysis

In understanding the possible **risks**, the **consequence** and **likelihood** of the identified hazardous incident scenarios are combined to produce an estimate of overall risks from IPL's existing fertiliser and chemicals storage and distribution operation and the new AN Manufacturing facility. The following risk levels are presented:

- individual fatality risk;
- injury risk from heat radiation and explosion overpressure;
- injury and irritation risk from toxic exposure;
- societal risk;
- risk of property damage and accident propagation; and
- the risk to the Biophysical Environment.

For each category, a risk contour map was produced to show the different areas that would be subjected to different levels of risk.

*Individual Fatality Risk*

The NSW individual fatality risk criteria are published in *Hazardous Industry Planning Advisory Paper No 4* (HIPAP 4) and are reproduced in Table 5.

*Table 5: Individual Fatality Risk Criteria for Land Use Safety Planning (HIPAP 4)*

| Land Use | Suggested Criteria (chances in a million per year) |
|---|---|
| Hospitals, schools, child-care facilities, old age housing | 0.5 |
| Residential, hotels, motels, tourist resorts | 1 |
| Commercial developments including retail centres, offices and entertainment centres | 5 |
| Sporting complexes and active open space | 10 |
| Industrial | 50 |

*Note: A detailed explanation of the criteria in Table 5 is provided in Section 2.4 of HIPAP 4.*

Figure 9 presents the individual fatality risk contours calculated for the proposed development.


*Figure 9: Individual Fatality Risk*

The 50 chances in a million per year fatality contour falls well within the boundaries of the site and the proposed development would comply with the relevant risk criterion for industrial land uses set by HIPAP 4 (see the ***navy blue contour*** in Figure 9).

The relevant fatality risk contour for residential land uses in HIPAP 4 of 1 chance in a million per year (see the ***red contour*** in Figure 9) does not encroach onto Stockton, which is the closest residential land use to the site. The fatality risk contours for all other land use classifications (i.e. sensitive, commercial, open space etc, as shown in Table 5) do not extend beyond Kooragang Island itself.

The proposed development complies with the relevant NSW individual fatality risk criteria.

*Injury and Irritation Risk*

Figures 10 and 11 show the risks of acute toxic injury and irritation calculated for the proposed development.

The assessment found that the injury risk contour applied to residential land uses does not encroach onto this land use.


*Figure 10: Risk of Acute Toxic Injury*

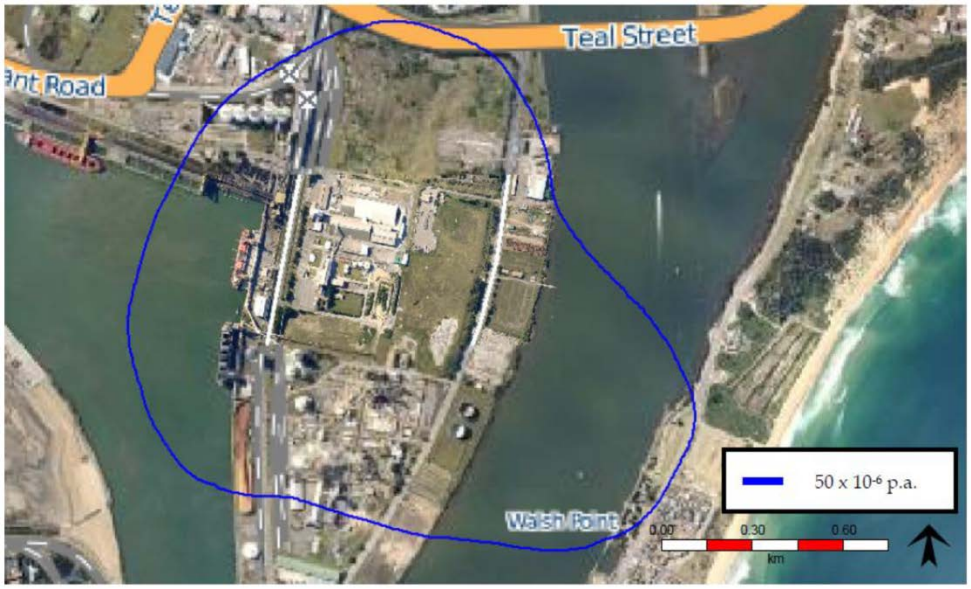


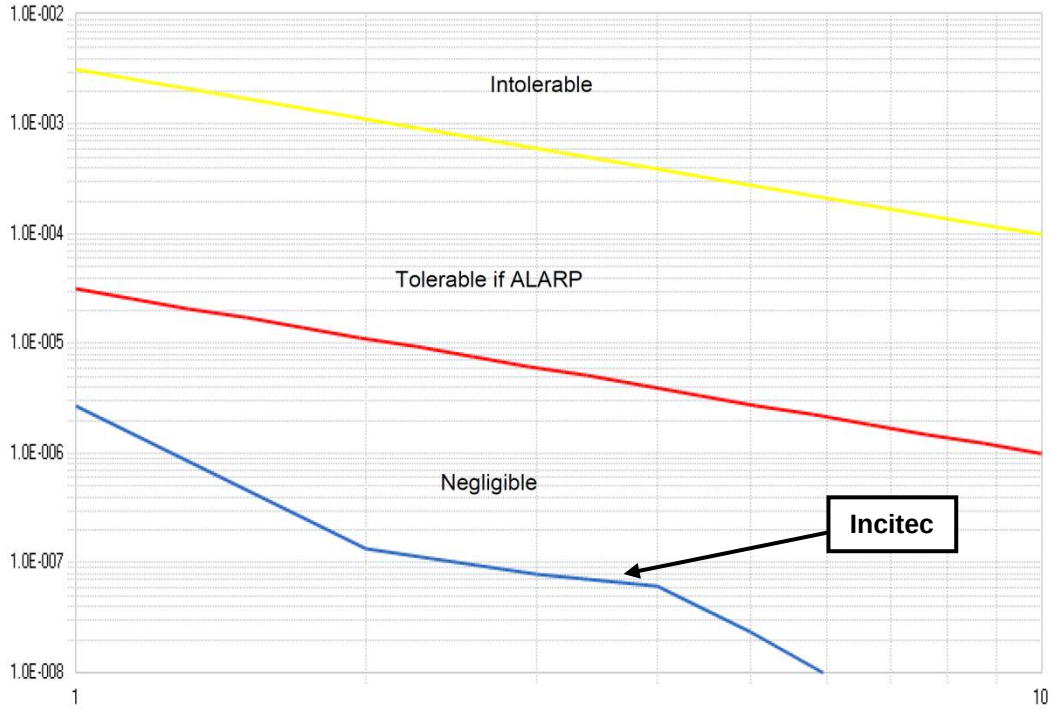

*Figure 11: Risk of Irritation*

It is recognised that the irritation risk contour (see the ***navy blue contour*** in Figure 11) applied to residential land uses extends across the foreshore onto Stockton peninsula and skirts Fullerton Street. Importantly, however, the contour does not encroach onto any residential land uses.

The proposed development complies with the relevant NSW injury and irritation criteria.

*Societal Risk*

Societal risk is a measure which takes into account the fact that society is particularly averse to incidents that can cause multiple fatalities. Estimated societal risk is shown in Figure 12.




*[Note: ALARP is an acronym for As Low As Reasonably Practicable. A detailed explanation of this term in the context of societal risk is provided in Section 2.4.3 of HIPAP 4]*

*Figure 12: Societal Risk*

In the 'negligible' zone, below the red line, provided other individual criteria are met, societal risk is not considered to be significant. Societal risk for the proposed development, as indicated by the blue

line, is very low in this case because fatality risks decreases a lot with distance from the site. The level of risk falls below the negligible line and societal risk is considered to be negligible.

*Low Frequency – High Consequence Events*

A number of public submissions raised the issue of the low-frequency, high-consequence events, also known as major accidents. Submissions referred to a number of international incidents. These events, which are extremely rare, have been considered in the overall risk calculations for the site. They are reflected in the above findings, which show compliance with applicable risk criteria.

Further, the existing operation is a Major Hazard Facility (MHF) under the *Work, Health and Safety Regulation 2011* (WHS Regulation) which is regulated by WorkCover. Like all operators of MHFs, IPL has certain obligations to reduce the risk and minimise the consequences of such incidents. The Department has consulted regularly with WorkCover during the course of the assessment and WorkCover considered there to be no major matters to preclude consent being issued provided its recommended conditions are included, which have been incorporated into the Department's recommended conditions of consent.

*Other Risks*

The risks of accident propagation and damage to property or the biophysical environment were found to comply with the relevant criteria.

Cumulative Risks

For many years, the Department has monitored the potential risks in the Newcastle and Kooragang Island area. In 1992, the Department released an "Area Risk Assessment Study" of Newcastle and Kooragang Island to assist in identifying and resolving potential land use conflicts in the area.

Since this study was released, there have been a number of land use changes in this area, including the closure of some industrial facilities and the implementation of major risk reduction measures at some others, including at Orica's adjacent facility.

During the course of 2011, the Department had discussions with IPL about its proposed AN manufacturing facility (the subject of this report) and was made aware of a potential liquefied natural gas (LNG) facility on a vacant parcel of land immediately to the north of the IPL site (see Figure 2).

If each of these development proposals were to obtain planning consent, there would be three large industrial facilities (taking into account the existing Orica facility) located on the south eastern tip of Kooragang Island which were at that time likely to be classified as Major Hazard Facilities (MHF) under the *NSW Work Health and Safety Regulation 2011*.

Given the close proximity of the these facilities to one another, the Department's view was that the cumulative risks from these MHF's on the surrounding land uses should be estimated to ensure that they remain within acceptable levels.

This requires all relevant information to be shared between the respective organisations to ensure that risks are consistently and thoroughly assessed. This can be a challenging and difficult task, given the technical complexities of the risk assessment process, as well as the potential sensitivity of some information. The Department facilitated a joint meeting with the relevant companies in December 2011 during which broad, in-principle agreement was reached to share relevant information between them.

When the PHA for IPL's development proposal was being prepared, the cumulative fatality risk calculations of the existing Orica facility (as currently approved) IPL's existing fertiliser and chemicals storage and distribution operation and the proposed AN manufacturing facility were included. Risks were estimated at nine representative locations in Stockton and Mayfield as shown in Figure 13.

The maximum cumulative individual fatality risk from Orica and IPL is between 0.034 and 0.036 in a million at Locations 3, 4 and 5. This is much lower than the Department's risk criterion for residential land uses of 1 chance in a million a year (see Table 5) for a single facility. The cumulative fatality risk values at all nine locations are below the fatality risk criteria for residential and sensitive land uses for an individual facility.


*Figure 13: Representative Modelling Locations for Cumulative Fatality Risk*

The findings of the cumulative fatality risk results show that the proposed development would not increase overall fatality risks at Stockton or any other surrounding communities.

Transport Risks

IPL was also required to undertake an evaluation of the risks arising from the transport of hazardous materials in the context of existing traffic movements in the surrounding area.

The scope of the transport risk assessment covers the transportation of the main hazardous materials to and from the site by road and ship, including anhydrous (liquid) ammonia, bulk TGAN and ANSOL.

A semi-quantitative risk assessment was undertaken to evaluate transport risks from the development, including a Bow-tie analysis[‡] to critically examine the control measures proposed to be implemented during transport and to identify any additional control measures to be implemented. As a result of the analysis, a number of recommendations are identified and listed in the assessment.

In NSW (as well as Australia), there is currently no set quantitative criterion in place to assess potential transport risks. IPL adopted the individual fatality risk criterion of 1 chance in a million per year for residential land uses from HIPAP No. 4, which is conventionally applied in the assessment of new fixed facilities (see Table 5) including the project (see above). The Department regards the use of this risk criterion as highly conservative when compared to everyday public risks such as travelling by motor car, the criteria for which is 145 times lower, which is one of the key principles advocated by HIPAP No. 4. As such, the application of this particular criterion to assess potential transport risks is considered by the Department to be appropriate in this case.

The risk assessment found that the individual fatality risks from the transport of hazardous materials to and from the overall site on the immediate surrounding area are much lower than 1 chance in a million per year.

Based on the findings of the transport risk assessment, the Department's view is that the potential transport risks posed by the facility would not considerably increase the overall risk on or in the vicinity of the transport routes and are considered to be tolerable.

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[‡]*Bow Tie Analysis provides a visual representation of the causes of unintended events and the potential outcomes of these events. It also shows the measures used to reduce the likelihood of the event from occurring ('prevention controls') and to mitigate the potential outcomes if this event were to occur ('mitigation controls').*

Conclusion

Overall, the results indicate that the risks from IPL's proposed operation (i.e. the existing fertiliser and chemicals storage and distribution facility and the proposed AN manufacturing facility) would comply with relevant fatality, injury and irritation criteria adopted in NSW for a new facility even when combined with the risks from the adjacent Orica facility.

Based on the extensive information provided during the course of the assessment and that all risk reduction measures and recommendations in the PHA and Transport QRA are to be implemented and maintained over time, the Department concludes that the proposed development would not increase either the project specific or cumulative risks to surrounding land uses to unacceptable levels and that all relevant NSW risk criteria would be met.

Nevertheless and to provide additional surety that the facility will operate in a safe manner, it is recommended that a series of hazard and risk related conditions of consent be imposed.

This includes a series of conditions which stipulate various requirements at the pre-construction, pre-commissioning, pre-start-up, and post-start-up phases, as well as various conditions applying to on-going site operations. This includes a requirement that IPL submit the following for review and approval:

- a Fire Safety Study considering and, if necessary, implementing measures to ensure acceptable fire protection levels at the site;
- a Final Hazard Analysis in accordance with the Department's relevant guideline/s, including a report on the implementation of the recommendations of the PHA;
- a Hazard and Operability Study consistent with the Department's relevant guideline/s;
- a Construction Safety Study consistent with the Department's relevant guideline/s;
- an updated Emergency Plan and Safety Management System to incorporate any changes associated with the proposed development;
- pre- and post- Start-up Compliance Reports detailing compliance with all conditions required to be met before and after operation has commenced; and
- on-going independent Hazard Audits to ensure safety and compliance with all statutory documents and approvals.

The Department concludes that with these recommended conditions in place, the potential hazards and risks from the proposed development would be effectively managed.

Scott Lister's peer review supports the Department's findings and can be read in Appendix G. In summary, it concludes that the PHA and Transport QRA, together with the Response to Submissions report:

- addresses the Department's requirements in respect of hazards/risks; and
- demonstrates that the Department's risk criteria for potentially hazardous developments would be met.

Scott Lister also notes that a number of recommendations are made within the PHA and Transport QRA, as well as in its own report, that are suitable to be imposed as conditions, should consent be granted. The Department has incorporated all recommendations made into the conditions of consent.

### 5.2 Air Quality

The EIS included a specialist air quality impact assessment carried out by URS (see Appendix E of the EIS).

To assist with the assessment, the Department appointed Todoroski Air Sciences (TAS) to provide an independent, technical review of the air quality impact assessment. TAS's final report is attached at Appendix H and should be read in conjunction with this section of the report.

Construction

Construction of the new facility is expected to take place in 4 main phases: site preparation, civil and structural work, erection of plant modules and associated activities and pre-commissioning and commissioning (see Section 2.2).

During the construction period, the main air emission with the potential to have an adverse impact on surrounding sensitive receivers is dust. The construction program indicates that the level of dust that

would be generated would be fairly minimal during the initial site preparation works but is likely to increase to its highest point during the (second) civil and structural works phase as excavation works, soil stockpiling and other related site establishment and ground preparation activities take place, particularly when two or more phases of construction are carried out concurrently.

Based on its review of the construction program, the existing heavy industrial and Port context in which the site is located and the intervening nature (i.e. water) and distance from the site to surrounding sensitive receivers, the Department generally agrees with the findings of the EIS in that the emission of dust and other pollutants (e.g. diesel fumes from plant and machinery) could be routinely managed through the implementation of a series of standard mitigation measures, such as dust suppression and maintenance of construction plant and equipment.

Through recommended conditions of consent, these mitigation measures would be implemented through an Air Quality Management Plan which would form one of a number of sub-plans making up a Construction Environmental Management Plan for the proposed development. The Plan would also require IPL to develop a series of management measures to further reduce potential air emissions during construction. This includes identifying high emission generating construction activities (such as those that would take place during the second phase, as referred to above), and nominating times when these works would best be carried out for example when weather conditions are favourable.

With these measures and conditions in place, dust and other emissions generated during construction would not result in adverse amenity or health impacts on surrounding receivers.

Operation

Existing air quality in the Newcastle regional air shed is typically dominated by emissions from human activities including traffic and domestic wood heaters in winter and emissions from major industries at Kooragang Island, Mayfield and Tomago. The main categories of heavy industrial development that contribute to the existing air emission profile of the area include coal handling operations, chemical manufacturing and the handling of various commodities through the port including fertiliser, pesticide, grains and metals. Natural sources of emissions include salt and particulates originating from storms and bushfires.

Ambient air quality data sourced from a combination of existing meteorological stations in Stockton, Newcastle, Wallsend and Beresfield was collected, analysed and adopted to determine existing background levels of nitrogen dioxide ($NO_2$), particulate matter ($PM_{10}$), and ammonia ($NH_3$), as the three most prevalent pollutants that would be generated by IPL's new facility.

Based on its review, TAS concluded that the meteorological data that was adopted and used in the air model was appropriate. In addition, TAS noted that the data used by URS in the assessment data correlates well with ambient air quality monitoring data that has been collected more recently by industry and the EPA in the Lower Hunter region to inform the development of the proposed Lower Hunter environmental monitoring network.

Point source and fugitive air emissions, together with the proposed duration and frequency of the development were inventoried and analysed to develop three emission modelling scenarios: *plant start-up*, *steady state* (typical operations) and *ammonia flaring*. These representative scenarios were also incorporated into the model, together with the other relevant factors (e.g. building wake).

A review was also undertaken of other approved and proposed development projects in the region that could generate comparable emission types to the project at sufficiently high levels to contribute to potential future cumulative air quality impacts. This review identified Orica's adjacent facility as having the highest potential to contribute to cumulative impacts (given the commonalities between the two operations), and, as such, a quantitative representation of relevant emission sources was also incorporated into the modelling as part of the cumulative impact assessment.

Since the air quality assessment was prepared in 2012, there are several new potential sources of emissions in the area including on Kooragang Island where PWCS intends to build a new coal terminal (T4). The T4 proposal has potential to generate coal particulate emissions that are unlike the types of air pollutants that would be produced by the project, which are combustion related $PM_{10}$ and $NO_2$ emissions. The Department has considered these air emissions in its consideration of the results of the assessment below. Overall, it was found that the contribution of these other potential emission sources (except Orica) would either not contribute to the types of pollutants that would be emitted by IPL from its facility and do not need to be considered cumulatively or that the level of emissions that

would be emitted by IPL are negligible in the context of other existing operations or development projects.

The incremental and cumulative modelling results (i.e. including Orica) were added to existing background levels and compared against the EPA's applicable air criteria for each of the three primary pollutants that would be emitted from the facility. The results were used to ascertain the magnitude of impact in the context of the existing regional airshed and to inform the scope of air emission controls that would need to be incorporated into the detailed design of the facility.

TAS concluded that the air modelling that was undertaken was generally conservative (i.e. may overestimate the air quality impacts at the majority of sensitive receivers) such that the actual air quality impacts would probably be lower than predicted in the assessment. A summary of the key aspects of this review are set out in detail in the TAS Report in Appendix H.

The EPA was comfortable that the air quality assessment that had been carried out was conducted soundly and in accordance with current policies and guidelines (including the *Approved Methods*) and that the results are commensurate with the magnitude of impact that would be expected of a facility of the nature and scale proposed.

Modelling Results

A comparison between the predicted impacts modelled at the most affected receiver against the EPA's applicable air quality impact assessment criteria for the primary pollutants that would be emitted by the project ($NO_2$, $PM_{10}$ and $NH_3$) for the routine (steady state) and non-routine scenarios modelled are set out in Table 6.

*Table 6: Predicted Maximum Impacts at Most Affected Receiver Locations (µg/m$^3$)*

| **Source/Scenario** | **Category** | **NO2 (all $NO_x$ as $NO_2$)** | | **$PM_{10}$** | | **$NH_3$** |
|---|---|---|---|---|---|---|
| | | **1-Hour Average** | **Annual Average** | **24-Hour Average** | **Annual Average** | **1-Hour Average** |
| | | **Air Quality Impact Assessment Criteria** | | | | |
| | | **246** | **62** | **50** | **30** | **330** |
| **Background Level** | | **84** | **18.7** | **31.7** | **21.7** | **N/A** |
| Plant Operation (steady state) | Increment | 25 | 0.4 | 2.2 | 0.2 | 0.2 |
| | Cumulative | 109 | 19.1 | 33.9 | 21.7 | - |
| NA Start up (non-routine) | Increment | 40 | - | - | - | - |
| | Cumulative | 124 | - | - | - | - |
| Flaring (non-routine) | Increment | 47 | - | - | - | 52 |
| | Cumulative | 131 | - | - | - | - |
| NA Start up (Orica and IPL) | Increment | 41 | - | - | - | - |
| | Cumulative | 125 | - | - | - | - |
| Plant Operation (Orica and IPL) | Increment | 41 | 0.7 | - | | - |
| | Cumulative | 125 | 19.4 | - | - | - |

As can be seen, the modelling results indicate overall that the predicted incremental level (due to the project, taking into account the existing facility) and the cumulative level including background and all other sources would be within the EPA's relevant air quality criteria for nitrogen dioxide ($NO_2$), particulate matter ($PM_{10}$), and ammonia ($NH_3$) at all receivers.

These results are considered further below together with figures showing the potential spatial extent of potential nitrogen dioxide impacts.

*Nitrogen Dioxide ($NO_2$)*

The worst case predicted level of nitrogen dioxide ($NO_2$[§]) during routine (steady state) operations would be 109µg/m$^3$ (and 125 µg/m$^3$ when Orica is added, as shown on Figure 14), which meets the relevant criterion of 246µg/m$^3$.

Maximum predicted cumulative emissions during non-routine scenarios is predicted to be 124µg/m$^3$ during plant start-up (Figure 15) and 131µg/m$^3$ when ammonia is flared (Figure 16). These events would not take place often, but in any event would not cause an exceedance of the relevant criterion of 246ug/m$^3$.

*§ To add conservatism into the air quality modelling, the assessment assumed that all NOx emitted would be NO2 when in reality emissions would be much lower than predicted.*

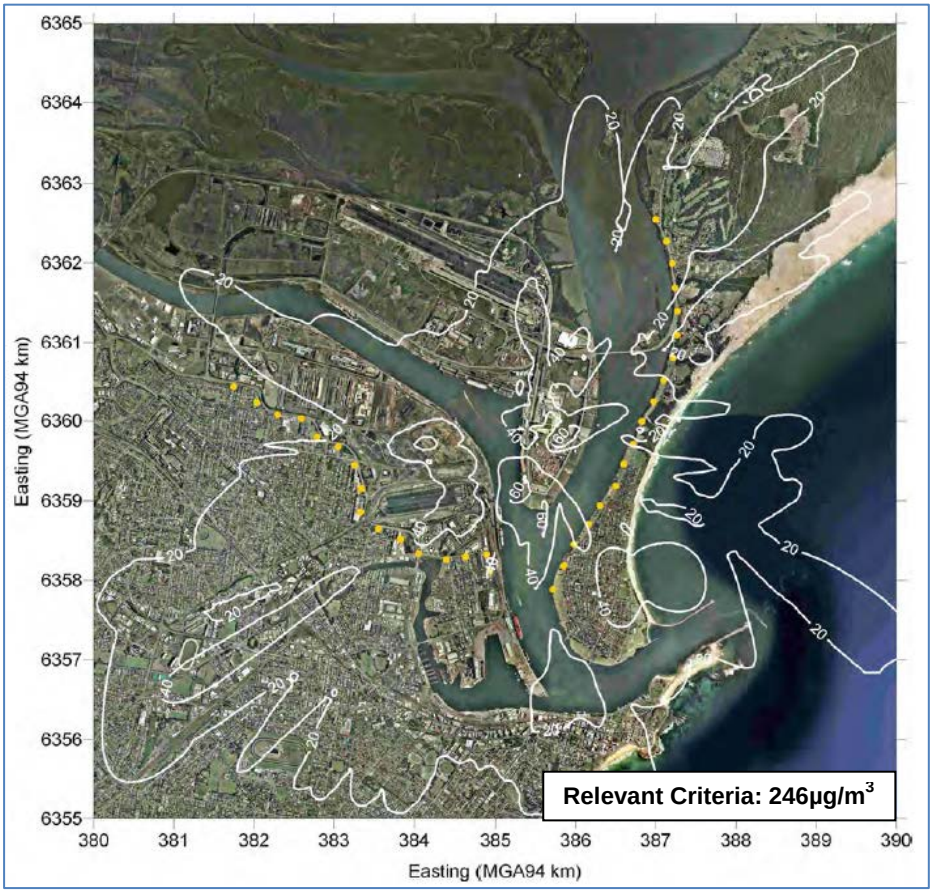


*Figure 14: Predicted Cumulative 1-Hour Average $NO_2$ (all $NO_X$ as $NO_2$) (µg/m³)*

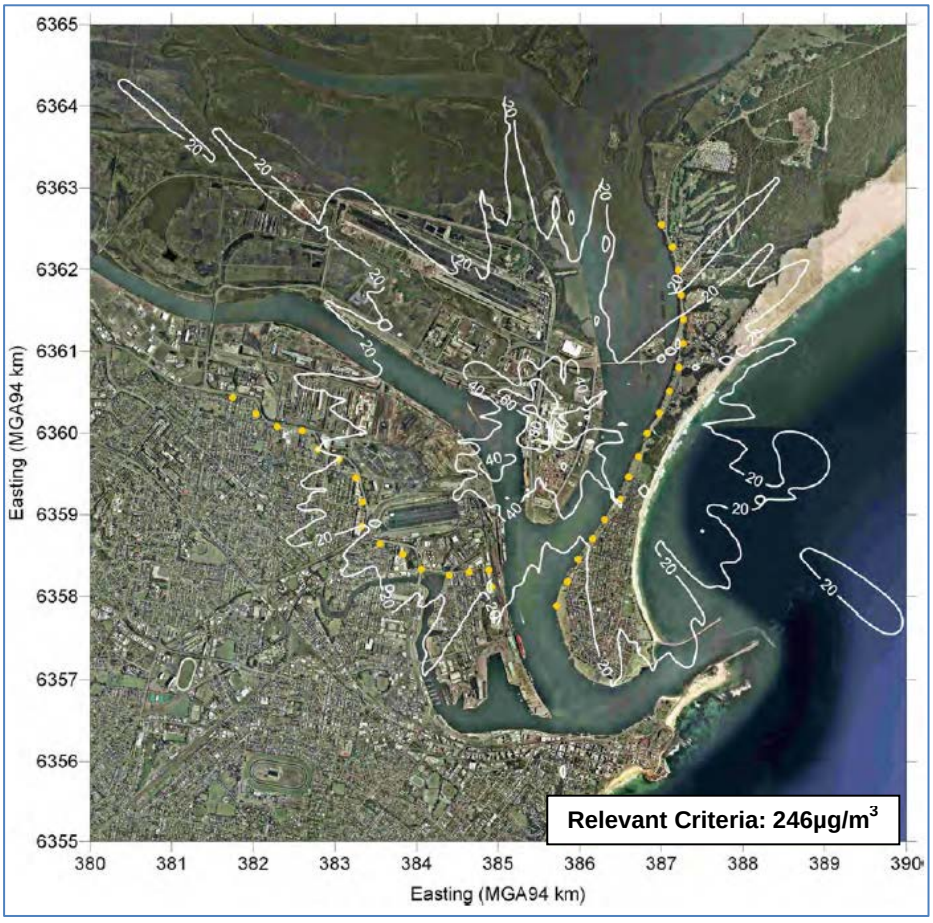


*Figure 15: Predicted Maximum Incremental 1-Hour Average $NO_2$ from Plant Start Up (all $NO_X$ as $NO_2$) (µg/m³)*

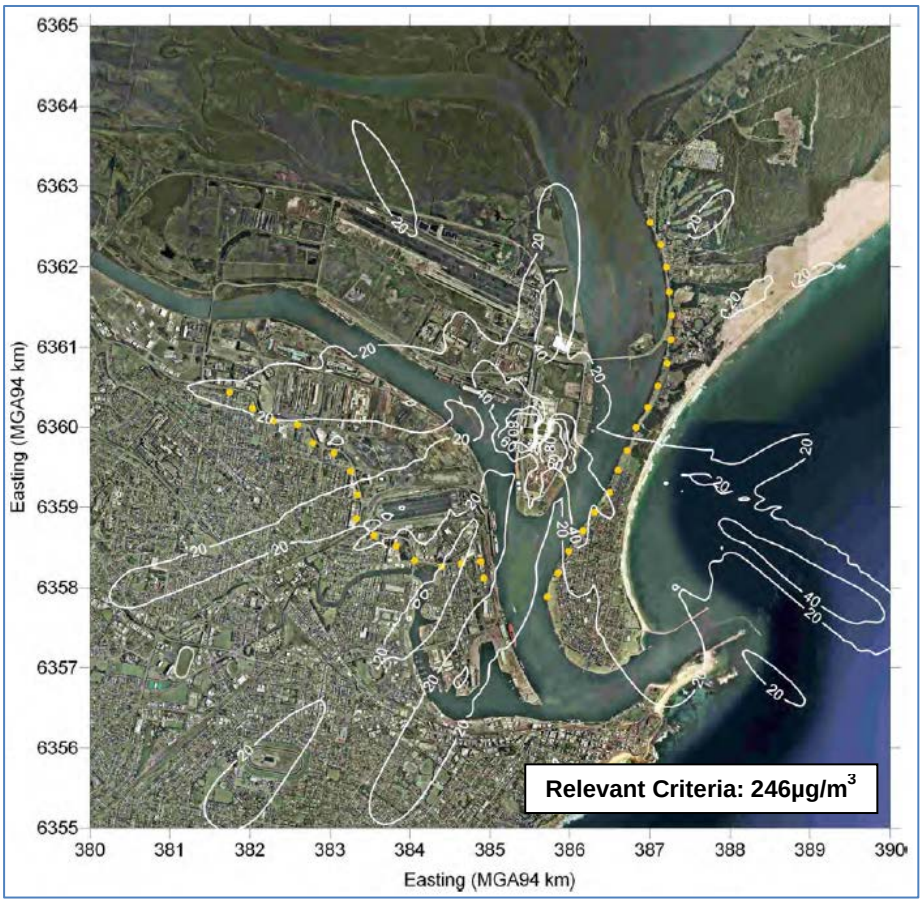


*Figure 16: Predicted Maximum Incremental 1-Hour Average $NO_2$ from Ammonia Flaring (all $NO_X$ as $NO_2$) (µg/m³)*

*Particulate Matter ($PM_{10}$ and $PM_{2.5}$)*

For $PM_{10}$, the assessment predicted that the maximum incremental short term (24-hour) and long term (Annual) average $PM_{10}$ concentrations would be 2.2µg/m³ and 0.2µg/m³ which become 33.9µg/m³ and 21.9µg/m³ when existing background levels are included. Again, the results indicate compliance with the applicable $PM_{10}$ criteria of 50 µg/m$^3$ and 30µg/m$^3$ at all surrounding receivers.

TAS noted that some recent air quality assessments have compared potential $PM_{2.5}$ impacts to advisory reporting levels. However, TAS notes that no $PM_{2.5}$ criterion has been adopted in NSW at present for assessment purposes. Notwithstanding this, TAS pointed out that in any event, since $PM_{2.5}$ is a subset of $PM_{10}$ and that incremental $PM_{10}$ predictions make such a minimal contribution (see previous paragraph), it follows that $PM_{2.5}$ emissions would also be low.

*Ammonia ($NH_3$)*

The predicted results showed that maximum ammonia ($NH_3$) emissions from the proposed facility would be approximately 1.2µg/m³ during routine plant operations but that this predicted level would increase to 52µg/m³ when flaring takes place. Both scenarios would meet the applicable criteria of 330µg/m³.

Ammonia also has the potential to cause odour and also needs to be considered. In instances where the compound in question is determined to be toxic at levels below which it is odorous (as in this case), the lower, and more stringent criterion is adopted for the purposes of the assessment. Since the more stringent health criterion of 330µg/m³ would be met, the less stringent odour criterion would also be met hence odour impacts are unlikely to cause a nuisance.

Whilst overall compliance with all relevant air impact assessment criteria is predicted, TAS noted that more recent ambient air quality monitoring data collected in the Lower Hunter (as referred to above) indicates that whilst no exceedances have yet been identified in the current dataset (the period from March to September 2013), potential exists for occasional short term elevated air pollutant levels downwind of IPL's and Orica's operations to occur in the future.

To address this potential future impact, a condition of consent is recommended which requires IPL to consult with the operators of the adjacent Orica facility, with the objective of developing an Air Quality Risk Management Strategy. The objective of this strategy would be to minimise the potential for cumulative air quality impacts from any air emissions from the two facilities, if IPL's facility does go ahead. It is expected that this would include protocols for the communication and scheduling of planned non-routine operations such as plant start-up, shutdown and commissioning events between the proposed development and the adjacent Orica facility.

A number of public submissions focussed on the anticipated deterioration of local air quality, potential cumulative impacts and the possible implications of a worst case event taking place such as a large ammonia release.

Based on the findings of the air quality impact assessment, the response to submissions and the proposed management and mitigation measures, TAS, the Department and the EPA agree that air emissions from the facility can be adequately mitigated and managed to meet relevant air quality criteria and avoid detrimental impacts on the surrounding community, including the issues raised in public submissions summarised above.

This conclusion is subject to a series of operation and emission controls being incorporated into the detailed design of the facility (including provision of an ammonia flare which would destroy more than 98% of ammonia in the event of a release). TAS and the EPA have reviewed the operation and emission controls put forward by IPL and consider them to represent current best practice.

As compliance with the air quality requirements for this facility would be dependent on the installation and efficient operation of these measures, conditions are recommended in the draft development consent to ensure that these measures are implemented prior to the commencement of operation of the facility.

Conclusion

In conclusion, during the construction period, dust impacts would be relatively low and able to be managed through the implementation of standard management and mitigation measures and the imposition of recommended conditions, as set out below.

Based on both the advice of TAS and the EPA, the Department concludes that the operational air quality modelling predictions adequately demonstrate that all relevant air quality impact assessment criteria for the key pollutants ($PM_{10}$, $NH_3$ and $NO_2$) would be complied with at all times at all surrounding receivers during normal, steady state operations, as well as during non-routine plant start-up and ammonia flaring events even when air emissions from the adjacent Orica facility and other proposed developments in the area are taken into account. Further, the capacity of the existing air shed would not be constrained as a result of the proposed development.

Nonetheless, TAS has made a series of recommendations most of which are consistent with the Department's recommended conditions for air quality, which have been incorporated into the recommended conditions of consent, and require IPL to:

- carry out an Air Quality Verification Study to validate the accuracy of the modelling predictions in the EIS once the facility becomes operational;
- implement all reasonable and feasible air quality mitigation measures to minimise the potential risks to adverse air quality in the regional air shed;
- prepare and implement an Air Quality Management Plan, which describes how the air quality impacts of the proposed development will be minimised during any adverse meteorological conditions or extraordinary events and identifies high emission generating construction and operational activities, including proposed times when these works will be carried out (including respite periods if required) and mitigation measures to minimise adverse impacts from these activities;
- consult with the operators of the adjacent Orica facility with the objective of developing an Air Quality Risk Management Strategy; and
- publicly report all air quality results monitoring results, and effectively respond to enquiries and complaints.

The EPA has recommended a series of air concentration limits, regular stack monitoring of sources on-site and ambient air quality monitoring in representative locations in the Stockton and Mayfield areas. These requirements would be included as additional conditions in the varied EPL for the premises.

The Department concludes that subject to the imposition of these recommended conditions in the development consent together with the additional licence conditions to be imposed by the EPA in the amended EPL (as per the previous paragraph), all air emissions from the proposed development would be adequately mitigated, minimised and managed to acceptable levels ensuring the amenity and health of surrounding communities would be safeguarded.

### 5.3 Noise and Vibration

The EIS included a specialist noise and vibration impact assessment carried out by URS (see Appendix F of the EIS).

As set out in Section 1.1 and shown in Figure 1, the nearest surrounding sensitive receivers are located in the residential area of Stockton, 800m to the south east of the site. The next nearest sensitive receivers are located in Carrington, 1.5km to the south and Mayfield, 2 kilometres to the south west. Fern Bay lies 2km to the north east.

Potential noise emissions were modelled at the most exposed receivers taking into account prevailing meteorological conditions for day, evening and night-time periods (including temperature inversions since they are known to be a feature of the area). The resultant predictions were compared against applicable INP criteria to determine the magnitude of potential noise impacts and to inform the development of measures to minimise, mitigate and manage these impacts.

The Department and the EPA accepted the methods used to calculate the relevant statistical noise levels, including the meteorological conditions that were adopted for noise modelling.

Construction Noise

Construction of the new facility is proposed to be carried out during standard daytime hours, being 7am to 6pm, Monday to Friday, 8am to 1pm on Saturdays with no works on Sundays or public holidays.

The construction noise assessment was found by the Department to be sufficiently conservative and represents worst-case, maximum impact scenarios, whereas in actuality, the duration of work and intensities of noise would probably be shorter and less intense. Overall, the potential construction noise impacts are unlikely to have a major impact on surrounding sensitive receivers since relevant ICNG noise management levels are predicted to be complied with at all times.

Conditions are recommended to restrict construction hours to standard daytime hours (unless works are inaudible or there are exceptional circumstances that warrant out of hours work) and to require the Applicant to prepare and implement a Noise and Vibration Management Plan as part of a wider Construction Environmental Management Plan for the proposed development. The plan would include identifying high noise generating construction activities, including proposed times when these works would be carried out (including respite periods if required) and mitigation measures to minimise adverse impacts from these activities, including those committed to by the Applicant in the EIS.

With these measures in place, the Department and EPA noise generated during construction of the facility would not adversely affect existing residential amenity.

Construction Vibration

The assessment calculated the predicted peak particle velocities (PPV) for a number of percussive and vibratory piling methods at varying distances from the site. The piling method to be adopted would be selected to minimise potential vibration effects which would likely be the adoption of vibratory or rotary piling techniques.

Piling has the highest potential to generate vibration levels, however given the nearest residential receiver is located some 800 metres away across the Hunter River, vibration risk to these receivers would be negligible.

The distance from the piling areas and the boundary of the nearest industrial neighbour (Orica) is about 80m. However, the assessment considers that the nature of the intervening ground is such that the transmission of vibration would be readily absorbed and that vibration impacts are not expected to cause annoyance or damage to Orica so long as an appropriate piling method is selected and used.

IPL has committed to implementing a series of appropriate vibration management and mitigation measures if required once the final piling method has been selected based on *Assessing Vibration: A Technical Guideline* (DEC, 2006). This approach is considered reasonable to the Department and would be required to be addressed as part of the Vibration component of the Construction Environmental Management Plan, as referred to in the previous section.

Road Traffic Noise

The traffic routes to be utilised by the project are classified as sub-arterial and arterial roads. Assessment goals of 60dB(A) (LAeq, period) and 55dB(A) (LAeq, period) have been applied to assess future road traffic noise from the development in accordance with the NSW RNP, which also requires any increase in total traffic noise to be limited to 2dB above corresponding road traffic noise levels, due to traffic growth, that would otherwise have occurred without the development.

Based on identified light and heavy vehicle movements associated with the construction and operation of the proposed development, road traffic noise levels would not increase by more than 2dB and therefore they would meet the requirements of the NSW RNP. It is also noted that an increase in road traffic noise of this magnitude is typically imperceptible to most people.

Operational Noise

The AN facility is proposed to operate 24 hours, 7 days a week. IPL's existing operation, Orica's adjacent AN facility and other developments within the Port are permitted to operate on this basis.

Ambient background noise measurements were made at four locations, two of which are representative of the potentially most affected sensitive receivers in Stockton: Receiver 1 (R1) is located at Corroba Oval Sports Ground opposite residences on Meredith Street and Receiver 2 (R2) is located at a group of residences at 320 – 324 Fullerton Street. Receivers 3 and 4 (R3 and R4) are located on Kooragang Island to the east of IPL's proposed facility (see Figure 17).


*Figure 17: Receiver Locations*

*Development of Noise Criteria*

The noise impact assessment in the EIS estimated existing night time noise levels in Stockton to be 46dBA LAeq at Location R1 and 47dBA LAeq at Location R2 but acknowledged that these results were obtained at a time when Orica's adjacent facility was operating at reduced capacity, which Orica has since confirmed was the case. As such, the EPA did not consider these reported levels to be an accurate reflection of night time noise levels in Stockton.

The EPA reviewed noise data presented in recent noise assessments including monitoring data undertaken by Orica. Based on this analysis, the EPA concluded that current background industrial noise levels in the area are at around 50dB(A).

Where there are multiple industrial noise sources in close proximity to one another, the INP amenity criteria is often used to cap the cumulative noise from industry. The setting of appropriate amenity criteria for a new, incoming industrial noise source such as IPL is influenced by existing and future noise levels from other existing or approved industrial noise sources and is developed to ensure it receives an equitable share of the remaining available allocation of amenity-related noise.

In particular, Table 2.2 of the INP provides the methodology on how to develop amenity criteria in this manner to account for cumulative noise levels from existing industrial noise sources whilst still protecting an acceptable noise level of an area. Accounting for the fact that the existing industrial night time noise level was thought to be 50dB(A), the EPA applied a night-time amenity criteria of 40dB(A) (and 41dB(A) for the day and evening periods). This was considered by the EPA to be an appropriate objective for the development proposal based on the *existing noise level minus 10dBA* approach (see Table 2.2 of the INP).

The Department agrees that imposing EPA recommended amenity criteria is appropriate in this case given the multitude of industrial noise sources being generated by the various heavy-industrial and Port related activities in the area and has incorporated these criteria into its recommended conditions of consent.

Several existing and proposed industrial and port operations on Kooragang Island have the potential to generate noise emissions, including Orica's adjacent facility, Port Waratah Coal Services (PWCS), and Newcastle Coal Infrastructure Group (NCIG). The location of Stockton directly across the north arm of the Hunter River means that of all the industrial noise emitters in the general vicinity, it is the adjacent Orica facility which has the most influence on existing noise levels in Stockton by a considerable margin.

Given that all existing industrial noise sources, including the Orica facility have been taken into account in the development of the cumulative amenity criteria as set out above, and that these criteria can be met at the Stockton receiver locations, as predicted, no cumulative operational noise increase would be expected to occur as a result of the proposed development.

*Modelling Results*

IPL has modelled the potential noise sources that would be generated by the various components of plant and equipment that would be used at the facility in accordance with the NSW INP. Taking into account all reasonable and feasible management and mitigation measures proposed to be incorporated into the detailed design of the new facility, noise modelling predictions indicate that the recommended amenity criteria of 40dB(A) at night could be met even during adverse, worst case meteorological conditions at all surrounding receivers (see Figure 18).

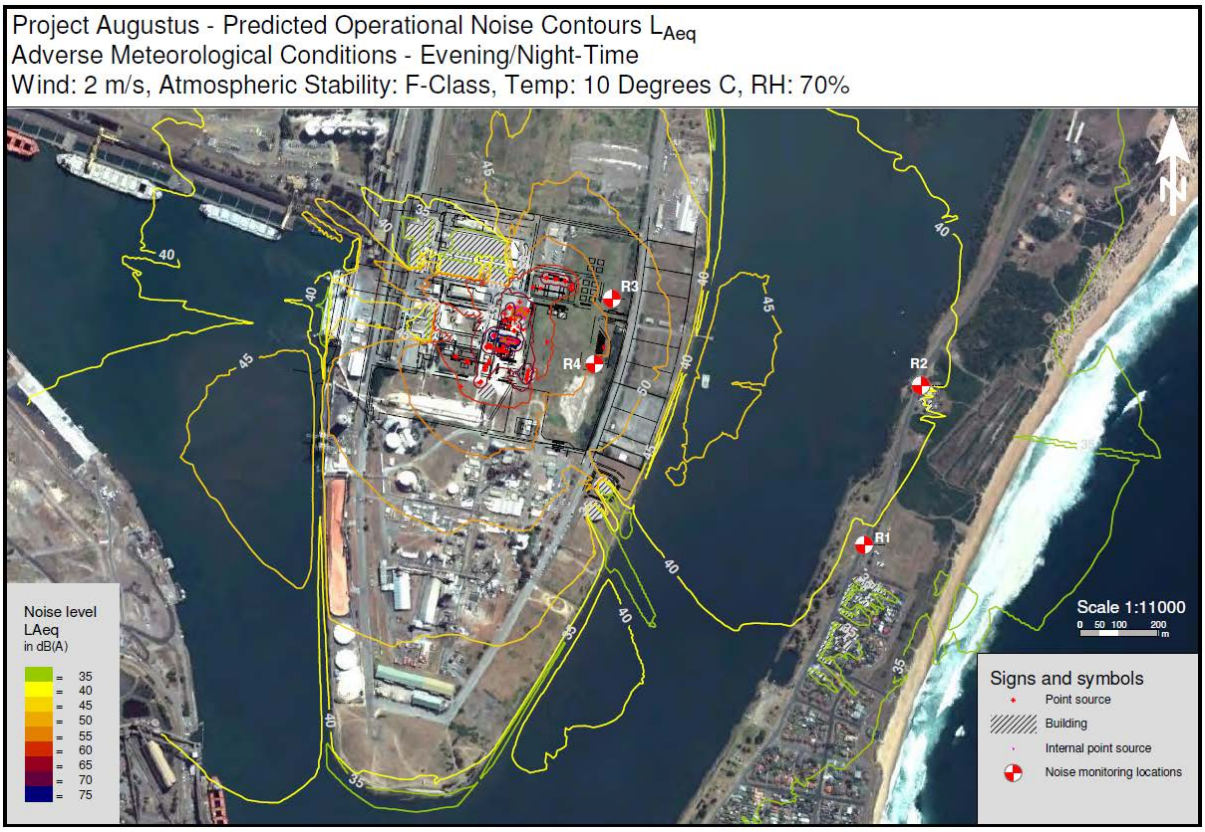


*Figure 18: Worst-case predicted operational noise contours (dB(A) LAeq)*

*Ports Precinct*

The Port of Newcastle is of strategic economic importance to the State and as such it is important that the future development and operation of the port precinct is not compromised. Currently, noise impacts in the ports area are assessed and managed on a case by case basis. Regulation using this approach is difficult to achieve as it is almost impossible to identify the source of any noise exceedance. Options to more effectively manage noise from the ports precinct as a whole are currently being considered, including initiatives to assess and maximise development by adopting a "whole of port approach" similar to the noise mapping conditions which were developed and are currently being implemented on the Mayfield development site.

This approach, if the decision were made to expand it to include the greater Newcastle Port, would allow a strategic approach to port planning, as well as having an ability to test different scenarios to maximise port development without compromising the amenity of adjoining residential areas. Whilst the Department has developed recommended conditions to manage noise contributions from the proposed development, it is recognised that there could be long term benefits for the port operator in adopting a more holistic approach. To this end, a recommended condition is included which would require the participation of the Applicant in the development of any such noise map/model.

*Noise Monitoring and Verification*

Over recent years, there has been a considerable amount of noise data collected showing uncharacteristically high background noise levels in Stockton. The Department considers there to be the potential for a high margin of error associated with the data collected because whilst the data generally contains industrial noise, it may also contain extraneous noise, particularly from traffic on Fullerton Street, insects, birds, surf and wind.

Further, there are certain weather conditions that are known to be a feature of the area, predominantly in the form of temperature inversions (particularly on cold, cloudless nights with little or no wind) which can also affect noise level measurements in Stockton.

To reduce this margin of error, it is recommended that the existing background noise monitoring sites in Stockton (R1 and R2) be retained in the longer term and that additional data continue to be collected from R3 and R4 on Kooragang Island. The monitoring data collected from the monitors on

Kooragang Island can then be extrapolated to the R1 and R2 Stockton locations which would provide for more accurate compliance measurements to be taken.

The Department and the EPA agree that this approach would be an effective method of gaining more meaningful and accurate noise monitoring data from IPL's operations. It is also noted that this method of noise monitoring has been successfully implemented since 2010 at Orica's adjacent facility to the south.

Conclusion

The Department concludes that potential construction noise and vibration impacts would have a negligible impact on surrounding receivers. Conditions of consent are recommended to limit construction activities to daytime hours only (subject to exemptions in certain circumstances) and for a Construction Noise Management Plan to be prepared and implemented during the construction phase.

Once the facility becomes operational, the level of noise currently experienced by sensitive receivers in the surrounding communities of Stockton, Fern Bay and Mayfield would not significantly increase as a result of the development provided the Department's recommended conditions are imposed, requiring IPL to:

- comply with contemporary operational noise criteria designed to protect existing amenity;
- implement all reasonable and feasible noise mitigation measures to prevent and minimise noise impacts and set out the procedures for implementing additional noise mitigation measures for the development in response to any exceedance/s of the applicable criteria and/or noise complaints;
- prepare and implement a noise management plan, which incorporates a noise monitoring program for reporting ongoing compliance and evaluating the performance of the development and verifies that noise levels from the development are consistent with or lower than the predictions made in the EIS;
- investigate the opportunity to carry out collaborative noise monitoring with the adjacent Orica facility with the aim of gaining more accurate and meaningful data;
- develop a protocol for determining exceedence/s of the relevant conditions of the consent and responding to complaints;
- publicly report all noise monitoring results, and effectively respond to enquiries and complaints; and
- participate in the development and implementation of a noise map / model if one is developed for the Port of Newcastle.

Subject to the imposition of these recommended conditions, potential noise impacts are likely to be adequately minimised and managed to within acceptable levels and would avoid having a detrimental impact on surrounding communities.

### 5.4 Transport

The EIS included a specialist transport assessment carried out by URS (see Appendix J of the EIS).

Site Access

Vehicular access to IPL's existing operation is currently provided via an existing site entrance off Heron Road. This entrance would be used by construction vehicles and personnel to provide access to the construction work areas whilst a new entrance off Greenleaf Road is being built.

Once this new entrance has been built, it would provide direct access to the construction work areas by plant and equipment. Construction personnel would continue to use the Heron Road entrance. IPL proposes to retain the Greenleaf Road entrance, construct a single storey gatehouse, security gates and a new weighbridge and use this entrance as the main access to the new facility.

This new connection to Greenleaf Road (and the construction of new ammonia and effluent pipelines over Heron Road) would require NPC's approval since both of these roads are unclassified and owned and managed by NPC. IPL would obtain the necessary approval for these works from NPC, as the private owner of the road.

Recommended conditions of consent have been included to ensure that the new entrance, as well as all internal roads and parking areas are constructed and maintained in accordance with relevant

Australian Standards and that the swept path of the longest vehicle entering and exiting the site from Greenleaf Road, as well as manoeuvrability through the site, is in accordance with *AUSTROADS – Guide to Road Design*.

Road Traffic

Heron Road and Greenleaf Road run in a north-south direction and join Teal Street about 1km to the north. Teal Street transects Kooragang Island in an east-west direction and forms part of a main transport corridor connecting the Island to the southern section of the Port, Newcastle CBD and the wider road network in Newcastle and NSW via Cormorant Road and Tourle Street Bridge.

In the opposite direction, Teal Street joins Nelson Bay Road, which crosses the north arm of the Hunter River over Stockton Bridge, providing access to Newcastle Airport, the communities of Fern Bay, Stockton and Port Stephens LGA.

The number of construction workers required on site would peak at around 340 during the second stage of the construction program. IPL plans to utilise 80 of the 170 or so existing parking spaces on site to accommodate some of these workers. The remainder of the construction workforce would arrive and depart from the site daily in up to 20 buses using an IPL operated park and ride service.

IPL has made a commitment to include final details of the park and ride service including on and off site pick-up, drop-off and parking locations, timing schedule/s and designated bus transport routes in a Traffic Management Plan, which has been incorporated into the recommended conditions of consent.

The remainder of construction traffic movements would be generated by heavy vehicles (e.g. oversize loads), trucks and light vehicles. These movements would be at their highest during the second stage of construction when up to 4 heavy vehicles, 30 trucks and 80 light vehicles would be arriving and departing from the site each day. These movements, when added to the 20 buses used to operate the park and ride bus service, equates to an additional 134 vehicles using the existing road network each day at the peak of construction.

Once the facility becomes operational, it is predicted that on weekdays, on-site staff would generate around 50 light vehicle movements to and from the new facility per day on average. Between 45 and 80 heavy vehicle movements would be generated each day primarily as a result of AN product distribution to IPL's Warkworth facility and its Hunter Valley customer base and, to a lesser extent, by ammonia distribution (see Section 2.1). These traffic movements would reduce quite considerably during the weekends.

The transport assessment found that when these additional traffic movements are added to existing and forecasted AM and PM peak traffic volumes (which includes the existing operation), there would be limited resultant impacts on current mid-blocks and intersections such that the existing level of service (LOS) of existing roads and key intersections would remain unchanged. As such, the local highway network would not require the provision of any specific mitigation measures to be implemented directly as a result of the project. It was also found that operational staff would predominantly arrive between 05:30 and 07:00 and leave between 16:00 and 17:00 which would not coincide directly with the morning and afternoon peak periods.

The Department also notes that when additional traffic volumes generated by other development proposals in the vicinity of the site are taken into account, including PWCS's proposed new coal terminal (T4) on Kooragang Island, the additional traffic volumes generated are not large enough to change the current LOS of the road infrastructure.

The Department's assessment also found that the lowest performing road is Cormorant Road and Tourle Street with an LOS of 'F'. It is however understood that RM has received NSW Government funding to upgrade this transport corridor and duplicate Tourle Street Bridge to improve traffic flow and to cater for a predicted increase in traffic movements generated by future urban development in Port Stephens, the expansion of Newcastle Airport and the growth of industrial development on Kooragang Island such as IPL's project and PWCS's

A number of submissions from special interest groups and members of the public raised concerns about the potential road traffic impacts of the development. However, for the reasons set out above, the project would make only a minor contribution to existing traffic volumes in this area of Newcastle and that conditions will improve in time once RM's planned upgrades have been completed.

Car Parking

There are currently 160 parking spaces in the site's main car park. In addition, there are ancillary car parks with capacity for an additional 10 cars and two covered areas which can accommodate 15 motorbikes or push bikes. These parking areas are currently underutilised as existing parking demand is for 25 cars and 3 motorbikes.

In its submission, Council requested that IPL provide onsite parking for cars, bikes and motorbikes for the new facility in accordance with the rates set out in Council's DCP and relevant Australian Standards.

In the RTS, IPL clarified that there is no planned change to the capacity of any of these light vehicle parking areas and that the design of the proposed facility has incorporated B-Double truck parking on site. As such, existing and proposed parking provision conform to the rates in Council's DCP during both construction and operation.

Sea Traffic

During construction, there would be 9 shipments of different sized, pre-fabricated plant modules which would be delivered to the Port's western basin berths and barged to the CTB wharf on Greenleaf Road where these modules would be received and transferred to the site either by SPMT's, hydraulic vehicles and flat or low bed trucks.

Once operational, 8 shipments of ammonia would be required for use in the facility each year, which would be received at Kooragang 2.5 Berth and pumped into the ammonia tank for use in the new facility.

RM (Maritime) did not raise any issues with the project. NPC were generally supportive subject to an agreement being reached regarding the use of NPC owned land for IPL's proposed construction, operational and maintenance activities. IPL made a commitment to enter into an agreement with NPC which the Department has incorporated as a requirement in the recommended conditions of consent.

There are currently more than 4,600 ship movements in the Port each year so the additional shipping movements generated by IPL are considered negligible.

Conclusion

Overall, the Department, RM and Council raised no issues with the findings of the transport assessment and do not consider that the project would have a major impact on the safety and efficiency of the surrounding road network. A series of conditions have been recommended, which incorporate RM and Council recommendations, and ensure that:

- all proposed road related infrastructure including the site entrance, internal roads, driveways and parking areas comply with relevant Australian Standards and the requirements of RM and Council;
- IPL to comply with a series of transport operating conditions on and around the site;
- parking is provided on site for light vehicles, heavy vehicles, motorbikes and push bikes in accordance with the rates set out in Newcastle DCP; and
- IPL prepares and implements a Traffic Management Plan in consultation with RM and Council which includes final details of the park and ride facility, a Driver Code of Conduct, a Vehicle Movement Plan (including RM nominated heavy vehicle routes) and a Traffic Control Plan.

### 5.5 Soil and Water

The EIS included a soil and groundwater assessment and a specialist assessment of surface water, flooding and wastewater issues carried out by URS (see Appendix H of the EIS).

Contamination

Given that the site has been used for industrial purposes since the early 1960s, a program of soil and groundwater sampling was undertaken to identify areas of existing contamination.

Soil sampling revealed some limited contamination from Total Petroleum Hydrocarbons (TPHs), Polycyclic Aromatic Hydrocarbons (PAHs) and ammonia; however all but one of these samples was

recorded as being below relevant soil investigation levels for commercial and industrial land uses. Some samples also indicated the presence of Acid Sulphate Soils (ASS) in certain locations.

Groundwater sampling revealed the presence of several contaminants including TPHs, PAHs, Benzene, Toluene, ethylbenzene and xylenes (BTEX), nutrients, ammonia, nitrogen and heavy metals. The levels of some contaminants, including ammonia, nitrogen and heavy metals were also slightly elevated and were recorded as being above the relevant criteria.

Notwithstanding, the assessment concluded that provided these contaminants are carefully managed during the construction phase, the eastern portion of the site is suitable for continuing industrial use in the future without the need for remediation.

During construction, as excavation, earth moving and other activities take place, contaminated material could be disturbed, which could have an adverse environmental impact on other soil and water resources. To minimise potential contaminant release from soil, the depth of excavation would be minimised where possible to reduce soil disturbance. Soils requiring excavation would be stockpiled, tested for contaminants and odour and if found to be contaminated, would be appropriately classified and sent to a licensed facility for disposal.

Groundwater is present at a depth of between 1 to 3m and, if encountered, would be dewatering and tested. Any groundwater found to be contaminated would be treated on site or stored and classified before being transported off site by a licensed contractor for appropriate treatment and disposal.

During construction, IPL has committed to preparing and implementing an Acid Sulphate Soil Management Plan, a Soil and Erosion Management Plan and a Groundwater Management Plan in accordance with applicable policies and guidelines, which would be incorporated into the Construction Environmental Management Plan for the new facility.

The intended methods for handling and disposing of contaminated soil and groundwater during construction set out in the EIS (as summarised above) are considered by the Department to represent current best industry practice.

Once operational, the new facility would incorporate stormwater and wastewater management systems (see following sub sections). All chemicals to be used by the facility would be stored in sealed areas with appropriate bunding designed to comply with relevant Australian Standards. Further, all equipment and infrastructure at risk of leaking would be regularly inspected, maintained and if necessary, repaired in accordance with a series of protocols which would be documented in an Operational Environment Management Plan for the site.

NOW did not raise any issues of concern but requested that IPL's groundwater monitoring network incorporate some of Orica's existing groundwater wells into its proposed Groundwater Management Plan and that clean dewatered groundwater is reinjected into the aquifer. NOW also noted that separate approval/s under the *Water Act 1912* may need to be obtained for some of the works.

Taking NOW's comments into account, as well as IPL's proposed management and mitigation measures, the Department has recommended a series of draft conditions for inclusion in the consent. These require IPL to:

- implement suitable erosion and sediment controls during construction in accordance with relevant policies and guidelines and best practice industry standards;
- obtain all necessary water related approvals from NOW in the event that groundwater is likely to be intercepted or extracted during construction;
- ensure that any reinjection of groundwater dewatered during construction is conducted in accordance with the relevant provisions of the POEO Act.
- store all chemicals in appropriately bunded areas in accordance with relevant Australian Standards; and
- prepare and implement a Contamination Management Plan and an Acid Sulphate Soil Management Plan in consultation with the EPA and Council to be incorporated into a wider Construction Environmental Management Plan for the project.

<u>Stormwater</u>

The stormwater management system for the existing operation would be maintained in the western portion of the site. A new stormwater management system would be incorporated into the design of the new facility, which would comprise of three areas (see Table 7).

*Table 7: Summary of Proposed Stormwater System*

| Area | Summary |
|---|---|
| **Contaminated Areas** | These areas would include operational process areas, product loading areas and other areas vulnerable to chemical spills and would be either roofed or bunded and designed to contain up to a 1 in 10 year (ARI) rainfall event. Bunded areas would be fitted with sumps to enable dirty water to be pumped to a dedicated on-site wastewater treatment system. |
| **First Flush Areas** | These areas would include new plant areas with moderate contamination potential and would be flushed of the first 10mm of stormwater run-off and directed to a flush retention pond for testing. If found to meet relevant EPL discharge limits, this water would be released off-site or re-used in the cooling system but if found to be contaminated, it would be directed to the waste water treatment system. |
| **Clean Areas** | These areas include roofed and parking areas and would be designed to be physically separated from contaminated areas by kerbing, grading to drains etc. Run-off from these areas would be collected in a contaminated water collection pond to the east of the site (see Figure 4) for re-use on site or direct discharge by pipe to the north arm of the Hunter River via an existing drain on Greenleaf Road. |

Neither the EPA nor Council raised any issues of concern with the proposed stormwater management system. Council did however request that rainwater tanks be incorporated into the design of the new facility to substitute toilet water and that where possible, rainwater and stormwater should be beneficially re-used in the industrial processes that would take place at the facility. In the RTS, IPL made a commitment to capture and reuse stormwater in this manner and to undertake a cost benefit analysis into the feasibility of reusing stormwater during chemical manufacturing processes that would take place at the facility.

The Department has formalised these and other water-related commitments into the recommended conditions, primarily through a requirement for IPL to prepare and implement a Water Management Plan in consultation with relevant Government agencies, which would include a Surface Water Management Plan.

Wastewater

Around 750KL of wastewater would be generated each day by a number of different streams associated with the AN manufacturing process. This process water, together with any other contaminated water, would be treated as wastewater and directed to the proposed wastewater treatment system.

Wastewater received would be treated and tested and, if found to meet relevant EPL limits, would be discharged to the south arm of the Hunter River. Wastewater and separated oil that exceed those limits would be stored on site in drums/tanks and disposed of at a licensed facility off-site.

Council and the EPA initially raised concerns about the potential impact that wastewater discharges could have on existing water quality in the Hunter River. The EPA requested that a water sampling program be conducted to verify baseline water quality in the river and that wastewater discharge from the site be modelled to understand potential water quality impacts downstream in more detail. IPL agreed to the EPA's request and carried out two further studies which was submitted to the Department and the EPA and formed part of the RTS.

The EPA generally agreed with the outcomes of these studies and were able to subsequently recommended a series of discharge limits and monitoring points which would be incorporated as conditions in the amended EPL for the premises to ensure that water discharged off-site does not have an adverse impact on the quality of receiving waters.

Flooding

Based on Council's *Newcastle City-wide Floodplain Risk Management Study and Plan 2012* and the *NSW Floodplain Development Manual*, the flooding assessment found that the majority of the site is classified as a flood fringe area, with the exception of a westerly strip of land that is classified as flood storage.

To mitigate potential flooding impacts, a pavement design level of 3.5 metres AHD was adopted which provides at least 1.2 metres of freeboard above the 1 in 100 year ARI level (2.3 metres AHD) allowing for climate change and 100mm freeboard above the most extreme PMF flood level estimate (3.4 metres AHD).

Council was comfortable with the level of assessment undertaken by IPL and the recommended design controls and advised that there would be long warning times for both river and ocean flood events which should provide adequate time to evacuate the site.

Water Supply/Use

Potable water demand would increase from what is currently used on site from 0.001 ML to 4.3 ML a day. The majority of this water would be used as process water during the AN manufacturing process and equates to approximately 2.49% of water supplied to the Hunter region per day (179 ML a day at 2011/12).

Given the significant increase in water use from the new facility, a number of measures to reduce water demand and promote its re-use were included in the design (e.g. a recycling process condensate in the absorption tower and re-use of boiler water in the cooling tower). Through the Department's recommended conditions, IPL would be required to prepare and implement a Water Efficiency Plan to identify additional options to further reduce potable water use and to maximise the recycling and/or re-use of process water at the facility, particularly in the cooling towers.

An underground water main currently supplies water to the existing operation which would need to be upgraded to service the extra water required by the new facility. Conditions have been recommended in consultation with HWC which requires IPL to provide the necessary water supply infrastructure upgrade works necessary to adequately service the existing operation and the new facility once it becomes operational.

Overall, subject to the imposition of a series of conditions recommended by Council, NOW and the EPA, existing contaminants present in soil and water and onsite stormwater and wastewater generated by operational processes can be satisfactorily managed to meet relevant standards and criteria, that there is an adequate supply of potable water available to operate the facility and that the future risk of flooding is minimal.

The Department's conditions which have been recommended for inclusion in the development consent are comprised of those listed above which address potential contamination impacts, water supply and flooding issues, together with the following conditions, which requires IPL to:

- comply with Section 120 of the POEO Act*,* which prohibits the pollution of waters, except as expressly provided for in an EPL;
- ensure that the pavement level for the proposed development is 3.5 metres AHD or greater to account for potential flood events; and
- prepare and implement a Water Management Plan for the development in consultation with EPA, Council and NOW which includes a Surface Water Management Plan, a Waste Water Management Plan and a Groundwater Management Plan;
- prepare and implement a Flood Evacuation Management Plan for the development in consultation with Council; and
- incorporate these management plans into broader Environmental Management Plans to cover the construction and operational phases of the development.

### 5.6 Visual

The EIS included a specialist visual impact assessment carried out by Green Bean Design (see Appendix K of the EIS).

The facility would introduce a series of industrial structures such as towers, stacks and columns and large-scale storage tanks, plant, buildings and other associated plants and infrastructure. Some of these structures would, to varying degrees, be visible from a number of locations surrounding the site, particularly from the nearest view location of Stockton.

A visual assessment matrix was used to assess the visual significance of these proposed structures from 13 representative viewpoints. To supplement this assessment, the main structures were modelled and incorporated into a series of photomontages to compare and contrast pre and post development views to the site from 4 key viewpoints in Stockton for day and night-time periods (see Figures 19 to 21).


Photo Location W6 - Existing view west from Fullerton Street, Stockton


Photo Location W6 - Proposed view west from Fullerton Street, Stockton


*Figure 19: Proposed View West from Fullerton Street, Stockton*

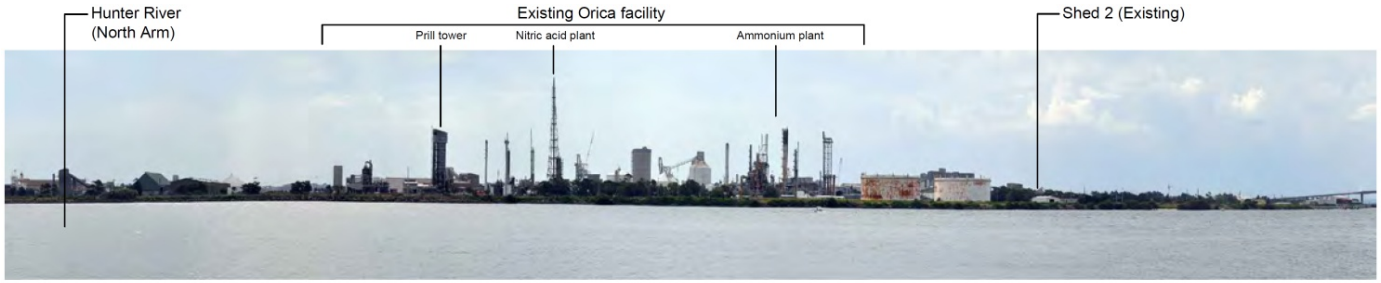


Photo Location W7 - Existing view west from boat ramp (west of Fullerton Street and Booth Street intersection), Stockton


Photo Location W7 - Proposed view west from boat ramp (west of Fullerton Street and Booth Street intersection), Stockton


*Figure 20: Proposed Day View West from Boat Ramp (West of Fullerton Street and Booth Street intersection) Stockton*

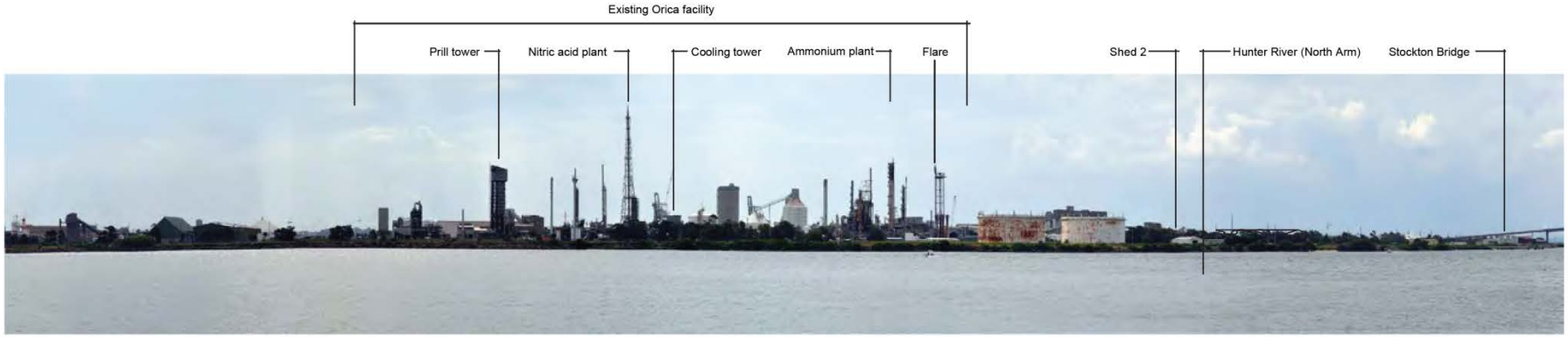


Photo Location W7 - Existing view west from boat ramp, Fullerton Road (Distance to proposed site approximately 800m)

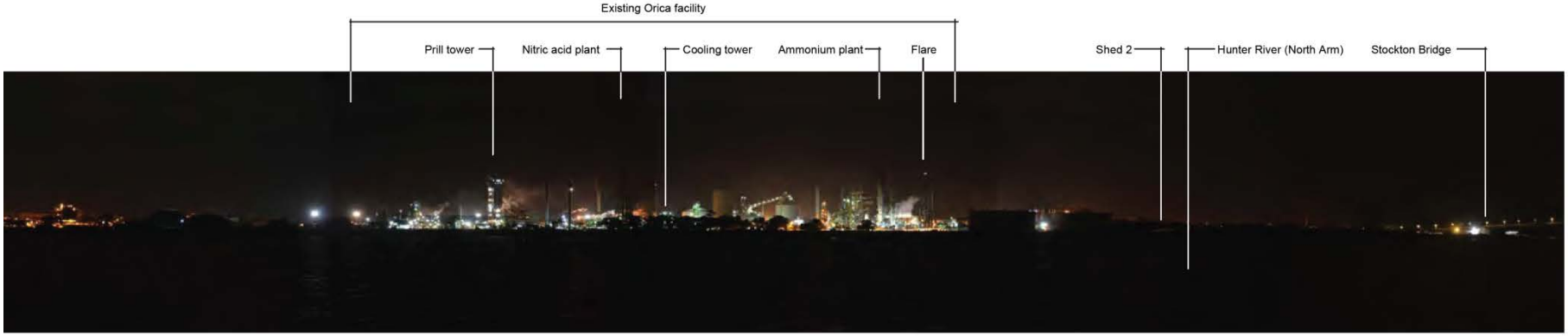


Photo Location W7 - Existing night time view west from boat ramp, Fullerton Road (Distance to proposed site approximately 800m)


*Figure 21: Proposed Night View West from Boat Ramp (West of Fullerton Street and Booth Street intersection), Stockton*

Overall, the visual impact assessment concluded that the introduction of the new facility into the existing visual landscape and industrial context of Kooragang Island would be of low visual significance for the majority of people living or travelling through the area surrounding the site and from public open spaces as well as recreational users of the Hunter River.

This conclusion was supported by the following main reasons:

- The site is located within the context of other existing heavy industrial and port related land uses which are similar in form and function to the proposed facility (such as Orica) so the resulting visual magnitude would therefore be low (see Figures 19 & 20);
- the location and extent of existing IPL and other industrial infrastructure on, and surrounding Kooragang Island means that there is high visual absorption capacity which means that the existing visual landscape is capable of accommodating further industrial infrastructure;
- existing mature tree planting surrounding IPL's site on Heron Road and Greenleaf Road, coupled with existing IPL and other industrial infrastructure on Kooragang Island, would continue to perform a screening and visual filtering function to some of the lower portions of the additional structures proposed on the site;
- there are no important views toward the site from surrounding dedicated public lookouts. Distant pubic vantage points including Fort Scratchley and foreshore areas adjoining the Newcastle CBD would not be significantly impacted by the proposal;
- the prill tower and NA absorber, which are the tallest structures proposed (at 63 and 51 metres respectively) would be visible from a number of surrounding residential properties and surrounding local roads and are would also be visible above the skyline from some surrounding viewpoints. However, given the generally narrow profile of these proposed structures and taking into account IPL's proposed mitigation measures (below), it is unlikely that these proposed structures would have a major visual effect;
- distant views (in excess of 3km) toward the proposed facility are more likely to be influenced by atmospheric conditions such as dust and moisture in the atmosphere between the proposed facility and the background against which it would be viewed;
- night lighting would be visible but only in the context and extent of existing night lighting at the adjoining Orica facility and more broadly from other development in the Port. As such, this lighting is not expected to significantly alter the existing night time lighting environment (see Figure 21); and
- the use of dark colours and non-reflective materials would help to minimise the potential for visual contrast between the development proposal and surrounding landscape when viewed from some view locations beyond the site.

The visual assessment also found that the introduction of the new facility would have limited potential to increase the significance of cumulative visual impact particularly given the relatively small scale of the infrastructure associated with the new facility in the context of other existing and proposed development on this part of Kooragang Island and within the broader visual catchment of the wider Port, including the new coal terminal proposed by PWCS (T4).

IPL has committed to implementing a series of measures to minimise the potential visual impact of the project during both the construction and operational phases. These measures include retaining and supplementing existing boundary tree planting, utilising materials that are dark and non-reflective during construction, minimising the overall use of lighting (including flood lights) on the site where possible and avoiding the use of lighting with a direct line of sight to nearby surrounding residences.

Conclusion

The Department generally agrees with the findings of the visual assessment and emphasises that IPL's and Orica's existing facilities have both been operating here in some form since the mid to late 1960's when Kooragang Island was first formed. As such, the new structures would be viewed in an existing, well established industrial and port context which has been in existence for several decades.

Overall, the Department concludes that the management and mitigation measures committed to by IPL are commensurate with the level of potential visual impact, and has incorporated four recommended conditions to formalise these commitments, which include requirements to:

- keep existing landscaped areas on the site clear of parked vehicles, stored goods, garbage or waste material and permanently maintained;
- not install any advertising signage on site without the written approval of the Secretary;

- ensure that the lighting associated with the development complies with the latest version of *AS 4282(INT) – Control of Obtrusive Effects of Outdoor Lighting* and is mounted so that it does not create a nuisance to surrounding properties or the public road network; and
- prepare and implement a Landscape and Vegetation Management Plan for the site in consultation with Council to the satisfaction of the Secretary, prior to construction.

### 5.7 Other Issues

*Table 8: Assessment of Other Issues*

| Issue | Assessment | Recommendation |
|---|---|---|
| *Greenhouse Gas* | • A Greenhouse Gas (GHG) Assessment was included in the EIS to quantify the GHG emissions that would be generated by the project.<br>• The primary GHG emissions from the project would be from liquid fuel and natural gas combustion, nitrous oxide ($N_2O$) emissions from NA production and electricity consumption. $N_2O$ emissions are the most important given the global warming potential of $N_2O$ is 310 times higher than that of $CO_2$-e.<br>• During construction, total Scope 1 and Scope 2 GHG emissions would be approximately 11,000 tonnes (t) of carbon dioxide equivalent ($CO_2$-e) per annum, 6,000t (55%) from combustion of fuel from vehicles and 5,000t (45%) from electricity consumption for plant start-up.<br>• During operation, total annual Scope 1 and Scope 2 GHG emissions would be approximately 86,041t $CO_2$-e per annum. Scope 1 emissions would be made up of 49% (42,186t) of $N_2O$ emissions, 36.9% (31,720t) from combustion of natural gas and 0.6% (562t) from combustion of liquid fuels. The remaining 13.5% (11,609t) would be Scope 2 emissions from electricity consumption.<br>• Overall, the operation of the development would contribute approximately 0.06% of total registered GHG emissions in NSW and 0.02% of total registered GHG emissions in Australia. These contributions are considered to be minor and would make a small contribution to climate change.<br>• Notwithstanding, IPL has incorporated a number of GHG emission control technologies into the design of the development to reduce GHG emissions and ensure it meets industry best practice. In particular, steam from process reactions would be utilised to generate approximately 7.5 megawatts (MW) of electricity. This would equate to about 51,660t $CO_2$-e or over 50% of the total estimated annual Scope 1 emissions for the project, should this electricity be purchased from the grid.<br>• Technology proposed to minimise the formation of $N_2O$ is also estimated to result in a 93% reduction in the amount of $N_2O$ produced in the process relative to a similar uncontrolled facility.<br>• The Department concludes that appropriate measures have been incorporated into the design of the facility so that it meets industry best practice for GHG emissions and that through the imposition of recommended conditions (including the preparation and implementation of an Energy Savings Action Plan) are likely to further reduce future greenhouse gas emissions from the proposed facility.<br>• TAS also reviewed the greenhouse gas assessment and recommended that IPL be required to prepare and implement an Energy Savings Action Plan (ESAP) and provide annual reports to the EPA on its progress to ensure suitable effort is being taken to further mitigate greenhouse gas emissions.<br>• Based on its review, TAS concluded that the estimated greenhouse gas impacts of the project would be appropriately monitored and managed via the ESAP and the future National Greenhouse and Energy Reporting System, and that the appropriate steps would be taken to minimise greenhouse gas emissions from the project (see Appendix H). | Conditions are recommended that would require IPL to:<br>• implement the emissions reduction technology identified in the EIS such as $N_2O$ abatement technology on the nitric acid plant and energy efficiency improvements to the process plant; and<br>• prepare and implement an Energy Savings Action Plan for the development in accordance with relevant guidelines and which incorporates the advice of TAS. |
| *Biodiversity* | • A Flora and Fauna Assessment (FAFA) was included the EIS which involved carrying out desktop and field surveys.<br><u>On-site</u><br>• Field surveys found that the site and study area are highly modified from previous industrial use. No threatened State or Federal listed species were identified on the site during field surveys.<br>• Vegetation to be removed from the site was found to be degraded, fragmented and dominated by exotic grassland and/or landscape plantings.<br>• Some feed trees for threatened fauna (e.g. Moreton Bay Figs, Swamp She-Oaks) would be removed to construct the site access on Greenleaf Road, however the trees in best condition to the south-east would be retained.<br>• Council requested that IPL rehabilitate and compensate for the loss of any vegetation removed as a result of the development and IPL has made a commitment to this effect in the RTS. | Conditions are recommended that would require IPL to:<br>• prepare and implement a Landscape and Vegetation Management Plan for the development (including a program to replace removed vegetation with native plant species) to the satisfaction of the Secretary, prior |

| Issue | Assessment | Recommendation |
|---|---|---|
| | Off-site<br>• The development is located in an existing cluster of heavy industry, however it is in proximity to the RAMSAR listed Hunter Wetlands National Park which are located approximately 545m to the north and north-east of the site. This park contains SEPP 14 listed wetlands located at approximately 860m, 940m and 1.45km from the site respectively.<br>• Potential impacts of the development on nearby wetlands was a specific concern raised in a number of public submissions.<br>• Another SEPP 14 listed wetland is also located approximately 700m to the east of the site, extending north along the foreshore of the Fullerton Street, Stockton.<br>• The proposed stormwater and wastewater management systems for the development have been designed so that water would be treated to an acceptable quality (and to meet the EPA's EPL limits) prior to off-site discharge to prevent adverse impacts on local water quality and ecology including the RAMSAR and SEPP 14 listed wetlands (see 'Water Management' above).<br>• The FAFA concluded that the due to the design of these systems, chemical containment and bunding measures, the development is unlikely to result in a major impact on nearby wetlands with no measurable change in hydrology or subsequent impacts on groundwater dependent ecosystems.<br>• Notwithstanding the conclusions of the FAFA, IPL has committed to preparing and implementing a number of management plans (e.g. flora and fauna, weed and pest, erosion, stormwater and sediment) as part of the CEMP for the development. The OEMP would also include measures to minimise impacts on local flora and fauna.<br>• OEH did not raise any issues of concern in relation to biodiversity.<br>• The Department generally agrees with the findings of the FAFA and has recommended conditions to ensure the development does adversely impact on biodiversity. | to construction. |
| *Heritage* | • The development is located on Kooragang Island which was reclaimed from the Hunter River in 1961 and zoned specifically for heavy industrial and port-related development.<br>• The Heritage Impact Assessment (HIA) in the EIS found that it was unlikely that items of Aboriginal heritage significance would be located on the site. Further, no items were identified by a qualified archaeologist during a site inspection.<br>• The HIA also found that no structures to be demolished as a result of the development held any heritage significance and no cultural heritage items located the vicinity of the site would be impacted upon by the development.<br>• Council supported the conclusions of the HIA and OEH did not raise any concerns in relation to heritage.<br>• The outcome of the Department's assessment is that the development of the new facility would not result in any adverse heritage impacts. Notwithstanding this, the Department has recommended conditions to deal with any unexpected finds. | Conditions are recommended that would require IPL to:<br>• stop work and notify the Heritage Council of NSW and the OEH if a previously unidentified heritage item is encountered during construction and do not re-commence works until authorised to do so. |
| *Waste* | • Construction of the development would generate waste in the form of soils, construction material, general and hazardous waste.<br>• Operation of the development would generate 3 new waste streams including hydrocarbon waste and plant process wastes (e.g. waste ANSOL and contaminated AN prill).<br>• Plant process waste would make up the highest proportion of the new waste streams generating over 4,500 tonnes per annum.<br>• During construction and operation, IPL has committed to ensuring waste streams are avoided, minimised, classified in accordance with the EPA's *Waste Classification Guidelines* (WCGs*)*, re-used on-site or sent to a licensed facility for recycling and/or disposal (e.g. via landfilling).<br>• To formalise these commitments, IPL proposes to prepare and implement Waste Management Plans (WMPs) for both construction and operational phases of the development, as part of the CEMP and OEMP.<br>• The EPA did not raise any concerns in relation to solid waste management and recommended standard draft EPL conditions.<br>• The Department considers that all project waste can be effectively minimised and managed and has recommended conditions to formalise IPL's commitments. | Conditions are recommended that would require IPL to:<br>• implement reasonable and feasible measures to minimise the waste;<br>• ensure all waste is classified and disposed of in accordance with the EPA's WCGs; and<br>• prepare and implement Waste Management Plans for construction and operation, to the satisfaction of the Secretary. |
| *Aviation Safety* | • Restrictions are placed on the airspace surrounding Newcastle Airport to protect aircraft flying in and out of the airport. To ensure safety of these aircraft and to limit restrictions, permission must be sought from the Department of Defence to erect cranes or tall structures in the vicinity of the airport in accordance with the Department of Defence's, *Operation of cranes and tall Structures in the vicinity of Newcastle Airport (2013)*.<br>• In that document, there is a requirement for all proposed permanent obstructions or structures exceeding 30m AHD in height and located within 15km radius of | A condition is recommended which requires IPL to obtain the necessary approvals from the Air Base Command Post of RAAF Base Williamstown and the Directorate of |

| Issue | Assessment | Recommendation |
|---|---|---|
| | Newcastle Airport to gain the approval of the Directorate of External Land Planning within the Defence Support Group of the Department of Defence.<br>• Similarly, all proposed temporary obstructions including cranes or tall structures which are located within the same radius but are more than 30m above ground level require approval from the Air Base Command Post of RAAF Base Williamtown.<br>• Information was provided to the Department by IPL which indicated that it was unlikely that any of the temporary or permanent structures proposed as part of the project, including the AN prill tower (63m high), NA absorption tower (51m high) or ammonia storage tank (42m high) would exceed the airport's height limit for structures on this part of Kooragang Island (which according to IPL's discussions with the Department of Defence is 156.6m above mean sea level).<br>• However, this advice did not fully satisfy the Department so a condition has been imposed which requires IPL to obtain the necessary aviation safety approvals prior to the commencement of construction. | External Land Planning within the Defence Support Group of the Department of Defence for all temporary and permanent structures in accordance with the *Operation of cranes and tall Structures in the vicinity of Newcastle Airport* (Department of Defence, 2013). |
| *Socio-Economic* | • The development proposal has an overall capital investment value of $600m. In terms of job creation, up to 340 staff would be needed to build the facility over a 28 month period. An additional 60 full time staff (plus contractors) would be employed on site to operate the new facility, bringing the overall number of people employed by IPL on the entire site to around 100, taking into account the 40 employees that currently operate the existing fertiliser and chemicals storage and distribution operation.<br>• A socio-economic assessment was included as part of the EIS. Based on a quantitative analysis of demographic, economic and other relevant data, the assessment gained an insight into the socio-economic profile of the local Newcastle population. The outcomes of this analysis was used firstly to estimate what proportion of IPL's workforce might be sourced from Newcastle's local labour market and secondly to provide the basis of an economic impact assessment of the development proposal using input-output analysis.<br>• The assessment found that the socio-economic characteristics of the existing Newcastle population is diverse and that a large proportion of the residential population have the necessary skills, expertise and capability to form the majority of IPL's proposed construction and operational workforce. Based on its analysis, the assessment concluded that much of the construction workforce and the entire operational workforce would be sourced from local labour supply in Newcastle.<br>• In terms of economic impacts, the assessment found that the development proposal would make a positive contribution to the local and regional economy, in the form of:<br>- $600m of capital investment over the 25 plus years that the facility would be operational;<br>- $319m of capital investment in Australian sourced inputs - $96m for materials and equipment (50% of which would be obtained from local suppliers) and $223m for labour costs (75% from the local area); and<br>- flow on local and regional benefits from this capital investment, including an increase in Gross Regional Product of $386m from the construction phase overall and a further $35m each year the facility is operational.<br>• The Department recognises the socio-economic benefits of the proposal in the form of new temporary and permanent local jobs and the flow on economic benefits that the financial investment in the new facility would bring to local businesses and residents of Newcastle and the wider region.<br>• These benefits are consistent with the NSW Government's main priorities of restoring economic growth, creating new jobs and further enhancing the future growth of the Port of Newcastle, as set out in *NSW 2021*, the *Lower Hunter Regional Strategy 2010* and other NSW Government strategic policy documents (see Section 3.1).<br>• Notwithstanding these economic and employment benefits to the Newcastle LGA, the Department acknowledges that the project would nonetheless have an impact on Council services and facilities. As a result, the Department has required IPL to pay a financial contribution towards the future provision of these services as outlined below. | |
| *Development Contributions* | • The Department's assessment concluded that the potential impacts of the project would be mitigated and managed such that there would be limited residual impacts on public services and facilities including roads and other physical infrastructure as well as social and community assets such as public open space, educational and recreational facilities.<br>• The main reasons for this are that the project would import most of its raw materials by ship and would utilise existing State owned transport corridors for product distribution, rather than Council roads. The modest level of traffic that would be generated can be accommodated within the existing road network | • A condition has been recommended requiring IPL to pay $396,105 in development contributions. |

| Issue | Assessment | Recommendation |
|---|---|---|
| | without the need for upgrades to the local road network even when other development proposals in the area are taken into account.<br>• IPL need to employ around 60 employees to operate the facility which are expected to be sourced from the local Newcastle area and would not therefore place additional demand on existing social services and facilities as would be the case if a large workforce was required from outside of the local area.<br>• Council recommended that a strict application of its *Section 94A Contributions Plan 2009* is applied which would mean a 1% levy of the cost of carrying out the development being payable by IPL. This equates to a development contribution in the order of $6 million because of the inherently high capital cost associated with constructing and operating the new facility (ie $600M).<br>• The Department has considered Council's position in this regard and considers that the quantum of the contribution requested by Council is excessive based on the limited impact that the project would have on Council services and taking into account the socio-economic benefits that the capital investment in the project would bring to the LGA.<br>• As such, whilst the Minister is not obliged to levy a contribution on IPL for the project, it is considered reasonable that a development contribution should be paid by IPL to Council towards the provision, extension or augmentation of public amenities or services in the area which is commensurate to the level of impact that the project could have on public services and facilities rather than being tied to capital cost.<br>• In its recommendation for the T4 project, the Department required the Proponent to pay a contribution equal to one percent of the total of Council's works schedule and new public facilities listed in the s94A Plan. This equates to around $528,140. Based on the 80 proposed operational positions to be generated by T4, this contribution would equal to approximately $6,601.75 per employee. Applying this same rate per employee to the 60 positions that would be generated by the Incitec proposal, this would equate to approximately $396,105. As such, the Department considers that a contribution of $396,105 from IPL would be appropriate in this instance. | |

# 6. CONCLUSION

The Department has carried out a detailed assessment of the merits of the proposal, in accordance with its statutory obligations, and considered the material submitted both in support and against the proposal.

In summary, the Department's assessment concludes that the construction and operation of the new facility would have socio-economic benefits, in the form of:

- 340 temporary construction jobs and 60 permanent operational jobs, most of which would be sourced from the Newcastle local labour supply;
- $600m in capital investment over the 25 plus years that the facility would be operational;
- $319m in capital investment in Australian sourced inputs - $96m for materials and equipment (50% of which would be obtained from local suppliers) and $223m for labour costs (75% from the local area); and
- flow on local and regional benefits from this capital investment, including an overall increase in Gross Regional Product of $386m from the construction phase and a further $35m each year the facility is operational.

These socio-economic benefits are consistent with and would contribute to the NSW Government's main priorities of restoring economic growth, creating new jobs and further enhancing the future growth of the Port of Newcastle, as set out in *NSW 2021*, the *Lower Hunter Regional Strategy 2010* and other NSW Government strategic policy documents.

The critical issue is the extent to which the introduction of the chemical manufacturing facility of the nature proposed would result in unacceptable impacts on surrounding communities.

In recognition of this and to ensure a robust an assessment process, the Department engaged an independent risk consultancy, Scott Lister, to provide a technical peer review of the risk assessment documents (in addition to the assessment carried out by the Department's technical hazards and risks specialists), and appointed Todoroski Air Sciences to provide an independent, technical review of the air quality impact assessment.

Taking into account the findings of these independent experts and the technical advice provided by Council and relevant Government agencies, most notably WorkCover and the Environment Protection Authority, the Department's assessment has found that the potential incremental and cumulative impacts of the development proposal are unlikely to result in exceedances of the relevant risk, air and noise criteria in the surrounding area given that:

- risk levels would comply with fatality, injury, irritation and societal risk criteria set out in *Hazardous Industry Planning Advisory Paper No 4*;
- noise levels would meet the noise criteria developed in accordance with the *NSW Industrial Noise Policy*; and
- levels of oxides of nitrogen, particulate matter and ammonia would remain well below the relevant ambient air quality criteria set by the *Approved Methods for Modelling and Assessment of Air Pollutants in NSW*.

The findings of the Department's visual assessment generally concurred with the conclusions reached in the EIS. These were that the introduction of the new facility into the existing visual landscape and industrial context of Kooragang Island would be of low visual significance for the majority of people living or travelling through the area surrounding the site and from public open spaces as well as recreational users of the Hunter River.

In terms of traffic generation, the Department concluded that the additional construction and operational traffic generated by the new facility is unlikely to have a major impact on the safety and efficiency of the local road network in the vicinity of the site and that no associated upgrades would be required.

Further, it was recognised that the development of the new facility would also have a limited impact on other local services so the Department has required IPL to pay Council a reasonable development contribution towards the provision, extension or augmentation of public amenities or services in the Newcastle area.

Finally, the Department's assessment in relation to other residual impacts of the proposed development (soil and water, greenhouse gas, biodiversity, heritage, waste and aviation safety) concluded that these impacts can be suitably mitigated, managed and/or offset.

Overall, the Department considers that development application is in the public interest and should be approved, subject to the recommended conditions.

# 7. RECOMMENDATION

It is recommended that the Planning Assessment Commission:

- **consider** all relevant matters prescribed under Section 79C of the EP&A Act, as contained in the findings and recommendations of the assessment report and appended documentation;
- **grant consent** to the development application, subject to conditions, under Section 89E of the EP&A Act, having considered all relevant matters in accordance with the above; and
- **sign** the attached instrument of consent at Appendix A.

Nicholas Hall
A/Team Leader – Industry Projects

**Signed 1 September 2014**

Chris Ritchie
**Manager**
**Industry Key Sites and Social Projects**

**Signed 2 September 2014**

Chris Wilson
**Executive Director**
**Development Assessment Systems and Approvals**

## APPENDIX A – INSTRUMENT OF CONSENT

# APPENDIX B – CONSIDERATIONS UNDER SECTION 79C

Section 79C of the EP&A Act requires that in determining a development application, a consent authority is to take into consideration the provisions such of the following matters as are of relevance to the development the subject of the development application:

| | |
|---|---|
| (a) The provision of:<br>(i) any environmental planning instrument, and | Consideration of the provisions of all environmental planning instruments (including draft instruments subject of public consultation under this Act) that apply to the proposed development is provided in Appendix F of this report. |
| (ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and | |
| (iii) any development control plan, and | Development Control Plans (DCPs) do not strictly apply to State Significant Development by virtue of Clause 11 of the SRD SEPP. Notwithstanding, the Department has considered certain relevant provisions of The *Newcastle DCP 2012* in its assessment of the proposed development. |
| (iiia) any planning agreement that has been entered into under section 93F, or any draft planning agreement that developer has offered to enter into under section 93F, and | The Applicant has not entered into any planning agreement under section 93F. |
| (iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph), and | The Department has undertaken its assessment of the DA in accordance with all relevant matters as prescribed by the regulations, the findings of which are contained within this report. |
| (v) any coastal zone management plan (within the meaning of the *Coastal Protection Act 1979*) that apply to the land to which the development application relates, | The site is not located within the coastal zone. Therefore, no coastal zone management plans apply to the proposed development. |
| (b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality, | The Department has considered the likely impacts of the proposed development in detail in Section 5 of this report. The outcome of this assessment is that all environmental impacts on both the natural and built environments can be appropriately managed and mitigated through recommended conditions of consent and has considered the social and economic impacts in the locality. |
| (c) the suitability of the site for the development, | Sections 1 to 3 and Appendix F of this report provide details on the suitability of the site for the proposed development. The site is located in the Port of Newcastle, is zoned for special activities and is permissible with development consent. |
| (d) any submissions made in accordance with this Act or the regulations, | All matters raised in these submissions have been summarised in Section 4 of this report and given due consideration as part of the assessment of the proposed development (see Section 5 of this report). |

| | |
|---|---|
| (e) the public interest. | The recommended conditions of consent impose a range of controls, which the Department considers will mitigate any potential environmental impacts of the proposed development.<br><br>The socio-economic benefits generated from the proposal are considerable, with the provision of 340 construction and 60 operational jobs. The proposal is therefore considered to be in the public's interest. |

# APPENDIX C – ENVIRONMENTAL IMPACT STATEMENT

See the Department's website at www.planning.nsw.gov.au

# APPENDIX D – SUBMISSIONS

See the Department's website at www.planning.nsw.gov.au

# APPENDIX E – APPLICANT'S RESPONSE TO SUBMISSIONS

See the Department's website at www.planning.nsw.gov.au

# APPENDIX F – CONSIDERATION OF ENVIRONMENTAL PLANNING INSTRUMENTS

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

The proposal is State Significant Development (SSD) under Part 4 of the EP&A Act because it constitutes development for the purpose of the manufacture, storage or use of dangerous goods in such quantities that constitute the development as a major hazard facility within the meaning of Chapter 6B of the Occupational Health and Safety Regulation, and as such meets the criteria in Clause 10(3) of Schedule 1 in the SRD SEPP.

Consequently, the Minister for Planning and Environment is the consent authority for the proposed development. The SRD SEPP is discussed in Section 3.2 of this report.

**State Environmental Planning Policy (Major Development) 2005 / State Environmental Planning Policy (Three Ports) 2013)**

The site forms part of Newcastle Port under the Three Ports SEPP but when the development application was made, the site formed part of the *Newcastle Port Site* (former 'Three Ports Site') under Part 20 in Schedule 3 of the Major Development SEPP.

The savings provision in the Three Ports SEPP states that if a development application has been made before the commencement of the application of that SEPP in relation to land to which the SEPP applies and the application has not been finally determined before that commencement, the application must be determined as if the (Three Ports) SEPP had not commenced.

The proposed development is permissible with consent on the site under the Major Development SEPP as a 'heavy industry'.

The Department considers the proposal to be consistent with the objectives of the 'SP1 (Special Activities)' zone in both the Major Development SEPP and the Three Ports SEPP as it is would facilitate development that is in keeping with the special characteristics of the site and minimise any adverse impacts on surrounding land. Further, it would also maximise the use of a waterfront area to accommodate an industrial premises that benefits from being located close to port facilities and the nature and scale of the development is such that it requires separation from residential and other sensitive land uses (see Section 5.1). The development proposal would also encourage temporary and permanent employment opportunities in the local area.

**State Environmental Planning Policy No. 33 – Hazardous and Offensive Development**

SEPP 33 aims to identify proposed developments with the potential for significant off-site impacts, in terms of risk and/or offence (odour, noise etc.). A development is defined as potentially hazardous and/or potentially offensive if, without mitigating measures in place, the development could have a risk and/or offence impact on off-site receptors.

The proposed quantities of dangerous goods to be manufactured, stored and used at the facility exceed the threshold limits established for SEPP 33. SEPP 33 requires that a PHA be carried out on a potentially hazardous development to ensure that any hazards are systematically evaluated as part of the overall environmental assessment.

Based on the information provided in the EIS, and assuming that all risk reduction measures and recommendations in the PHA are implemented and maintained over time, the Department's assessment concluded that the proposed development would not increase either the project specific or cumulative risks to surrounding land uses to unacceptable levels. Nevertheless and to ensure that the facility will operate in a safety manner, it is recommended that a series of hazards and risks related conditions of consent be imposed.

This includes a series of conditions which impose requirements at the pre-construction, pre-commissioning, pre-start-up, post-start-up phases as well as various conditions applying to on-going site operations. The Department considers that with these conditions in place the potential hazards and risks from the development would be continually mitigated, monitored and managed to within acceptable levels. The Department's detailed assessment of hazards and risk is contained in Section 5.1 of this report.

**State Environmental Planning Policy (Infrastructure) 2007**

The Infrastructure SEPP aims to facilitate the effective delivery of infrastructure across the State by improving regulatory certainty and efficiency, identifying matters to be considered in the assessment of development adjacent to particular types of infrastructure development, and providing for consultation with relevant public authorities about certain development during the assessment process.

The project satisfies the criteria for traffic generating development under the SEPP and as such, was referred to the RM for comment. RM's comments are detailed in Section 4 of this report. The proposal is considered to be consistent with the Infrastructure SEPP given the consultation and consideration of the issues raised by RM has been undertaken and assessed in Section 5 of this report.

**State Environmental Planning Policy No. 55 – Remediation of Land**

SEPP 55 aims to ensure that potential contamination issues are considered in the determination of a development application.

The Department has reviewed all contamination issues associated with the proposal and outlined in the EIS. A detailed assessment of these issues is provided in Section 5.5 of this report.

The Department's assessment found that, subject to recommended conditions such as the requirement for IPL to prepare an Acid Sulphate Soils Management Plan and a Contamination Management Plan in consultation with the EPA and Council, the potential environmental risks of the development associated with disturbance of contamination can be effectively managed.

The Department considers the proposal is therefore generally consistent with the aims and objectives of SEPP 55.

**State Environmental Planning Policy No. 14 – Coastal Wetlands**

SEPP 14 aims to ensure that the coastal wetlands are preserved and protected in the environmental and economic interests of the State.

The site is not located in a coastal wetland zone but water run-off from the site would enter the Hunter River which has the potential to have indirect impacts on RAMSAR listed wetlands located approximately 545m to the north and north-east of the site and a SEPP 14 listed wetland located approximately 700m to the east of the site.

The proposed stormwater and wastewater management systems for the new facility have been designed so that water would be treated to an acceptable quality (and to meet EPL discharge limits) prior to off-site discharge to prevent adverse impacts on local water quality and existing biodiversity. The Department's detailed assessment of potential water quality impacts and ecological impacts on wetlands in the vicinity of the site is contained in Section 5.7 of this report.

Overall, the Department's assessment concluded that subject to the imposition of recommended conditions, stormwater and wastewater generated on site can be effectively mitigated and managed and the development of the new facility would not have an adverse impact on existing biodiversity values. As such, it is considered that existing coastal wetlands would continue to be preserved and protected and is therefore consistent with the overall aim of SEPP 14.

**State Environmental Planning Policy No. 71 – Coastal Protection**

SEPP 71 generally aims to protect and improve public access to the NSW coastline, protect and preserve the coastal environment, protect and manage the natural, cultural, recreational and economic attributes of the NSW coast, to manage development in the coastal zone in accordance with the principals of ecologically sustainable development and to ensure the bulk, scale and size of development is appropriate for the coastal zone.

The subject site is located in the coastal zone as defined in the SEPP and as such, SEPP 71 applies to the proposed development.

Clause 8 and Part 4 of SEPP 71 outline key matters for consideration of a consent authority in determining a development application. Key provisions relate to preservation and enhancement public access to the coast, consideration of development suitability and site context, water quality, coastal ecological conservation, effluent disposal and stormwater management.

The Department has considered all relevant provisions of SEPP 71 in its assessment of the proposal in Section 5 of this report and concluded that the proposed development would not adversely impact on the coastal zone and is therefore consistent with the overall intent of SEPP 71.

**Newcastle Local Environmental Plan 2012**

Newcastle LEP aims to conserve and manage the natural and built resources of the LGA for present and future generations applying the principles of ecologically sustainable development. The Plan also aims to contribute to the economic well-being of the community in an environmentally responsible manner and to strengthen the regional position of the Newcastle as an innovative centre that encourages employment and economic growth.

The Department has consulted Newcastle City Council extensively throughout the assessment process. The Department has considered all relevant provisions of the Newcastle LEP and those matters raised by Newcastle City Council in its assessment of the proposal in Section 5 of this report.

The development proposal is considered by the Department to be generally consistent with the relevant provisions of Newcastle LEP.

# APPENDIX G – INDEPENDENT PEER REVIEW OF HAZARDS AND RISKS

# APPENDIX H – INDEPENDENT REVIEW OF AIR QUALITY