



## **ORICA KOORAGANG ISLAND**

# **ANNUAL ENVIRONMENTAL MANAGEMENT REPORT**

**DECEMBER 2014**



| <b>Revision</b> | <b>Date</b> | <b>Description</b>               | <b>Author</b> | <b>Approver</b> |
|-----------------|-------------|----------------------------------|---------------|-----------------|
| 0               | 3/12/2014   | 2014 Annual Environmental Report | A Taylor      | S Woodroffe     |

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**ABBREVIATIONS**

|       |   |
|-------|---|
| AN3   | No. 3 Ammonium Nitrate Plant                          |
| CSEMP | Construction Safety and Environmental Management Plan |
| DECCW | Department of Environment, Climate Change and Water   |
| DPI   | Department of Planning and Infrastructure             |
| EPA   | Environment Protection Authority                      |
| EPL   | Environment Protection Licence                        |
| HAZOP | Hazard and Operability Study                          |
| ktpa  | kilo tonnes per annum                                 |
| NAP4  | No. 4 Ammonium Nitrate Plant                          |
| SH&E  | Safety, Health and Environment                        |

## 1 Introduction

Orica Australia Pty Ltd (Orica) operates an ammonia nitrate manufacturing facility on Kooragang Island, NSW (**Figure 1**). The facility commenced operations in 1969 and has undergone several projects aimed at increasing the ammonium nitrate production capability of the site since. The current site operations consist of an Ammonia Plant, three Nitric Acid Plants, two Ammonium Nitrate Plants and associated despatch and support infrastructure (Existing Operations).

An approval for the expansion of the Kooragang Island site (the expansion Project) was granted by the Department of Planning and Infrastructure (DoPI) on 1 December 2009 allowing ammonium nitrate production to increase from 500 kilo tonnes per annum (ktpa) to 750ktpa. The expansion project broadly involves the uprate of the existing ammonia plant, construction of an additional Nitric Acid (NAP4) and Ammonium Nitrate Plants (AN3) and the upgrade and expansion of the site's ammonium nitrate storage and ancillary infrastructure.

Since the approval was granted in 2009, Orica has twice applied to the NSW Department of Planning and Infrastructure (DoPI) to modify the approval.

Modifications to the 2009 approval include:

- The relocation of plant and equipment further away from the closest residential properties;
- Relocation of the No. 3 Ammonium Nitrate Plant closer to the No. 4 Nitric Acid Plant in order to reduce the pipeline distance in which ammonia is required to be transported;
- Rationalisation and upgrade of ammonia storage and distribution infrastructure including a reduction in ammonia inventories stored in plant ammonia storage tanks;
- The construction and operation of three ammonia flares; and
- The relocation and increase in storage quantity of a previously approved nitric acid tank.

This report has been prepared in accordance with Condition 50 of the expansion project's Development Consent (08-0129) which requires an Annual Environmental Management Report (AEMR) to be submitted to the Department of Planning and Infrastructure.



Figure 1: Site Location

## 1.1 Project Description

The activities detailed in the Project Approval include the:

- Upgrade to the existing Ammonia Plant designed at increasing ammonia manufacture capacity from 295 ktpa to 360 ktpa;
- Construction and operation of an additional Nitric Acid Plant (NAP4), capable of manufacturing approximately 260 ktpa of nitric acid;
- Construction and operation of an additional Ammonium Nitrate Plant (ANP3) capable of producing both Ammonium Nitrate Solution (ANS) and the solid prilled product Nitropril®;
- Construction and operation of additional storages for nitric acid, solid ammonium nitrate and ammonium nitrate solution;
- Construction and operation of three ammonia flares
- Supporting infrastructure including cooling towers, an effluent treatment system and boiler; and
- Construction of additional minor storage facilities and improvements to product loading facilities for road transport.

## 2 Project Approval Requirement

Condition 50 of Project Development Consent (08-0129) requires that Orica submit an AEMR within the first 12 months of commencing the project and annually thereafter. This report details environmental compliance of the Project between the 1 December 2013 and 30 November 2014 and also:

- a) Identifies the standards and performance measures for the project;
- b) Describes the works carried out in the past 12 months and the works to be carried out in the next 12 months;
- c) Includes a summary of complaints received in the past year and provide a comparison with previous years;
- d) Reports results of all monitoring required by this approval and an EPL for the Project
- e) Provides analysis of monitoring results in the context of the relevant criteria and limits, previous monitoring results and predictions made in the EA.
- f) Identifies any trends in monitoring results over the life of the Project; and
- g) Reports on compliance with the project approval, summarises non-compliances in the previous 12 months and reports on actions taken to rectify non conformances.

### 3 Project Standards and Performance Measures

The Project is required to meet the standards and conditions detailed in the following documents (Table 1):

- Project Approval 08-0129 dated 1 December 2009
- Project Environmental Assessment dated June 2009
- Statement of Commitments dated August 2009
- Submissions Report dated 13 October 2014
- Modification Application 08-0129 MOD 1 and supporting documentation titled Kooragang Island Facility Modification Request dated 20 April 2011;
- Modification Application 08\_0129 MOD 2 Environmental Assessment titled Kooragang Island Modification Request dated 13 November 2013;
- Response to MOD 2 submissions dated 10 February 2014;
- Orica Mining Services Report for Kooragang Island Uprate PHA MOD1 Report dated March 2012
- Orica Mining Services Kooragang Island Uprate PHA MOD2 rev 1 dated May 2014 including Appendix VIII” nitric Acid Tank PHA, Rev C dated May 2014.

**Table 1 - Standards and performance implemented in plant design and construction**

| Criteria         | Standard   | Performance Measure   | Comment   |
|------------------|--|---|---|
| Noise Management | No increase in community noise levels as a result of the Project.  | Operating Project to be at least 10dB (A) less than the existing plant noise levels.          | Noise control measures have been included in new plant design. A noise management plan and monitoring program has submitted and approved by the DoPI. The noise management plan has commenced following the commencement of operations of the uprated ammonia Plant. Quarterly noise data has confirmed compliance to the project's noise performance criteria. |
| Air Quality      | Minimisation of particulate emissions associated with the Project. | AN3 stack emissions to be $\leq 20\text{mg/Nm}^3$   | Requirement incorporated into AN3 plant design. This phase of the project has yet to be constructed   |
|                  | Minimisation of NOx emissions associated with the project.         | Existing Reformer Stack NOx emission $\leq 350\text{mg/Nm}^3$ (as NO <sub>2</sub> equivalent) | A new purge gas scrubber has been incorporated into the Ammonia Plant expansion.<br><br>Annual stack emission test  |



| Criteria | Standard | Performance Measure   | Comment   |
|----------|----------|---|---|
|          |          |   | <p>data has demonstrated compliance to the requirement. Orica has continued to undertake voluntary quarterly testing of the Reformer stack to support Ammonia Plant performance improvement initiatives.</p> <p>An air quality verification study, in compliance with Condition 23 has been completed with monitoring data consistent with the predictions detailed in the environmental Assessment and EPL limits.</p> |
|          |          | Pre-Reformer Furnace Stack NOx emission $\leq 350\text{mg}/\text{Nm}^3$ (as NO <sub>2</sub> equivalent) | <p>Requirement incorporated into plant design.</p> <p>Annual stack emission testing has been performed following the commencement of operations on the 29 February 2012. In total three tests have been completed, with NOx emissions significantly below the predictions detailed in the Environmental Assessment and the site's EPL discharge limit.</p>  |
|          |          | Expansion Boiler Stack NOx emission $\leq 350\text{mg}/\text{Nm}^3$ (as NO <sub>2</sub> equivalent)     | Requirement has been incorporated into the Expansion Boiler design.   |
|          |          | NAP4 Stack NOx $\leq 150\text{ppm}$ (99%tile)   | Requirement incorporated into design for the new acid plant.  |
|          |          | Scrubbing of ammonia emissions under normal plant operations to be installed for NAP4 and AN3.          | Requirement has been incorporated into design. In addition the site has commenced a program of works to ensure that ammonia emissions generated from existing operating plants are appropriately treated including the construction   |

| Criteria                 | Standard  | Performance Measure   | Comment  |           |            |
|--------------------------|---|---|--|-----------|------------|
|                          |   |   | and operation of three ammonia flares.   |           |            |
| Greenhouse Gas Emissions | Installation of abatement technology on Nitric Acid Plants  | <p>Site N<sub>2</sub>O emissions to be reduced by ≤65% compared to a “do nothing” approach.</p> <p>Abatement projects to be completed within 6 months of commissioning of NAP4.</p> | A N <sub>2</sub> O emissions reduction strategy for the site is currently being implemented with N <sub>2</sub> O abatement technology now installed in NAP2 from July 2013. N <sub>2</sub> O emissions are continually monitored in the plants. |           |            |
| Water Emissions          | New Plant and Equipment to comply with existing EPL conditions for effluent discharge parameters. |   | <p>Requirement incorporated into design.</p> <p>Effluent discharged from the site is continually monitored and reported in the site's Annual Return.</p>   |           |            |
|                          |   |   |  | mg/L      |            |
|                          |   |   |  | 90% limit | 100% limit |
|                          |   | As  |  |           | 0.05       |
|                          |   | Oil and Grease  |  |           | 10         |
|                          |   | Nitrogen  |  | 1500      | 2000       |
|                          |   | Cr (6+)   |  | 0.05      | 0.2        |
|                          |   | TSP   |  |           | 50         |
|                          |   | pH  |  |           | 6.2 – 9.5  |
|                          |   | Temperature   |  |           | 43°C       |
| Volume                   |   | 4500kL/day  |  |           |            |
| Nitrogen Mass Discharge  |   | 200tpa  |  |           |            |
| Production Limits        | Production not to exceed prescribed levels.   | <p>Ammonia – 360ktpa</p> <p>Nitric Acid – 605ktpa</p> <p>Ammonium Nitrate – 750ktpa</p>   | <p>Requirement incorporated into design.</p> <p>Production during the 2013/2014 reporting period was as follows:</p> <p>Ammonia – 328ktpa</p> <p>Nitric Acid – 327ktpa</p> <p>Ammonium Nitrate – 414ktpa</p>                                     |           |            |

To ensure that environmental performance standards are appropriately integrated into the new plant design and associated construction activities, a Construction Environmental Management Plan (CSEMP) has been developed and approved for use by Department of Planning and Infrastructure (DoPI) in 2011. Environmental control measures addressed in the CEMP relate to air quality, water quality, contaminated soil and acid sulphate soil, waste management, traffic, heritage and erosion and sediment control.

## 4 Project Status

### 4.1 Project Progress Review

Orica is undertaking the expansion of the site in a number of construction phases. This approach has been adopted to ensure that construction works associated with the upgrade have minimal impact on the site's existing operations, that upgraded ammonium nitrate product storage and loadout facilities are completed prior to the construction of the new Nitric Acid and Ammonium Nitrate plants and that market demand is accommodated in the construction timing.

Project construction phases are as follows:

*Phase 1: Ammonia Plant Uprate:* including improvement works designed to increase production capacity of the existing ammonia plant from 295ktpa to 360ktpa. This phase has been completed, with the uprated Ammonia Plant commencing operation on the 28 February 2012.

*Phase 2: Upgrade and improvement works to the site's supporting infrastructure:* including the construction and upgrade of the site's ammonium nitrate storage facilities and product load out infrastructure. Construction works associated with this phase have been designed to reduce the site's risk profile associated with the storage of ammonium nitrate and the transportation and use of ammonia onsite.

*Phase 3: Ammonium nitrate expansion:* construction works designed to increase ammonium nitrate production capability of the site from 430ktpa to 750ktpa through the construction of a new nitric acid and ammonium nitrate plant.

*Phase 4:* The construction of three ammonia flares. Orica has applied to the DoPI to modify the Project's approval to include the construction and operation of three ammonia flares (MOD 2). The flares are only one component of a broader program currently being implemented at the site, designed to reduce the risk associated with handling ammonia.

*Phase 5:* The construction of a Nitric Acid tank. Orica has formally applied to the DoPI to change the proposed location and increase the storage capacity of a previously approved nitric acid tank (MOD 2).

*Phase 6: Construction and Operation of the Projects Boiler.* Orica has recently completed a consistency review to support a change to the expansion project boiler site location.

Orica's DoPI approved project Staging Plan is detailed in Error! Reference source not found.:

Table 2 – Project Staging Plan

| Phase Stage  | Description of Work  | Sub Stage   | Approval Status   | Estimated Construction Timing |
|--|--|---|---|-------------------------------|
| <b>Ammonia Plant Update</b>  |  |   |   |                               |
| 1  | <b>Ammonia Plant Expansion – Plant Air Compressor Building</b><br>Construction of Plant Air Compressor building shell (compressor installed in Stage 1(b)).  | Completed   | Construction Complete and Operational                             | Completed                     |
|  | <b>Ammonia Plant Expansion - Installation/Modification of Plant</b><br>Installation of new equipment including new compressor, process vessels pipework and instruments in the Ammonia Plant.  | Completed   |   |                               |
| <b>Proposed Trident Nitrates Expansion Project Construction Scheduling</b> |  |   |   |                               |
| 2  | <b>OBL 1(a) –Nitrates Infrastructure &amp; ANS Loadout</b><br>Installation of new site infrastructure including the new site entrances, internal access roads, security and weighbridge facilities, ANS product storage and despatch facilities.   | 1. Internal access roads and minor civil works.<br>2. Site entrances, security offices and weighbridges.<br>3. Major civil works including piling and foundations.<br>4. New ANS storage vessel loading equipment | Approval for Construction granted / construction yet to commence. | Yet to be determined          |
|  | <b>OBL 1(b) – Nitrates Despatch &amp; Support Infrastructure</b><br>Construction of new AN Bag store, AN Despatch facilities and amenities, demolition of existing AN Bag store and despatch, construction of new AN Bulk Store, modification to existing AN bulk store, construction of WANS, construction of new control room and electrical infrastructure. |   |   |                               |
| 3  | <b>NAP4 – Nitric Acid &amp; AN Solution plants and Support Infrastructure</b><br>Construction of the NAP4/ ANS Plant and tie-ins<br>Construction of Nitrates support infrastructure including new Nitric Acid Storage, Ammonia Storage, Boiler, Cooling Tower, Demin Plant expansion Instrument Air upgrades, new Ammonia pumps, pipebridges, transfer lines.  |   | Approval to commence construction not yet granted by DoPI.        | Yet to be determined          |

| Phase Stage                                   | Description of Work   | Sub Stage   | Approval Status  | Estimated Construction Timing |
|---|---|---|--|-------------------------------|
|   | <b>AN3 – AN Prill Plant</b><br>Construction of ANP3 Dry Section plant and tie-ins   |   | Approval to commence construction not yet granted by DoPI. | Yet to be determined          |
| 3b  |   |   |  |                               |
| <b>Ammonia Management Improvement Program</b> |   |   |  |                               |
| 4   | <b>Ammonia Flares</b><br>Construction and operation of three ammonia flares.  | 1. Nitrates Plant Flare<br>2. Ammonia Storage Flare<br>3. Ammonia Plant Flare | Approval to commence construction not yet granted by DoPI. | Commence in 2015              |
| 4   |   |   |  |                               |
| <b>Nitric Acid Tank</b>                       |   |   |  |                               |
| 5   | <b>Nitric Acid Tank</b><br>Construction and Operation of a nitric acid tank and associated scrubber, capable of exporting and importing nitric acid via the sites nitric acid wharf pipeline. |   | Approval to commence construction not yet granted by DoPI. | Yet to be determined          |
| 5   |   |   |  |                               |
| <b>Expansion Project Boiler</b>               |   |   |  |                               |
| 6   | <b>Construction of the expansion project Boiler</b>   |   | Approval to commence construction not yet granted by DoPI. | Commence in 2015              |
| 6   |   |   |  |                               |

Orica is currently undergoing discussions with customers to confirm market growth profile in order to determine the optimal time to commence construction of works associated with phases 2 and 3 of the Project construction schedule.

A summary of the Project works completed between 1 December 2013 and 30 November 2014 are detailed below.

#### **4.1.1 Phase 1: Ammonia Plant Expansion**

Works that have been performed in the last 12 months associated with the uprate of the Ammonia Plant include:

- Stack emission testing of Reformer and Pre Reformer monitoring points in accordance with the site's EPL.
- Annual compliance noise monitoring in compliance with the revised noise management plan.
- Regulatory reporting in accordance with the approvals Condition of Consent.

#### **4.1.2 Phase 2: Outside Boundary Limits**

No construction activities have commenced in the previous 12 months associated with Phase 2 construction activities .

#### **4.1.3 Phase 3: Nitrate expansion**

No construction activities have commenced in the previous 12 months associated with Phase 3 construction activities.

#### **4.1.4 Phase 4: Ammonia Management Improvement Project**

Orica is currently seeking approval from DoPI for the installation of three ammonia flares. Ammonia improvement works associated with the replacement of the site's Nitrates pressurised ammonia storage tanks has commenced as no additional DoPI approvals were required.

#### **4.1.5 Phase 5: Nitric Acid Tank**

Orica is currently seeking approval from DoPI prior to finalising the construction schedule for the nitric acid tank.

#### **4.1.6 Phase 6: Boiler**

Orica has completed a consistency review to support a change in the Project boiler location. The site's current boilers, that support existing ammonia and nitric acid plants require a high level of maintenance and are less efficient than modern designs. Orica is therefore proposing to relocate the boiler approved in 2009, to a new location adjacent to the ammonia plant, where its operation can improve the efficiency and production of the site's steam system.

## **4.2 Planned Project Progress during 2014/2015**

In light of current market conditions, construction works associated with phase 2 and phase 3 of the project continue to be on hold. Orica is currently consulting with customers to determine an appropriate time to complete the project. Orica is still progressing with reporting requirements associated with Phase 1 as detailed in the project approval Condition of Consent.

Project works anticipated to be completed in the following twelve months include:

### **4.2.1 Phase 1 Ammonia Plant Upgrade**

- Environmental monitoring as outlined in the site's Environment Protection Licence (EPL).
- Annual noise monitoring in compliance with the updated project noise monitoring plan.
- Reporting requirements as detailed in the project's Development Consent

### **4.2.2 Phase 2 - Outside Boundary Limits (OBL)**

No construction works associated this phase are expected in the next 12 months.

### **4.2.3 Phase 3 – Nitrates expansion**

No construction works associated this phase are expected in the next 12 months.

### **4.2.4 Ammonia Management Improvement Project**

Pending DoPI approval, Orica intends to commence the following activities associated with the Ammonia Management Improvement Project:

- Complete construction works associated with the replacement of the nitrates ammonia storage tank (bullet 6);
- Complete civil preparation works associated with the three ammonia flares located in the nitrates, ammonia storage and ammonia plant areas
- Commence construction works associated with the nitrates ammonia flare.

### **4.2.5 Nitric Acid Tank**

A Nitric Acid Tank construction schedule will be developed following the approval of the MOD 2 application.

### **4.2.6 Boiler**

Orica intends to commence civil and construction works associated with the Boiler in the second quarter of 2015. Prior to commencing construction, Orica will complete pre construction reporting requirements as detailed in the Project Approval.

## 5 Environmental Monitoring and Complaints Summary

### 5.1 Environmental Monitoring

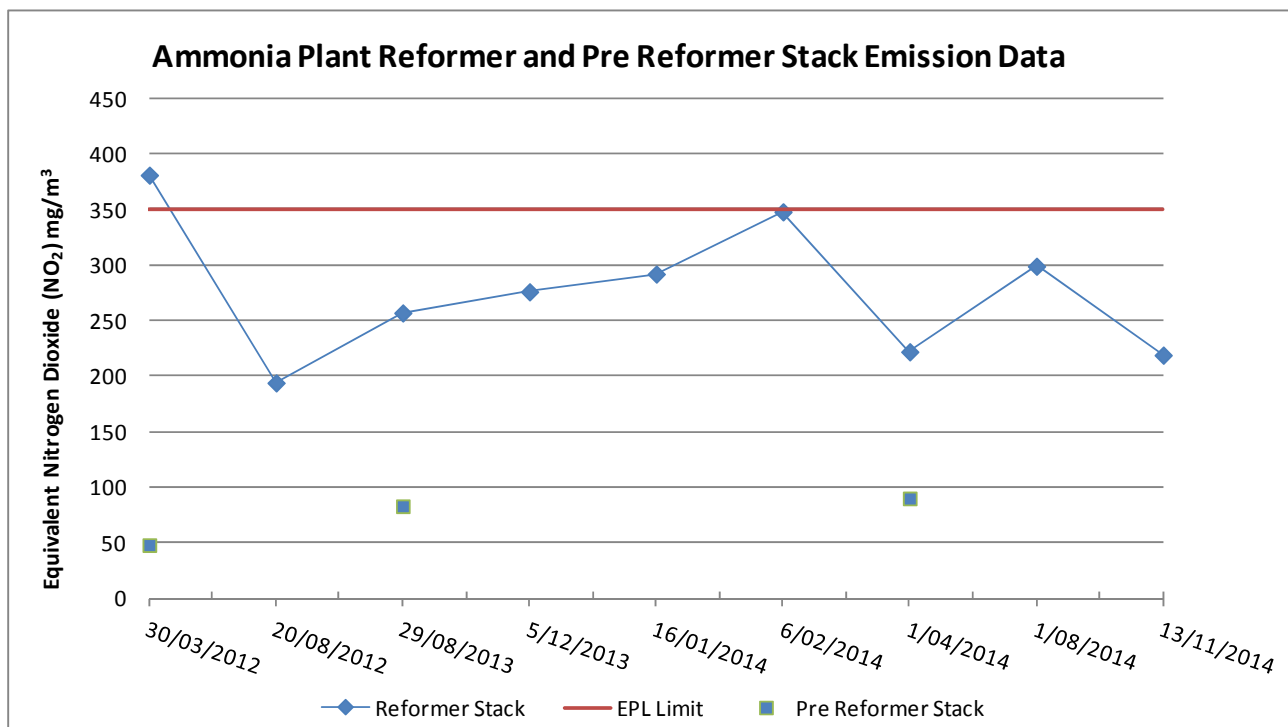
The Project Approval and EPL does not require environmental monitoring to be undertaken during the construction phase of the Project, however control measures specified in the project's CEMP will be implemented to minimise any fugitive emissions.

The updated Ammonia Plant has completed all required environmental monitoring in accordance with the site Environment Protection Licence (EPL 828).

#### 5.1.1 Air Quality

Orica is required to perform stack emission testing of both the Pre-Reformer and Reformer Stacks annually in accordance with the site's EPL anniversary date, 1 April each year. Additional nitrogen oxide (NO<sub>x</sub>) emission sampling was completed for the Reformer Stack following the commissioning of a new purge gas scrubber in July 2012, with NO<sub>x</sub> results found to have significantly reduced (Figure 2). Orica intends to continue with increase Reformer testing program to support Ammonia Plant performance improvement initiatives.

**Figure 2 – Stack emission testing for updated Ammonia Plant**



#### 5.1.2 Noise

In order to demonstrate compliance to noise criteria for new plant and equipment associated with the ammonia plant uprate, the following procedure was developed by Orica and detailed in the Project's Noise Management Plan (NMP). This plan was approved by the DoPI in July 2011, with compliance to the project's noise criteria to be demonstrated through the:

- Update of the site's noise model (Table 3) following the commencement of operation of the Project to predict the noise contribution for expansion project new plant and equipment in



relation to identified reference monitoring locations. This process assisted in the identification of further noise reduction opportunities.

- Undertake attended and unattended noise monitoring to evaluate changes in noise levels and identify trends in ambient noise levels.

Noise modelling detailed in the 2009 environmental assessment predicted that the noise contribution associated with the site expansion would satisfy the 10dB below pre expansion predicted levels consent requirement. As the expansion project is being implemented in three phases, the noise model will be updated following the commencement of operations for each project phase.

**Table 3** – Noise compliance modelling results detailed in 2011 mod 1 report

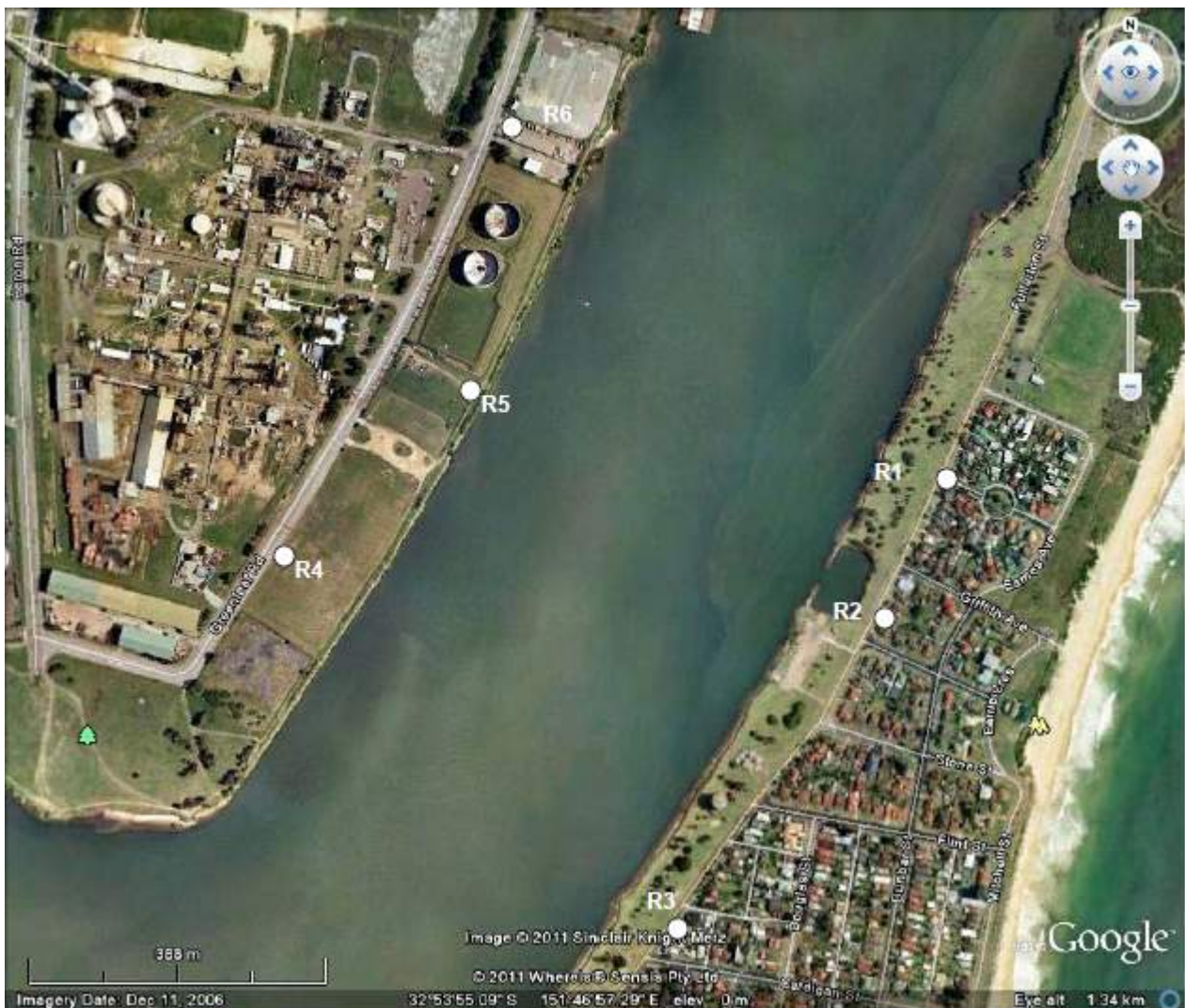
| Assessment Location    | Predicted Sound Pressure Levels<br>LAeq, 15min |               |
|------------------------|--|---------------|
|                        | Existing Plant                                 | Uprated Plant |
| Assessment Location R1 | 50   | 37            |
| Assessment Location R2 | 53   | 41            |
| Assessment Location R3 | 51   | 39            |

The site's noise model was updated following the commencement of operations of the uprated ammonia plant representing the completion of Phase 1 construction activities. This model was updated using noise data collected from near field noise monitoring. Updated site noise modelling results confirmed that that noise level contribution associated with the uprated ammonia plant were less than 10dB below the predicted noise levels for the reference locations in Stockton and therefore did not increase existing noise levels (Table 4).

**Table 4** – Revised compliance modelling results (quarter 1 testing)

| Assessment Location    | Predicted Sound Pressure Levels<br>LAeq,15min (dBA) |                              |                                  |
|------------------------|---|------------------------------|----------------------------------|
|                        | Existing Plant                                      | Post Ammonia<br>Plant Uprate | Ammonia<br>Plant<br>contribution |
| Assessment Location R1 | 50  | 50                           | 20                               |
| Assessment Location R2 | 53  | 52                           | 22                               |
| Assessment Location R3 | 51  | 50                           | 21                               |

Attended and unattended noise monitoring was also undertaken at the reference locations in order to establish noise trends, consistent with the process previously undertaken in 2011. The location of each noise monitoring point is detailed in Figure 3 – Noise Monitoring Locations **Figure 3**.



**Figure 3 – Noise Monitoring Locations**

Whilst it is difficult to directly compare current noise data against historical trends due to variability in the meteorological conditions under which the data was collected, attended and unattended monitoring can be useful in gaining an increased understanding of the individual noise sources that contribute to the overall noise profile of the site. Noise monitoring was undertaken on a quarterly basis for a 12 month period along the Orca boundary, and then annually thereafter. Noise monitoring results are detailed in **Figure 4**.

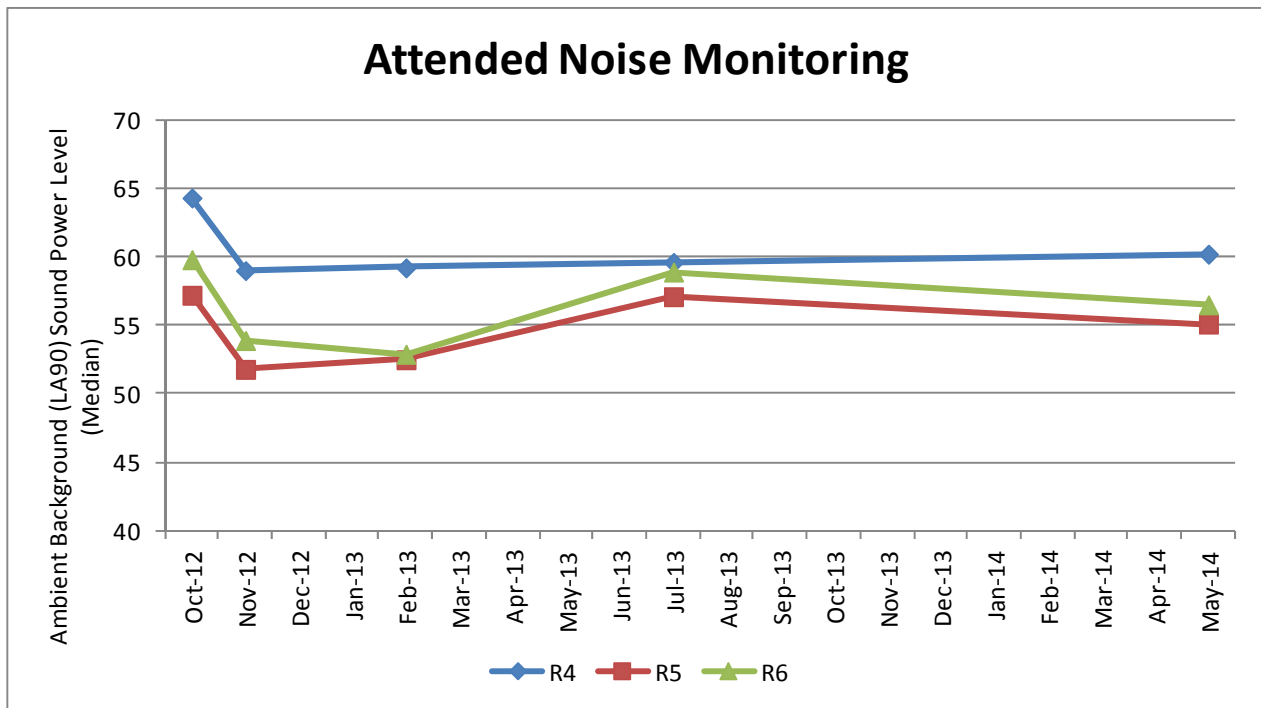


Figure 4 – Attended noise results for Kooragang Island

Following the completion of both attended and unattended monitoring, the data was evaluated against the baseline 2012 data, with medium noise levels found to be consistent with the 2012 median range as detailed in Table 5.

Table 5: Comparison of baseline and attended and unattended monitoring results

| Reference Measurement Location | Ambient Background RBL's dBA |        |                           |                           |
|--------------------------------|------------------------------|--------|---------------------------|---------------------------|
|                                | Baseline Levels (2012)       |        | Measured Levels 2012/2013 | Measured Levels 2013/2014 |
|                                | Median Range                 | Median | Median                    | Median                    |
| R4 - Roadside (South)          | 61.2 - 62.9                  | 62     | 59.6                      | 61.5                      |
| R5 - Riverside (Central)       | 55.8 - 58.2                  | 57     | 55.4                      | 55.0                      |
| R6 - Riverside (North)         | 58.2 - 60.6                  | 59.8   | 57.7                      | 60.0                      |

## 5.2 Community Complaints

Information on how the community can contact Orca to discuss the project or make a complaint in relation to our activities is provided in community newsletters, which are distributed to adjacent suburbs including Stockton, Fern Bay, Carrington, and areas of Mayfield, Maryville and Tighes Hill, via the Orca Kooragang Island website ([www.orca.com/kooragang](http://www.orca.com/kooragang)) and in periodic advertorials run in the local print media.

All complaints received by Orca are documented in the site's incident reporting system (Enablon). All complaints are investigated to establish the root cause of the concern.

During the 2013/2014 reporting period 10 complaints were received relating to noise and ammonia odour. Although noise and odour related complaints could not be directly attributed to the uprate of the Ammonia Plant, complaints received following the commencement of operations of the uprated Ammonia Plant have been included in this report for completeness (**Table 6**).

**Table 6** – Community complaints potentially attributable to the Project

| Year | Total | Concern raised in complaint   |
|------|-------|---|
| 2014 | 10    | <ul style="list-style-type: none"> <li>• 7 Complaints were received relating to ammonia odour</li> <li>• 1 Complaint received regarding noise from the Ammonia Plant</li> <li>• 2 complaints relating to ignition of vent stack in Ammonia Plant during plant startup.</li> </ul> |
| 2013 | 7     | <ul style="list-style-type: none"> <li>• 6 complaints relating to noise</li> <li>• 1 complaint relating to ammonia odour as a result of an incident in the Ammonia Plant</li> </ul>   |
| 2012 | 27    | <ul style="list-style-type: none"> <li>• 18 related to ignition of vent stacks during Ammonia Plant restart</li> <li>• 9 complaints relating to noise</li> </ul>  |
| 2011 | 219   | <ul style="list-style-type: none"> <li>• 8 August 2011 hexavalent chromium incident</li> </ul>  |

## 6 AN1 Prill Tower Emission Reduction Investigations

Condition 27 of the Project Approval requires:

- 27 The Proponent shall investigate and report on the progress to reduce PM<sub>10</sub> emissions from the existing Prill Tower on the Ammonium Nitrate Plant No. 1. The report shall:
- a) be provided annually, and can be reported through the Annual Environmental Management Report required by condition 50; and
  - b) Provide an update on the timeframe for the implementation of emission controls.

In addition to the Project Approval requirements Orica's Environment Protection License includes the particulate investigation program as a Pollution Reduction Program (PRP). The PRP required the following investigations to be completed:

**U1.1** *The licensee must undertake a program of works to characterise the emission of particulates from the No. 1 Ammonium Nitrate ("AN1") Prill Tower. The investigation must include, but is not limited to, an assessment of the following:*

- (a) *Monitoring of the concentration of coarse and fine particulates; and, the estimated annual mass discharge of particulates from the AN1 Prill Tower. Monitoring must be undertaken in accordance with the requirements under Australian Standard AS4323.1:1995.*
- (b) *A review of the relationship between plant operating conditions and particulate concentrations and characteristics.*

(c) *A review of the effect of meteorological conditions on particulate concentrations and characteristics.*

**U1.2** - *The licensee must undertake a review that identifies available options to reduce particulate emissions from the AN1 Prill Tower and assess the feasibility of the options identified, and*

**U1.3** - *The licensee must undertake a detailed evaluation of identified feasible options to reduce particulate emissions from the AN1 Prill Tower.*

## **6.1 . AN1 Prill Tower Particulate Emission Reduction Project Feasibility Report**

In the last 12 months the site has completed the AN1 Prill Tower Particulate Emission Reduction Project Feasibility Report, dated 20 December 2013. A robust program was completed to identify the most feasible option to meet the project objectives of reducing particulate emissions from the AN1 Prill Tower.

In determine the most appropriate improvement project the site undertook a feasibility assessment including:

- Identification of potential emission reduction technologies and screening against predetermined assessment criteria. This work identified a short-list of potential options retained for further assessment.
- Detailed feasibility assessment of 11 short-listed options against the assessment criteria (technical effectiveness; operability; implementability; safety, health, environment and community; and cost).
- Comparative assessment and ranking of the options.

The feasibility assessment was developed by Orica with input from a Technical Panel comprising of internal and external members with significant international experience across ammonium nitrate manufacturing and Orica processing industries including Orica engineers, managers, health safety and environment representatives.

The Particulate Minimisation Program was selected from 11 short listed projects as the Orica's preferred option. The Particulate Minimisation Program comprises an ongoing program of source control measures to reduce coarse particulate emissions from the Prill Tower. The program consists of four stages, with progression to each stage dependent on review of results from ongoing sampling / monitoring programs against performance metrics and triggers. An overview of the projects program is outlined in **Table 7**.

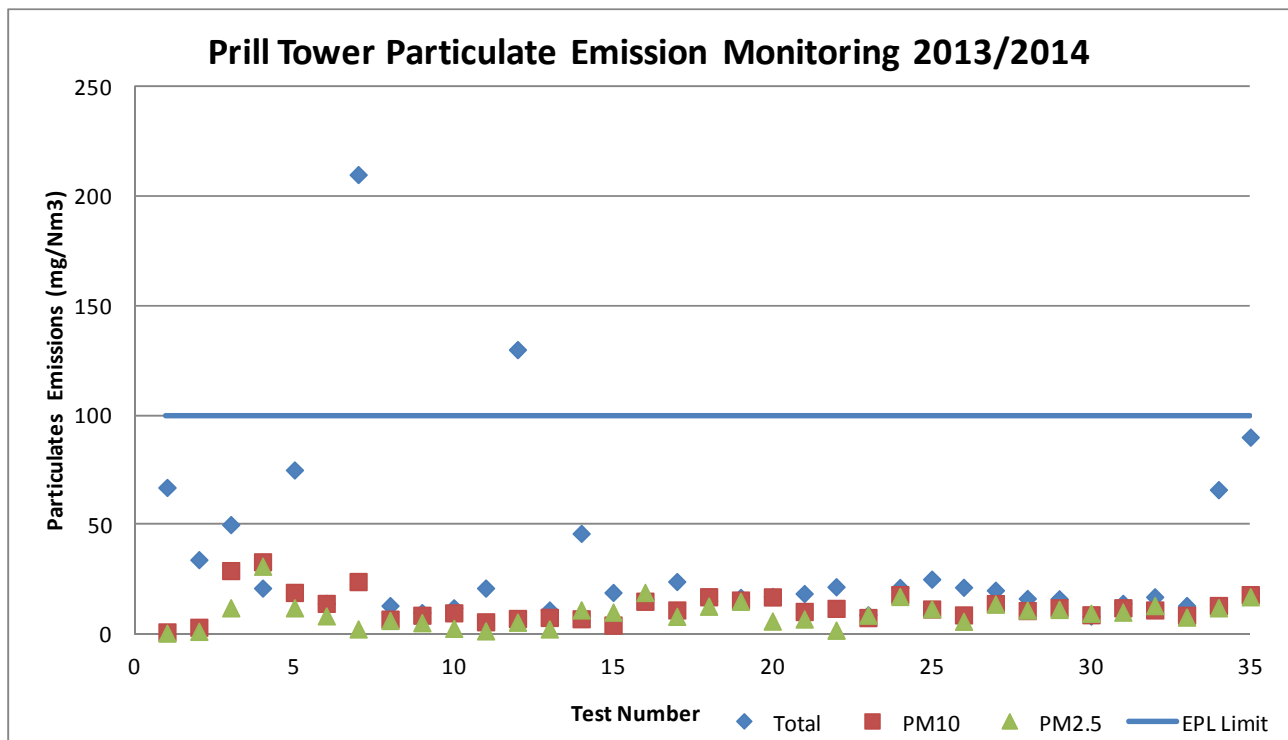
**Table 7 - Particulate Minimisation Program**

| Stage          | Description  | Proposed Timeframe |
|----------------|--|--------------------|
| <b>Stage 1</b> | <p>Develop and/or improve monitoring method(s) for coarse particulates and undertake further baseline monitoring.</p> <p>Develop metrics by which the performance will be assessed and triggers for further assessment or consideration of additional options.</p> <p>Validate CFD modelling.</p> <p>Further improvement of operator awareness and active process monitoring.</p> <p>Review prill head condition, design and availability.</p>                       | 3 to 6 months      |
| <b>Stage 2</b> | <p>Further improve prill head management.</p> <p>Upgrade vibrating prill head system.</p>  | 6 to 9 months      |
| <b>Stage 3</b> | <p>Design and implement system to minimise the impact of wind at the inlet louvres, based on validation of CFD results performed in Stage 1.</p> <p>Review impact of optimising prill size distribution and/or reducing prill head hole size.</p> <p>Consider further reduction in air flow through implementation of cooling system or internal sleeve, and progress design if installation appears justified.</p>  | 9 to 12 months     |
| <b>Stage 4</b> | <p>Document the Particulate Minimisation Program.</p> <p>Review and validate results of sampling / monitoring programs from Stages 1 – 4 activities against performance metrics and triggers, and assess whether further particulate reduction controls are required.</p> <p>If so, reassess options (in particular Options 1, 5 and 10) for feasibility with consideration of the additional information obtained through the Particulate Minimisation Program.</p> | Ongoing            |

Orica is currently implementing the Particulate Minimisation Program and a report on the outcomes of the works will be provided to the EPA in March 2015 and details provided in the 2014/2015 Annual Environmental Management Report.

## 6.2 Prill Tower particulate monitoring data

Orica has continued with a particulate monitoring program over the past 12 month period to support emission reduction initiatives implemented by the Particle Minimisation Program. Results of the sampling program for 2013 and 2014 are detailed below in **Figure 5**.



**Figure 5 – Particulate monitoring results**

The particulate results demonstrated that particulate levels associated with PM 10 and PM 2.5 are significantly below regulatory limit's and also lower than the conservative PM10 concentration data that was utilised in the air quality assessment that was previously submitted to the DoPI to support Orica's expansion project approval.

## 7 Reclaimed Water Project

As detailed in Condition 37 of the Project Approval, Orica is required to investigate the feasibility of receiving recycled water from Hunter Water Corporation's recycled water scheme. During the 2013/2014 AEMR reporting period, Orica has signed an agreement with Hunter Water to take recycled water from its new recycled water plant at Mayfield.

The agreement is the Hunter region's largest ever and will save up to 2.3 billion litres of drinking water a year. The project involved the construction of a new pipeline to divert up to 12 million litres of treated effluent a day from the Shortland Wastewater Treatment Works to the Advanced Water Treatment Plant (AWTP) located within the Steel River Industrial Area in Mayfield. The AWTP uses membrane micro-filtration and reverse osmosis to produce ultra pure recycled water. The water is then transported to Orica's facility on Kooragang Island via an 8-kilometre pipeline.

Over the last nine months, the site has installed the necessary infrastructure, such as tanks and pipework, to take the recycled water. Recycled water was received by the site for the first time on the 28 November 2014. The water is used in the Ammonia Plant Cooling Tower and the Demineralised Water Treatment Plant.

Orica KI is the Lower Hunter's largest consumer of drinking water, using almost five per cent of all drinking water in the region - that's the equivalent of around 1440 olympic-sized swimming pools.

This project will see Orica KI switch the majority of its water consumption from drinking water to recycled water. It will move Orica from Hunter Water's largest user down to the 19<sup>th</sup> largest user in the Hunter, saving the equivalent of around 12,000 homes annual water consumption. Making the switch to recycled water will significantly reduce the site's environmental footprint and contribute to its sustainability.

## **8 Project Approval Compliance**

A review of the current status of compliance with the Project Approval 08-0129 is detailed in the table below. Where there was not complete compliance with the condition, actions to address the issues are detailed.



**SUMMARY OF REPORTS SUBMITTED DURING 2013/2014 REPORTING PERIOD**

| <b>Issue</b>                    | <b>Condition</b> | <b>Requirement</b>   | <b>Compliance Status</b> | <b>Comment</b>  |
|---------------------------------|------------------|--|--------------------------|---|
| <b>General Responsibilities</b> | 1                | Implement all reasonable and feasible measures to prevent pollution and minimise harm to the environment.  | Complied                 | Management plans and project management activities are in place to ensure that environmental harm during construction activities is minimised.  |
|                                 | 2                | Project to be carried out in accordance with the EA, Statement of Commitments, Project Approval and Submission Approval, Modification report and PHA.                                | Complied                 | Project documentation has been updated to reflect development consent mod1 documentation.   |
|                                 | 3                | Management of inconsistencies between the various Project Approval documents.  | Complied                 | No issues were identified during the period.  |
|                                 | 4                | Comply with the requirements of the Director-General   | Complied                 | No issues were identified during the period.  |
|                                 | 5                | Production capacity limits for ammonia, nitric acid and ammonium nitrate.  | Complied                 | Ammonia – 328ktpa (360ktpa)<br>Nitric Acid – 327ktpa (605ktpa)<br>Ammonium Nitrate – 414ktpa (750ktpa)  |
|                                 | 6                | Management of Project Approval conditions in the event that there are delays to the stages of the project.   | Complied                 | No construction works were undertaken in relation to Phase 2 and 3 of the expansion construction program have been delayed. Regulatory reporting associated with the uprated ammonia plant (Phase 1) has continued in accordance with the Conditions of the project approval. |
|                                 | 7                | Submission of plans on a progressive basis.  | Complied                 | Orica has submitted plans on a progressive basis following discussions with the Department of Planning and Infrastructure. A revised Staging Plan outlining the progressive submission of plans was submitted to the DoPI dated 13 October 2014.                              |
|                                 | 8                | Buildings and structures to be constructed in accordance with the requirements of the Building Code of Australia.  | Complied                 | No buildings or structures were constructed or designed during the 2013/2014 monitoring period  |
|                                 | 9                | The Proponent is required to repair any public infrastructure damaged as a result of the Project.  | Complied                 | No construction works requiring the use of public roads were undertaken during 2013/2014.   |
|                                 | 10               | Undertaking of a dilapidation report prior to the commencement of construction. The report is to be undertaken in consultation with NPC and submitted to the Department of Planning. | Complied                 | No updates to the dilapidation report were required during the 2013/2014 reporting period.  |

| Issue                    | Condition | Requirement   | Compliance Status | Comment  |
|--------------------------|-----------|---|-------------------|--|
|                          | 11        | Obtain approval from service providers prior to commencement of utility construction activities | Complied          | Recycled water was connected to the site in cooperation with Hunter Water Corporation.   |
|                          | 12        | Ensure all equipment is maintained and operated in a proper and efficient manner.               | Complied          | Phase 1 - ongoing. Maintenance and training activities associated with Phase 1 have been incorporated into routine plant activities. |
|                          | 13        | Section 94 contribution to NCC.   | Complied.         | Section 94 contribution was submitted to NCC in September 2010.  |
| <b>Hazard Management</b> | 14        | Undertake the following studies and submit to DoP Director-General for approval:                |                   |  |
|                          | a)        | <ul style="list-style-type: none"> <li>Fire Safety Study</li> </ul>                             | Complied          | No updates to the Project's Fire Safety Study were made during the 2013/2014 monitoring period.                                      |
|                          | b)        | <ul style="list-style-type: none"> <li>HAZOP</li> </ul>   | Complied          | No updates to the projects previously submitted HAZOP reports were made during the 2013/2014 reporting period.                       |
|                          | c)        | <ul style="list-style-type: none"> <li>Final Hazard Analysis</li> </ul>                         | Complied          | No updates to the FHA were made during the 2013/2014 reporting period.   |
|                          | d)        | <ul style="list-style-type: none"> <li>Construction Safety Study</li> </ul>                     | Complied          | No additional construction safety studies were submitted to the DoPI during the 2013/2014 reporting period.                          |
|                          | 15        | Undertake the following studies and submit to DoP Director-General for approval:                | Complied          | No amendments to the transport of hazardous materials study were required during the 2013/2014 reporting period.                     |
|                          |           | <ul style="list-style-type: none"> <li>Transport of Hazardous Materials Study</li> </ul>        |                   |  |
|                          |           | <ul style="list-style-type: none"> <li>Emergency Plan</li> </ul>                                | Complied          | An annual review of the site emergency management plan was completed by the site during the 2013/2014 reporting period.              |
|                          |           | <ul style="list-style-type: none"> <li>Safety Management System</li> </ul>                      | Complied          | The site's safety management system was regularly reviewed by the site.  |
|                          | 16        | Submission of Pre-Startup Compliance Report   | Complied          | No additional pre startup reports were required to be submitted to the DoPI during the 2013/2014 reporting period.                   |
|                          | 17        | Submission of Post-Startup Compliance Report  | Complied          | No additional post startup reports were required to be submitted to the DoPI during the 2013/2014 reporting period                   |
|                          | 18        | Submission of Risk Reduction Program to reduce risk to neighbouring land                        | Complied          | This Condition is deemed satisfied through the risk reduction measures detailed in the Mod1 and Mod 2 PHA.                           |

| Issue                           | Condition | Requirement  | Compliance Status | Comment   |
|---------------------------------|-----------|--|-------------------|---|
|                                 | 19        | Undertake a Hazard Analysis of the site operations   | Complied          | This report was not required to be submitted during the period.   |
|                                 | 20        | Undertake a comprehensive Hazard Audit of the Project and submit a report to the DoP Director-General                                    | Complied          | No hazard audit was required during 2013/2014. The next scheduled hazard audit will be completed during 2016.   |
| <b>Air Quality</b>              | 21        | Emission controls detailed in Section 7.8.1 of the Environmental Assessment are to be incorporated into the design.                      | Complied          | The Refrigeration Purge Gas Scrubber has been commissioned and is operating in accordance with the environmental assessment. Orica has maintained quarterly stack testing during the 2013/2014 reporting period to support plant improvement initiatives. |
|                                 | 22        | Air emission monitoring required by the EPL is to be undertaken for the Project.   | Complied          | Air emission monitoring has been performed on the uprated ammonia plant in accordance with the requirements of the site's EPL.  |
|                                 | 23        | Undertake an Air Quality Verification Study  | Complied          | No updates to the Project's air quality verification study were required during the 2013/2014 reporting period.   |
|                                 | 24        | Implement reasonable and feasible actions to address exceedences identified in the Air Quality Verification Study or routine monitoring. | Complied          | No exceedences were identified in the Air Quality Verification Study.   |
|                                 | 25        | Minimisation of dust generation from Project using reasonable and feasible means.  | Complied.         | Measures for the control of dust were included in the Construction Environmental Management Plan which was approved by DoPI in February 2010. The CEMP was updated in 2011.<br>No construction works were completed during this period of reporting       |
|                                 | 26        | Trucks entering or leaving the Project site must have their loads covered and must not track dirt onto public roads                      | Complied.         | Measures for the control of dust were included in the Construction Environmental Management Plan which was approved by DoP in February 2010.  |
|                                 | 27        | An annual report must be prepared detailing the progress of the project to reduce PM10 emission from the existing Prill Tower            | Complied.         | A summary of the progress is detailed in this Annual Environmental Management Report.   |
| <b>Greenhouse Gas Emissions</b> | 28        | Emission reduction technologies to be implemented in accordance with EA commitment   | Complied.         | The following emission reduction technologies have been included in the Ammonia Plant; a Pre-Reformer, a new compressor powered by a steam turbine and a larger motor generator (Item 28b) have been installed in the plant.                              |

| Issue   | Condition  | Requirement  | Compliance Status                       | Comment   |                 |            |          |            |                            |     |   |  |           |
|---|------------|--|---|---|-----------------|------------|----------|------------|----------------------------|-----|---|--|-----------|
|   | 29         | Implementation of N <sub>2</sub> O abatement technology on NAP1, NAP2 and NAP3.  | n/a during the period.                  | N <sub>2</sub> O abatement technology has been installed in the No. 2 Nitric Acid Plant. The performance of the technology is currently being assessed.   |                 |            |          |            |                            |     |   |  |           |
| <b>Water Management</b>                             | 37         | Water management Plan, including reporting on progress of investigations to receive recycled water from Hunter Water Corporations recycled water scheme.   | Complied                                | A Water Management Plan for Phase 1 has been completed. Infrastructure associated with receiving recycled water has been installed and commissioned with recycled water received at site on the 24 November 2014. |                 |            |          |            |                            |     |   |  |           |
|   | 40         | The Project is to meet the requirements of the EPL in relation to stormwater and effluent discharge  | Complied                                | The site's effluent and stormwater was monitored in accordance with the requirements of the EPL. No non compliances were recorded during the 2013/2014 monitoring period.   |                 |            |          |            |                            |     |   |  |           |
|   | 37         | A Water Efficiency Plan is to be prepared and implemented to the satisfaction of the DoP Director-General  | Complied                                | No amendments to the Project's water efficiency plans were required in the 2013/2014 reporting period.  |                 |            |          |            |                            |     |   |  |           |
|   | 41         | Compliance with s120 of POEO   | Complied.                               | There were no water pollution related incidents directly attributed to the Project recorded during the 2013/2014 reporting period.  |                 |            |          |            |                            |     |   |  |           |
|   | 42         | A Stormwater Management Plan is to be prepared and implemented   | Complied                                | No changes to the Project's approved stormwater monitoring plan were recorded during the 2013/2014 reporting period,  |                 |            |          |            |                            |     |   |  |           |
|   | 43         | Bunding design to meet Australian and DECCW requirements   | Complied                                | A bunding specification in accordance with the Australian standard has been implemented into the design of the plants.  |                 |            |          |            |                            |     |   |  |           |
| <b>Noise Management</b>                             | 30         | Noise emissions from Project to be 10dB(A) below that of the existing operations.  | Complied.                               | Annual noise monitoring was completed during the 2013/2014 reporting period.  |                 |            |          |            |                            |     |   |  |           |
|   | 31         | Existing Operations Noise Verification Program to be developed and implemented to the satisfaction of the DoP Director-General   | Complied.                               | An updated noise management plan, including details of the Project's noise verification program was submitted and approved by the DoPI in May 2012  |                 |            |          |            |                            |     |   |  |           |
|   | 32         | A Noise Management Plan is to be developed and implemented. The plan is to be updated annually.  | Complied                                | An updated noise management plan, including details of the Project's noise verification program was submitted and approved by the DoPI in May 2012  |                 |            |          |            |                            |     |   |  |           |
|   | 33         | <table border="1"> <tr> <td colspan="2">Construction hours for the Project are:</td> </tr> <tr> <td>Monday – Friday</td> <td>7am to 6pm</td> </tr> <tr> <td>Saturday</td> <td>8am to 1pm</td> </tr> <tr> <td>Sunday and Public Holidays</td> <td>Nil</td> </tr> <tr> <td colspan="2">Construction outside of these hours is permitted if</td> </tr> </table> | Construction hours for the Project are: |   | Monday – Friday | 7am to 6pm | Saturday | 8am to 1pm | Sunday and Public Holidays | Nil | Construction outside of these hours is permitted if |  | Complied. |
| Construction hours for the Project are:             |            |  |   |   |                 |            |          |            |                            |     |   |  |           |
| Monday – Friday                                     | 7am to 6pm |  |   |   |                 |            |          |            |                            |     |   |  |           |
| Saturday  | 8am to 1pm |  |   |   |                 |            |          |            |                            |     |   |  |           |
| Sunday and Public Holidays                          | Nil        |  |   |   |                 |            |          |            |                            |     |   |  |           |
| Construction outside of these hours is permitted if |            |  |   |   |                 |            |          |            |                            |     |   |  |           |

| Issue                     | Condition | Requirement  | Compliance Status      | Comment   |
|---------------------------|-----------|--|------------------------|---|
|                           |           | inaudible at the nearest residences.   |                        |   |
|                           |           | Operational hours for the Project are:   | Complied               | The Project operated in accordance with the requirements.   |
|                           |           | All days 24 hours  |                        |   |
| <b>Land Management</b>    | 38        | Provide a Project Site Contamination Plan to the DoP Director-General                                  | Complied.              | Phase 1 - Complete.<br>Phase 2 and 3 – no construction activities have commenced at this time. However the revised CEMP for Phase 2 and 3, which includes measures for the management and identification of contamination, was submitted to DoPI on 05/11/2011.                         |
|                           | 39        | Prepare an Acid Sulphate Soil Management Plan  | Complied.              | Phase 1- Complete.<br>Phase 2 and 3 – no construction activities have commenced at this time. However the revised CEMP for Phase 2 and 3, which has measures for the management and identification of ASS, was submitted to DoPI on 05/11/2011.   |
|                           | 44        | Prepare an Erosion and Sediment Control Plan   | Complied.              | Phase 1 -Complete.<br>Phase 2 and 3 – no construction activities have commenced at this time. However the revised CEMP for Phase 2 and 3, which has measures for erosion and sediment control, was submitted to DoPI on 05/11/2011.   |
| <b>Traffic Management</b> | 34        | All roads, access points and parking to comply with the nominated Australian Standards                 | n/a during the period. | N/A   |
|                           | 35        | Traffic associated with the Project must not impede traffic on Greenleaf Road and Heron Road           | Complied.              | Phase 1- Complete.<br>Phase 2 and 3 – no construction activities have commenced at this time. However a revised Construction Traffic Management Plan for Phase 2 and 3, which includes measures for the management of traffic during construction, was submitted to DoPI on 05/11/2011. |
|                           | 36        | A Construction Traffic Management Plan (CTMP) is to be submitted to the DoP Director-General           | Complied.              | A CTMP for Phase 2 and 3, including measures for the management of traffic during construction has been submitted to DoPI (05/11/2011). No amendments were made to the plan during the 2013/2014 reporting period.  |
| <b>Visual</b>             | 45        | Prepare a Landscape Plan for the Project and submit to the DoP Director-General                        | n/a during the period. |   |
|                           | 46        | Lighting to comply with Australian Standards and avoid nuisance to surrounding landusers and roadways. | n/a during the period. | Phase 1 – There was no additional external lighting installed by the project during the 2013/2014 reporting period.   |

| Issue                   | Condition | Requirement  | Compliance Status | Comment   |
|-------------------------|-----------|--|-------------------|---|
| <b>Waste Management</b> | 37        | Water management Plan, including reporting on progress of investigations to receive recycled water from Hunter Water Corporation's recycled water scheme.  | Complied          | A Water Management Plan for Phase 1 has been completed. Infrastructure associated with receiving recycled water has been installed and commissioned with recycled water received at site on the 24 November 2014. |
|                         | 47        | Waste to be classified in accordance with DECCW guidelines and disposed of to approved premises  | Complied.         | All wastes disposed of at the site are classified in accordance with the relevant EPA guidelines.   |
|                         | 48        | Prepare and implement a Waste Management Plan which has been submitted to the DoP Director-General   | Complied          | A waste management plan from the uprated Ammonia Plant was submitted to the DoPI on 28 March 2013.  |
|                         | 53        | The following information regarding the Project is to be included on the website: <ul style="list-style-type: none"> <li>• Copy of all current statutory approvals</li> <li>• Copy of the current EMS and associated plans and programs</li> <li>• Copy of the last 5 years of Annual Reports</li> <li>• Copy of Independent Environmental Audit reports and responses to recommendations</li> </ul> | Complied          | Copies of relevant information relating to the project continue to be included on the Kooragang Island website ( <a href="http://www.orica.com/kooragang">www.orica.com/kooragang</a> ).                          |
|                         | 51        | The DoP Director-General is to be notified of any incident associated with the Project that results in actual or potential for offsite harm to people or the environment   | Complied          | No incidents associated with the Project occurred during the 2013/2014 monitoring period.   |
|                         | 50        | Prepare an Annual Environmental Management Report and submit to the DoP Director-General   | Complied.         | Submission of this report annually  |
|                         | 52        | An Independent Environmental Audit by a team of experts is to be undertaken in relation to the Project   | Complied.         | An Independent Environmental Audit was completed during February and March 2014. An audit report was submitted to DoPI on 24 March 2014.  |

**Orica Kooragang Island Ammonium Nitrate Expansion Project**  
**Department of Planning and Infrastructure Reporting Requirements**

✓ = Submitted to DoPI and Approved    ✓ = Submitted to DoPI awaiting approval from DoPI or Other    x = not submitted to DoPI

| Condition   | Condition Requirement                            | Project Phase        |          |          |            |     |         | Reports submitted to DoPI to date |   |
|---|--|----------------------|----------|----------|------------|-----|---------|-----------------------------------|---|
|   |  | Phase 1              | Phase 2  |          | Phase 3    |     | Phase 4 |                                   | Phase 5   |
|   |  | Ammonia Plant Uprate | OBL 1(a) | OBL 1(b) | NAP4 & ANS | ANP | AMI     |                                   | Nitric Acid Tank  |
| <b>Reporting Requirements for Commencing Construction</b> |  |                      |          |          |            |     |         |                                   |   |
| 14 (a)  | A Fire Safety Study                              | ✓                    | ✓        | ✓        | ✓          |     | x*      | N/A                               | 1. FSS Kooragang Island Site (21 June 2011)<br>2. FSS Ammonia Uprate project (17 April 2010)<br>3. FSS Phase 2 OBL 1(a) (17 February 2012)<br>4. FSS Phase 2 OBL 1(b) ( 23 October 2012)<br>5. FSS Phase 3 Nitric Acid and Ammonium Nitrate plants (7 January 2013)<br>* Site FSS to be updated |
| 14 (b)  | A Hazard and Operability Study                   | ✓                    | ✓        | ✓        | ✓          | ✓   | x       | x                                 | 1. Ammonia Plant Uprate ( 22 March 2010)<br>2. Phase 2 OBL 1(a) (27 March 2012)<br>3. Phase 2 OBL 1(b) (30 October 2012)<br>4. Ammonium Nitrate Prill Plant (15 Nov 2012)<br>5. Nitric Acid 4 and Ammonium Nitrate Solution 3 (28 Oct 2012)   |
| 14 (c)  | A Final Hazard Analysis                          | ✓                    | ✓        |          |            | x   | x       | x                                 | 1. Kooragang Island Phase 1 Uprate FHA (March 2010)<br>2. OBL 1(a) ( letter dated 28 March 2012)  |
| 14 (d)  | A Construction Safety Study                      | ✓                    | ✓        | ✓        |            | ✓*  | x       | x                                 | 1. CSS for air compressor building (5 December 2009)<br>2. CSS for ammonia plant uprate ( 29 March 2010)<br>3. CSS OBL 1 (a) (3 December 2011)<br>4. CSS OBL 1(b) ( 1 August 2012)<br>* Civil construction activities associated with phase 3 considered in OBL 1(b) CSS only                   |
| 36  | Construction Traffic Management Plan             | ✓                    |          |          | ✓          |     | N/A     | N/A                               | 1. Ammonium Nitrate Facility Upgrade CTMP (March 2010)<br>2. Ammonium Nitrate Facility Upgrade CTMP (September 2011)  |
| 37  | Water Efficiency Plan                            | ✓                    | N/A      | N/A      |            | ✓   | N/A     | N/A                               | 1. Water efficiency Plan Phase 1: Ammonia Plant Upgrade ( April 2011)<br>2. Water efficiency Plan Phase 3: NAP4 and AN3 (May 2013)  |
| 38  | Soil and Groundwater Contamination investigation |                      |          | ✓        |            |     | N/A     | N/A                               | 1. Soil Management Plan (December 2009)<br>2. Targeted soil and groundwater quality assessment ( 13 April 2012)   |
| 42  | Stormwater Management Plan                       | ✓                    |          | ✓        |            |     | N/A     | N/A                               | 1. Stormwater Nitrate Facility Upgrade Stormwater Management Plan Phase 1 (March 2010)<br>2. Stormwater Nitrate Facility Upgrade Stormwater Management Plan (November 2011)   |
| 45  | landscape plan                                   |                      |          | ✓        |            |     | N/A     | N/A                               | 1. Landscape Plan (3 June 2011)   |

| Condition   | Condition Requirement                  | Project Phase        |          |          |            |     |         |                  | Reports submitted to DoPI to date |   |
|---|--|----------------------|----------|----------|------------|-----|---------|------------------|-----------------------------------|---|
|   |  | Phase 1              | Phase 2  |          | Phase 3    |     | Phase 4 | Phase 5          |                                   |   |
|   |  | Ammonia Plant Uprate | OBL 1(a) | OBL 1(b) | NAP4 & ANS | ANP | AMI     | Nitric Acid Tank |                                   |   |
| 49  | Environmental Management Strategy      |                      |          | ✓        |            |     |         | N/A              | N/A                               | 1. Environmental Management Strategy (December 2009)  |
| <b>Reporting Requirements for Commencing Commissioning</b>    |  |                      |          |          |            |     |         |                  |                                   |   |
| 15 (a)  | Transport of Hazardous Materials Study | N/A                  | N/A      | N/A      | N/A        | ✓   |         | N/A              | N/A                               | 1. Transport and hazardous materials study (22 April 2013)  |
| 15 (b)  | Emergency Plan                         |                      |          | ✓        |            |     |         | X                | X                                 | 1. KI emergency response plan (11 April 2011)   |
| 15 (c)  | Safety Management System               |                      |          | ✓        |            |     |         | X                | X                                 | 1. Safety management system (December 2010)   |
| 16  | Pre-Startup Compliance Report          | ✓                    | X        | X        | X          | X   |         | X                | X                                 | 1. Pre- Start up Compliance report Phase 1 Ammonia plant uprate ( June 2011)  |
| <b>Reporting Requirements following Commencing Operations</b> |  |                      |          |          |            |     |         |                  |                                   |   |
| 17  | Post-Startup Compliance Report         | ✓                    | X        | X        | X          | X   |         | X                | X                                 | 1. Post- Start up Compliance report Phase 1 Ammonia plant uprate (May 2012)   |
| 18  | Further risk reduction program         |                      |          |          |            |     |         | N/A              |                                   | Not required due to updated PHA is now compliant  |
| 19  | Hazard Analysis Update                 |                      |          |          |            |     |         | X                |                                   | 3 years after commencing operations – due 28 Feb 2015   |
| 20  | Hazard Audit of the Project            |                      |          |          |            | ✓   |         |                  |                                   | Hazard Audit (28 March 2013)<br>* Three yearly schedule   |
| 23  | Air quality verification study         | ✓                    | N/A      | N/A      | X          | X   |         | X                | X                                 | Ammonia Plant uprate (27 February 2014)   |
| 30  | Noise Verification Program             |                      |          |          |            | ✓   |         |                  |                                   | 1. Noise verification assessment Orica Ammonium Nitrate expansion project (March 2011)  |
| 32  | Noise Management Plan                  | ✓                    |          |          |            |     |         | ✓                |                                   | 1. Noise Management plan (August 2011)<br>* quarterly compliance noise testing completed<br>* noise management plan reviewed in 2014<br>* Annual noise test requirement |
| 45  | landscape plan                         |                      |          |          |            | ✓   |         |                  |                                   | 1. Landscape plan (3 June 2011)   |
| 48  | Waste Management Plan                  | ✓                    |          |          | X          |     |         | N/A              | X                                 | 1. Ammonia Plant waste management plan (February 2013)  |



| Condition | Condition Requirement                  | Project Phase         |          |          |            |     |         | Reports submitted to DoPI to date   |                  |
|-----------|--|-----------------------|----------|----------|------------|-----|---------|---|------------------|
|           |  | Phase 1               | Phase 2  |          | Phase 3    |     | Phase 4 |   | Phase 5          |
|           |  | Ammonia Plant Upgrade | OBL 1(a) | OBL 1(b) | NAP4 & ANS | ANP | AMI     |   | Nitric Acid Tank |
| 50        | Annual Environmental Management Report |                       |          |          | ✓          |     |         | 1. Annual Environmental Management Plan (November 2010)<br>2. Annual Environmental Management Plan (November 2011)<br>3. Annual Environmental Management Plan (November 2012)<br>4. Annual Environmental Management Plan (November 2013)<br>5. Annual Environmental Management Plan (November 2014) |                  |
| 52        | Independent Environmental Audit        |                       |          |          | ✓          |     |         | 1. Independent Environmental audit dated (24 March 2014)<br>* 3 yearly audit schedule.  |                  |



