

ORICA KOORAGANG ISLAND

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT

DECEMBER 2017



Revision	Date	Description	Author	Approver
0	12/1/2018	2017 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
DPE	Department of Planning and Environment
EPA	Environment Protection Authority
EPL	Environment Protection Licence
HAZOP	Hazard and Operability Study
ktpa	kilo tonnes per annum
NAP4	No. 4 Nitric Acid Plant
SH&E	Safety, Health and Environment

1 Introduction

Orica Australia Pty Ltd (Orica) operates an ammonium 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 involved 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 applied to the DoPI to modify the approval on three occasions.

Modifications to the 2009 approval included:

Project Modification 1 (approved 11 July 2012)

- The relocation of plant and equipment further away from the closest residential properties located in Stockton;
- Relocation of AN3 to NAP4 to reduce the pipeline distance in which ammonia is required to be transported;

Project Modification 2 (approved 17 December 2014)

- 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; Instrumentation and integrity improvements to ammonia handling and storage systems; and
- The relocation and increase in storage quantity of a previously approved nitric acid tank.

Project Modification 3 (approved 17 December 2015)

- Increase the allowable annual production limit relating to the manufacture of ammonia at the site from 360,000t to 385,000t.

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 Environment (DPE) (formerly the Department of Planning and Infrastructure).



Figure 1: Site Location

2 Annual Environmental Management Report Requirements

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 2016 and 30 November 2017 and:

- 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 Approvals

The following licences and permits are held by the site relating to the Project.

Requirement	Issuing Authority	Licence Identifier	Licence Activities	Changes made during 2017 AEMR reporting period
Licences				
Environmental Licence	NSW EPA	No. 828	Details the environmental performance standards, monitoring and reporting requirements for manufacturing activities at the Kooragang Island site.	<p>Varied 9 December 2016 (Inclusion of PRPs to install a new sampling port on a stack, undertake stormwater quality improvements and investigate PM2.5 emissions. Additional stormwater monitoring parameters were included.</p> <p>Varied 18 January 2017 (Removal of PRP to install a new sampling port on a stack and noted completion of a stormwater quality improvement action)</p> <p>Varied 31 August 2017 (Inclusion of a scheduled activity to receive effluent from an adjacent facility)</p> <p>Varied 19 December 2017 (Variation of a completion date for the PM2.5 PRP)</p>
Major Hazard Facility	Safework NSW	10037-01	Manufacture and storage of NSW WHS Regulation Schedule 15 chemicals.	Nil
Licence to Manufacture Explosives and Security Sensitive Dangerous Goods	SafeWork NSW	XMNF100001	Authority to manufacture and store security sensitive dangerous goods (ammonium nitrate).	Nil
Notification of Dangerous Goods	SafeWork NSW	Acknowledgement No. NDG015329	Notifies SafeWork NSW of the storage of hazardous chemicals	Nil

Requirement	Issuing Authority	Licence Identifier	Licence Activities	Changes made during 2017 AEMR reporting period
Anhydrous Ammonia Pipeline Licence Agreement	Port of Newcastle	44400033	Licence for the operation of the anhydrous ammonia import and export pipeline between the site and the K2 berth.	Nil
Sewerage systems <ul style="list-style-type: none"> Collection tanks Transpiration system 	NSW EPA	No. 828	Operation of a site based sewerage system	
Ammonia Plant Main Cooling tower	Newcastle City Council	2/1	Operation of a water cooling system (Ammonia Plant Cooling Tower)	Renewed
Ammonia Storage Cooling tower	Newcastle City Council	2/2	Operation of a water cooling system (Ammonia Plant Cooling Tower)	renewed
Permit to Import Prohibited Chemicals - MDEA Import	Australian Government	2017/41	Permit to import MDEA for use in the ammonia plant.	Renewed
Consents				
Project Approval – Ammonium Nitrate Expansion Project	Minister for Planning and Infrastructure	08_0129		Nil
Easements				
Effluent Pipeline	Roads and Maritime		Agreement with RMS for the effluent pipeline in the North Arm of the Hunter River.	Renewed
Effluent Pipeline Easement	Port of Newcastle	N/A	Agreement with Port of Newcastle for the effluent pipeline between the site and the Hunter River	Nil
Lease Agreement				

Requirement	Issuing Authority	Licence Identifier	Licence Activities	Changes made during 2017 AEMR reporting period
Lot 9 Lease agreement	Port of Newcastle	44400157	Licence to enable access to land adjacent to the site effluent pipeline.	Renewed

4 Actions identified from previous Annual Environmental Management Report

Feedback regarding Orica's 2016 AEMR was provided by DPE on 20 January 2017. Three actions were detailed in the DPE correspondence as detailed in Table 1.

Table 1 – Actions provided by DPE from 2015/2016 AEMR

Action required from previous AEMR	Requested By	Action taken by	Where discussed in the 2017 AEMR
<p>Action 1</p> <p>All approvals held by Orica Australia Pty Ltd for the Kooragang Island site that are relevant to the operation associated with the Approval are provided in a summarized tabular format. This should include a summary of what the approval authorises and the relevant changes that may have occurred to the approval during the relevant AEMR reporting period such as an Environment Protection Licence variation.</p>	DPE	Orica	Section 3
<p>Action 2</p> <p>Provide specific comments of compliance against each approval condition for the AEMR reporting period. For example, schedule 4, Condition 50, this should include the date of the last and the next independent Environment Audit.</p>	DPE	Orica	Section 11
<p>Action 3</p> <p>A brief description of community activities undertaken such as social events or sponsorship for the reporting period.</p>	DPE	Orica	Section 8

5 Project Standards and Performance Measures

The Project is required to meet the standards and conditions detailed in the following documents:

- Project Approval 08-0129 dated 1 December 2009
- Project Environmental Assessment dated June 2009
- Statement of Commitments dated August 2009
- 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.
- Submissions Report dated 13 October 2014

- Orica Kooragang Island Ammonia Annual Quantity Increase Environment Assessment dated 28 April 2015.

Key design criteria detailed in these documents are detailed in Table 2.

Table 2 - 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 implementing the Project.	Operating Project to be at least 10dB (A) less than the existing plant noise levels.	<p>No additional noise sources were installed during the 2016/2017 AEMR reporting period.</p> <p>To enable the site to demonstrate compliance with the noise conditions detailed in the Development Consent, background noise testing at the community interface was performed prior to the Ammonia Plant uprate in 2011 in compliance with requirements detailed in Condition 31. Quarterly noise testing was subsequently performed during the 2013 AEMR period and annually thereafter in accordance with the DPI approved noise management plan.</p> <p>Noise testing undertaken during the 2017 AEMR reporting period was performed June 2017.</p>
Air Quality	Minimisation of particulate emissions associated with the Project.	AN3 stack emissions to be $\leq 20\text{mg}/\text{Nm}^3$	<p>Ammonium Nitrate Plant 3 has yet to be constructed; however, the requirement has been incorporated into the plant design.</p> <p>Particulate emission performance of AN3 will be confirmed during plant commissioning activities.</p>
	Minimisation of NOx emissions associated with the project.	Existing Reformer Stack NOx emission $\leq 350\text{mg}/\text{Nm}^3$ (as NO ₂ equivalent)	<p>A purge gas scrubber was installed in 2011 during the Ammonia Plant uprate aimed at reducing NOx emissions from the Ammonia Plant Reformer Stack.</p> <p>Two samples were collected and analysed during the 2017 AEMR reporting period with both samples complying with the site's EPL NOx concentration limit.</p>
		Pre-Reformer Furnace Stack NOx emission $\leq 350\text{mg}/\text{Nm}^3$ (as NO ₂ equivalent)	<p>Annual stack emission testing has been performed following the commencement of operations on the 29 February 2012. In total five annual stack tests have been performed in compliance the EPL requirements, with NOx emissions significantly below the predictions</p>

Criteria	Standard	Performance Measure	Comment		
			detailed in the Environmental Assessment and the site's EPL concentration limit. Orica last undertook stack emission testing of the Pre-Reformer on 7 July 2016 during the 2016/2017 EPL reporting period. The next stack emission test is schedule for January 2018 corresponding to the 2017/2018 EPL reporting period.		
		Expansion Boiler Stack NOx emission $\leq 350 \text{mg/Nm}^3$ (as NO ₂ equivalent)	Requirement has been incorporated into the Expansion Boiler design. Confirmation testing of NOx concentration will be completed following the commissioning of the new boiler which is expected to be completed in late 2018.		
		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 and operation of three ammonia flares.		
Greenhouse Gas Emissions	Installation of abatement technology on Nitric Acid Plants	Site N ₂ O emissions to be reduced by $\leq 65\%$ compared to a "do nothing" approach. Abatement projects to be completed within 6 months of commissioning of NAP4.	A N ₂ O emissions reduction strategy for the site has been implemented, with N ₂ O abatement technology installed in NAP2 from July 2013. N ₂ O emissions are continually monitored in all existing nitric acid plants. Orica is continuing to investigate suitable technology for application in NAP3.		
Water Emissions	New Plant and Equipment to comply with existing EPL conditions for effluent discharge parameters.		Effluent discharged from the site is continually monitored and reported in the site's EPA Annual Return. During the 2016/2017 AEMR reporting period 4 effluent quality non-compliances. Although effluent is generated from many sources onsite and not limited to effluent generated by the Project, all effluent noncompliance events have been included for completeness.		
				mg/L	
				90% limit	100% limit
		As			0.05
		Oil and Grease			10
		Nitrogen		1500	2000
		Cr (6+)		0.05	0.2
TSS		50			
pH		6.2 – 9.5			

Criteria	Standard	Performance Measure			Comment
		Temperature		43°C	<ul style="list-style-type: none"> • Effluent temperature was exceeded on two occasions' relating to the Ammonia Plant being restarted. • TSS, arsenic and zinc effluent concentration was exceeded on one occasion relating to algae dislodgement from the effluent discharge pipeline. • Oil concentration was exceeded on one occasion relating to an oil heat exchanger failure during start-up of the Ammonia Plant.
		Volume		4500kL/day	
		Nitrogen Mass Discharge		200tpa	
Production Limits	Production not to exceed prescribed levels.	Ammonia – 385ktpa Nitric Acid – 605ktpa Ammonium Nitrate – 750ktpa			Requirement incorporated into design. Production during the 2017 AEMR reporting period was as follows: Ammonia – 237ktpa Nitric Acid – 334ktpa Ammonium Nitrate – 418ktpa

To ensure that environmental performance standards are appropriately integrated into the new plant design and associated construction activities, a Construction Environmental Management Plan (CEMP) was developed and approved for use by DoPI in 2011. The site CEMP has been recently updated to reflect the additional requirements outlined in Condition 49A of the development consent. 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.

6 Project Status

6.1 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 385ktpa. 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 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 approval 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 DPE approved project Staging Plan is detailed in Table 3:

Table 3 – Project Staging Plan

Phase Stage	Description of Work	Sub Stage	Approval Status	Estimated Construction Timing	
Ammonia Plant Uprate					
1	1a	Ammonia Plant Expansion – Plant Air Compressor Building Construction of Plant Air Compressor building shell (compressor installed in Stage 1(b)).	Completed	Construction Complete and Operational.	Completed
	1b	Ammonia Plant Expansion - Installation/Modification of Plant Installation of new equipment including new compressor, process vessels pipework and instruments in the Ammonia Plant.	Completed		
Proposed Trident Nitrates Expansion Project Construction Scheduling					
2	2a	OBL 1(a) –Nitrates Infrastructure & ANS Loadout 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. 2. Site entrances, security offices and weighbridges. 3. Major civil works including piling and foundations. 4. New ANS storage vessel loading equipment	Approval for construction granted, construction yet to commence.	Yet to be determined
	2b	OBL 1(b) – Nitrates Despatch & Support Infrastructure 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.		Approval to commence construction not yet granted by DPE.	Yet to be determined
3	3a	NAP4 – Nitric Acid & AN Solution plants and Support Infrastructure Construction of the NAP4/ ANS Plant and tie-ins		Approval to commence construction not yet granted by DPE.	Yet to be determined

Phase Stage	Description of Work	Sub Stage	Approval Status	Estimated Construction Timing
	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.			
3b	<p>AN3 – AN Prill Plant Construction of ANP3 Dry Section plant and tie-ins</p>		Approval to commence construction not yet granted by DPE.	Yet to be determined
Ammonia Management Improvement Program				
4	<p>Ammonia Flares Construction and operation of three ammonia flares.</p>	<ol style="list-style-type: none"> 1. Nitrates Plant Flare 2. Ammonia Storage Flare 3. Ammonia Plant Flare 4. Ammonia storage tank (nitrates) 	<p>Approval to commence construction of the flares was granted on 23 June 2015.</p> <p>Ammonia Flares The nitrates flare became operational during February 2016 The ammonia storage flare became operational during April 2016. The ammonia plant flare was commissioned during April 2017.</p>	Completed
Nitric Acid Tank				

Phase Stage		Description of Work	Sub Stage	Approval Status	Estimated Construction Timing
5	5	<p>Nitric Acid Tank</p> <p>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.</p>		Approval to commence construction not yet granted by DPE.	Yet to be determined
Expansion Project Boiler					
6	6	<p>Construction and operation of Expansion Project Boiler</p>		<p>Approval to commence construction granted on 27 July 2015.</p> <p>Construction of the boiler has commenced.</p>	<p>Construction on hold during 2017. Construction is expected to recommence during 2018.</p>

A summary of the Project works completed between 1 December 2016 and 30 November 2017 is detailed below.

6.1.1 **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.
- Ammonia Plant flare constructed and commissioned
- Replacement of the ammonia export pipeline

6.1.2 **Phase 2: Outside Boundary Limits**

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

6.1.3 **Phase 3: Nitrate expansion**

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

6.1.4 **Phase 4: Ammonia Management Improvement Program**

The Ammonia Plant flare was constructed and commissioned during the 2016/2017 AEMR period.

6.1.5 **Phase 5: Nitric Acid Tank**

No construction activities commenced in the previous 12 months associated with Phase 5 construction activities.

6.1.6 **Phase 6: Expansion Project Boiler**

Construction of the new Boiler is currently on hold with no construction activities undertaken during the 2016/2017 AEMR reporting period.

6.2 **Planned Project Progress during 2017/2018**

Orica is continuing to focus on implementing site improvement works associated with Phase 4 and 6 of the Project.

Current market conditions have meant that Stages 2, 3 and 5 remain on hold. The timing associated with the implementation of these stages will be reviewed when market conditions are more favourable.

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:

6.2.1 Phase 1 Ammonia Plant Uprate

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

6.2.2 Phase 2 - Outside Boundary Limits (OBL)

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

6.2.3 Phase 3 – Nitrates expansion

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

6.2.4 Ammonia Management Improvement Program

Project has been completed. No further construction works expected in the next 12 months.

6.2.5 Nitric Acid Tank

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

6.2.6 Expansion Project Boiler

Construction activities associated with the expansion project boiler have been suspended due to changing site priorities and capital availability. The commissioning of the boiler is now expected to be completed in early 2019.

Orica will complete stack emission testing to confirm environmental performance of the boiler combustion system (NO_x concentration) compared to that predicted in the project EA documentation upon commissioning of the expansion project boiler. This data will be submitted in the Project Stage Air Quality Verification Study (Condition 23).

7 Environmental Monitoring and Complaints Summary

7.1 Environmental Monitoring

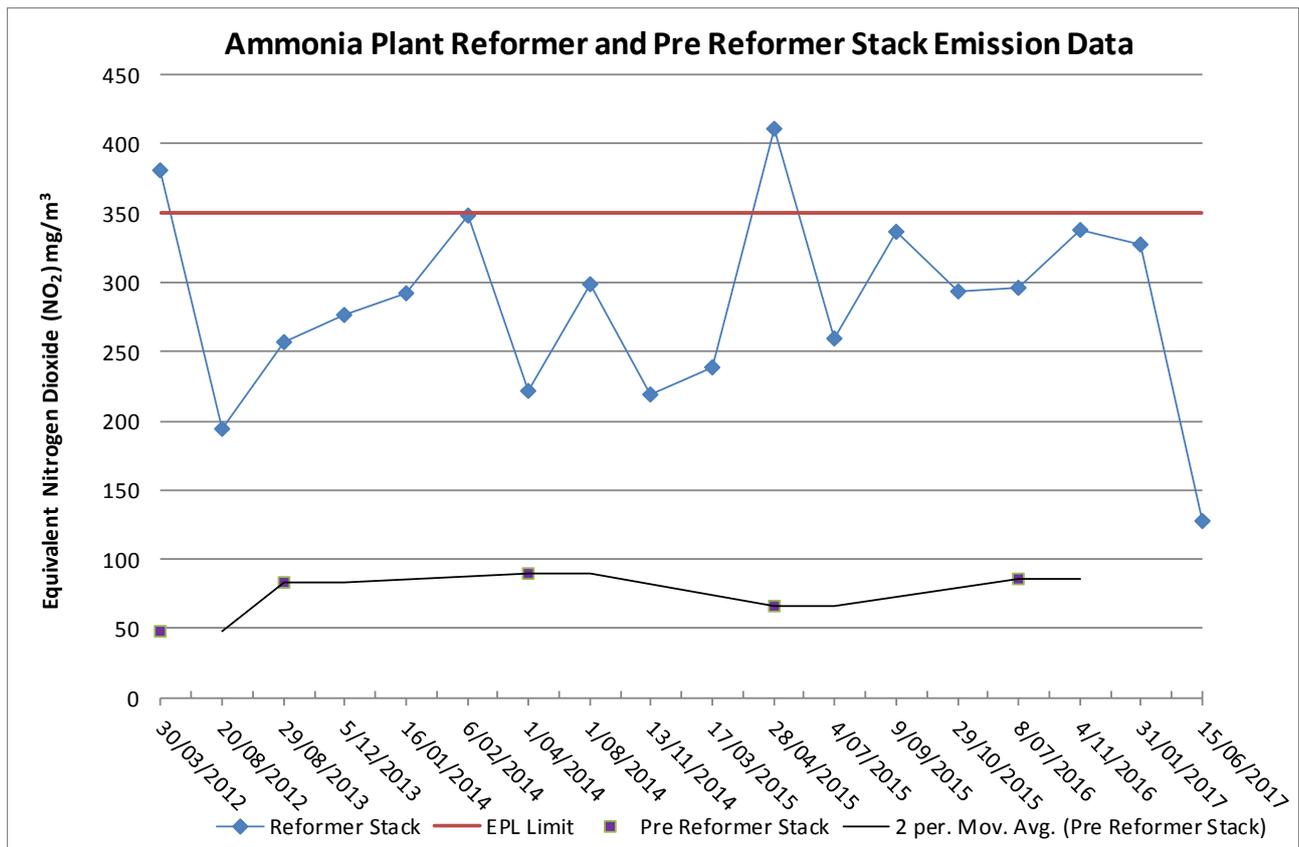
The Project Approval and EPL do not require environmental monitoring to be undertaken during the construction phase of the Project, however control measures specified in the project’s CEMP have been implemented.

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

7.1.1 Air Quality

Orica is required to perform stack emission testing for both the Pre-Reformer and Reformer Stacks annually in accordance with the site’s EPL anniversary date, 1 April each year. Two stack tests were performed at the Reformer Stack during the 2017 AEMR reporting period. Both tests complied with the NO_x concentration limit of 350mg/m³ with plant emissions significantly reducing following maintenance being completed on the Ammonia Plant during February 2017. The Pre-Reformer was last sampled on the 8 July 2016, with the next test scheduled to be completed during January 2018 as required for the 2017/2018 EPL reporting period.

Figure 2 – Stack emission testing for uprated ammonia plant



Stack emission data collected during the 2017 AEMR reporting period complied with the site’s Environment Protection Limit.

7.1.2 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 DPI in July 2011, with compliance to the project's noise criteria to be demonstrated through the:

- Update of the site's noise model (Table 4) 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 4 – Noise compliance modelling results detailed in 2011 mod 1 report

Assessment Location	Predicted Sound Pressure Levels 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. 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 5).

Table 5 – Revised compliance modelling results (quarter 1 testing)

Assessment Location	Predicted Sound Pressure Levels LAeq,15min (dBA)		
	Existing Plant	Post Ammonia Plant Uprate	Ammonia Plant 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 six reference locations to establish noise trends for the entire site, consistent with the process previously undertaken in 2011. Noise monitoring reference points R4, R5 and R6 have predominately been utilised to establish Orica's contribution to surrounding noise levels. Monitoring Location R6 was relocated in 2014 due to access to the location being restricted by new tenancy. The location of each noise monitoring point is detailed in **Figure 3**.

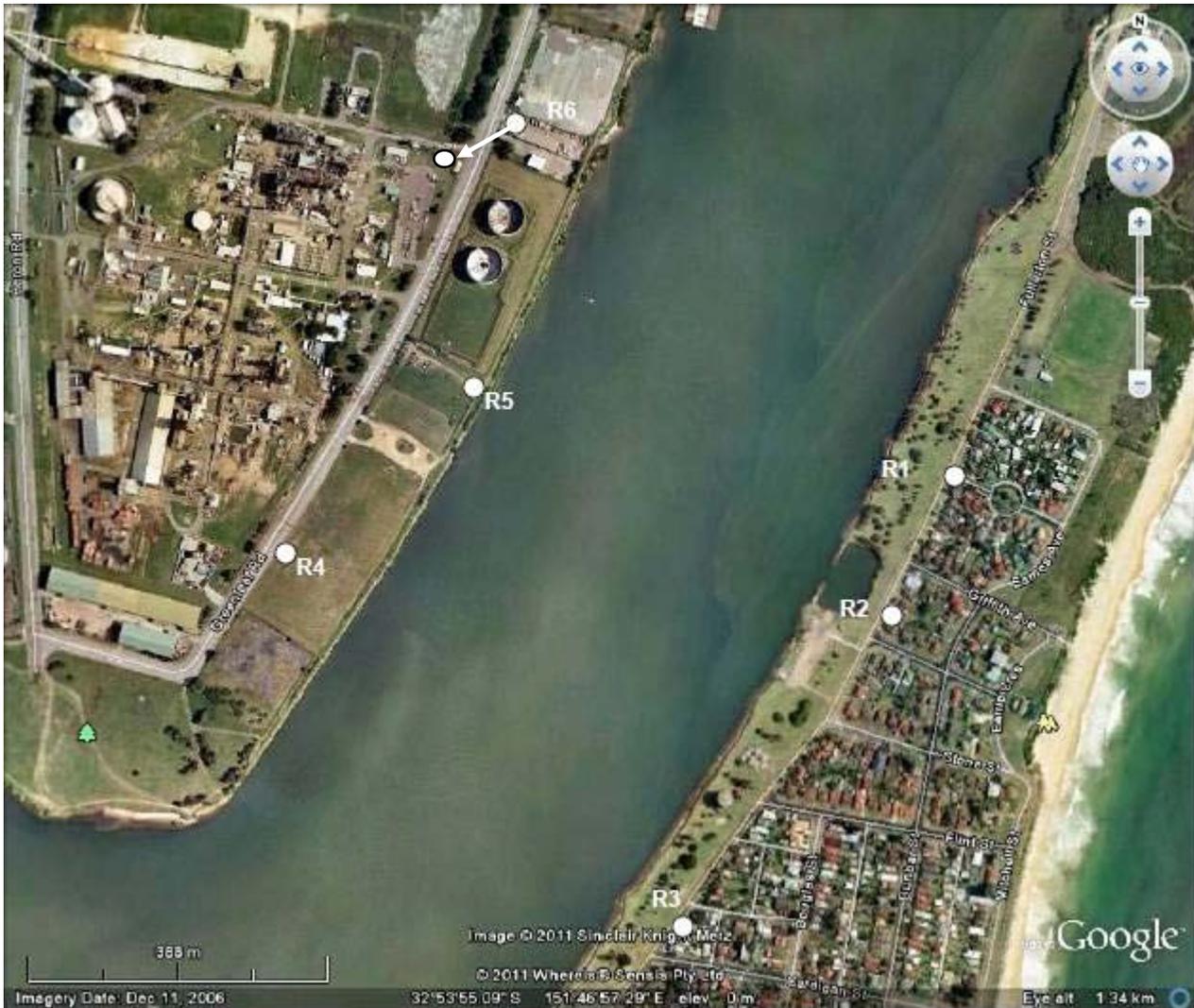


Figure 3 – Noise Monitoring Locations

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 during the first 12 months of the ammonia plant being updated (2013) and annually thereafter.

Unattended and attended measurements were conducted during May 2017 to assess noise from the Orica site and ambient noise trends. Unattended noise monitoring results are detailed in Figure 4.

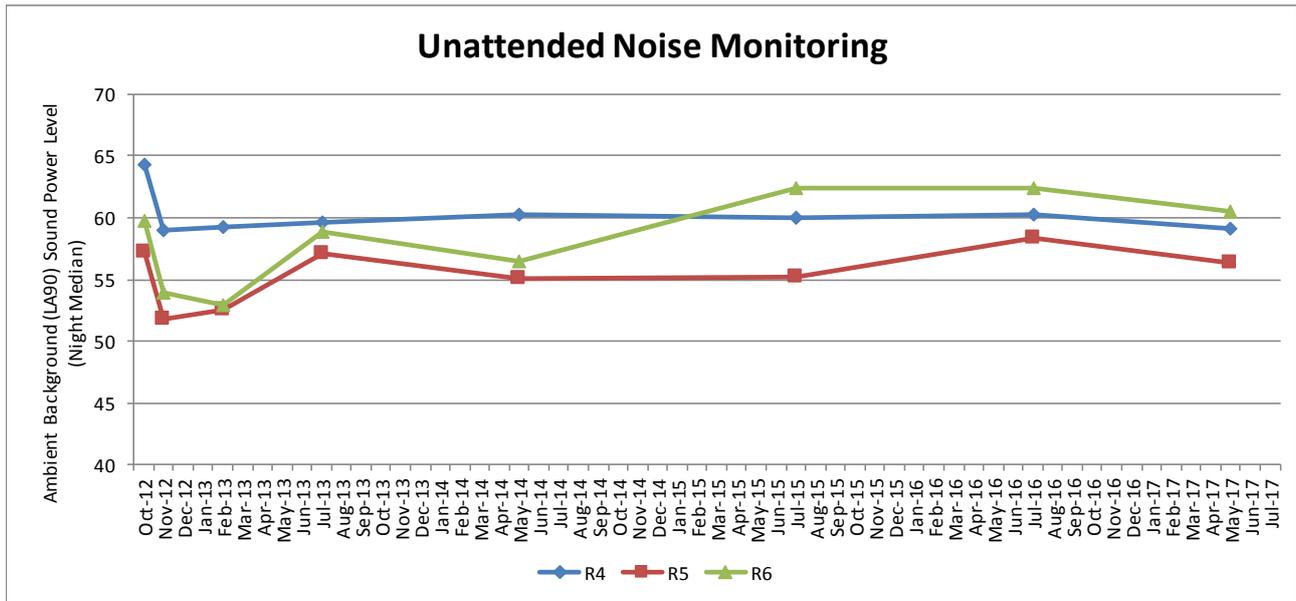


Figure 4 – Unattended noise results for Kooragang Island

Following the completion of both attended and unattended monitoring, the data was evaluated against the baseline 2012 data, with median noise levels found to be consistent with the 2012 median range as detailed in **Table 6**.

Table 6: 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	Measured Levels 2014/2015	Measured Levels 2015/2016	Measured Levels 2016/2017
	Median Range	Median	Median	Median	Median	Median	Median
R4 - Roadside (South)	61.2 - 62.9	62	59.6	61.5	59.7	60.2	60.1
R5 - Riverside (Central)	55.8 - 58.2	57	55.4	55.0	54.9	55.5	55.9
R6 - Riverside (North)	58.2 - 60.6	59.8	57.7	60.0	62.8	62.5	62.2

Observations noted during attended audits that noise from the Ammonia Plant CO₂ vent had reduced and that the median levels for R4, R5 and R6 were within the normal range of ambient levels with no significant noise trends identified. An increase in noise from R6, outside of the median range since 2014/2015 has been attributed to a change in the noise monitoring location approximately 40m closer to the ammonia plant.

Modelling undertaken utilising the unattended noise monitoring data demonstrated that noise contributions from the site satisfied the project noise criteria established in 2012. Attended night audits confirmed that Orica related maximum (L_{Amax}) noise levels were not observed to cause exceedances greater than 5DBA above the measured L_{Aeq} levels at any of the reference monitoring locations.

7.1.2 Water Management

Process effluent generated from the site's Ammonia Plant, three nitric acid plants and two ammonium nitrate plants is discharged to the north arm of the hunter river via an effluent pipeline. An effluent monitoring station, located on the western bank of the north arm of the Hunter River, continually monitors effluent water quality in compliance with the requirements detailed in the site's

Environment Protection Licence No. 828. Although the ammonia plant is one of several effluent sources generating from operating plants onsite, with no additional effluent sources generated by the uprate of the ammonia plant, a summary of effluent monitoring results is detailed in Table 7 for completeness.

Table 7 – Effluent Monitoring Results

Pollutant	Units of Measure	Monitoring Frequency Required by Licence	Min. Value	Max. Value	90 percentile Licence Limit	100 percentile Licence Limit	Exceedence? (Yes/No)
Arsenic	mg/L	Daily	<0.01	0.24	-	0.05	Yes
Chromium (hexavalent)	mg/L	Daily	<0.01	0.02	0.05	0.2	No
Nitrogen (Total)	mg/L	Daily	32	426	1500	2000	No
Oil and Grease	mg/L	Twice per Week	0.1	33.0	-	10	Yes
pH	pH	Continuous	6.2	9.4	-	6.2-9.5	No
Temperature	Degrees Celsius	Continuous	11.5	43.7	-	43	Yes
TSS	mg/L	Daily	2	1500	-	50	Yes
Zinc	mg/L	Daily	<0.1	8.1	-	5	No
Flow	kL/day	Daily	561	3627	-	4500	No

Effluent temperature was exceeded on two occasions' relating to the Ammonia Plant being restarted. Changes to start up procedure have reduced the likelihood of similar exceedances from occurring.

TSS, arsenic and zinc effluent concentration was exceeded on one occasion relating to algae dislodgement from the effluent discharge pipeline. The site has increased the frequency in which algae is removed from this pipe.

Oil concentration was exceeded on one occasion relating to an oil heat exchanger failure during start-up of the Ammonia Plant. The oil heater is scheduled for replacement.

8 Community

8.1 Community Engagement Activities

Orica Kooragang Island is committed to effective and targeted stakeholder engagement by ensuring that the community is informed during each stage of the Project. To do so, the site undertakes the following activities.

- The production and distribution of five community newsletters per year which are delivered to residents in our neighboring suburbs of Stockton, Carrington, Tighes Hill, Mayfield East, Fern Bay and Maryville;
- Regular (3 monthly) Community Reference Group (CRG) meetings, a number of which feature independent guest speakers to talk about specific matters;
- Regular site tours for the general community and special interest groups;
- Annual emergency response briefings with industrial neighbors; and

- Quarterly briefings with EPA and SafeWork.

In addition, an Orica employee has been an industry representative on the EPA's Newcastle Community Consultative Committee for the Environment.

Each year the site develops a community report outlining the site's community engagement and investment achievements. The 2017 Community Report is attached in Appendix A.

8.2 Community Investment

Orica Kooragang Island aims to have a positive contribution to the community by supporting local initiatives and events. Through the Orica Kooragang Island Community Investment Program a range of projects that promote education and lifelong learning, improve and protect the environment, and build strong communities are funded. In 2016/2017 Orica Kooragang Island provided approximately \$129,000 worth of grants to 16 community groups.

As well as providing funds through the Community Investment Program, the site also invested around \$121,000 sponsoring a range of local events, activities and organisations including:

- Surfest's Orica Team Challenge
- Mentor Support Network
- Museum Express
- Harry's House
- Chuck Duck Breakfast Club
- Opera Hunter
- Grand Masters Hockey World Cup
- Hunter District Cycling Club
- Hunter Business Chamber
- Newcastle Rotary Clubs
- Stockton Surf Life Saving Club
- Carrington Starlight Cinema
- Local Sporting Clubs

8.3 Community Complaints

Information on how the community can contact Orica to discuss the Project or make a complaint in relation to site 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 Orica Kooragang Island website (www.órica.com/kooragang), the White pages, a community calendar which is distributed to Stockton and Fern Bay and in periodic advertorials run in the local print media.

All complaints received by Orica are documented in the site's incident reporting system (Enablon). All complaints are investigated to establish the root cause of the concern and determine whether the complaint is justified.

During the 2017 AEMR reporting period 5 complaints were received relating to noise and ammonia odour or associated with the ammonia plant operations. Investigation of the complaints was undertaken to determine whether they were potentially associated with Orica's operations. Although noise and odour related complaints were not 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 8**).

Table 8 – Community complaints received regarding noise and ammonia odour or associated with the ammonia plant

Year	Total	Concern raised in complaint
2017	5	<ul style="list-style-type: none"> • 3 complaints related to odour received from residents and industrial neighbours • 2 complaints related to noise from Stockton residents
2016	14	<ul style="list-style-type: none"> • 10 complaints related to odour received from residents and industrial neighbours • 3 complaints were received regarding noise • 1 complaint regarding ignition of ammonia plant vent
2015	8	<ul style="list-style-type: none"> • 6 complaints related to odour received from residents and industrial neighbours • 2 complaints related to noise generated from steam venting
2014	10	<ul style="list-style-type: none"> • 7 complaints were received relating to ammonia odour • 1 complaint received regarding noise from the Ammonia Plant • 2 complaints relating to ignition of vent stack in Ammonia Plant during plant startup.
2013	7	<ul style="list-style-type: none"> • 6 complaints relating to noise • 1 complaint relating to ammonia odour as a result of an incident in the Ammonia Plant
2012	27	<ul style="list-style-type: none"> • 18 related to ignition of vent stacks during Ammonia Plant restart • 9 complaints relating to noise

9 AN1 Prill Tower Emission Reduction Investigations

9.1 Particulate Minimisation Program

Condition 27 of the Project Approval requires:

The Proponent shall investigate and report on the progress to reduce PM10 emissions from the existing Prill Tower on the Ammonium Nitrate Plant No. 1. The report shall:

- be provided annually, and can be reported through the Annual Environmental Management Report required by condition 50; and*
- Provide an update on the timeframe for the implementation of emission controls.*

In addition to the Project Approval requirements Orica's Environment Protection License previously included 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.

In compliance with both Condition 27 and the Pollution Reduction Program, Orica has completed an assessment of feasible options designed to reduce particulate emissions from the AN1 Prill Tower. From the 11 feasible options identified by the study, the Particulate Minimisation Program was identified as the preferred option. A final report was developed in accordance with the requirements detailed in PRP U1.3 titled *AN1 Prill Tower Particulate Emission Reduction Project Feasibility Report*, dated 20 December 2013 and submitted to the EPA.

The program consists of four stages, with progression to each stage dependent on a review of results from ongoing sampling / monitoring programs against performance metrics and triggers. An update regarding progress made in implementing the program is outlined in Table 7.

Table 9 - Particulate Minimisation Program update

Task	Description	Completed	Dates
Stage 1			
1.1	Identify the most appropriate monitoring method for coarse particulate emissions	✓	Jan 2014 - ongoing
1.2	Undertake further baseline monitoring	✓	Jan–Aug 2014
1.3	Develop metrics by which the performance will be assessed and triggers for further assessment or consideration of additional options	✓	Aug 2014
1.4	Improve operator awareness and active process monitoring	✓	Apr 2014-ongoing
1.5	Validate CFD modelling	-	Partial
1.6	Review of prill head design, condition and availability	✓	Apr-Aug 2014

Task	Description	Completed	Dates
1.7	Review and validate results of sampling / monitoring programs against performance metrics and triggers, and assess whether progression to Stage 2 is required.	✓	Ongoing and this report
Stage 2			
2.1	Improvements to the vibrating prill head system	✓	Oct 2014 - ongoing
2.2	Improvements to prill head management (handling, change-outs, systems and cleaning)	✓	Aug-Nov 2014
2.3	Review and validate results of sampling / monitoring programs against performance metrics and triggers, and assess whether progression to Stage 3 is required.	✗	Not applicable - further monitoring required
Stage 3			
3.1	Design and implement system to minimise the impact of wind at the inlet louvres (to assist in creating uniform air flow at the base of the Prill Tower). Reduction of Prill Tower air flow:	✗	Not currently required
3.2	Review effects of optimising prill size distribution and/or reducing prill head hole size to minimise cooling requirements Consider further reduction in air flow through implementation of cooling system or internal sleeve, and progress design if installation appears justified.	-	Partial – prill head design modifications and prill size changes completed
3.3	Review and validate results of sampling / monitoring programs from Stages 1 – 3 activities against performance metrics and triggers, and assess whether progression to Stage 4 is required.	✗	Not applicable - further monitoring required
Stage 4			
4.1	Document the Particulate Minimisation Program Consider next steps:	✗	Not yet applicable
4.2	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.	✗	Not yet applicable

Orica propose to continue implementation of the Particulate Minimisation Program during the next 12 months in general accordance with the plan presented in the Feasibility Assessment and summarised in Table 9 - Particulate Minimisation Program update

Planned works for 2017/2018 include:

- Ongoing iso-kinetic sampling, deposition monitoring and continuous stack monitoring to ensure compliance with requirements of the site's EPL and assess the effectiveness of Particulate Minimisation Program measures.
- Continued logging of relative emission concentrations exceeding trigger levels and plant operating conditions.
- Continued management of prill heads.

9.2 PM2.5 Particle Characterisation Study

The Lower Hunter Particle Characterisation Study undertaken by the NSW EPA, NSW Office of Environment and Heritage, CSIRO and ANSTO, which was released in April 2016, identified that elevated levels of ammonium nitrate were present in PM2.5 samples collected at the Stockton Air Quality Monitoring Station during the winter months of 2014. In response to these findings Orica entered into a Pollution Reduction Program with the following requirements:

U3.1 – The licensee must fund the analysis of the ammonium and nitrate component of samples collected at the Stockton Air Quality Monitoring Station as part of the ANSTO Aerosol Sampling Program (ASP) PM2.5 during the period April to September 2015 and April to September 2016.

Within one month of receiving the results the licensee must submit them to the EPA's Regional Manager - Hunter at PO Box 488G, Newcastle NSW 2300, or by email to hunter.region@epa.nsw.gov.au.

U3.2 – The licensee will undertake an investigation to determine the contribution of ammonium nitrate particles with a diameter of 2.5µm or less (PM2.5) discharged from sources located at the site to total PM2.5 concentrations at the Stockton Air Quality Monitoring Station.

A report detailing this investigation and its findings must be submitted to the EPA's Regional Manager - Hunter at PO Box 488G, Newcastle NSW 2300, or by email to hunter.region@epa.nsw.gov.au.

Date for completion: 28 February 2018

U3.3 - The licensee must undertake a review that identifies feasible options to reduce PM2.5 ammonium nitrate particle emissions from sources identified as being significant as a result of the investigation completed in U3.2.

A report detailing the outcomes of the review must be submitted to the EPA's Regional Manager – Hunter at PO Box 488G, Newcastle NSW 2300, or by email to hunter.region@epa.nsw.gov.au.

Date for completion: 28 February 2018

Orica will provide a summary of the outcomes from the program in the 2018 AEMR.

9.3 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 in the Particulate Minimisation Program. Results of the sampling program for 2014, 2015, 2016 and 2017 are detailed below in Figure 5.

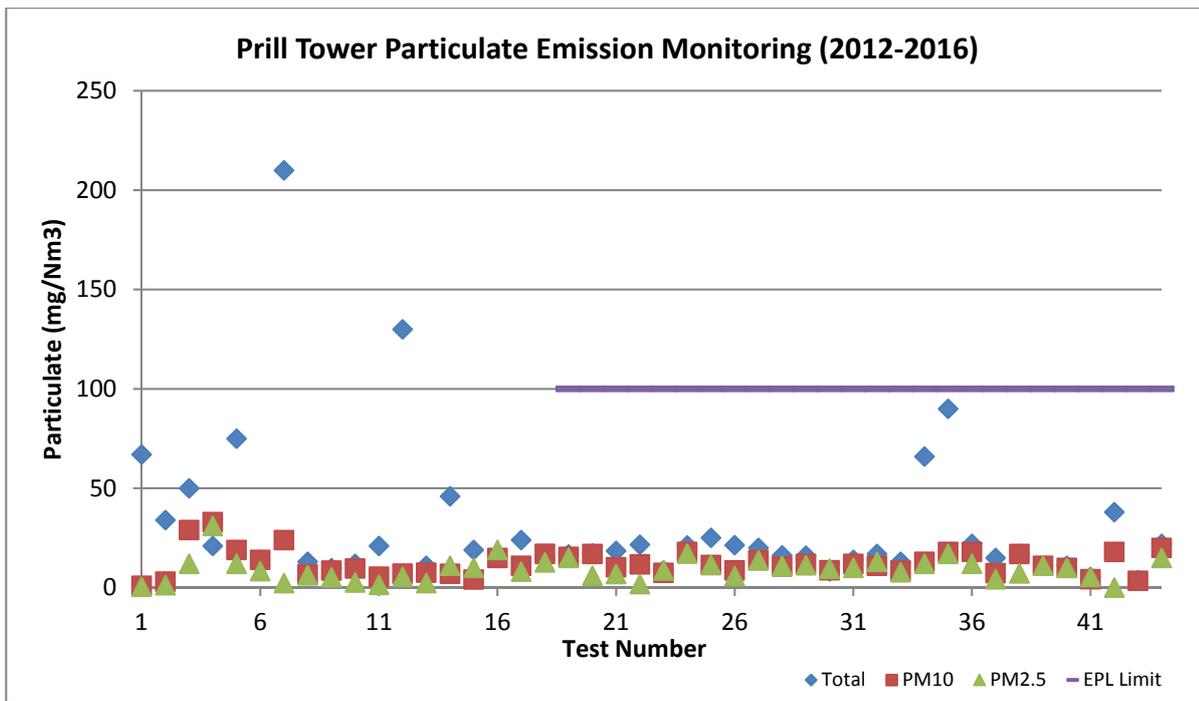


Figure 5 – Particulate monitoring data from AN1 collected during 2015, 2016 and 2017

During the 2017 AEMR reporting period, two prill tower stack emission tests were performed (Sample 45 and 46).

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

10 Reclaimed Water Project

As detailed in Condition 37 of the Project Approval, Orica was required to investigate the feasibility of receiving recycled water from Hunter Water Corporation’s recycled water scheme. This project was successfully implemented, with recycled water received by the site for the first time on the 28 November 2014. The water is used in the Ammonia Plant Cooling Tower, Demineralised Water Treatment Plant and No. 1, 2 and 3 Nitric Acid Plant Cooling Towers. A breakdown of potable water usage compared with recycled water usage is detailed in **Error! Reference source not found.**

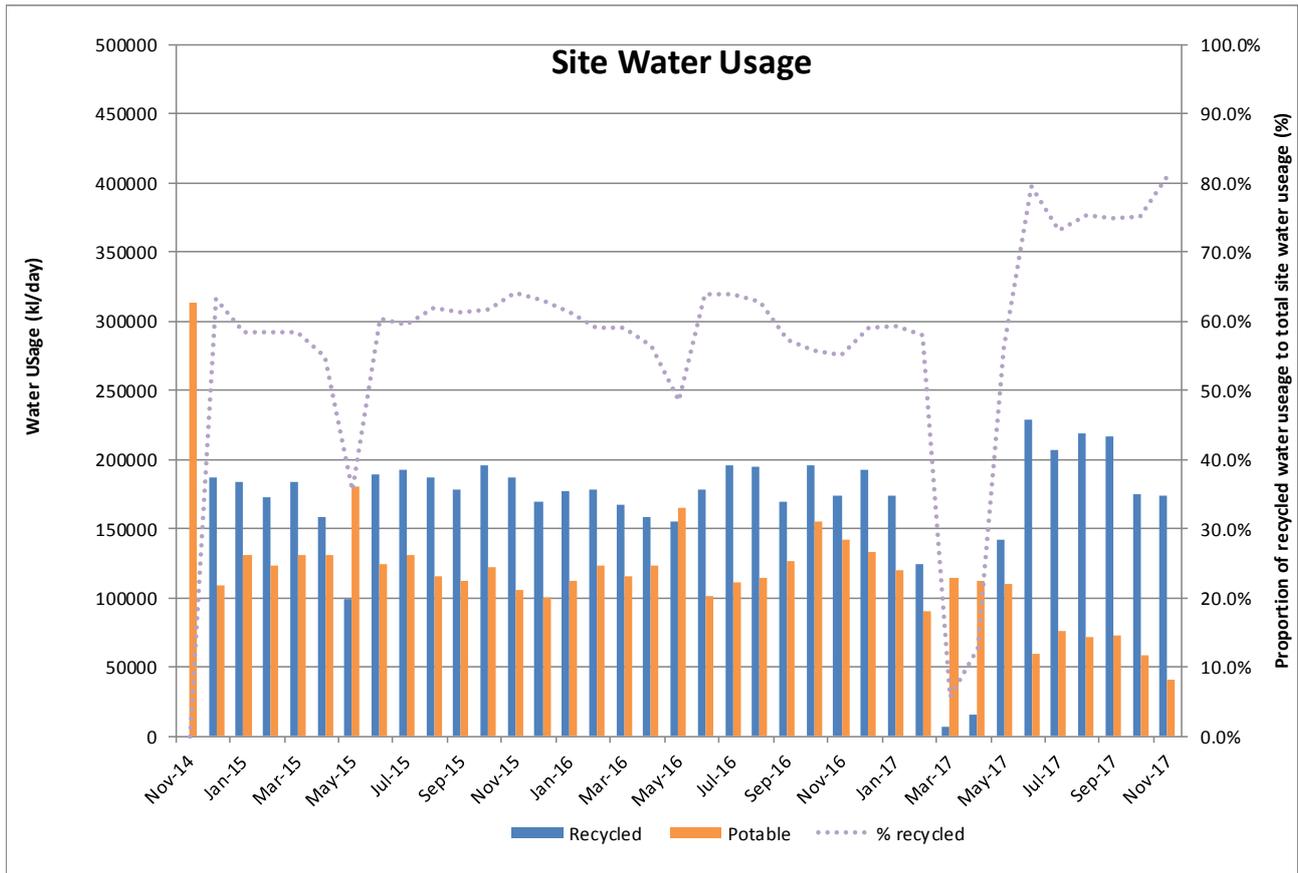


Figure 6 Potable water and recycled water usage comparison

Orica has increased recycled water usage during the 2017 AEMR period, with recycled water contributing to 80% of water consumed at the site.

11 Project Approval Compliance

11.1 Condition Compliance

A review of the 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. Any noncompliance identified in Table 11, have been identified in accordance with the following risk level detailed in below.

Table 10 – Noncompliance risk level ranking

Risk level	Colour code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

Table 11 Summary of Compliance with Project Approvals during 2017 AEMR Reporting Period

Issue	Condition	Requirement	Compliance Status	Comment
General Responsibilities	1	Implement all reasonable and feasible measures to prevent pollution and minimise harm to the environment.	Compliant	Management plans and project management activities are in place to ensure that environmental harm during construction and operational 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.	Compliant	Project documentation has been updated to reflect development consent MOD1, MOD2 and MOD3 documentation.
	3	Management of inconsistencies between the various Project Approval documents.	Compliant	No issues were identified during the period.
	4	Comply with the requirements of the Secretary	Compliant	No issues were identified during the period.
	5	Production capacity limits for ammonia, nitric acid and ammonium nitrate.	Compliant	Ammonia – 237ktpa (360ktpa) Nitric Acid – 334ktpa (605ktpa) Ammonium Nitrate – 418ktpa (750ktpa)
	6	Management of Project Approval conditions in the event that there are delays to the stages of the project.	Compliant	No construction works were undertaken in relation to Phase 2, 3 and 5 of the expansion construction program. Regulatory reporting associated with the updated ammonia plant (Phase 1) has continued in accordance with the conditions of the project approval.
	7(a) 7(b)	The project shall be carried out generally in accordance with the approved Staging Plan	Non-Compliant	The revised Staging Plan was not submitted two months prior to the commencement of construction of the flares (June 2015) in compliance with Condition 7B. However, the staging plan is updated annually and submitted to DPE as part of the AEMR reporting process. Orica will ensure that the staging plan is updated within two months of commencing each stage detailed in the staging plan.
	7 (e)	Submission of plans on a progressive basis.	Compliant	Orica has submitted plans on a progressive basis following discussions with the DPE. A revised Staging Plan outlining the progressive submission of plans is submitted annually to the DPE in the AEMR.

Issue	Condition	Requirement	Compliance Status	Comment
	7(f)	Minor design Variations	Compliant	No minor modifications were sought by Orica during the 2017 AEMR reporting period.
	8	Buildings and structures to be constructed in accordance with the requirements of the Building Code of Australia.	Compliant	No buildings or structures were constructed or designed during the 2017 AEMR monitoring period
	9	The Proponent is required to repair any public infrastructure damaged as a result of the Project.	Compliant	No construction works requiring the use of public roads were undertaken during the 2017AEMR reporting period.
	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.	Compliant	No updates to the dilapidation report were required during the 2017 AEMR reporting period.
	11	Obtain approval from service providers prior to commencement of utility construction activities	Compliant	Recycled water was connected to the site in cooperation with Hunter Water Corporation in 2014. No additional utilities were connected to the site during the 2017 AEMR reporting period.
	12	Ensure all equipment is maintained and operated in a proper and efficient manner.	Compliant	Phase 1 - ongoing. Maintenance and training activities associated with Phase 1 have been incorporated into routine plant activities.
	13	Section 94 contribution to NCC.	Compliant.	Section 94 contribution was submitted to NCC in September 2010.
Hazard Management	14	Undertake the following studies and submit to DoP Secretary for approval:		
	a)	<ul style="list-style-type: none"> Fire Safety Study 	Compliant	No changes to the site FSS were made during the 2017 AEMR period.
	b)	<ul style="list-style-type: none"> HAZOP 	Compliant	No HAZOP reports were submitted to DPE during the 2017 AEMR reporting period.
	c)	<ul style="list-style-type: none"> Final Hazard Analysis 	Compliant	No FHA's were submitted during the 2017 AEMR period.
	d)	<ul style="list-style-type: none"> Construction Safety Study 	Compliant	No CSS's were submitted to DPE during the 2017 AEMR reporting period.
	15	Undertake the following studies and submit to DoP Secretary for approval: <ul style="list-style-type: none"> Transport of Hazardous Materials Study 	Compliant	No amendments to the transport of hazardous materials study were required during the 2017 reporting period.

Issue	Condition	Requirement	Compliance Status	Comment
		<ul style="list-style-type: none"> Emergency Plan 	Compliant	<p>The site's Emergency Plan was updated during 2017 AEMR reporting period.</p> <p>Next Updated scheduled for June 2018</p>
		<ul style="list-style-type: none"> Safety Management System 	Compliant	No changes to the site safety management system were made during the 2017 AEMR reporting period.
	16	Submission of Pre-Startup Compliance Report	Compliant	No additional pre-start-up reports were required to be submitted to DPE during the 2017 AEMR reporting period.
	17	Submission of Post-Startup Compliance Report	Non-Compliant	<p>A post start-up report was not submitted to DPE following the commissioning of the Ammonia Plant Flare.</p> <p>Orica will complete a post start-up report and submit to DPE by 31 March 2018.</p>
	18	Submission of Risk Reduction Program to reduce risk to neighbouring land	Compliant	This Condition is deemed satisfied through the risk reduction measures detailed in the Mod1, Mod 2 and MOD3 PHA's.
	19	Undertake a Hazard Analysis of the site operations	Compliant	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 Secretary	Compliant	<p>A Hazard Audit report was submitted to DPE on 14 November 2016. An action plan to address recommendations was also submitted on 14 December 2016. An update regarding the status of actions included in the plan is detailed in Section 12.1</p> <p>The next Hazard Audit is scheduled for November 2019.</p>
Air Quality	21	Emission controls detailed in Section 7.8.1 of the Environmental Assessment are to be incorporated into the design.	Compliant	The Refrigeration Purge Gas Scrubber was commissioned in 2012 and is operating in accordance with the environmental assessment.
	21 (a)	The site will operate the flares in a proper and efficient manner	Compliant	The ammonia storage and nitrates flares were operational during the 2017 AEMR reporting period. The ammonia plant flare was operational from commissioning in April 2017 to the end of the reporting period.
	22	Air emission monitoring required by the EPL is to be undertaken for the Project.	Compliant	Orica has maintained quarterly stack testing during the 2017 AEMR reporting period to support plant improvement initiatives. All tests complied with the site's EPL requirements.

Issue	Condition	Requirement	Compliance Status	Comment
	23	Undertake an Air Quality Verification Study	Non-Compliant	Orica will seek clarification from DPE regarding the requirement for an Air Quality Verification Study to be completed relating to the site's three ammonia flares.
	24	Implement reasonable and feasible actions to address exceedences identified in the Air Quality Verification Study or routine monitoring.	Compliant	No exceedences were identified in the Air Quality Verification Study.
	25	Minimisation of dust generation from Project using reasonable and feasible means.	Compliant	Measures for the control of dust were included in the Construction Environmental Management Plan which was approved by DPI in February 2010. The CEMP was updated during the 2016 AEMR period.
	26	Trucks entering or leaving the Project site must have their loads covered and must not track dirt onto public roads	Compliant	Measures for the control of dust were included in the Construction Environmental Management Plan which was approved by DPI 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	Compliant.	A summary of the progress is detailed in this Annual Environmental Management Report.
	27 (a)	Air Quality Management Plan	N/A	IPL expansion project is not operational
	27 (b)	Consult with IPL in regard to the Air Quality Management Plan	N/A	IPL expansion project is not operational
Greenhouse Gas Emissions	28	Emission reduction technologies to be implemented in accordance with EA commitment	Compliant	The following emission reduction technologies were 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.
	29	Implementation of N ₂ O abatement technology on NAP1, NAP2 and NAP3.	n/a during the period.	N ₂ O abatement technology was installed in the No. 2 Nitric Acid Plant. Assessment of technologies suitable for use in No. 3 Nitric Acid Plant continue to be undertaken.
Water Management	37	Water management Plan, including reporting on progress of investigations to receive recycled water from Hunter Water Corporations recycled water scheme.	Compliant	A Water Management Plan for Phase 1 was completed. Infrastructure associated with receiving recycled water has been installed and commissioned, with recycled water received at site on 28 November 2014.
	40	The Project is to meet the requirements of the EPL in relation to stormwater and effluent discharge	Compliant	The site's effluent and stormwater were monitored in accordance with the requirements of the EPL. Although not directly contributed to the Project, the site recorded 4 noncompliance effluent quality events including:

Issue	Condition	Requirement	Compliance Status	Comment
				<ul style="list-style-type: none"> Effluent temperature was exceeded on two occasions' relating to the Ammonia Plant being restarted. TSS, arsenic and zinc effluent concentration was exceeded on one occasion relating to algae dislodgement from the effluent discharge pipeline. Oil concentration was exceeded on one occasion relating to an oil heat exchanger failure during start-up of the Ammonia Plant.
	37	A Water Efficiency Plan is to be prepared and implemented to the satisfaction of the DoP Secretary	Compliant	No amendments to the Project's water efficiency plans were required in the 2017 AEMR reporting period.
	41	Compliance with s120 of POEO	Compliant	There were no water pollution related incidents directly attributed to construction activities associated with the Project recorded during the 2017 AEMR reporting period. Effluent oil and grease concentration was however exceeded on one occasion resulting from a leak from an oil cooler located in the Ammonia Plant. This event was reported to the EPA as a EPL licence noncompliance.
	42	A Stormwater Management Plan is to be prepared and implemented	Compliant	No changes to the Project's approved stormwater monitoring plan were required during the 2017 AEMR reporting period,
	43	Bunding design to meet Australian and DECCW requirements	Compliant	A bunding specification in accordance with the Australian standard has been implemented into the design of the plants. Orica continues to upgrade existing bunds in accordance with Special Condition detailed in the EPL.
Noise Management	30	Noise emissions from Project to be 10dB(A) below that of the existing operations.	Compliant	Annual noise monitoring was completed during the 2017 AEMR reporting period. Next noise monitoring event is scheduled for June 2018.
	31	Existing Operations Noise Verification Program to be developed and implemented to the satisfaction of the DoP Secretary	Compliant	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.	Compliant	An updated noise management plan, including details of the Project's noise verification program was submitted and approved by the DoPI in May 2012. The noise management plan was reviewed and updated during the 2017 AEMR reporting period.
	32 (a)	Ports Precinct Noise Management	n/a	Study yet to commence.

Issue	Condition	Requirement	Compliance Status	Comment	
	33	Construction hours for the Project are:	Compliant	Construction activities associated with the expansion project Boiler and AMI were limited to the hours detailed in the condition.	
		Monday – Friday			7am to 6pm
		Saturday			8am to 1pm
		Sunday and Public Holidays			Nil
		Construction outside of these hours is permitted if inaudible at the nearest residences.			
		Operational hours for the Project are:	Compliant	The Project operated in accordance with the requirements.	
		All days			24 hours
Land Management	38	Provide a Project Site Contamination Plan to the DPI Secretary	Compliant	Phase 1 - Complete. Phase 2, 3 and 5 – 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 DPI on 05/11/2011.	
	39	Prepare an Acid Sulphate Soil Management Plan	Compliant	Phase 1- Complete. Phase 2, 3 and 5 – 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 DPI on 05/11/2011.	
	44	Prepare an Erosion and Sediment Control Plan	Compliant	Phase 1 -Complete. Phase 2, 3 and 5 – 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 DPI on 05/11/2011.	
Traffic Management	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	Compliant	Phase 1- Complete. Phase 2, 3 and 5 – 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 DPI on 05/11/2011.	
	36	A Construction Traffic Management Plan (CTMP) is to be submitted to the DoP Secretary	Complaint	A CTMP for Phase 2 and 3, including measures for the management of traffic during construction has been submitted to DPI (05/11/2011). No amendments were made to the plan during the 2017 AEMR reporting period.	

Issue	Condition	Requirement	Compliance Status	Comment
Visual	45	Prepare a Landscape Plan for the Project and submit to the DoP Secretary	Non-Compliant	A landscape plan has been developed for the project however not submitted to DPE or implemented. Orica will seek clarification from DPE by 31 March 2018 regarding the timing of the landscaping requirements as landscaping is linked to stage 2 of the project which is yet to commence.
	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 2017 AEMR reporting period.
Waste Management	37	Water management Plan, including reporting on progress of investigations to receive recycled water from Hunter Water Corporation's recycled water scheme.	Compliant	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 28 November 2014.
	47	Waste to be classified in accordance with DECCW guidelines and disposed of to approved premises	Compliant	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 Secretary	Compliant	A waste management plan for the uprated Ammonia Plant was submitted to the DPI on 28 March 2013.
Environmental Reporting and Auditing	49(a)	Construction Environmental Management Plan	Compliant	CEMP was reviewed and updated during 2017 AEMR reporting period.
	49(b)	Operational Environmental Management Plan	Non-Compliant	Although the site has an Operational Environmental Management Plan for the site, it is not in the form stipulated by the condition or approved by the secretary. Orica will submit an OEMP for the Project to DPE for approval by 30 June 2018.
	50	Prepare an Annual Environmental Management Report and submit to the DoP Secretary	Compliant	Submission of this report annually
	51(a)	The DoP Secretary 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	Compliant	No incidents associated requiring Secretary notification occurred during the 2017 AEMR monitoring period.
	51(c)	Flare activation reporting	Compliant	Flare activation reports were submitted to DPE every 3 months during the 2017 AEMR period.

Issue	Condition	Requirement	Compliance Status	Comment
	52	An Independent Environmental Audit by a team of experts is to be undertaken in relation to the Project	Compliant	<p>The independent environmental audit report was submitted to DPE on 29 September 2017. The status of progress made regarding recommendations in the report is detailed in Section 12.2</p> <p>Next independent audit is scheduled for June 2020.</p>
	53	<p>The following information regarding the Project is to be included on the website:</p> <ul style="list-style-type: none"> • Copy of all current statutory approvals • Copy of the current EMS and associated plans and programs • Copy of the last 5 years of Annual Reports • Copy of Independent Environmental Audit reports and responses to recommendations 	Compliant	<p>Copies of relevant information relating to the project continue to be included on the Kooragang Island website (www.orica.com/kooragang).</p> <p>Orica will seek clarification regarding what reports are required to be published on the website as project documentation can contain sensitive design and risk management data.</p>

11.2 Summary of Submitted Reports

Details on the reports submitted in compliance with the Project Approval are detailed in the table below.

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

Condition	Condition Requirement	Project Phase							Reports submitted to DPE to date	
		Phase 1	Phase 2		Phase 3		Phase 4	Phase 5		Phase 6
		Ammonia Plant Uprate	OBL 1(a)	OBL 1(b)	NAP4 & ANS	ANP	AMI	Nitric Acid Tank		Boiler
Reporting Requirements for Commencing Construction										
14 (a)	A Fire Safety Study	✓	✓	✓	✓		N/A*	N/A	✓^	1. FSS Kooragang Island Site (21 June 2011) – updated on 14 February 2016 2. FSS Ammonia Uprate project (17 April 2010) 3. FSS Phase 2 OBL 1(a) (17 February 2012) 4. FSS Phase 2 OBL 1(b) (23 October 2012) 5. FSS Phase 3 Nitric Acid and Ammonium Nitrate plants (7 January 2013) * No formal requirement for FSS associated with Phase, however reduction in ammonia inventories to be updated to site FSS in next FSS revision ^ Boiler detailed in Site FSS. New location to be updated in Site FSS in next revision
14 (b)	A Hazard and Operability Study	✓	✓	✓	✓	✓	✓	x	✓	1. Ammonia Plant Uprate (22 March 2010) 2. Phase 2 OBL 1(a) (27 March 2012) 3. Phase 2 OBL 1(b) (30 October 2012) 4. Ammonium Nitrate Prill Plant (15 Nov 2012) 5. Nitric Acid 4 and Ammonium Nitrate Solution 3 (28 Oct 2012) 6. AMI HAZOP Report (dated 12 January 2015) 7. KI Steam HAZOP Report (dated 22 June 2015)
14 (c)	A Final Hazard Analysis	✓	✓		x		✓	x	N/A	1. Kooragang Island Phase 1 Uprate FHA (March 2010) 2. OBL 1(a) (letter dated 28 March 2012) 3. AMI FHA (dated 7 April 2015)
14 (d)	A Construction Safety Study	✓	✓	✓	✓*		✓	x	✓	1. CSS for air compressor building (5 December 2009) 2. CSS for ammonia plant uprate (29 March 2010) 3. CSS OBL 1 (a) (3 December 2011) 4. CSS OBL 1(b) (1 August 2012) 5. CSS AMI Rev C (dated 2 April 2015) 6. CSS Boiler Rev B (dated 15 June 2015) * Civil construction activities associated with phase 3 considered in OBL 1(b) CSS only
36	Construction Traffic Management Plan	✓		✓			N/A	N/A	N/A	1. Ammonium Nitrate Facility Upgrade CTMP (March 2010) 2. Ammonium Nitrate Facility Upgrade CTMP (September 2011)
37	Water Efficiency Plan	✓	N/A	N/A	✓		N/A	N/A	N/A	1. Water efficiency Plan Phase 1: Ammonia Plant Upgrade (April 2011) 2. Water efficiency Plan Phase 3: NAP4 and AN3 (May 2013)

Condition	Condition Requirement	Project Phase								Reports submitted to DPE to date	
		Phase 1	Phase 2		Phase 3		Phase 4	Phase 5	Phase 6		
		Ammonia Plant Uprate	OBL 1(a)	OBL 1(b)	NAP4 & ANS	ANP	AMI	Nitric Acid Tank	Boiler		
38	Soil and Groundwater Contamination investigation					✓				1. Soil Management Plan (December 2009) 2. Targeted soil and groundwater quality assessment (13 April 2012)	
42	Stormwater Management Plan	✓					✓			1. Stormwater Nitrate Facility Upgrade Stormwater Management Plan Phase 1 (March 2010) 2. Stormwater Nitrate Facility Upgrade Stormwater Management Plan (November 2011)	
45	Landscape Plan					✓				1. Landscape Plan (3 June 2011)	
49	Environmental Management Strategy			✓				N/A	N/A	1. Environmental Management Strategy (December 2009)	
49A	Construction Environment Management Plan					✓				1. Construction Environment Management Plan rev 2 dated September 2011	
Reporting Requirements for Commencing Commissioning											
15 (a)	Transport of Hazardous Materials Study	N/A	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) 2. KI emergency response plan update (August 2015) 3. KI emergency response plan (December 2015) *Update to approved ERP undertaken for Phase
15 (c)	Safety Management System			✓				✓*	X*	X*	1. Safety management system (December 2010) 2. Safety management system update (August 2015) *Update to approved SMS undertaken for Phase
16	Pre-Startup Compliance Report	✓	X	X	X	X		✓	X	X	1. Pre- Start up Compliance report Phase 1 Ammonia plant uprate (June 2011) 2. Pre-Start up Compliance report Phase 4 AMI (dated August 2015)
49B	Operational Environmental Management Plan					✓^					1. Environmental Management Strategy (December 2009) ^ update to approved EMS is required to meet additional requirements incorporated into Development Consent following the completion of MOD2 approval process.
Reporting Requirements following Commencing Operations											
17	Post-Startup Compliance Report	✓	X	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 the completion of the Project
20	Hazard Audit of the Project					✓					1. Hazard Audit (28 March 2013) 2. Hazard Audit (11 November 2016)

Condition	Condition Requirement	Project Phase								Reports submitted to DPE to date
		Phase 1	Phase 2		Phase 3		Phase 4	Phase 5	Phase 6	
		Ammonia Plant Uprate	OBL 1(a)	OBL 1(b)	NAP4 & ANS	ANP	AMI	Nitric Acid Tank	Boiler	
										* Three yearly schedule
23	Air quality verification study	✓	N/A	N/A	X	X	X	X	X	1. Ammonia Plant uprate air verification study (27 February 2014)
27A	Air Quality Management Plan	✓	X	X	X	X	X	X	X	1. Construction Air Quality Management Plan dated 15 January 2010
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) * Quarterly noise testing compliance noise testing completed (2012-2013) * Noise management plan reviewed in 2014 * Annual noise test requirement
45	landscape plan					✓				1. Landscape plan (3 June 2011)
48	Waste Management Plan	✓			X		N/A	N/A	N/A	1. Ammonia Plant waste management plan (February 2013)
50	Annual Environmental Management Report					✓				1. Annual Environmental Management Plan (November 2010) 2. Annual Environmental Management Plan (November 2011) 3. Annual Environmental Management Plan (November 2012) 4. Annual Environmental Management Plan (November 2013) 5. Annual Environmental Management Plan (November 2014) 6. Annual Environmental Management Plan (November 2015) 7. Annual Environmental Management Plan (December 2016) 8. Annual Environmental Management Plan (December 2017)
51C	Ammonia Flare Activation					✓				1. Flare activation Summary (January to March 2016) 2. Flare Activation Summary (April to June 2016) 3. Flare Activation Summary (July to September 2016) 4. Flare Activation Summary (October to December 2016) 5. Flare activation Summary (January to March 2017) 6. Flare Activation Summary (April to June 2017) 7. Flare Activation Summary (July to September 2017) 8. Flare Activation Summary (October to December 2017)
52	Independent Environmental Audit					✓				1. Independent Environmental audit dated (24 March 2014) 2. Independent Environmental audit dated (26 September 2017) * 3 yearly audit schedule.

12 Independent Audits

12.1 Independent hazard audit action plan

Recommendations	Proposed Action	Area Owner	Proposed completion date
1 Observation: the available Safety policy at the time of the audit (Sept 2016) was signed in July 2013 by previous CEO (this is a corporate issue and can't be addressed at the KI site level). Noted that at the time of the audit there was a review of the SHECMS being undertaken at corporate level so the policy would most likely be updated as part of this). Check at next Hazard Audit (2019).	Orica will ensure that this recommendation is included in the 2019 Hazard Audit Scope.	Sherree Woodroffe	30/6/2019
2 Confirm lightening protection is adequate for AN bulk store and AN bag store	Orica has completed an audit of lighting protection in both the bag and bulk storage areas	Paul Hastie	15/12/2017 Completed
3 Observation: The QRA (in FHA) appears to use the total inventory of the Bag Store (Table AV-5) in the consequence assessment. Given the storage configuration with 8m between stacks there may be scope to reduce this to a single stack basis in future revision of the QRA. Orica to review QRA AN bag store basis when QRA update is next required	Orica will ensure that this observation is considered when updating the site's QRA	Sherree Woodroffe	N/A
4 Observation: The wooden walkways between the disused building adjacent to the AN bulk store are the only identified combustible building materials in the vicinity of the Bulk Store. Whilst ignition and escalation are unlikely, removal is suggested which would eliminate all combustibles in the vicinity of the Bulk Store.	The wooden walkway has been removed.	Paul Hastie	30/6/2017 Complete
5 Confirm the design fire / suppression basis for the fire protection systems in the AN Bulk and Bag Stores to ensure they are "adequate", eg meet relevant codes or control measure adequacy tests adopted in MHF risk assessments.	Orica has completed a verification process to confirm that fire suppression systems in the bulk and bag store are adequate.	Yasmine Vosper	15/12/2017 Complete
6 Observation: It is not clear what "adequate" ventilation is for the AN storage buildings. It is suggested that this be clarified ie is it to meet relevant codes or control measure adequacy tests adopted in MHF risk assessments and whether provided systems achieve this	Orica has completed a ventilation assessment for both the bulk and bag stores.	Yasmine Vosper	15/12/2017 Complete

Recommendations	Proposed Action	Area Owner	Proposed completion date
7 Develop implementation plan for improving HA compliance with gaps identified in HA inspection activities (which were completed Dec 2015) and verify progress in next Hazard Audit (2019)	Orica will ensure that this recommendation is included in the 2019 Hazard Audit Scope.	Sherree Woodroffe	30/6/2019
8 Observation: (2013 Hazard Audit Rec 4) Fire pump test log results are available in electronic form but not in pump house. If hard copy local records are not preferred by Orica, it is suggested that information be provided in the Pump house as to where to find the records.	Fire pump test log now maintained at pumphouse.	Bruce Volkiene	30/6/2017 Complete
9 (2013 Hazard Audit Rec 7) Clarify the process for providing feedback on completion of a job completed under a WO, ie if there is an issue with completion of work confirm how is this captured and how any patterns are identified over time.	Orica has completed a review of the WO closeout procedure including an audit of WO's to ensure that they are completed appropriately.	Bruce Volkiene	15/12/2017 Complete
10. (2013 Hazard Audit Rec 14) The installed pressure / flow capability of the modified fire water system at the AN Bag store needs to be confirmed to ensure that it meets the required design basis. Confirmation the velocities in firewater piping do not exceed AS requirements is also required	Orica has completed a verification process to demonstrate that the AN Bag Store fire system upgrades have achieved the site's performance objective.	Paul Hastie	15/12/2017 Completed
11. Confirm that the separation distance between the H2 cylinders and the adjacent oxidising gas cylinders is adequate, for example meets requirements in AS 4332 <i>The storage and handling of gases in cylinders</i>	Orica will undertake an audit to confirm that the H2 cylinders located in plant areas are appropriately located and stored.	Steve Hessel	30/9/2017 Completed
12. Observation: Overall reduction in combustibles in vicinity of AN can only be achieved by removal of wooden pallets and potentially change in AN bag material. It is suggested that Orica ensure that the current project investigating use of non-combustible pallets / bags include a formal SFARP demonstration that supports the project decision (as required under MHF regulations) and also that project outcomes be checked in next Hazard Audit (2019)	Orica has completed building modifications to allow for the requirement for pallets to be used in the bag store.	Paul Hastie	15/12/2017 Completed
13. Observation: Orica has previously had in place Technical Panels to provide advice to the sites on best practices for the various technologies (AN, ammonia). These are referred to in the SHEC MS and the BoS. If this structure is changed, KI will need to update	Orica will ensure that this recommendation is included in the 2019 Hazard Audit Scope.	Mick Gill	30/6/2019

Recommendations	Proposed Action	Area Owner	Proposed completion date
process for seeking technical advice in various systems, for example Modifications. Check in next Hazard Audit (2019)			
14. Observation: The TWC system appears to be being phased out. It was unclear at time of the audit if all compliance information had been migrated to Enablon. Check in next Hazard Audit (2019).	Orica will ensure that this recommendation is included in the 2019 Hazard Audit Scope.	Sherree Woodroffe	30/6/2019
15. An overall risk profile for the KI site should be developed to allow identification of the highest site risks, and also used to show risk reduction over time or effect of removal of safeguards. From a hazard perspective this should cover risk with a safety consequence. (However it is noted that SHECMS requires that each site maintain a record of their current hazards in a Major Hazard Register, with Major Hazards definition covering Safety as well as Health, Environment, Community, Business)	Orica will consolidate the site's risk assessment process's to allow for the prioritization of the site's risks to be developed.	Sherree Woodroffe	30/6/2018
16. Develop a system for managing actions arising from hazard studies and risk assessments that allows demonstration of progress to be shown. This should include: - prioritisation of the actions in a timely manner as they arise out of studies such as periodic hazard study 2 and 3. (Priority could be based on addressing non-compliance with regulations, magnitude of potential risk reduction / effectiveness, ease of installation, cost etc similar to the SFARP process for MHF) - implementation schedule and associated resources that suit allocated priority. A KPI could also be developed around completion rate or overdue high priority actions.	Orica has developed a procedure to priorities actions in HAZOPS and risk assessment processes to ensure that resources are effectively deployed to the highest priorities.	Yasmine Vosper	30/9/2017 Complete
17. Observation: The Nitrates area operating procedures include specific guidance and instructions for responding to abnormal process situations, the NH3 plant doesn't although there is some coverage in scenario based training. Orica to review whether the NH3 plant should adopt a similar approach to developing procedures for response to abnormal situations as has been done in the Nitrates areas. Check in next Hazard Audit (2019)	Orica will develop a procedure to include specific guidance and instructions for responding to abnormal process situations in the Ammonia Plant, consistent with the approach adopted by nitrates.	Paul Hastie	15/12/2017 Date extended to 30/4/2018

Recommendations	Proposed Action	Area Owner	Proposed completion date
18. Observation: The FSS has been updated (Feb 016) and provides a clear summary of firewater demands however does not refer to the basis for these (for example an AS or NFPA, process dilution rate or something else). The protection basis should be identified and included in the next FSS revision	The basis of fire water demand will be included in the next update of the site FSS.	Sherree Woodroffe	28/2/2019
19. Observation: Labeling standard in new equipment was good. Some areas of older plant also good. Check progress of equipment labeling project in next audit (2019)	Orica will ensure that this recommendation is included in the 2019 Hazard Audit Scope.	Sherree Woodroffe	30/6/2019
20. Develop a formal process covering required response to Capstone pressure vessel failure criticality ratings, and required documentation and authorization / acceptance process for any deferrals of inspection or maintenance.	Orica whas developed a formal process covering required response to Capstone pressure vessel failure criticality ratings, and required documentation and authorization / acceptance process for any deferrals of inspection or maintenance.	Bruce Volkiene	30/6/2017 Complete
21. Observation: Lockout isolation sheets appear to be developed as a list of valves / isolation points on isolation sheet on a case by case basis. A potential improvement would be to have predefined isolation plans for common isolations and also to attach the marked up PIDs to the isolation sheet for all process isolations.	Orica will develop and trial the effectiveness of standard isolation sheets for routine isolations.	Paul Hastie	15/12/2017 Date extended to 30/4/2018
22. Observation: A potential improvement would be to add the Modification number to the WO information in SAP so it also appears with the PTW and it is immediately clear the proposed work is part of a modification.	Orica will evaluate the feasibility of including the modification number to the PTW documentations.	Bruce Volkiene	15/12/2017 Date extended to 30/4/2018
23. Observation: The MHF Process HIRACs have identified some procedures as critical controls. It is suggested that Orica determine a process for differentiating these from other procedures, eg "critical" tag on document, different review frequency, specific observations, auditing or training requirements. Check in next Hazard Audit (2019)	Orica will develop a procedure to ensure that procedures associated with HIRAC's are easily recognizable.	Steve Hessel	15/12/2017 Complete
24. Observation: Organizational change assessment was not reviewed in 2016 audit. Ensure this is covered in 2019 Hazard Audit	Orica will ensure that this recommendation is included in the 2019 Hazard Audit Scope.	Sherree Woodroffe	30/6/2019

Recommendations	Proposed Action	Area Owner	Proposed completion date
25. Observation: the quality of closeout of some hazard study actions associated with Mods was variable. To monitor this it is suggested that some sample mods be selected periodically and a detailed check of closeout action quality be carried out to identify any patterns and determine if there the need for any actions such as refresher training.	Orica has developed and implement an auditing schedule of closed out mods to ensure that close out actions quality is maintained at a high standard.	Mick Gill	30/9/2017 Complete
26. Observation: It would be useful for KPI tracking for MHF purposes to include a Process Safety Event (PSE) flag in Enablon. It is recognised that this would need to be done at a corporate level . Check progress of PSE tracking at next Hazard Audit (2019)	Orica will ensure that this recommendation is included in the 2019 Hazard Audit Scope.	Sherree Woodroffe	30/6/2019
27. Observation: Notes from emergency response exercise debriefs are available. However it is suggested that any actions are formally prioritised and completion tracked (eg using Enablon)	Orica has updated the emergency response procedure to include the requirement to upload actions resulting from emergency exercises into Enablon.	Steve Hessel	30/9/2017 Complete
28. Check progress on compliance with site firewater booster arrangements against AS2419 in next Hazard Audit (2019)	Orica will continue to investigate the feasibility of upgrading the site's fire water booster arrangement in compliance with AS2419.	Sheree Woodroffe	15/12/2018
	To ensure that risks are appropriately managed, Orica will undertake a risk assessment to identify whether additional controls are required in the interim to management this risk until the system is upgraded to meet to Australian standard requirement.	Paul Hastie	30/9/2017 Date extended to 30/4/2018
Additional Recommendations associated with Department of Planning Feedback			
Please clarify why, taking into account that contaminated TGAN may occur in site as Orica, which manufacture and store significant quantities of AN.	Orica has undertaken a review of the procedure including ensuring additional control measures are implemented to ensure compliance with the maximum permissible quantity allowed to be stored onsite with consideration to SAFEX requirements.	Paul Hastie	31/7/2017 Complete

Recommendations	Proposed Action	Area Owner	Proposed completion date
<p>Orica to provide 6 monthly updates regarding the progress made in address recommendations detailed in the 2016 Hazard Audit</p>	<p>Orica will recommence provision of six monthly hazard audit updates to DPE from 30 June 2017 and will continue until all actions detailed in the 2016 Hazard Audit are completed.</p>	<p>Antony Taylor</p>	<p>Commenced in 30 June 2017</p>
<p>Orica has been implementing a program to progressively upgrade labelling of pipes and valves within the site's existing plants. Several of these areas were inspected during the audit. On page 17 of the 2016 Hazard audit report a recommendation was made to inspect progress made in implementing this program in 2019. This requirement will be transferred to the hazard audit action plan to ensure it is addressed during the next audit.</p>	<p>Include a review of labelling of piping and valves in existing plant areas in 2019 Hazard Audit</p>	<p>Antony Taylor</p>	<p>30/6/2019</p>

12.2 Independent environmental audit

Of the 73 conditions audited, the audit identified compliance with 42 conditions, and non-compliance associated with aspects of 6 conditions. 25 conditions were unable to be assessed as the condition had yet to be triggered or did not require re-audit. Non-compliances were considered to generally be technical in nature; that is, they related to the submission timing of regulatory reports and DPE approval of management plans. A small number of non-compliances were also identified with respect to the implementation of commitments detailed in construction management plan documentation.

Auditors recommendation	Orica response	Date of Action
Ensure the submission requirements relating to new stages in the Project are fully complied with	Orica has updated the Projects staging plan to ensure that Project milestone reports are submitted in accordance with the relevant timeframes.	Complete
Prepare and submit to the Secretary an updated landscape plan and gain approval for a staged implementation of landscaping required under the approval, potentially tied to the broader staging plan submitted annually.	A landscape plan has been developed for the project however not submitted to DPE or implemented. Orica will seek clarification from DPE regarding the timing of the landscaping requirements as landscaping is linked to stage 2 of the project which is yet to commence.	31 March 2018
Commence implementation of a weekly environmental inspections program when undertaking construction activities associated with the project.	This requirement has been detailed in the Projects Construction Environment Management Plan (CEMP)	Complete
Prepare and implement an Operational Environmental Management Plan for the flares.	Although the site has an Operational Environmental Management Plan for the site, it is not in the form stipulated in the condition or approved by the secretary. Orica will submit an OEMP for the Project to DPE for approval by 30 June 2018.	30 June 2018
Ensure all relevant post approval and audit documents are available on the website	Orica will seek clarification regarding what reports are required to be published on the website as project documentation can contain sensitive design and risk management data.	31 March 20178
Opportunities for Improvement		
Noting the infrequent use of the flares (one reported activation between April and June 2017) it is recommended that Secretary	Orica will seek clarification from DPE regarding the requirement for an Air Quality Verification Study to be	30 June 2018

confirmation be sought that an update to the Air Quality Management Plan is not required and that volumetric flow determination remains a suitable method for describing the emissions at points 24-36.	completed for the site's three ammonia flares.	
The Noise and Vibration Management Plan should include LAeq and LAm _{ax} noise management for the site following the addition of the boiler.	The noise management plan will be updated following commissioning of the boiler.	To be undertaken following commissioning
Once the boiler is constructed and operational, conduct noise verification assessment to ensure noise levels from operation are below 10db. Low frequency components of boilers may require special attention.	Noise verification testing will be completed following the commissioning of the Boiler	To be undertaken following commissioning
Whilst there have been no complaints regarding traffic management, it is recommended that weekly inspections are undertaken during construction and recorded and that occasional review of this requirement is included.	Requirement included in Project CEMP	Complete.
The Water Efficiency Plan should be updated after the boiler is operational.	The Water Efficiency Plan will be updated following the commissioning of the Boiler	To be undertaken following commissioning

Appendix A – 2017 Community Report