



ORICA KOORAGANG ISLAND

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT

NOVEMBER 2010



Revision	Date	Description	Author	Reviewer	Approver
0	30/11/2010	2010 Annual Environmental Report	S Woodroffe Sustainability Manager	C Gent Project Owner	S Newman Site Manager

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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
DoP	Department of Planning
EPL	Environment Protection Licence
HAZOP	Hazard and Operability Study
ktpa	kilo tonnes per annum
NAP4	No. 4 Ammonium Nitrate Plant
SH&E	Safety, Health and Environment

1 Introduction

Orica Australia Pty Ltd (Orica) operates a manufacturing facility at Kooragang Island, Newcastle, NSW, which produces ammonia, nitric acid and ammonium nitrate (**Figure 1**). The facility commenced operations in 1969 and there have been several major increases to production capacity at the site. The existing operations at the site include an Ammonia Plant, three Nitric Acid Plants, two Ammonium Nitrate Plants and associated despatch and support infrastructure (Existing Operations).

In December 2009 approval of an expansion project (the Project) at the site was granted by the Minister for Planning to enable the production of ammonium nitrate to increase from the current maximum of 500 kilo tonnes per annum (ktpa) to 750ktpa.

This document has been prepared to comply with the requirement of the Project Approval (08-0129) that an Annual Environmental Management Report be prepared for the Project.

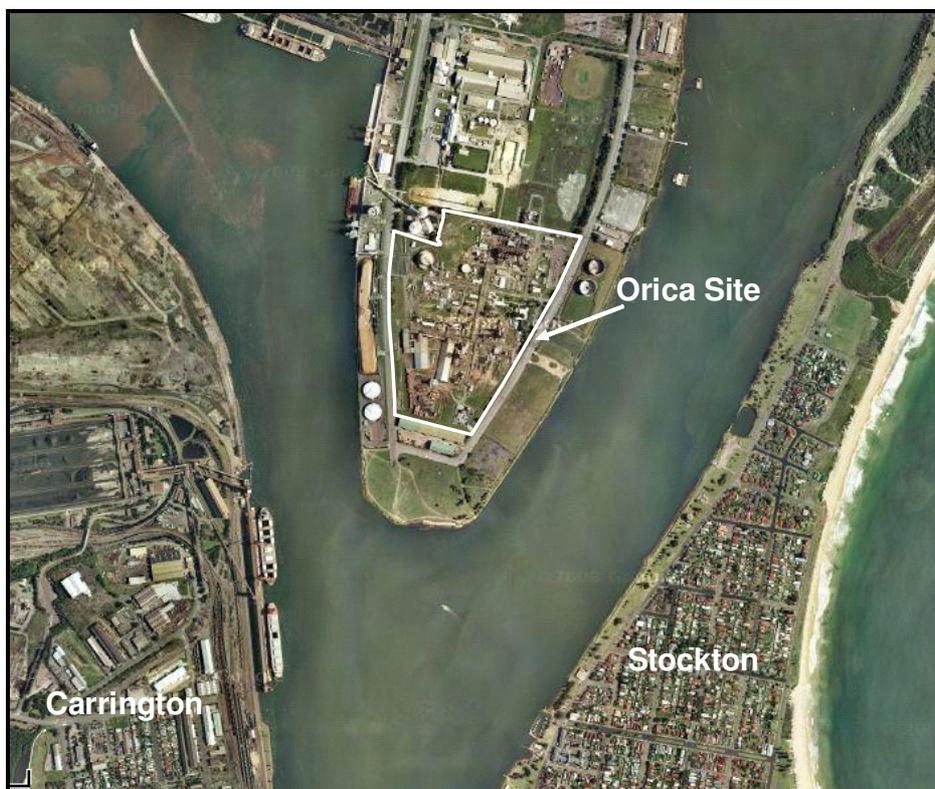


Figure 1: Site Location

1.1 Project Description

The activities covered by the Project Approval include the following:

- An upgrade to the existing Ammonia Plant to increase its capacity from 295 ktpa to 360 ktpa;
- Construction and operation of an additional Nitric Acid Plant (NAP4), which would produce approximately 260 ktpa of nitric acid, increasing the total capacity of the facility from approximately 345 ktpa to 605 ktpa;
- Construction and operation of an additional Ammonium Nitrate Plant (ANP3) to produce increased volumes of Ammonium Nitrate Solution (ANS) and the solid prilled product Nitropril®. The proposed expansion and construction of the third Ammonium Nitrate

Plant would enable the facility to increase its maximum capacity from 500 ktpa to 750 ktpa.

- Construction and operation of additional storages for nitric acid, solid ammonium nitrate and ammonium nitrate solution; and
- Some additional infrastructure such as cooling towers, effluent treatment system and boiler.

The proposal also includes construction of additional minor storage facilities and improvements to product loading facilities for road.

2 Project Approval Requirement

Condition 50 of Project Approval 08-0129 requires that Orica prepare an Annual Environmental Management Report by the 1 December 2010 and each subsequent year thereafter. The report is to include the following:

- 50 Within 12 months of this approval, and annually thereafter, the Proponent shall submit an Annual Environmental Management Report (AEMR) for the Project to the Director-General. The report must:
- a) Identify the standards and performance measures for the Project;
 - b) Describe the works carried out in the past 12 months and the works to be carried out in the next 12 months;
 - c) Include a summary of complaints received in the past year and provide comparison with previous years;
 - d) Report results of all monitoring required by this approval and an EPL for the Project;
 - e) Provide analysis of monitoring results in the context of relevant criteria and limits, previous monitoring results and predictions made in the EA;
 - f) Identify any trends in monitoring results over the life of the Project; and
 - g) Report on compliance with the project approval, summarise non-compliances in the previous 12 months and report on actions taken to rectify non-compliances.

3 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
- Statement of Commitments dated August 2009
- Project Environmental Assessment dated June 2009
- Submissions Report dated August 2009

The key standards and performance measures for the operating Project include:

	Standard	Performance Measure	Comment
Noise Management	No increase in community noise levels as a result of the Project.	Operating Project to be at least 10dB(A) less than the existing plant noise levels.	Noise control objectives have been incorporated into the design and selection of new plant and equipment for the project.
Air Quality	Minimisation of particulate emissions associated with the Project.	AN3 stack emissions to be $\leq 20\text{mg}/\text{Nm}^3$	Requirement incorporated into design.

	Standard	Performance Measure	Comment	
	Minimisation of NOx emissions associated with the project.	Existing Reformer Stack NOx emission $\leq 234\text{mg/Nm}^3$ (as NO ₂ equivalent)	A new purge gas scrubber has been incorporated into the Ammonia Plant expansion.	
		Pre-Reformer Furnace Stack NOx emission $\leq 234\text{mg/Nm}^3$ (as NO ₂ equivalent)	Requirement incorporated into design.	
		New Boiler Stack NOx emission $\leq 234\text{mg/Nm}^3$ (as NO ₂ equivalent)	Requirement incorporated into design.	
		NAP4 Stack NOx $\leq 150\text{ppm}$ (99%tile) (NOx = NO + NO ₂)	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 incorporated into design.	
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 is currently being developed to ensure this commitment is met.	
Water Emissions	New Plant and Equipment to comply with existing EPL conditions for effluent discharge parameters.		Requirement incorporated into design.	
				mg/L
				90% limit 100% limit
		As		0.05
		Oil and Grease		10
		Nitrogen		1500 2000
		Cr (6+)		0.05 0.2
		TSP		50
		pH		6.2 – 9.5
		Temperature		43°C
Volume	4500kL/day			
Nitrogen Mass Discharge	200tpa			
Production Limits	Production not to exceed prescribed levels.	Ammonia – 360ktpa Nitric Acid – 605ktpa Ammonium Nitrate – 750ktpa	Requirement incorporated into design.	

Performance standards for the construction phase of the project were incorporated into the Construction Safety and Environmental Management Plan (CSEMP). This includes requirements associated with air quality, water quality, contaminated soil and acid sulphate soil, waste management, traffic, heritage and erosion and sediment control.

4 Project Status

4.1 Project Progress Review

The expansion project activities are being undertaken in two separate phases, as detailed below:

- Phase 1: Ammonia Plant expansion, which involves undertaking works to increase production capacity from 295 ktpa to 360 ktpa.
The expanded Ammonia Plant is expected to commence operation in mid 2011.
- Phase 2: Increasing ammonium nitrate production capacity from 430 ktpa to 750 ktpa through the installation of a new nitric acid plant, new ammonium nitrate plant and associated infrastructure.
The expected date for the operation of all plant and equipment associated with the increase in ammonium nitrate capacity has not been finalised, however it is expected to be post 2013.

A summary of the key works undertaken since 1 December 2009 on each of these phases is described below.

4.1.1 Phase 1: Ammonia Plant Expansion

During the last 12 months there has been significant activity associated with the expansion of the Ammonia Plant. This includes:

- detailed design work;
- construction activities;
- procurement of equipment;
- mobilisation of design and construction personnel;
- project management activities; and
- preparation of SH&E management plans and other activities to ensure compliance with Project Approval conditions.

Construction activities, as defined in the Project Approval, commenced in March 2010, and included:

- Installation of a new building to house the plant air compressor. The building incorporates extensive noise control measures to ensure compliance with the Project Approval conditions regarding noise management.
- Arrival of the new Ammonia Plant air compressor onsite and commencement of its installation in the new air compressor building.
- Installation of a new switchroom associated with the new air compressor building.
- Construction of an additional Cooling Tower cell.
- Installation of foundations for new equipment associated with the expansion.

4.1.2 Phase 2: Ammonium Nitrate Expansion Project

The last 12 months of activity in Phase 2 of the expansion project has involved the following:

- Commencement of engineering design associated with the nitric acid and ammonium nitrate plants; and
- Commencement of mobilisation of the project team for the Phase 2 activities.

4.2 Planned Project Progress

4.2.1 Phase 1: Ammonia Plant Expansion

Construction of the Ammonia Plant expansion will be completed in early July 2011, with the newly expanded plant to commence operation as soon as the construction and pre-commissioning activities have been completed.

Prior to the commencement of operation of the expanded Ammonia Plant the following key activities are to be undertaken:

- Installation of the Pre-Reformer Furnace, Reaction Vessel and associated stack, which is expected to occur during December 2010 and January 2011;
- Installation of the remaining plant and equipment associated with the expansion project, including heat exchangers, pipework and valves;
- Decommissioning of redundant equipment;
- Pre-commissioning of plant and equipment including the new Ammonia Plant air compressor, Cooling Tower and Pre-Reformer Furnace;
- Tie-in activities to connect the new plant and equipment into the existing Ammonia Plant. These will be completed during a maintenance Turnaround, which will occur during late June and July 2011.
- Completion of the required activities associated with the Project Approval and Orica's project processes.

4.2.2 Phase 2: Ammonium Nitrate Expansion Project

The expansion of ammonium nitrate production capacity will be undertaken in two stages:

- Phase 2a): Infrastructure associated with the new site entrance and exit and ammonium nitrate storage.
- Phase 2b): Installation of the new Nitric Acid Plant, Ammonium Nitrate Plant and associated infrastructure.

Over the next 12 months there will be significant activity associated with Phase 2a) of the expansion project, including:

- Finalisation of the layout of the new plants and associated infrastructure;
- Commencement of detailed design of the new Phase 2a) plant, equipment and infrastructure;

- Preparation of management plans and other activities to ensure compliance with Project Approval conditions associated with the commencement of construction of this stage of the project; and
- Commencement of preliminary construction activities associated with the new site entrance and exit and ammonium nitrate storage facilities.

The Phase 2b) activities will involve the continuation of engineering activities on the Nitric Acid and Ammonium Nitrate Plants.

5 Environmental Monitoring and Complaints Summary

5.1 Environmental Monitoring

The Project Approval and Environment Protection Licence (EPL) does not include any requirements for the undertaking of Project specific environmental monitoring during the construction phase of the Project.

Following the commissioning of the expanded Ammonia Plant monitoring will be undertaken to assess the compliance of the Ammonia Plant with relevant conditions in the Project Approval and the modified EPL.

5.2 Community Complaints

During the first 12 months of the expansion project there were no community complaints received by the site in relation to the Project activities.

Information on how the community can contact Orica to discuss the project or make a complaint in relation to our activities is provided in the Annual Community Calendar, which is distributed to the adjacent suburbs of Stockton and Fern Bay, via the Orica Kooragang Island website (www.oricaki.com.au) and in the phone directory.

6 AN1 Prill Tower Emission Reduction Investigations

Condition 27 of the Project Approval requires:

- 27 The Proponent shall investigate and report on the progress to reduce PM₁₀ emissions from the existing Prill Tower on the Ammonium Nitrate Plant No. 1. The report shall:
- a) be provided annually, and can be reported through the Annual Environmental Management Report required by condition 50; and
 - b) Provide an update on the timeframe for the implementation of emission controls.

During the year a project to investigate options to reduce PM₁₀ emissions from the existing Prill Tower was commenced. To date the following activities have been undertaken:

- Formation of a steering committee to oversee the investigation program.
- Undertaking of a workshop to review the project requirements and assist in the development of the project scope.
- Identification and selection of an engineering consultant to assist in the development and delivery of the investigation program.
- Undertaking of a preliminary literature search to provide information on the process which result in the formation of emissions from Prill Towers, testing methods that have been used in previous investigations and technology which has been used to reduce emissions.

During 2011 it is proposed to undertake the following activities:

- Complete a detailed literature search of causes of Prill Tower emissions, testing that can be undertaken to quantify the emission and its characteristics and technology to reduce emissions.
- Design of a system to enable testing of the Prill Tower to determine current particulate emissions levels and enable quantification of factors such as the particle size and shape and the effect of plant and atmospheric conditions on the emissions.
- Commencement of a program of Prill Tower emission testing.

7 Project Approval Compliance

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

SUMMARY OF KEY PROJECT APPROVALS

Issue	Condition	Requirement	Compliance Status
General Responsibilities	1	Implement all reasonable and feasible measures to prevent pollution and minimise harm to the environment.	Complied. Management plans and project management activities have been undertaken to ensure that environmental harm during construction activities is minimised.
	2	Project to be carried out in accordance with the EA, Statement of Commitments, Project Approval and Submission Approval.	Complied.
	3	Management of inconsistencies between the various Project Approval documents.	n/a No issues have been identified.
	4	Comply with the requirements of the Director-General	n/a No issues were identified during the period.
	5	Production capacity limits for ammonia, nitric acid and ammonium nitrate.	n/a Plant and equipment has not been installed to enable the production of additional products above these limits.
	6	Management of Project Approval conditions in the event that there are delays to the stages of the project.	n/a There have been no significant delays to the project during the period.
	7	Submission of plans on a progressive basis.	Complied. Orica has submitted plans on a progressive basis following discussions with the Department of Planning.
	8	Buildings and structures to be constructed in accordance with the requirements of the Building Code of Australia.	Complied. Buildings are being designed in accordance with the relevant requirements. Construction certificates have been obtained for relevant buildings.
	9	The Proponent is required to repair any public infrastructure damaged as a result of the Project.	n/a No repairs were required to be undertaken.

Issue	Condition	Requirement	Compliance Status
	10	Undertaking of a dilapidation report prior to the commencement of construction. The report is to be undertaken in consultation with NPC and submitted to the Department of Planning.	Complied. A dilapidation report was prepared in consultation with NPC and submitted to the Department of Planning on 15/01/2010.
	11	Obtain approval from service providers prior to commencement of utility construction activities	n/a There have been no utility related construction activities.
	12	Ensure all equipment is maintained and operated in a proper and efficient manner.	Complied. The CSEMP details the systems installed to ensure compliance with this condition.
	13	Section 94 contribution to NCC.	Complied. The Section 94 contribution was made to NCC in September 2010.
Hazard Management	14	Undertake the following studies and submit to DoP Director-General for approval:	
		<ul style="list-style-type: none"> a) • Fire Safety Study b) • HAZOP 	<p>Partial Compliance</p> <p>The Phase 1 Fire Safety Study (FSS) for the Ammonia Plant was submitted in March 2010. The DoP approved the study in May 2010. The FSS was submitted to the NSW Fire Brigade (FB) in May 2010. Additional information was sought by the FB, including submission of the existing site FSS, updating of drawings detailing maximum heat flux and information on fire fighting water and demand. This information will be provided when the FSS for the existing site is submitted to NSW FB and DoP in January 2011.</p> <p>Complied.</p> <p>The Phase 1 HAZOP was submitted to the DoP in March 2010. The DoP approved the study in May 2010.</p>

Issue	Condition	Requirement	Compliance Status
	c)	<ul style="list-style-type: none"> • Final Hazard Analysis 	<p>Complied. The Phase 1 FHA was submitted to the DoP in March 2010. The DoP approved the study in May 2010.</p>
	d)	<ul style="list-style-type: none"> • Construction Safety Study 	<p>Complied. The Phase 1a) Construction Safety Study was submitted to the Department of Planning in January 2010. Approval was obtained from the DoP in February 2010. The Phase 1b) Construction Safety Study was submitted to the DoP in March 2010. The DoP approved the study in May 2010.</p>
15		<p>Undertake the following studies and submit to DoP Director-General for approval:</p> <ul style="list-style-type: none"> • Transport of Hazardous Materials Study • Emergency Plan • Safety Management Plan 	<p>n/a These studies were not required to be submitted during the period.</p>
16		Submission of Pre-Startup Compliance Report	<p>n/a This report was not required to be submitted during the period.</p>
17		Submission of Post-Startup Compliance Report	<p>n/a This report was not required to be submitted during the period.</p>
18		Submission of Risk Reduction Program to reduce risk to neighbouring land	<p>n/a This report was not required to be submitted during the period.</p>
19		Undertake a Hazard Analysis of the site operations	<p>n/a This report was not required to be submitted during the period.</p>
20		Undertake a comprehensive Hazard Analysis of the Project and submit a report to the DoP Director-General	<p>n/a This report was not required to be submitted during the period.</p>

Issue	Condition	Requirement	Compliance Status
Air Quality	21	Emission controls detailed in Section 7.8.1 of the Environmental Assessment are to be incorporated into the design.	n/a The design of item 21 d) has been completed and the equipment is currently being constructed.
	22	Air emission monitoring required by the EPL is to be undertaken for the Project.	n/a during the period.
	23	Undertake an Air Quality Verification Study	n/a during the period.
	24	Implement reasonable and feasible actions to address exceedences identified in the Air Quality Verification Study or routine monitoring.	n/a during the period.
	25	Minimisation of dust generation from Project using reasonable and feasible means.	Complied. Measures for the control of dust were included in the Construction Environmental Management Plan which was approved by DoP in February 2010.
	26	Trucks entering or leaving the Project site must have their loads covered and must not track dirt onto public roads	Complied. Measures for the control of dust were included in the Construction Environmental Management Plan which was approved by DoP in February 2010.
	27	An annual report must be prepared detailing the progress of the project to reduce PM10 emission from the existing Prill Tower	Complied. A summary of the progress is detailed in this Annual Environmental Management Report.
Greenhouse Gas Emissions	28	Emission reduction technologies to be implemented in accordance with EA commitment	Complied. The design of items detailed in 28b) have been completed and construction of the items is underway.
	29	Implementation of N ₂ O abatement technology on NAP1, NAP2 and NAP3.	n/a during the period.
	40	The Project is to meet the requirements of the EPL in relation to stormwater and effluent discharge	n/a during the period.
	37	A Water Efficiency Plan is to be prepared and implemented to the satisfaction of the DoP Director-General	Orica has requested a request to DoP to vary the date for submission of the Water Efficiency Plan to the 31 January 2011.

Issue	Condition	Requirement	Compliance Status						
	41	Compliance with s120 of POEO	Complied. There were no water pollution related incidents associated with the Project.						
	42	A Stormwater Management Plan is to be prepared and implemented	Complied. The Phase 1a) Stormwater Management Plan was submitted in January 2010. The Phase 1b) Stormwater Management Plan was submitted in March 2010. Conditional approval was obtained in May 2010.						
	43	Bunding design to meet Australian and DECCW requirements	n/a during the period.						
Noise Management	30	Noise emissions from Project to be 10dB(A) below that of the existing operations.	Complied. Design of plant and equipment has considered the requirements to meet this condition.						
	31	Existing Operations Noise Verification Program to be developed and implemented to the satisfaction of the DoP Director-General	Complied. A Noise Verification Program was submitted in February 2010. The program was approved by the DoP in February 2010.						
	32	A Noise Management Plan is to be developed and implemented. The plan is to be updated annually.	n/a during the period.						
	33	Construction hours for the Project are: <table border="1"> <tr> <td>Monday – Friday</td> <td>7am to 6pm</td> </tr> <tr> <td>Saturday</td> <td>8am to 1pm</td> </tr> <tr> <td>Sunday and Public Holidays</td> <td>Nil</td> </tr> </table> Construction outside of these hours is permitted if inaudible at the nearest residences.	Monday – Friday	7am to 6pm	Saturday	8am to 1pm	Sunday and Public Holidays	Nil	Complied. Measures for the control of noise were included in the Construction Environmental Management Plan which was approved by DoP in February 2010.
	Monday – Friday	7am to 6pm							
Saturday	8am to 1pm								
Sunday and Public Holidays	Nil								
	Operational hours for the Project are: <table border="1"> <tr> <td>All days</td> <td>24 hours</td> </tr> </table>	All days	24 hours	n/a during the period.					
All days	24 hours								
Land Management	38	Provide a Project Site Contamination Plan to the DoP Director-General	Complied. Measures for the management of site contamination was included in the Soil Management Plan which was submitted in January 2010 and approved by DoP in February 2010.						

Issue	Condition	Requirement	Compliance Status
	39	Prepare an Acid Sulphate Soil Management Plan	Complied. Measures for the management of acid sulphate soils was included in the Soil Management Plan which was submitted in January 2010 and approved by DoP in February 2010.
	44	Prepare an Erosion and Sediment Control Plan	Complied. Measures for the control of erosion and sediment were included in the Construction Environmental Management Plan which was approved by DoP in February 2010.
Traffic Management	34	All roads, access points and parking to comply with the nominated Australian Standards	n/a during the period.
	35	Traffic associated with the Project must not impede traffic on Greenleaf Road and Heron Road	Complied. Traffic associated with the construction has not impeded traffic on Greenleaf Road.
	36	A Construction Traffic Management Plan is to be submitted to the DoP Director-General	Complied. Measures for the control of traffic were included in the Construction Traffic Management Plan which was submitted in January 2010 and approved by DoP in February 2010.
Visual	45	Prepare a Landscape Plan for the Project and submit to the DoP Director-General	n/a during the period.
	46	Lighting to comply with Australian Standards and avoid nuisance to surrounding landusers and roadways.	n/a during the period.
Waste Management	47	Waste to be classified in accordance with DECCW guidelines and disposed of to approved premises	Complied. Measures for the control of waste were included in the Construction Environmental Management Plan which was approved by DoP in February 2010.
	48	Prepare and implement a Waste Management Plan which has been submitted to the DoP Director-General	n/a during the period.

Issue	Condition	Requirement	Compliance Status
	53	The following information regarding the Project is to be included on the website: <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 	Complied. Copies of information relating to the project were included on the Kooragang Island website (www.oricaki.com.au) in December 2009. Information has subsequently been updated as required.
	51	The DoP Director-General is to be notified of any incident associated with the Project that results in actual or potential for offsite harm to people or the environment	Complied. There were no incidents relating to the Project that required reporting to the DoP.
	50	Prepare an Annual Environmental Management Report and submit to the DoP Director-General	Complied. Submission of this report by 1 December 2010.
	52	An Independent Environmental Audit by a team of experts is to be undertaken in relation to the Project	n/a during the period.