

22 May 2017

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Industry Assessment
NSW Department of Planning and Environment
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Dear Chris,

**Orica Kooragang Island Remediation Program (SSD 7831)
Response to Submissions Report**

I refer to correspondence received by Orica Australia Pty Ltd (Orica) from the NSW Department of Planning and Environment (DPE) dated 10 April 2017 regarding submissions received following the public exhibition of Orica Kooragang Island Remediation Program (SSD 7831) Environmental Impact Statement (EIS). This letter presents Orica's response to feedback provided in these submissions.

1 Project Overview

Orica is seeking to obtain development consent to install a cap and containment remediation system at its Kooragang Island facility to address on-site arsenic contamination located in a small area in the north-western portion of the Orica facility.

The remediation system is designed to prevent, to the extent practicable, further off-site migration of arsenic and in doing so, addresses the objectives of a Management Order (Order No. 20131407) issued by the NSW Environment Protection Authority. The cap and containment system involves the installation of a low permeability cut-off wall to a depth of approximately 12 metres below ground level and integration of a low permeability capping system.

The development application was submitted to the DPE on 24 February 2017 and included a detailed Environmental Impact Assessment and the Remediation Action Plan.

The EA was publically exhibited by DPE between 2 and 31 March, with submissions received during this process supplied to Orica on 10 April 2017 and 20 April 2017.

2 Submissions Received Following Exhibition Period

In total eight submissions in relation to the project were received.

Submissions received from regulatory authorities included:

1. NSW Department of Health - Hunter New England Local Health District dated 21 March 2017
2. NSW Environment Protection Authority dated 28 March 2017
3. NSW Office of Environment and Heritage dated 31 March 2017
4. Newcastle City Council dated 3 April 2017
5. SafeWork NSW

6. NSW Department of Primary Industries dated 7 April 2017
7. NSW Department of Planning and Environment dated 10 April 2017

Submissions received from commercial organisations:

1. Port of Newcastle Operations Pty Ltd dated 31 March 2017

This letter presents Orica's response to the submissions.

3 Orica Response to Regulatory Authority Submissions

3.1 NSW Department of Health – Hunter New England Local Health District Submission (21 March 2017)

Hunter New England Local Health District provided comment regarding the management of mosquito risks.

Orica Response:

Table 1 details the Hunter New England Local Health District recommendations and Orica's response.

Table 1: Hunter New England Local Health District

HNELHD Feedback	Orica Response
<i>If the Department of Planning and Environment grants development consent for the proposal the EPA recommends including the following conditions as conditions of consent.</i>	
<i>HNEPH recommends that a mosquito management plan focusing on exotic mosquito species identification should be included in a vector management strategy....The mosquito management plan will also assist to prevent both nuisance biting mosquitos and disease transmitting mosquitos affecting employees, visitors and the local population.</i>	Agreed. Orica will develop a mosquito management plan for the construction phase of the project that will incorporate the HNEPH requirements.
<i>The stormwater management plan must address mosquito breeding issues such as natural depressions around the site and drainage channels. This is to reduce both nuisance biting and disease transmitting mosquitos to the local population.</i>	Agreed. Orica will incorporate these requirements into the mosquito management plan for the construction phase of the project that will incorporate the HNEPH requirements.

3.2 NSW Environment Protection Agency (28 March 2017)

The NSW EPA provided general comments on the EIS and recommended Conditions of Consent as detailed below.

Orica Response

Table 2 details the EPA recommended Conditions of Consent and Orica's response.

Table 2: EPA

EPA Feedback	Orica Response
<i>If the Department of Planning and Environment grants development consent for the proposal the EPA recommends including the following conditions as conditions of consent.</i>	
1. <i>The proposed remedial works are to be implemented as specified in the remedial action plan prepared by Golder Associates: "Orica Kooragang Island: Arsenic Management Order – Remediation Action Plan", dated 8 July 2016.</i>	Action 2 b) of the EPA Management Order (no. 20131407) requires that Orica implement the proposed works in accordance with the design specifications and requirements detailed in the approved RAP. Orica is committed to complying with this requirement.
2. <i>The remedial works are to be carried out in accordance with relevant guidelines produced or approved under the Contaminated Land Management Act 1997.</i>	Agreed. The Remediation Action Plan has been developed with consideration of the requirements of the relevant guidelines produced or approved under the Contaminated Land Management Act 1997.
3. <i>Independent review and verification of the remedial program, including the long-term environmental management plan, is to be undertaken by a NSW EPA accredited Site Auditor, with a Site Audit Statement (SAS) to be provided following the implementation of the remedial program</i>	Agreed. Orica will engaged a NSW EPA accredited Site Auditor to prepare a Site Audit Statement and Site Audit Report in relation to the program.

3.3 NSW Office of Environment and Heritage (31 March 2017)

NSW Office of Environment and Heritage (OEH) provided comments regarding threatened biodiversity, Aboriginal cultural heritage and flooding and floodplain management.

Orica Response

Table 3 details the feedback from OEH and Orica's response.

Table 3: OEH

OEH Feedback	Orica Response
<i>Threatened Biodiversity: OEH requested that a Biodiversity Assessment Report, undertaken by an accredited assessor, be provided to support the EIS and enable OEH to complete their assessment of the proposed project.</i>	In response to OEH's recommendation that an assessment in accordance with the Framework for Biodiversity Assessment be undertaken by an accredited assessor, Orica engaged Eco Logical Australia Pty Ltd to prepare a Biodiversity Assessment Report. A copy of the report is provided in Attachment 1. The Biodiversity Assessment Report found that 'the biodiversity values at the Development Site have been significantly altered from pre-European conditions. No remnant, native

OEH Feedback	Orica Response
	vegetation, threatened species habitat, or wetlands was identified within the Development Site'. The Project would not result in any direct or indirect impacts to ecological communities and species of flora and fauna listed under the TSC [Threatened Species Conservation Act 1995] or the Environmental Protection and Biodiversity Conservation 1999 Act (EPBC Act). The project will not substantially reduce the width of vegetation in the riparian buffer zones bordering wetlands or estuaries. The project will not impact the biodiversity values of the upstream Hunter Estuary Wetland. The assessment has demonstrated that the site does not warrant a full Biodiversity Assessment Report under the Framework for Biodiversity Assessment, considering the absence of: • Native vegetation • Threatened species habitat • Potential impacts to waterway, estuaries, rivers, streams or wetlands. The provision of the report will enable OEH to complete the project assessment in relation to any impacts on threatened biodiversity.
<i>Aboriginal Cultural Heritage: OEH noted that the management and mitigation measures detailed in the EIS would ensure that if unexpected Aboriginal objects were uncovered during the remediation works they would be appropriately managed.</i>	Noted. These requirements are included in the CEMP for the project.
<i>Flooding and Floodplain Management: OEH noted that the flood impact report had indicated that the site was above the probably maximum flood level for the Hunter River. It was also noted that OEH was satisfied that the strategy to manage erosion and sedimentation and stormwater would minimise potential impacts associated with the development.</i>	Noted. These requirements are included in the CEMP for the project.

3.4 Newcastle City Council Submission (3 April 2017)

Newcastle City Council (Council) development assessment team provided comments in relation to the remediation action plan and Section 94A contributions for the project.

Orica Response

Table 4Table 3 details the feedback from Council and Orica's response.

Table 4: Council

Council Feedback	Orica Response
<i>Remediation Action Plan. Council noted that the independent reviewer of the Remediation Action Plan had recommended a number of actions be taken to address issues raised with the plan. The mechanism to ensure that the consent authority could be reasonably satisfied that these issues had been addressed at the completion of the project was not clear to Council and they recommended that a site audit statement be prepared for the project by a site auditor.</i>	In late March 2017, following discussions with the EPA, Orica confirmed that it had no objection to the engagement of a site auditor to prepare a Site Audit Statement and Site Audit Report in relation to the remediation program.
<i>Section 94A Development Contributions Plan. Council noted that the proposal was not identified as exempt under the relevant provisions of the City of Newcastle Section 94A Contributions Plan 2009 and therefore formal consideration of the Plan by the consent authority is required.</i>	Orica notes that the council has requested consideration of the City of Newcastle Section 94A Contributions Plan 2009 in relation to the program, stating that the development is not exempt from this plan. Orica understands that, as the determining authority, the Minister (or delegate) is not bound by the plan and can impose an alternate percentage levy, a specific monetary amount or no contribution. DFP Planning Pty Ltd (DFP) reviewed the council's request for consideration of the City of Newcastle Section 94A Contributions Plan 2009 and noted that clause 25J (3) of the <i>Environmental Planning and Assessment Regulation 2000</i> includes: (3) <i>The following costs and expenses are not be included in any estimate or determination of the proposed cost of carrying out development:</i> (g) <i>the costs of fittings and furnishings, including any refitting or refurbishing, associated with the development (except where the development involves an enlargement, expansion or intensification of a current use of land)</i> DFP have considered the effect of the clause on whether a development is exempt from the determination of a contribution. In their opinion the intention of the provision is to exempt from contributions development which does not involve the enlargement, expansion or intensification of a current use of land, as the proposed development is merely remediation works rather than any expansion of the existing facility. Indeed the remediation works are required by the EPA and will provide a broader community benefit in addressing historical contamination at the site. The City of Newcastle Section 94A Contributions Plan 2009 also provides for an exemption for "Any other development for which

Council Feedback	Orica Response
	<i>Council considers an exemption warranted.</i>” For this project, the Minister is the consent authority and has the role of the Council. In light of these matters Orica considers that it is unreasonable that a monetary contribution be imposed as a condition of the development consent pursuant to Section 94A.

3.5 NSW Department of Planning and Environment Submission (10 April 2017)

The DPE requested additional information in relation to the following matters:

1. Construction Environmental Management Plan
2. Management and Monitoring Measures
3. Waste Management
4. Traffic and Access
5. Financial Assurance

Orica Response:

A response to each point outlined in Appendix 1 of the DPE submission is detailed in

Table 5.

Table 5 –Department of Planning and Environment

DPE Feedback	Orica Response
Construction Environmental Management Plan	
<i>The EIS states that a CEMP will be prepared prior to construction that will outline the procedures for the assessment and management of:</i> • Soil and water • Waste management • Traffic • Human health risk • Air and odour; and • Noise <i>It appears that the assessment and management of several important issues have been deferred to the preparation of the CEMP.</i> <i>The Department will require the CEMP and any other management plans that the EIS relies on to accompany the RTS report. The management plans are required to ensure that the Department can undertake a thorough review of the development.</i>	The facility Construction Environmental Management Plan (CEMP) is provided in Attachment 2 for review by DPE. The CEMP details the processes for the management of soil and water, waste management, traffic, air and odour and noise. Relevant sections are detailed below: • Soil and water - Sections 7 and 9 • Waste management – Section 10 • Traffic management – Section 11.2.4 • Air and odour – Section 6 • Noise – Section 8 Where required, detailed work plans for the implementation of the specific controls associated with each of these items will be developed with consideration of the control measures detailed in the CEMP in conjunction with the contractor prior to the commencement of the construction. A draft Workplace Health and Safety Plan has been developed to document the systems to be

DPE Feedback	Orica Response
	utilised to manage these issues. The relevant excerpt from the draft plan is provided in Attachment 3.
Management and Monitoring Measures	
<i>The management and monitoring measures contained in Chapter 16 of the EIS are inadequate as they defer the preparation of specific measures to the CEMP. Please ensure a consolidated summary of all proposed environmental management and monitoring measures highlighted in the EIS and CEMP are provided.</i>	Sections 6, 7, 8, 9, 10 and 11 of the CEMP detail environmental management practices that can be implemented during the construction phase of the program. Section 12 of the CEMP (Appendix 2) details monitoring measures for ensuring compliance with the controls detailed in the above sections of the CEMP.
Waste Management	
<i>The EIS states that leachate may be generated? How much leachate will be generated? How will the leachate be managed? If leachate can't be managed at the site where will leachate be disposed?</i>	Section 12.2 of the Remediation Action Plan discusses a potential contingency that could be implemented should monitoring of the installed remediation system fail to provide sufficient evidence that the remediation objective is being achieved. The potential solution could involve the low-flow extraction of groundwater from inside the containment cell. Extracted water would be collected and tested to determine the appropriate method of treatment and disposal. The Long-term Environmental Management Plan will incorporate the monitoring requirements to assess the performance of the remediation system and the notification of the EPA in the event that performance criteria are not being achieved.
<i>The EIS states that Virgin Excavated Natural Material (VENM) and Excavated Natural Material (ENM) may be used in containment cell. Where will the ENM and VENM be stockpiled? How will the VENM and ENM stockpiles be managed to prevent runoff?</i>	VENM and ENM may be required during the construction of the cap. The ENM and VENM will be stockpiled within the cap and containment construction area and erosion and sediment controls as detailed in the CEMP.
Traffic and Access	
<i>Figure 1.1 of the EIS identifies a proposed roadway to be constructed. The EIS lacks any details regarding this road. Will the roadway be sealed or unsealed? Will a wheel wash be required if the roadway is unsealed to prevent sediment tracking on public roads?</i>	Figure 1.1 of the EIS noted a proposed roadway. Access to the Site is through an existing seal roadway. The management of vehicles entering the site will be undertaken in accordance with Section 6.3.2 of the CEMP.
<i>Figure 1.1 of the EIS identifies that the containment cell is within 1.6 metres of the boundary to Lot 2 in DP234288. Has a contingency been formulated in case the crane</i>	Orica has consulted with the preferred contractor regarding the equipment to be used to install the cut-off wall. The equipment discussed in the EIS has been selected for its

DPE Feedback	Orica Response
<i>or any other machinery can't be used within the site?</i>	ability to work in close proximity to the boundary of the adjacent neighbouring facilities.
<i>Provide details regarding the heavy vehicle access to the site and turning paths for entrance to the site?</i>	Heavy vehicle access to the site will be via the facility's existing paved roadway. The management of vehicles entering the site will be undertaken in accordance with Section 6.3.2 of the CEMP.
Financial Assurance	
<i>Please note, the Department and the Environment Protection Authority (EPA) will require financial assurance for the long-term management of the containment cell in accordance with Division 6A of the Contaminated Land Management Act 1997. The Department understands that the EPA will modify the Management Order (Order No. 20131407) to require financial assurance to be maintained in perpetuity. The Department will require specific details regarding the proposed financial assurance mechanisms to satisfy the amended order with the Response to Submissions Report.</i>	Orica has had discussions with both DPE and the EPA in relation to the provision of a financial assurance for the long-term management of the containment cell. Orica will arrange a further meeting with DPE shortly to discuss this matter.

3.6 SafeWork NSW Submission

SafeWork NSW noted in its review of the EIS that arsenic trioxide is a toxic substance in accordance with Schedule 15, table 15.3 of the *Work Health and Safety Regulation 2011*. They also noted the findings of the human health risk assessment which concluded that the health risk to workers and the general public is low and acceptable given the arsenic concentrations of soil, groundwater and ambient air are below the relevant health based screening criteria and there are management control measures proposed to minimise exposure. On this basis they had “*no concerns in relation to the submitted proposal.*” They did not recommend any conditions of approval.

Orica Response

Orica notes the response from SafeWork NSW and confirms that controls as detailed in the human health risk assessment will be implemented during the program to ensure the risk health risk to workers and the general public will be minimised.

3.7 Department of Primary Industries (7 April 2017)

The Department of Primary Industries (DPI) noted that the EIS had been reviewed and that it ‘considers that the proponent has adequately addressed the requirements relevant to the Department’.

4 Orica Response to Commercial Organisations Submission

4.1 Port of Newcastle Operations Pty Ltd (31 March 2017)

Port of Newcastle Operations Pty Ltd (PON) stated in its submission that it supported the project and the overall objective to minimise risk to either human health or the

environment from the identified arsenic contamination. PON suggested a number of matters be included as Conditions of Approval if development consent was issued. These are detailed below, along with Orica's response.

Orica Response

A response to each point outlined in the Port of Newcastle submission is detailed in Table 6.

Table 6 – Orica Response to Port of Newcastle Operations Pty Ltd Submission

PON Feedback	Orica Response
<i>PON understands that the proposed works will not be conducted on PON land, nor will PON land be used for equipment or other storage or associated activities. If Orica proposes to use PON land for any such purpose, a commercial agreement with PON will be required.</i>	Orica does not propose to conduct any works on PON land or use PON land for storage of equipment or associated activities. If PON land was required for these purposes Orica will obtain a commercial agreement from PON.
<i>As indicated in Section 13 of the Remediation Action Plan a Construction Traffic Management Plan will be prepared. As the manager of Cormorant (in part), Heron and Greenleaf Roads, this plan should be prepared in consultation with PON.</i>	Agreed. Orica will consult with PON on the preparation of the Construction Traffic Management Plan.
<i>During construction, additional short-term monitoring should be undertaken of adjacent groundwater monitoring wells to ensure works are not exacerbating existing arsenic levels, or mobilising dormant contamination.</i>	Agreed. Orica will update the Groundwater Monitoring Plan to incorporate a short-term groundwater monitoring program downgradient of the Site during the construction program.
<i>Given that PON's land is currently affected by the arsenic contamination through groundwater movement, it is requested that the development of the Long-term Environmental Management Plan and Groundwater Monitoring Program as set out in Section 15 of the Remediation Action Plan, be undertaken in consultation with PON.</i>	Agreed. Orica will consult with PON and other relevant stakeholders during the development of the Long-term Environmental Management Plan.

5 Conclusion

Orica has responded to the matters raised in submissions by the regulatory authorities and commercial organisations and provided additional information to enable the authorities to complete their assessment of the proposed development.

If you require any further information, or further clarification regarding information detailed in Orica's response to submissions, please do not hesitate to contact me.

Yours sincerely



Sherree Woodroffe

Environment and Community Manager – Kooragang Island

Attachment 1: Biodiversity Assessment Report



Orica Remediation Program, Kooragang Island

Biodiversity Assessment Report

Prepared for
Orica Australia Pty Ltd

1 May 2017



DOCUMENT TRACKING

Item	Detail
Project Name	Orica Facility, Kooragang Island
Project Number	6996
Project Manager	Lily Gorrell 02 4910 3401 PO Box 1056 Newcastle NSW 2300
Prepared by	Lily Gorrell – Accredited Assessor 145
Reviewed by	Martin Sullivan
Approved by	Martin Sullivan
Status	FINAL
Version Number	1
Last saved on	1 May 2017
Cover photo	Proposed works site at Kooragang Facility. Photo taken 10/4/17 by Lily Gorrell.

This report should be cited as ‘Eco Logical Australia 2017 *Orica Facility Kooragang Island Biodiversity Assessment*. Prepared for Orica Australia Limited.’

ACKNOWLEDGEMENTS

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Abbreviations

Abbreviation	Description
AHD	Australian Height Datum
BAR	Biodiversity Assessment Report
Bionet	NSW Atlas of Wildlife
DP&E	NSW Department of Planning and Environment
EIS	Environmental Impact Statement
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW Environmental Planning & Assessment Act 1979
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
FBA	Framework for Biodiversity Assessment
GPS	Global Positioning System
OEH	NSW Office of Environment and Heritage, Department of Premier and Cabinet

PCT	Plant Community Type
SEARs	Secretary's Environmental Assessment Requirements
the Development Site	the works area as defined in the EA for the Orica Facility, Kooragang Island
the Facility	Orica Facility, Kooragang Island
TSC act	NSW Threatened Species Conservation Act 1995
VIS	Vegetation Information Systems

Executive summary

Orica Australia Pty Ltd (Orica) owns the Kooragang Island Facility which is located on Kooragang Island, NSW. Orica operates a manufacturing facility which produces ammonia, nitric acid and ammonium nitrate. Ammonium nitrate produced at the Facility is primarily supplied to mining operations in the Hunter Valley, where it is a raw material in the manufacture of explosives.

An Environmental Impact Statement (EIS) was prepared by Golder Associates on behalf of Orica to support a State Significant Development (SSD) application under Part 4 (Division 4.1) of the *Environmental Planning and Assessment Act 1979*. The SSD application is seeking to obtain development consent to install a cap and containment remediation system at Orica's Kooragang Island Facility to address on-site arsenic contamination located in a small area in the north-western portion of the Orica Facility (Kooragang Island Remediation Program, the Development Site).

Acknowledging the modified condition of the site, Eco Logical Australia (ELA) have prepared this Biodiversity Assessment Report (BAR) to fulfil the obligations of the Biodiversity Offset Policy for Major Projects and the Framework for Biodiversity Assessment (FBA). This report provides information required by the FBA including desktop analysis, site inspections, and surveys to demonstrate how the assessment addresses the Framework for Biodiversity Assessment.

An investigation was undertaken at the Development Site to determine whether a BAR was required under the FBA. The assessment was undertaken by an assessor accredited under s142B(1) of the NSW *Threatened Species and Conservation Act 1995* (TSC Act) on 10 April 2017. The site inspection assessed whether native vegetation, threatened species habitat, or wetlands and estuaries occurred within the Development Site.

Surveys of the site included a 20 m x 20 m full floristic plot, a plot and transect survey, and a threatened species habitat assessment. The Development Site and adjacent land has been the subject of ongoing impacts including land reclamation and industrial development. The assessment found that the biodiversity values at the Development Site have been significantly altered from pre-European conditions. No remnant, native vegetation, threatened species habitat, or wetlands was identified within the Development Site.

The Project would not result in any direct or indirect impacts to ecological communities and species of flora and fauna listed under the TSC Act or the *Environmental Protection and Biodiversity Conservation 1999 Act* (EPBC Act). The project will not substantially reduce the width of vegetation in the riparian buffer zones bordering wetlands or estuaries. The project will not impact the biodiversity values of the upstream Hunter Estuary Wetland.

The assessment has demonstrated that the site does not warrant a full Biodiversity Assessment Report under the Framework for Biodiversity Assessment, considering the absence of:

- Native vegetation
- Threatened species habitat
- Potential impacts to waterways, estuaries, rivers, streams or wetlands.

Therefore, an assessor is not required to calculate the impacts to biodiversity nor the quantum of offset. It is concluded that the impacts of the proposal do not require further consideration by the consent authority.

1 Introduction

Eco Logical Australia Pty Ltd was contracted by Orica Australia Pty Ltd (Orica) to draft a Biodiversity Assessment Report (BAR) to support the Environmental Impact Statement in order to obtain development consent for the installation of a cap and containment cell in the north-western portion of the facility at Orica, Kooragang Island (the Development Site).

1.1 Purpose of this Report

This report has been prepared to support a State Significant Development (SSD) application under Part 4 (Division 4.1) of the *Environmental Planning and Assessment Act 1979*. This document has been prepared to fulfil the obligations of the Biodiversity Offset Policy for Major Projects and the FBA.

This report responds to the Secretary's Environmental Assessment Requirements (SEARs) as applicable to biodiversity. The relevant SEARs relating to biodiversity are shown in **Table 1** below.

Table 1: Relevant SEARs Addressed in this Report

Relevant SEAR	Action
Biodiversity/threatened species impacts related to the proposed development are to be assessed and documented in accordance with the Framework for Biodiversity Assessment, by a person accredited in accordance with s142B(1)(c) of the <i>Threatened Species Conservation Act 1995</i> .	This report responds to the request by OEH to provide a BAR on the biodiversity values at the Project, within the context of the requirements of the FBA.

Given the degraded nature of the Development Site, the reporting requirements for this assessment are discussed in detail in **Section 2.3** of this report.

1.2 Project Background

An EIS was prepared by Golder Associates on behalf of Orica to support a SSD application under Part 4 (Division 4.1) of the *Environmental Planning and Assessment Act 1979*. The SSD application is seeking to obtain development consent to install a cap and containment remediation system at Orica's Kooragang Island Facility to address on-site arsenic contamination located in a small area in the north-western portion of the Orica Facility (Kooragang Island Remediation Program, the Development Site).

The Development Site is located within the north-western portion of the Orica Facility (part of Lot 2 and Lot 3 DP 234288) and is accessed via an internal roadway of the Orica Facility located at 15 Greenleaf Road, Kooragang Island, NSW. The Orica Facility is approximately 22 hectares, with the Development Site an area of approximately 4,200 m² within the Facility.

The Project will install a cap and containment remediation system to enclose arsenic contaminated soil. This will involve the construction of a soil-bentonite cut-off wall (approximately 75 m by 50 m) to enclose the on-site contamination with a cap constructed to minimise rainfall infiltrating and mitigate the flow through the impacted soil and aquifer material.

The proposed remediation works will be undertaken independent of existing Facility operations with the only interaction consisting of utilising an access road for traffic generated by the Project predominantly

during the construction period. Detailed descriptions of the operation of the proposal are found in the EIS.

1.3 Identification of the Construction and Operational Footprint

The Development Site and construction footprint of the project is identified in **Figure 1**. The temporary construction zone will be removed at completion of the works and will comprise of construction site amenities and contractor laydown areas. The permanent works area will comprise of the cap and containment remediation system. Due to construction constraints within the site, the works will include the use of a hydraulic excavator with a cable-suspended clamshell grab and a specialist long-armed excavator.

1.4 General Description of the Development Site

1.4.1 Landform, geology, and soils

The Development Site is relatively flat and has an elevation of approximately two to four metres Australian Height Datum (AHD).

1.4.2 Current Land Use

The Development Site is currently utilised as vacant land and is zoned SP1 Special Activities pursuant to the Three Ports SEPP.

1.4.3 Rivers, Streams, Wetlands, and Estuaries

No rivers, streams, wetlands, or estuaries occur within the development site. The nearest wetland is the Hunter Estuary Wetland, and one estuary, the Hunter River occurs approximately 520 m east and 205 m west of the Development Site respectively. The Development Site occurs outside the 50 m riparian buffer identified in **Appendix 2** of the FBA.

1.4.4 Biodiversity Values Present

The Development Site has been significantly disturbed through land reclamation, construction and ongoing operation of industry. No areas of remnant native vegetation remain at the Facility, and no natural or artificial watercourses are located within the development site. There are no shrub, mid-storey or canopy species present within the construction or operational footprint.

As a result of previous land disturbance within and adjoining the Development Site there are no threatened ecological communities and threatened flora present. The Development Site does not provide suitable habitat for threatened fauna.

1.5 Information Sources

The following documentation and databases were reviewed whilst preparing this report:

- NSW Atlas of Wildlife (Bionet)
- Commonwealth Threatened Species Profile Database
- VIS Classification Database
- SIX Maps – Vegetation Map Viewer
- Directory of Important Wetlands
- Environmental Impact Statement – Orica Kooragang Island Remediation Program (Golder Associates 2017)

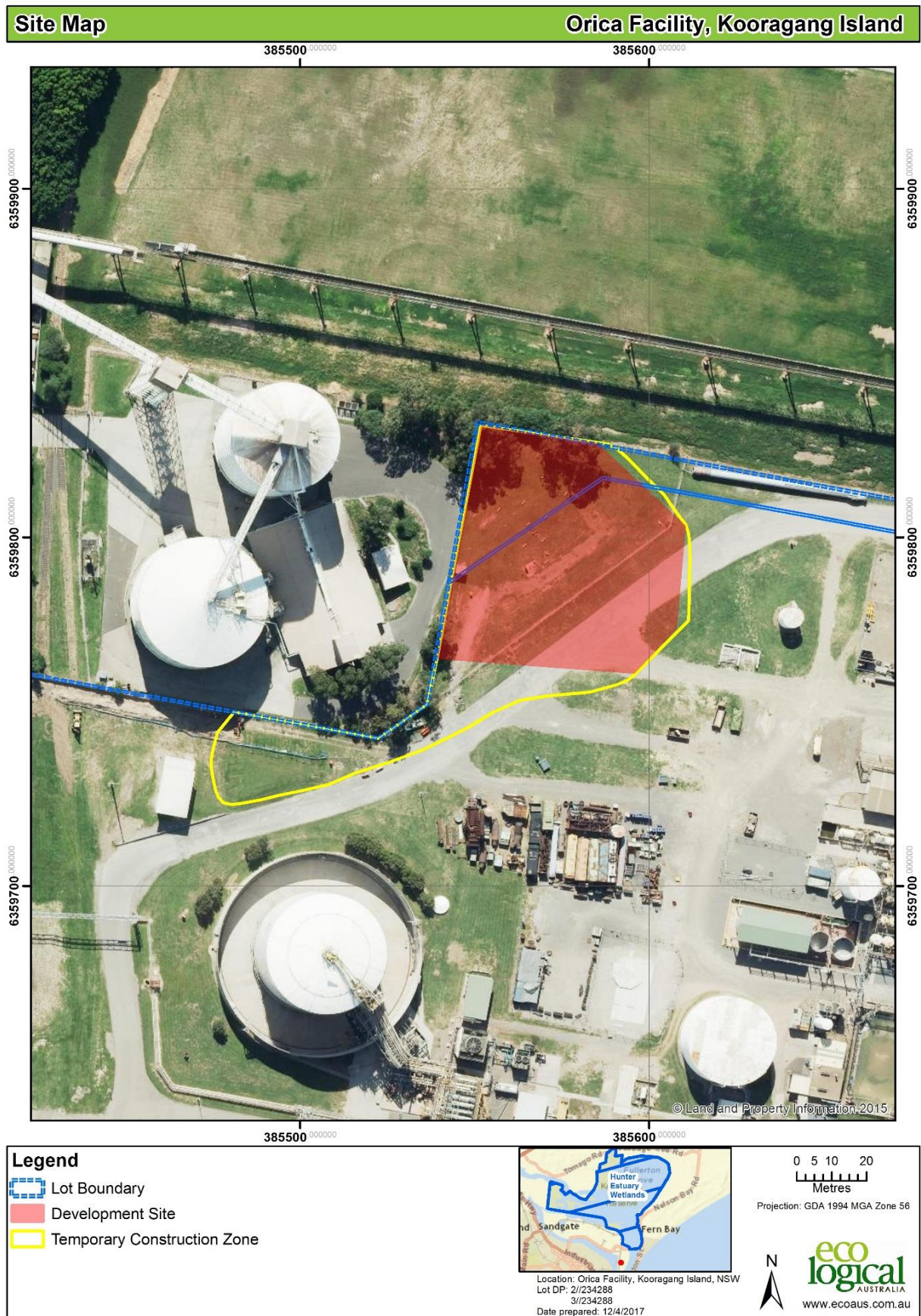


Figure 1: Site Map

2 Legislation and Policies

2.1 Commonwealth

2.1.1 EPBC Act

Under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), Matters of National Environmental Significance (MNES) are protected. The FBA requires proponents to identify and assess the impacts on all nationally listed threatened species and threatened ecological communities that may be on the development site. Other MNES are not considered under the FBA.

No MNES have been identified within the development site.

2.2 New South Wales

2.2.1 Environmental Planning and Assessment Act 1979

As part of an application for a Major Project under the EP&A Act, a proponent must prepare an EIS. Before preparing an EIS, proponents must apply to the Secretary of the Department of Planning and Environment (DP&E) for the Secretary's Environmental Assessment Requirements (SEARs), which sets out matters to be addressed in the EIS.

2.2.2 NSW Biodiversity Offsets Policy for Major Projects

As the project is identified as a Major Project, under the NSW Biodiversity Offsets Policy for Major Projects, the SEARs require the proponent, unless otherwise specified, to apply the FBA to assess impacts on biodiversity. The FBA must be applied to identify reasonable measures and strategies that can be taken to avoid and minimise impacts to biodiversity. A BAR will describe the biodiversity values present on the Development Site and the impact of the Major Project on these values. If required, a Biodiversity Offset Strategy (BOS) will outline how the proponent intends to offset the impacts of the Major Project. The BAR and BOS then form part of the EIS.

The SEARs may identify additional assessment requirements for biodiversity impacts not considered by the FBA, which must be documented separately within the EIS.

2.3 OEH consultation

The SEARs for the Project were issued by DP&E on 18 August 2016. Following Submission of the EIS on 23 February 2017, the NSW OEH responded with a formal submission indicating that the EIS did not contain a BAR as required within the SEARs. A timeline for the actions throughout the assessment process is shown below in **Table 2**.

Table 2: Project Timeline and Ongoing Negotiations

Date	Action
20 July 2016	SEARs Requested from the Department of Planning by the Proponent
18 August 2016	SEARs Issued by the Department of Planning
23 February 2017	EIS submitted by Golder Associates on behalf of Orica
31 March 2017	OEH Submitted a formal response to the EIS identifying the absence of the Biodiversity Assessment Report and that assessment could not proceed without the BAR.
6 April 2017	ELA contacted to assist in providing information to satisfy the requirements of the FBA

Acknowledging the modified condition of the site, this BAR to be submitted to OEH identifies and demonstrate that:

- There are no impacts on native vegetation – as the FBA is self-limiting in s5.1 to native vegetation; and
- Any non-native vegetation does not represent habitat for threatened species (as the above exemption only applies where non-native vegetation is not habitat); and
- There are no impacts on watercourses/wetlands/estuaries (which are impacts for further consideration).

The report also details the desktop information/site visits/surveys that support the above conclusions.

It is also noted that:

- If there is native vegetation within the footprint, but it is in poor condition, OEH would expect to see how the FBA has been applied to the point that allows the proponent to demonstrate that vegetation zones have a site value score of less than 17 and are not Endangered Ecological Communities (EEC) or Critically Endangered Ecological Communities (CEEC).
- If the non-native vegetation does represent suitable habitat for threatened species, then they would expect to see survey (or expert report) to determine presence in accordance with s6.5 of the FBA.
- The report should take into account the impacts of both the operational and construction footprint.

This BAR fulfils the requirements detailing how the FBA does not apply to the site in the absence of native vegetation and threatened species habitat.

3 Native Vegetation

3.1 Landscape Features

There is no remnant native vegetation present within the Development Site and all vegetation has been landscaped. The Development Site has been reclaimed, filled and levelled and consists of common lawn species and exotic species.

Therefore, as the Development Site was predominantly exotic (99%), no vegetation zones were identified, and the Landscape score is 0 there is no need to undertake the landscape features component under the FBA.

3.2 Flora Surveys

A Flora survey was undertaken within the Development Site on 10 April 2017 by a qualified, accredited assessor. Survey effort is shown in **Figure 2**. The assessment included obtaining an overview of the biodiversity values of the Development Site, as well as mapping of vegetation communities and floristic sampling. Areas of native vegetation were delineated using a handheld Global Positioning System (GPS). The assessment met the full requirements of the FBA including full floristic survey, as well as plot and transect survey within any PCTs identified within the Development Site.

In order to identify PCTs within the Development Site, plot based full floristic survey and plot and transect survey was undertaken within vegetation zones as identified in Table 1 of the FBA. Given the limited extent of existing vegetation within the development site, only one (1) full floristic plot, and plot and transect survey was undertaken. Photographs and site notes were recorded. Photographs are presented in **Appendix A** and the location of photograph points is shown on **Figure 2**.

The location of the surveys was chosen to occur within the approximate development footprint of the proposal. At the survey site, the following information was collected:

- Site ID;
- Name of recorder(s);
- Date;
- Plot orientation, slope, and aspect;
- Easting and Northing at either end of the 50m transect;
- Site photographs;
- A plot-based full floristic survey; and
- A plot and transect survey.

3.2.1 Plot-based Full Floristic Survey Method

Within a 20m x 20m quadrat, the following data was collected at each plot-based full floristic survey site:

- **Species name:** Scientific name and common name;
- **Cover:** an estimate of the appropriate cover measure for each recorded species: from 1-5 and then to the nearest 5%;
- **Abundance:** A relative measure of the number of individuals or shoots of a species within the plot using the following intervals: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 50, 100, 500, 1000, or specify a number greater than 1000 if required;
- **Form:** (T) Tree; (M) Mallee tree; (S) Shrub; (G) Tussock Grass (Poa/Themeda); (D) Sod grass (Couch/Kikuyu); (L) Vine/climber/scrambler; (V) Sedge (Cyperoid); (R) Rush (Restioid, Juncaceae); (F) Forb; (E) Fern; (P) Palm; (A) Cycad.

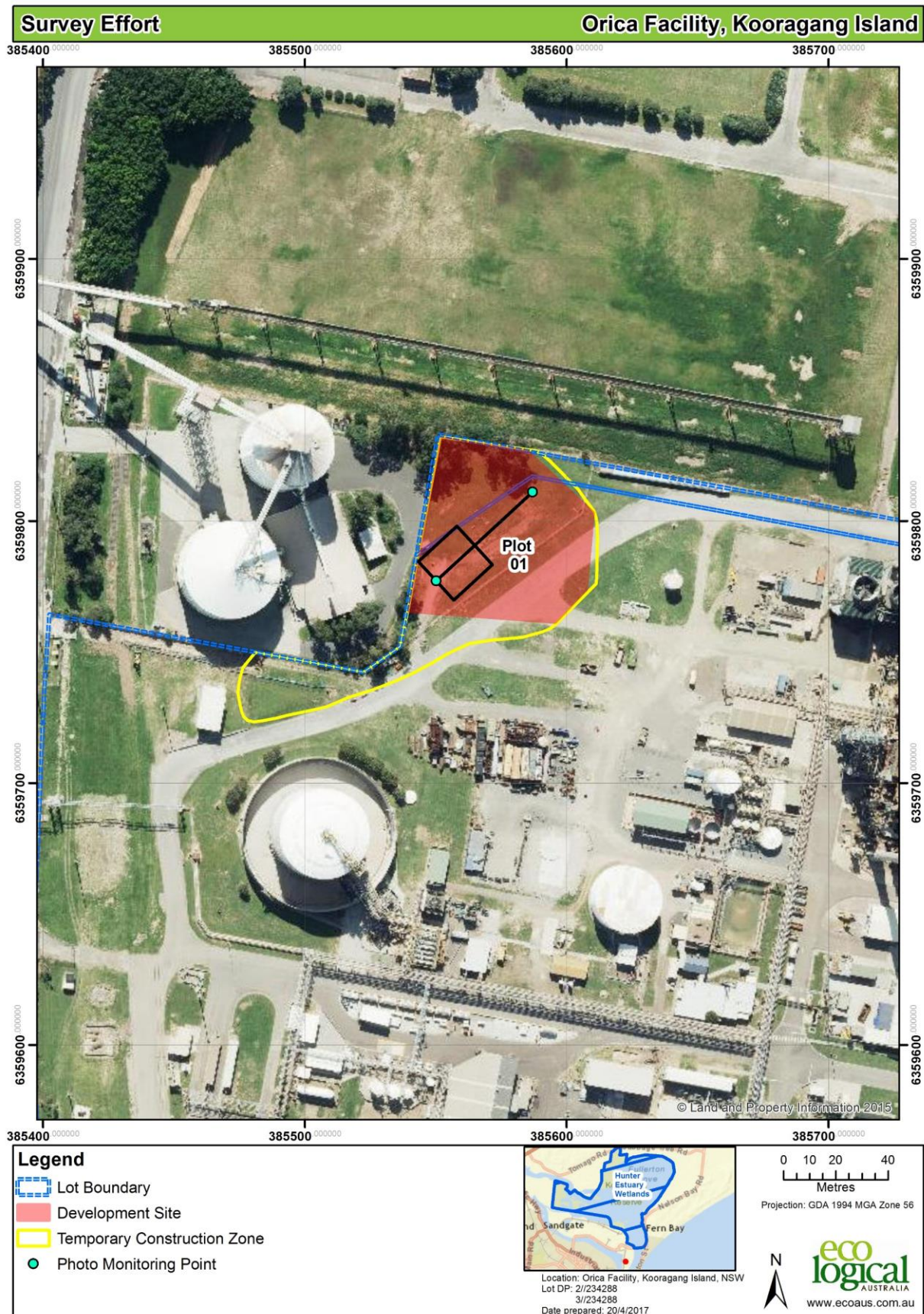


Figure 2: Survey Effort

3.2.2 Plot and Transect Survey Methods

Within each plot and transect survey, the following information was collected:

- Within a 20m x 20m quadrat:
 - The number of native species present;
- Along a 50m transect every 5m:
 - Native over-storey cover (%);
 - Native mid-storey cover (%);
 - Exotic over-storey cover (%); and
 - Exotic mid-storey cover (%);
- Along a 50m transect every 1m:
 - Native ground cover (grasses);
 - Native ground cover (shrubs);
 - Native ground cover (other); and
 - Exotic ground cover.
- Within a 50m x 20m quadrat:
 - Number of trees with hollows; and
 - Total length of fallen logs > 10cm width (m);
- Within whole vegetation zone:
 - All canopy species; and
 - Proportion of regenerating canopy species.

3.2.3 Survey Results

There is no remnant native vegetation present within the Development Site and all vegetation has been landscaped. The Development Site has been reclaimed, filled and levelled and has been planted with common lawn species.

Vegetation within the proposed Development Site is confined to a relatively small area of managed land, with some areas used intermittently for vehicle park up and for storage of metal bins. The vegetation within this area is dominated (99% cover) by exotic species including *Eragrostis curvula* (African Lovegrass) and *Chloris gayana* (Rhodes grass).

Only one native species was identified within the plot-based full floristic survey as shown in **Table 3**. *Commelina cyanea* (Scurvy weed), generally grows in moist forest or woodlands, however in certain situations is considered weedy and can colonise disturbed sites (Plantnet 2017).

Table 3: Full Floristic Plot Data

Species Name	Common Name	Form	Cover	Abundance
<i>Eragrostis curvula</i> *	African Lovegrass	G	30	1000+
<i>Chloris gayana</i> *	Rhodes Grass	G	30	1000+
<i>Cynodon dactylon</i> *	Couch	D	10	1000
<i>Ambrosia tenuifolia</i> *	Lacy ragweed	F	10	500
<i>Galenia pubescens</i> *		F	2	200
<i>Eleusine tristachya</i> *	Goose Grass	G	2	300

<i>Cyperus rotundus</i> *	Nutgrass	V	2	100
<i>Plantago lanceolata</i> *	Lamb's Tongue	F	1	50
<i>Oxalis corniculata</i> *	Creeping woodsorrel	F	1	100
<i>Setaria parviflora</i> *	Slender Pigeon grass	G	1	100
<i>Commelina cyanea</i>	Scurvy weed	F	1	20
<i>Spergularia rubra</i> *	Sandspury	F	1	20
<i>Rumex obtusifolius</i> *	Broadleaf Dock	F	1	50
<i>Verbena bonariensis</i> *	Purpletop	F	1	20
<i>Trifolium repens</i> *	Clover	F	1	100
<i>Aster subulatus</i> *	Wild aster	F	1	20
<i>Solanum americanum</i> *	Glossy nightshade	F	1	10

*Denotes exotic species

3.2.4 Site Value Score

Considering the persistent land use, history of the site, absence of any native species within the canopy and mid-storey, and the landscaped nature of the Development Site, no vegetation zone can be attributed to the vegetation within the Development Site as it currently stands. However, for the purposes of this assessment, and to calculate a site value score, the Plant Community Type (PCT) 1728 *Swamp Oak - Prickly Paperbark - Tall Sedge swamp forest on coastal lowlands of the Central Coast and Lower North Coast* is considered to most closely resemble the community likely to have occurred in the locality. Supporting biometric data collected at the survey site has been provided in **Table 4**. Based on this data the site value score has been calculated against the Benchmark data for the above PCT (**Table 5**) and using the 'scoring and weighting of site attributes' (**Table 2** within the FBA) the score has been calculated at 12.5 which demonstrate that, should the Development Site have comprised of the above PCT, the vegetation zone has a site value score of less than 17 and is not EEC/CEEC.

This score of 12.5 has been calculated only due to the fact that the PCT utilised for the exercise has a lower benchmark of 0 for Native Mid-Storey (NMS) and Native Ground Cover Grass (NGCG), therefore triggering a weighting of 10 and 2.5 respectively. As discussed above, the Development Site is totally cleared, and comprises no canopy, mid-storey or shrub layers and the groundlayer is almost totally exotic (99%), with the exception of one native species with low cover and abundance. Therefore, in reality, the site value score for the Development Site is 0.

Table 4: Biometric Data within Plot and Transect

Variable	Abbreviation	Value
Number of Native Plant Species	NPS	1
Native Over-storey %	NPS	0
Native Mid-storey %	NMS	0
Native Ground-cover Grasses	NGCG	0
Native Ground-cover Shrubs	NGCS	0
Native Ground-cover Other	NGCO	0
Exotic Cover	Exotic	100
Number of Trees with Hollows	NTH	0
Total Length of Fallen Logs >10cm width (m)	Fallen Logs	0
Proportion of regeneration of Canopy Species	Regen	0

Table 5: Site value score based against Benchmark data

	Site attributes	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Easting	Northing	Zone
	Plot 01	1	0	0	0	0	0	100	0	0	0	385549	6359777	56
Benchmark		15	15-65	0-50	0-90	1-15	2-90	-	0.8	-	10	-	-	-
Score		0	0	10	2.5	0	0	0	0	0	0	-	-	-

4 Threatened Species and Populations

4.1 Desktop Analysis

As the Development Site was predominantly exotic and no vegetation zones were identified, the BioBanking Credit Calculator was unable to determine a list of candidate species. As such a desktop analysis was conducted on 10 April 2017 using NSW Atlas of Wildlife. A 5 km search radius from the Development Site was applied and all potential listed threatened species were considered during the assessment. A total of 18 species credit species have been recorded within 5 km of the Development Site as shown in **Table 6**. Ecosystem species habitat was not considered during the analysis.

4.2 Habitat Assessment

4.2.1 Methods

Habitat assessment was undertaken at the Development Site on 10 April 2017. Habitat considered during the assessment included:

- Hollow-bearing trees;
- Emergent aquatic vegetation;
- Wetlands and lakes;
- Estuaries and shorelines;
- Riparian vegetation;
- Caves and cliffs; and
- Koala feed trees listed in **Appendix 2** of the NSW State Koala Recovery Plan.

4.2.2 Results

No threatened species habitat was identified within the development site. There are no hollow-bearing trees, wetlands, emergent aquatic vegetation, or caves within or adjacent to the development site.

A complete analysis of the likelihood of all potential threatened species habitat is provided within **Table 5** below.

Table 6: Likelihood of Occurrence of Species Credit Species within the Development Site

Common Name	Species Name	Habitat Requirement	Species Likely?
Green and Golden Bell Frog	<i>Litoria aurea</i>	land within 100 m of emergent aquatic or riparian vegetation	Unlikely. No emergent aquatic or riparian vegetation
Australasian Bittern	<i>Botaurus poiciloptilus</i>	land containing brackish or freshwater wetlands	Unlikely. No wetlands present
Osprey	<i>Pandion haliaetus</i>	land within 40 m of fresh/brackish/saline waters of larger rivers or creeks; estuaries, coastal lagoons, lakes and/or inshore marine waters	Unlikely. The site is further than 40m from shorelines
Sooty Oystercatcher	<i>Haematopus fuliginosus</i>	land within 40 m of rocky intertidal shorelines or sandy beaches within 1km of intertidal mudflats	Unlikely. The site is further than 40m from shorelines
Pied Oystercatcher	<i>Haematopus longirostris</i>	land within 40 m of high water mark on beaches, sandbars, margins of estuaries or lagoons	Unlikely. The site is further than 40m from beaches and estuaries
Lesser Sand-plover	<i>Charadrius mongolus</i>	intertidal mudflats or sandflats within inlets, bays, harbours, estuaries, lagoons or ocean beaches or sandy spits	Unlikely. No intertidal habitat present
Great Knot	<i>Calidris tenuirostris</i>	coastal beaches, tidal mudflats, bare open coastal lagoons or inland lakes	Unlikely. No beaches present
Black-tailed Godwit	<i>Limosa limosa</i>	land within 40 m of sheltered bays, estuaries, lagoons with intertidal mudflats, sandflats, saltmarsh, shallow swamps, freshwater or saline lakes and/or dams	Unlikely. The site is further than 40m from estuaries
Terek Sandpiper	<i>Xenus cinereus</i>	intertidal mudflats or sandflats within inlets, bays, harbours, estuaries, lagoons, ocean beaches and/or sandy spits	Unlikely. No tidal areas present
Little Tern	<i>Sterna albifrons</i>	land within 40 m of inshore coastal waters or shallow waters of estuaries, coastal lagoons and/or lakes	Unlikely, the site is further than 40m from estuaries
Koala	<i>Phascolarctos cinereus</i>	As per Koala Food Tree Species listed in Appendix 2 of the NSW State Koala Recovery Plan (DECC 2008)	Unlikely. No feed tree species present. The site is fenced and disjunct from any areas of habitat.

Common Name	Species Name	Habitat Requirement	Species Likely?
Grey-headed Flying-fox (Breeding)	<i>Pteropus poliocephalus</i>	land within 40 m of rainforest, coastal scrub, riparian or estuarine communities	Unlikely. No vegetation present for the species
Eastern Bentwing-bat (Breeding)	<i>Miniopterus schreibersii oceanensis</i>	land containing caves or similar structures	Unlikely. The site contains no caves
Little Bentwing-bat (Breeding)	<i>Miniopterus australis</i>	land containing caves or similar structures	Unlikely. The site contains no caves
Eastern Bentwing-bat (Breeding)	<i>Miniopterus schreibersii oceanensis</i>	land containing caves or similar structures	Unlikely. The site contains no caves
Southern Myotis	<i>Myotis macropus</i>	Hollow-bearing trees, bridges, caves or artificial structures within 200 m of riparian zone	Unlikely. The construction footprint contains no hollow-bearing trees or artificial structures, and is greater than 200m from riparian zones
Eucalyptus parramattensis subsp. decadens	<i>Eucalyptus parramattensis subsp. decadens</i>	deep, low-nutrient sands	Unlikely. Soils comprise of dredged river sands and does not provide suitable conditions.
Zannichellia palustris	<i>Zannichellia palustris</i>	land containing freshwater bodies	Unlikely. The site does not contain freshwater bodies

5 Conclusion

The site is heavily degraded and altered by land reclamation and industry. Biodiversity values at the site are limited to exotic species with the exception of one native species with low cover and abundance.

The Project would not result in any direct or indirect impacts to ecological communities and species of flora and fauna listed under the TSC Act or the EPBC Act. The project will not substantially reduce the width of vegetation in the riparian buffer zones bordering these wetlands and estuaries. The project will not impact the biodiversity values of the upstream Hunter Estuary Wetland.

Table 7 below outlines the rationale to each of these findings.

Table 7: Compliance with FBA and OEH Conditions

OEH Condition	FBA Reference	Response	Detail of desktop information, site visits, and surveys to support conclusions
There are no impacts on native vegetation	5.1.1.3	Of the vegetation on site 99% is exotic. A total of 17 species are present within the Development Site and 16 of these are exotic.	Chapter 3
Any non-native vegetation does not represent habitat for threatened species	6.5.1.3	The habitat components present are substantially degraded such that species credit species known from the locality are unlikely to utilise the development site	Chapter 4
There are no impacts on watercourses/wetlands/estuaries	Appendix 2	The proposal will not impact on the riparian areas of 4 th order or higher streams and rivers, important wetlands, or estuaries.	Chapter 1

Therefore, it is concluded that the impacts of the proposal do not require further consideration by the consent authority.

In the opinion of the assessor, the site does not warrant further consideration under the FBA, considering the absence of:

- Native vegetation
- Threatened species habitat
- Potential impacts to waterways, estuaries, rivers, streams or wetlands.

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Appendix A Site Photos



Plate 1: Transect start



Plate 2: Transect end



Plate 3: Transect start looking left



Plate 4: Transect start looking right



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Attachment 2: Orica Kooragang Island Construction Environmental Management Plan



ORICA KOORAGANG ISLAND CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN



Quality Information

Document Orica Kooragang Island CEMP

Date 08/11/2016

Prepared by Nicholas Woodard

Reviewed by

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	23/09/16	Draft CEMP	A Taylor	
B	4/10/16	Revised Draft	A Taylor	
B	8/11/16	Revised Draft		

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LIST OF ABBREVIATIONS

Table 1 List of Abbreviations

Acronym	Abbreviation
ABCP	Air Base Command Post
AHD	Australian Height Datum
AN	Ammonium nitrate
CEMP	Construction Environmental Management Plan
CSHEMP	Construction Safety Health and Environmental Plan
CSS	Construction safety studies
DECCW	Department of Environment Climate Change and Water
EHC Act	Environmentally Hazardous Chemicals Act.
EMS	Environmental Management Strategy
ENCM	Environmental Noise Control Manual
EPA	Environmental Protection Authority
EPBC Act	Environment Protection and Biodiversity Act
EPL	Environment Protection Licences
ERP	Emergency Response Plan
GL	Ground level
HAZCON	Hazards of Construction
INP	Industrial Noise Policy
JSERA	Job Safety and Environment Risk Analysis
KI	Kooragang Island
NOW	NSW Department Primary Industries Office of Water
NPC	Newcastle Port Corporation.
OEH	Office of Environment and Heritage
PASS	Potential Acid Sulphate Soil
POEO Act	Protection of the Environment Operations Act 1997

RAP	Remedial Action Plan
RPL	Recognition of Prior Learning
RTA	Roads and Maritime Services
SHE	Safety, Health and Environment
SHE MR	Safety Health & Environmental Management Representative
SHEC	Safety, Health, Environment and Community
SHECMS	Safety Health Environment Community Management System
SHERMIS	Safety, Health and Environment Management and Reporting System
UAP	Unsafe Act Prevention
WARR	Waste Avoidance and Resource Recovery Act 2001

1 DOCUMENT CONTROL AND AMENDMENTS

1.1 DOCUMENT CONTROL

It is the responsibility of the site's Environment department to maintain, review and update the site's Construction Environmental Management Plan (CEMP).

Access to the control copy of the CEMP is available electronically on the site's document management system (DMS), reference number KIW – 2684. It is the responsibility of each Project Manager to ensure that the current CEMP is reviewed when implementing a project.

1.2 AMENDMENTS

Approval to deviate from the control measures detailed in the CEMP must be approved by the Environment department.

A review of the CEMP shall be undertaken:

- ▶ At the commencement of a project to identify relevant environmental controls that are required to be integrated into the project's design;
- ▶ When a project scope significantly deviates from the original design;
- ▶ Prior to commissioning of individual plant and equipment;
- ▶ Following either an internal and/or external audit of the CEMP;
- ▶ Following an investigation of a significant incident associated with works being undertaken on site which recommends changes relevant to the CEMP; and
- ▶ At least on an annual basis.

Amendments to the current version shall be highlighted in the revised version of the CEMP. Any changes to the CEMP must be documented and approved.

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2 SITE OVERVIEW

2.1 SITE BACKGROUND

Orica operates a manufacturing facility (the Site) on Kooragang Island (KI), Newcastle. The site produces ammonia, nitric acid and ammonium nitrate, which is predominately utilised in the Hunter Valley.

2.2 DESCRIPTION OF KI SITE

The Orica Site is located on KI, at the confluence of the North and South arms of the Hunter River, and is approximately 3.5 km north of Newcastle CBD.

Neighbouring land use surrounding the site includes:

- ▶ North - Incitec Pivot Fertiliser Distribution Centre;
- ▶ North West – Kooragang Berth No.2. The berth is used for the unloading of cement, vegetable oil, woodchip and bulk products (fertiliser and ammonia);
- ▶ West – Qube holds the lease over this land for use in port related activities;
- ▶ South West – Qube. The terminal is used for bulk material handling (coal, wood chip, fertiliser, grain and soda ash).
- ▶ South – Patricks Warehousing and Despatch site. The site operates adjacent to the southern boundary of the Facility;
- ▶ South East – Walsh Point. The point is located across Heron Road (i.e. the southern end of KI), Tasmania Mines operates a magnetite storage facility; and
- ▶ East – Vacant land. The thin strip of land between Greenleaf Road and the Facility is currently vacant, apart from the storage tanks located to the northern east of the site which are utilised as a diesel and marine fuel terminal.

The nearest residential areas are located at Stockton, approximately 800 m to the east and Fern Bay, approximately 1.5 km to the north east. There are also residential areas located approximately 2 km to the south at Carrington and 2.2 km to the south west at Mayfield.



G:\ENV\GIS\Projects\60360306451 Orca Kooragang Island Flare Modification\Figures\CEMP\60306451_F1 Site Location 08.11.2016 TO

Orica's KI Site consists of:

- ▶ An Ammonia Plant;
- ▶ Three Nitric Acid Plants, NAP1, NAP2 and NAP3 (nitric acid is used in the production of ammonium nitrate);
- ▶ Two AN Plants, which manufacture Nitropril (a porous prilled ammonium nitrate product) and 88% ammonium nitrate solution;
- ▶ Bagging and bulk dispatch facilities for anhydrous ammonia, solid ammonium nitrate, AN solution, nitric acid; and
- ▶ Offices and amenities located adjacent to Greenleaf Road on the eastern side of the Site.



Figure 2 *Orica Kooragang Island*

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2.3 PURPOSE AND OBJECTIVES OF ORICA'S CEMP

Orica Kooragang Island has developed a Construction Environmental Management Plan (CEMP) to ensure that environmental hazards relating to construction activities at its KI site are effectively identified and managed.

This CEMP forms one element of the site's comprehensive Safety, Health and Environmental management system and should not be implemented in isolation to the requirements of the site's safety management system or Emergency Management Plan. Together they form a construction safety, health and environmental management plan (CSHEMP).

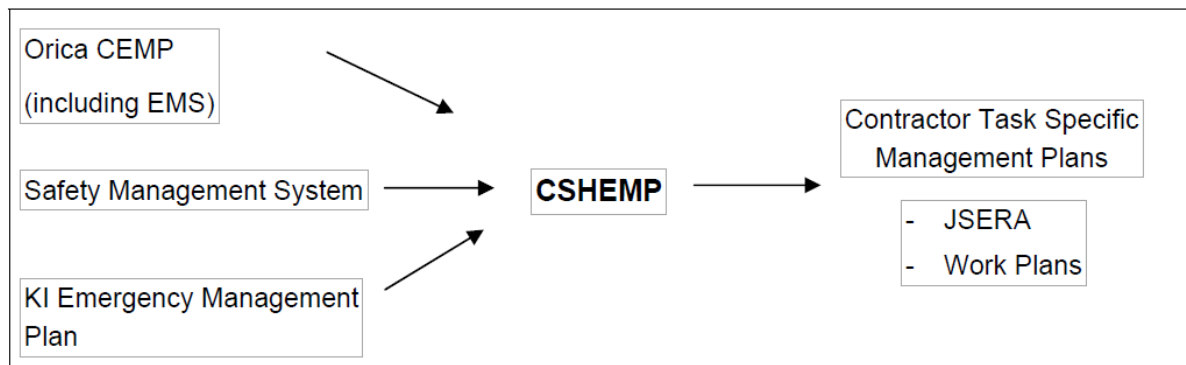


Figure 4 CEMP Relationship with CSHEMP

Construction activities that are permitted onsite, and are subject to the requirements outlined in the CEMP include:

- ▶ Bulk earthworks and excavations;
- ▶ Civil works including concreting and paving, drainage, road works, piling and foundation works;
- ▶ Plant and equipment construction and installation
- ▶ Plant maintenance works;
- ▶ Electrical and Instrumentation installation;
- ▶ Demolition works;
- ▶ Landscaping and vegetation rehabilitation activities; and
- ▶ Remediation works.

The purpose and objectives of this plan are to:

- ▶ Provide an overview of the regulatory obligations construction works are required to comply with;
- ▶ Describe the systems that will be implemented to deliver effective environmental management;
- ▶ Describe how site approvals, statements of commitment and other statutory requirements relate to the different construction activities around the site;
- ▶ Provide an overview of personnel responsible for the implementation of the control measures detailed in this plan and its associated sub plans to ensure compliance with regulatory requirements; and
- ▶ Provide an overview of effective environmental controls to manage key environmental aspects identified in a project's environmental risk reviews.

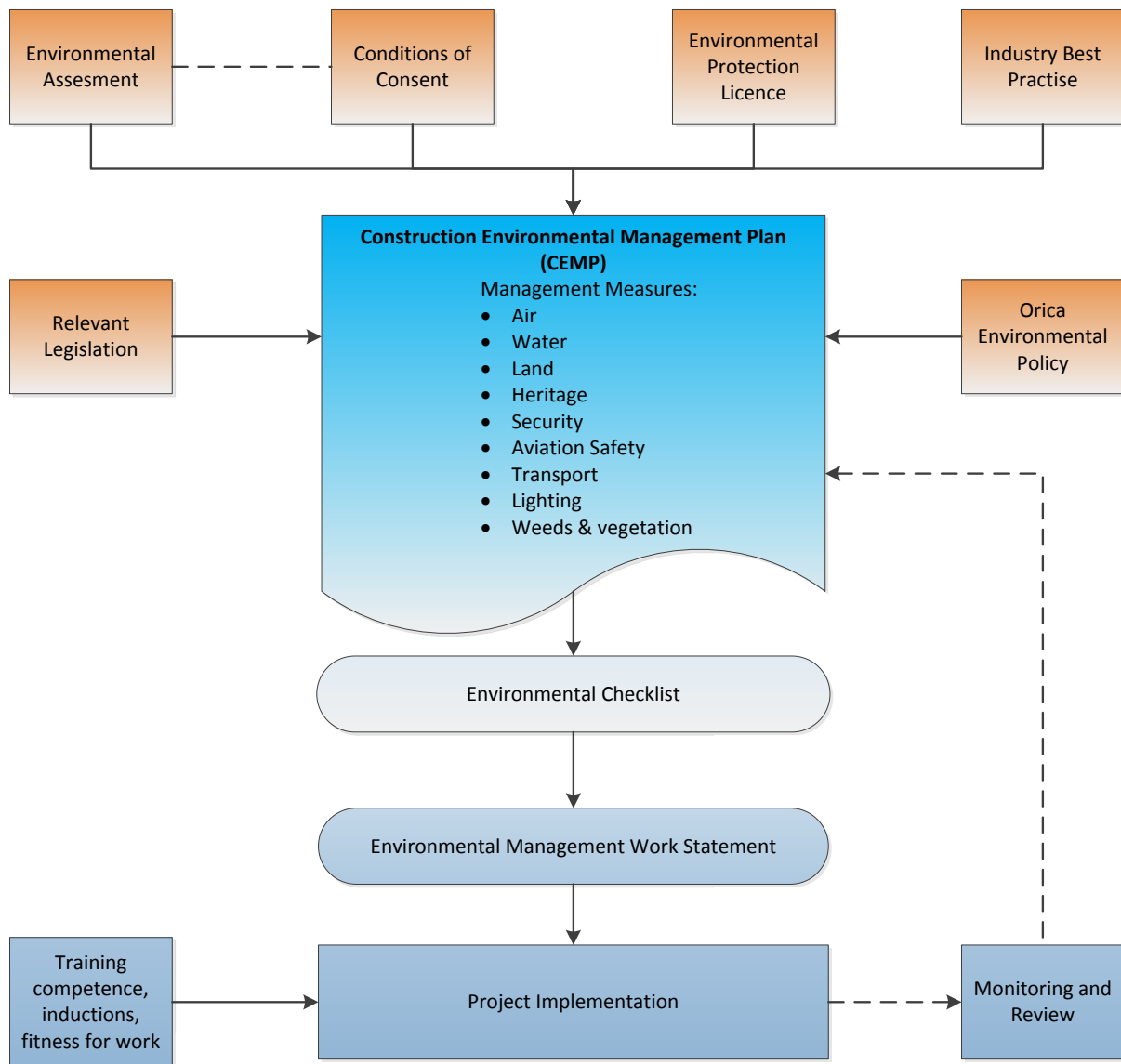


Figure 5 CEMP Inputs and Operation

3 APPROVALS AND REGULATORY OVERVIEW

3.1 OVERVIEW

Development of the Site is required to be undertaken in accordance with relevant environmental legislation, government guidelines and standards, site environmental assessments, statement of commitments and other relevant project approval requirements.

3.1.1 Orica Kooragang Island Planning Approvals

Approval for the operations at Orica's Kooragang Island site was originally granted by Newcastle City Council (NCC) under the Local Government Act 1919 and the Northumberland County Planning Scheme Ordinance. This approval was modified by Council on 20 December 1971 to allow for additions to the chemical plant under certificate of consent number 278/71. This approval under the now repealed Local Government Act 1919 is equivalent to the current planning approvals granted under the EP&A Act.

The site has had several additional planning approvals to support the expansion of the site over the past 50 years. An overview of Orica KI's previous projects is outlined in **Table 2**.

Table 2 Summary of Existing Approvals

Project name	Project Summary	DMS Reference Documentation
NAP2/AN2 DA 379/87 (Newcastle City Council)	- Construction of NAP2 - Construction on AN2	KIW - 3559
NAP3 / AN1 (N91/00593) (NSW Department of Urban Affairs and Planning)	- Construction of NAP3 - Upgrade of production capability of AN1	KIW - 3555
Triella (DA 685/93) (Newcastle City Council)	Construction of anhydrous ammonia packaging and aqua ammonia plant	KIW - 3586
Orica Kooragang Island Ammonium Nitrate Expansion Project (08_0129) (NSW Department of Planning)	- Upgrade Ammonia Plant from 800t/day to 1050t/day; - Proposed to expand existing facility to increase maximum production rate from 500000 to 750000 tonnes of AN per annum; - Construction of NAP4 and AN3 - Construction of additional storage; and - Installation of new infrastructure (cooling towers, access points, loading facilities)	KIW - 3052

Orica Kooragang Island Ammonium Nitrate Expansion Project (08_0129) – MOD 1 (NSW Department of Planning)	• The modification amended the layout of the site and changes to the choice of plant and equipment for the project.	KIW - 3052
Orica Kooragang Island Ammonium Nitrate Expansion Project (08_0129) – MOD 2, 2014 (NSW Department of Planning)	• Relocation and increase in storage capacity of the approved expansion project nitric acid tank; • Ammonia Flaring Stacks – installation of three ammonia flares for the treatment of non-routine process relief-valve ammonia discharges.	KIW - 3500
Orica Kooragang Island Ammonium Nitrate Expansion Project (08_0129) – MOD 3, 2015 (NSW Department of Planning)	• Increased the allowable annual production limit relating to the manufacture of ammonia at the site from 360,000t to 385,000t.	KIW - 3761

3.2 PROJECT PLANNING APPROVAL REQUIREMENTS

It is the responsibility of the project manager to identify if planning approval is required for the project to ensure that compliance to the requirements of the site's existing approvals are not compromised. This analysis should be completed in consultation with a site environmental representative and prior to the completion of the project's design. The methodology detailed in the following figure should be used as a guide to determine if an existing approval is adequate to cover the proposed works. Should there be any ambiguity the site environmental representative should be contacted as early as possible to avoid delays should additional approval be required.

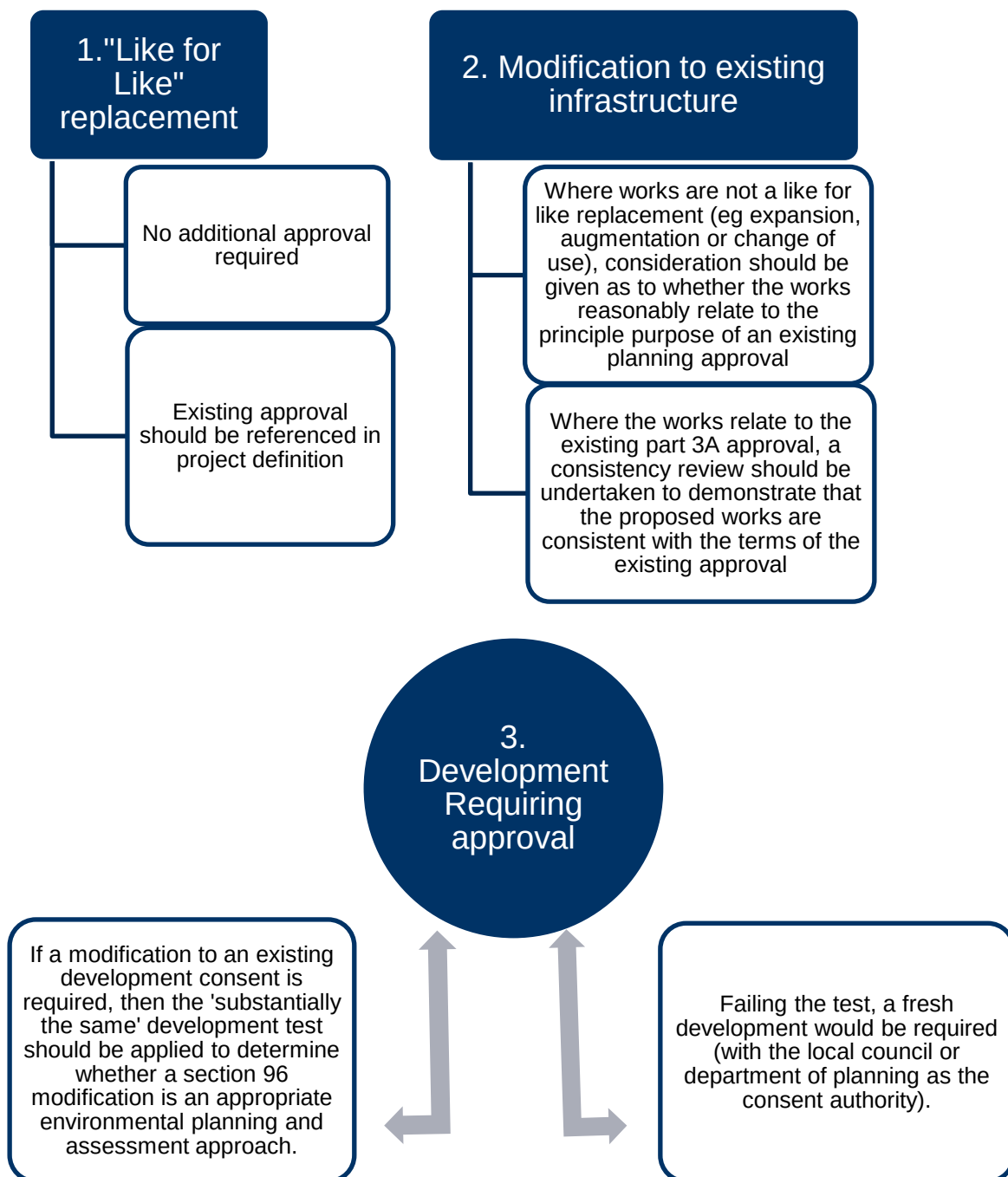


Figure 6 Project Approval Test

3.3 ENVIRONMENTAL PROTECTION LICENCE

The NSW Environment Protection Authority (EPA) issues Environment Protection Licences (EPL) to owners/operators of industrial premises in compliance with the requirements detailed in the Protection of the Environment Operations Act 1997 (POEO Act). The objective of the POEO Act is to achieve the protection, restoration and enhancement of the quality of the NSW environment.

The site's Environment Protection Licence (EPL 828) can be accessed either by the site's DMS, reference number KIW - 1021 or on the [NSW EPA website](#):

Orica's EPL details the environmental performance requirements in which the site must operate. These include requirements relating to the way the site impacts on the local environment including air, water, land, noise and waste management at the site. Any project or process change that could potentially alter the site's performance will need to consider the requirements detailed in the site EPL.

The EPL is not limited to just operational requirements, but also includes construction related requirements including dust, waste, transportation, water and community complaint management.

All EPL holders must comply with their licence conditions, make pollution monitoring data available, prepare pollution incident response management plans, submit annual returns and pay annual administrative and load based licence fees.

3.4 OTHER RELEVANT LEGISLATION

Works on the KI site are required to be undertaken with consideration to environmental legislation, government guideline documents, the Environmental Assessment for the project, the Statement of Commitments, the Project Approval and the EPL. Legislation that requires consideration in any construction works at the site includes:

Contaminated Land Management Act 1997

The Contaminated Lands Management Act 1997 establishes an investigation and remediation (if appropriate) process where contamination presents a significant risk of harm to human health or the environment.

Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act 1979 (EP&A Act) is the primary legislation regulating land use planning in NSW. It provides the framework for the development of state and local planning instruments which, through their hierarchy, determine the statutory process for environmental impact assessment.

Protection of the Environment Operations Act 1997

The Protection of the Environment Operations Act 1997 (POEO Act) provides a framework for the licencing of certain activities and is administered by the EPA.

4 SITE ENVIRONMENTAL MANAGEMENT SYSTEMS

4.1 SAFETY HEALTH AND ENVIRONMENTAL VISION

Orica's SHEC Vision of: **"No Injuries Today"** symbolises Orica's commitment to eliminate all injuries, illnesses, motor vehicle incidents, environmental incidents, complaints and other adverse Safety, Health, Environment and Community Management System (SHECMS) incidents and acknowledges the belief that all such incidents are preventable. Orica's aim is to continually reduce the number of injuries and other adverse SHEC incidents. A copy of Orica's environment policy is provided in **Appendix A**.

The objective is zero incidents during all phases of site activity including the construction, pre commissioning, commissioning and start up phases of the works to be undertaken on site.

All activities undertaken at the site are required to comply with the requirements of Orica's SHEC Management System.

4.2 CONSTRUCTION ENVIRONMENTAL MANAGEMENT

Orica's approach to construction environment management is based on a risk based process whereby environmental hazards are identified and controls implemented to minimise the environmental risk of implementing a project. This is achieved through:

- ▶ Management ownership and responsibility for environmental performance which is active and visible at all levels;
- ▶ Clear environmental expectations and objectives for managers and employees of both Orica and contractors;
- ▶ Involvement of all site participants including Orica and contractors in the environmental management program;
- ▶ Site environmental standards which are not compromised by conflicts in schedule, cost or quality objectives; and
- ▶ Comprehensive construction environmental management procedures and instructions which:
 - o Comply with the Orica SHEC management system and regulatory requirements;
 - o Are communicated and understood by all personnel working on the site; and
 - o Include programs to help people identify hazards, anticipate the potential risk of incident, and to encourage personal action to minimise these risks, through the use of such processes as:
 - Hazards of Construction (HAZCON) and Constructability review(s);
 - Job Safety and Environment Risk Analysis (JSERA) Program;
 - Job Start;
 - Periodic Toolbox Talk Meetings;
 - Behavioural Safety Program;
 - Construction Risk Assessments; and
 - Incident Investigation Process.

4.3 SAFETY HEALTH AND ENVIRONMENT MANAGEMENT SYSTEM

4.3.1 General

The Orica SHEC Management System has been developed to manage the interaction between people and the work environment, to ensure sustained compliance with legislative requirements and the Orica Group SHEC Standards. The system also acts to manage interaction between the local community and the site as well as ensuring compliance with other Orica group operations and general industry environmental standards.

4.4 KEY CONSTRUCTION RELATED ENVIRONMENTAL MANAGEMENT DOCUMENTS

4.4.1 Environmental Management Strategy

An Environmental Management Strategy (EMS) has been prepared for the site, detailing Orica's, management systems and practices that shall be utilised to ensure Orica's environmental objectives are achieved during each stage of the project process (**Appendix B**).

The EMS also includes information on the management of community complaints, incident management, emergency management and stakeholder communication.

4.5 KEY CONSTRUCTION RELATED ENVIRONMENTAL MANAGEMENT TOOLS

The EMS outlines the key tools and procedures required for the site to feed into the management plans for individual projects including:

- ▶ **Inductions and Training** - all personnel working at the site shall undertake the KI general site induction. Training will be developed to address any identified environmental issues during the construction programme;
- ▶ **PPE Requirements** – An overview of PPE requirements for the site is detailed on the site's procedure located on the DMS (see KIW 0629)
- ▶ **Permit to Work System** - All field based activities associated with construction projects will only be undertaken after a Permit to Work is issued for the work activity (See DMS document KIW-2540);
- ▶ **Risk Assessment & JSERA** - a risk assessment in the form of a Job Safety and Environmental Risk Analysis (JSERA) must be completed before a Permit to Work can be issued;
- ▶ **Incident and Non-compliance Reporting and Investigation** - Orica has a model procedure which details the requirements for immediate action, investigation and reporting of incidents and non-compliances (MP-BG-06), which will be adapted for use during future site works. A summary of the response to an incident or non-conformance is detailed in **Appendix C**;
- ▶ **Behavioural SHEC Programme** - Most safety and environmental incidents have been shown to occur as a result of the unsafe actions or omissions of people. Behavioural SHEC programmes have been shown to reduce incidents by raising people's awareness of risk in the activities that they are undertaking and enabling them to take action to improve their safety. The components of the programme of relevance to the construction phase of the works undertaken on site include such things as: Housekeeping; Clearance Checks; Take 5/JSERA; UAP/Clear; Job Cycle Check; and Safety Equipment Check;
- ▶ **Communication Processes** – Will include Job Start meetings daily or as required, Tool Box Talks and Site and external communication; and
- ▶ **Emergency Response Plan** -All construction projects shall be incorporated into the site Emergency Response Plan (ERP) (KIW-1020), which details the management measures that will be implemented to manage any type of emergency onsite.

4.5.1 Project Management

All Orica personnel, contractors and sub-contractors are responsible for environmental performance associated with their works. The importance of complying with the requirements detailed in the site's CEMP should be discussed at regular intervals throughout any Project.

The following identifies the environmental responsibilities of key personnel for the projects.

4.5.2 Project Management Team

Each member in the Project Management Team will have assigned responsibilities for environmental management.

All contractors' team members, including sub-contractors, will acknowledge their SHEC responsibilities in writing by completing the Orica Contractors SHE Charter.

A summary of potential key personnel for projects is outlined below.

- ▶ Project Manager;
- ▶ Construction Supervisors;
- ▶ General Responsibilities - All employees; and
- ▶ Project Environmental Representative(s).

4.5.3 Roles, Responsibilities and Accountability

Project Manager

Responsible for ensuring that:

- ▶ Appropriate environmental requirements form part of any tendering and contract documentation and that all contractors understand and comply with these requirements;
- ▶ Orica SHEC Management System is implemented during all phases of projects including construction, commissioning and start up;
- ▶ Managing the development and implementation of environmental requirements detailed in the CEMP and its associated plans;
- ▶ Ensuring adequate resources are available to manage environmental issues;
- ▶ Reviewing environmental performance of construction activities against projects targets;
- ▶ Initiating reviews of any plan if monitoring identifies an opportunity for improvement;
- ▶ Ensuring the commissioning management and implementation teams understand and comply with the requirements of the CEMP; and
- ▶ Auditing contractor SHE plans.

Construction Supervisors

Construction Supervisors are accountable for the conduct of all work activities under their control, and for ensuring that all work is carried out in accordance with approved procedures and work practices.

They are also responsible for ensuring:

- ▶ Initiatives such as Job Safety Environment Risk Assessment's (JSERA's), Unsafe Act Prevention (UAP's) and Job Start Meetings are maintained;
- ▶ All work activities under their control are carried out in accordance with the CEMP requirements;
- ▶ Implementation of relevant mitigation measures detailed in the CEMP; and
- ▶ Advising the site's Environment Representative of any requirements to update the CEMP.

General Responsibilities - All employees

All personnel working on the site have a responsibility to consider the environment at all times. More specifically all personnel associated with any works undertaken on site are required to:

- ▶ Comply with relevant statutory requirements;
- ▶ Comply with the requirements of the Permit to Work and the associated JSERA;
- ▶ Comply with the relevant requirements of this plan;
- ▶ Comply with environmental requirements detailed in the General Site Induction and any other specific construction inductions;
- ▶ Report to their immediate supervisor any incident, injury, near miss or opportunity for improvement which arises in the course of, or in connection with, their work; and
- ▶ Ensure that the environmental and housekeeping standards are maintained.

Project Environmental Representative(s)

Generally responsible for ensuring:

- ▶ The CEMP is reviewed on a regular basis and updated as required;
- ▶ Assisting in the implementation of relevant mitigation measures detailed in the CEMP;
- ▶ Providing specialist advice in relation to issues associated with construction;
- ▶ Undertaking periodic reviews of compliance with the CEMP; and
- ▶ Ensuring construction personnel are aware of their obligations under the CEMP.

5 HOW TO USE THE CEMP

The CEMP should be used as a reference documented throughout each stage of Orica's project implementation process. When initiating a project, the requirements in the CEMP should be utilised to highlight potential environmental controls that should be incorporated into the final project design. During construction, environmental controls should be implemented to limit the environmental impact associated with construction activities. The CEMP should be reviewed at regular intervals throughout the project, particularly following a change to the project.

The flow chart below demonstrates how the CEMP should be incorporated into the site risk identification and implementation processes.

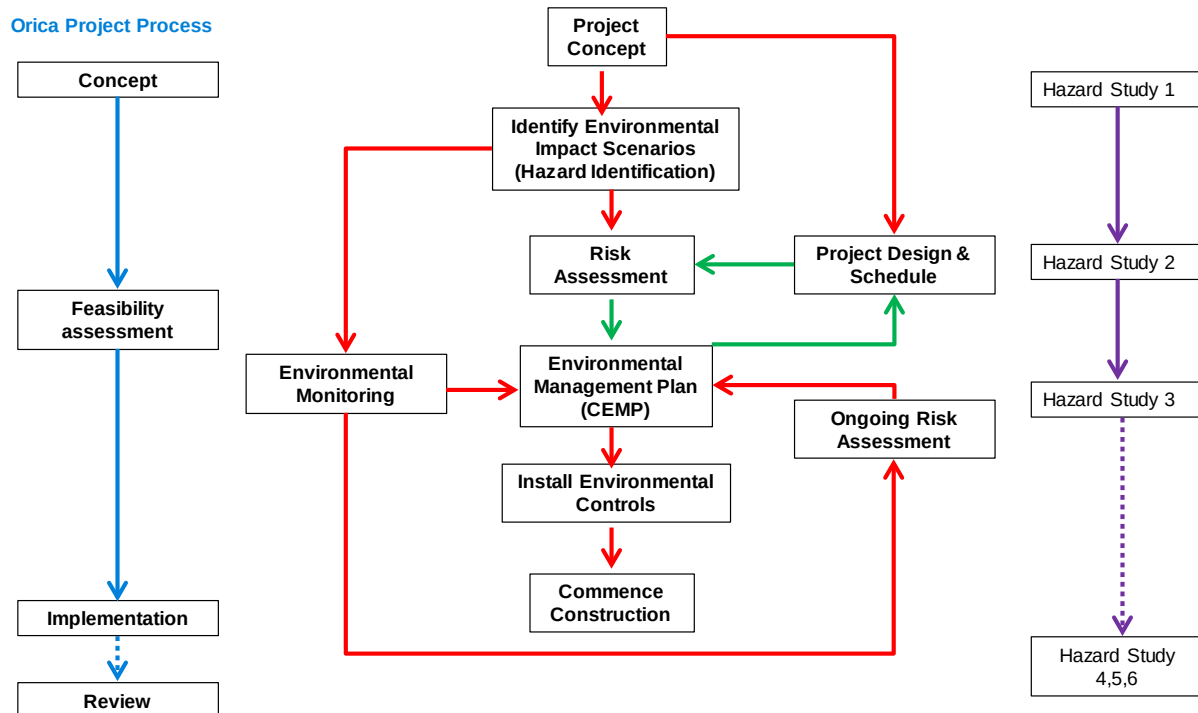


Figure 7 CEMP Flow Chart

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6 AIR

6.1 OBJECTIVES

Whilst undertaking construction activities there is a greater potential to generate airborne emissions including dust, odour and vehicle emissions that can impact on the local amenity of the site. When undertaking excavation, demolition, transportation and stockpiling, air quality mitigation controls should be implemented prior to undertaking the work.

The following objectives apply for all works on the KI site to manage and minimise potential air quality impacts:

- ▶ Minimise air emissions generated by construction activities and wind erosion;
- ▶ Prevent the generation of visible dust emissions from vehicles at the site;
- ▶ Minimise odour generation generated from construction and maintenance activities;
- ▶ Outline environmental control measures to minimise the impact on air quality; and
- ▶ Protect the air quality amenity of nearby sensitive receivers (including local residents);

6.2 RELEVANT LEGISLATION/REGULATORY REQUIREMENTS

The management of potential air quality impacts on Orica's KI site is to comply with the following legislation and regulations:

- ▶ **Protection of the Environment Operations Act 1997 (POEO)** and associated regulations, in particular the Protection of the Environment Operations (Clean Air) Regulation 2010;
- ▶ **Minister for Planning's Conditions of Approval.**

The Minister for Planning's Conditions of Approval (08_0129) requires that:

- **Condition 25:**

The Proponent shall carry out all reasonable and feasible measures to minimise dust generated by the Project.
- **Condition 26:**
 - During construction, the Proponent shall ensure that:
 - o All trucks entering or leaving the Project Site with loads have their loads covered.
 - o Trucks associated with the Project do not track dirt onto the public road network.
- ▶ **Environmental Protection Licence 828** – Works and activities must be carried out in accordance with the requirements contained in the licence. All activities relating to air quality management must be carried out in a competent manner.
 - **Dust:**
 - o The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.
 - o All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.
 - o Trucks entering and leaving the premises that are carrying loads of dust generating materials must have their loads covered at all times, except during loading and unloading.

- **Potentially offensive odour:**

- o L6.1 - No condition of the licence identifies a potentially offensive odour for the purposes of Section 129 of the Protection of the Environment Operations Act 1997.
- o L6.2 - the licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.

6.3 PROPOSED CONTROLS AND RESPONSIBILITIES

The following tables outline the recommended measures to manage air quality in regards to:

- ▶ Dust Management Control Measures - **Table 3**;
- ▶ Transport Emission Management Control Measures - **Table 4**; and
- ▶ Odour Management Control Measures - **Table 5**

6.3.1 Dust Management

When undertaking any works that could potentially create dust, the following mitigation controls shown in the table below should be considered.

Table 3 Dust Management Control Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
On-site Dust Suppression Measures - Where required, water shall be applied through the use of water carts, sprays, sprinkler systems or similar, to reduce dust from stockpiles, roads or work area. - The water spraying equipment shall be available at all times and regularly maintained to enable dust control when required. - Water use for dust suppression shall not create run-off that could enter surface water bodies or drains. - Where practicable, construction vehicle traffic will use existing sealed roads at all times. - Disturbed areas will be; - Minimised during construction at all times. - Sealed or revegetated as soon as practicable to minimise dust generation. - Excavation/fill works will only be undertaken during periods of low wind speed	Construction Supervisor	Construction
Stockpiles - Stockpile location/s will be planned to minimise the number of potentially affected areas and in accordance with the measures outlined in Section 9.0 for the management of contaminated land. - Stockpiles will be managed to minimise dust generation, including water spraying, covering or temporary seeding as necessary. - Stockpiles shall be appropriated shaped to minimise the potential for wind erosion. - The duration for which stockpiles are to be located on the site should be minimised. Stockpiles should be grasses or covered if duration of the stockpile is proposed to be greater than 20 days.	Construction Supervisor Project Manager	Construction
Contingencies in event of Dust Generation The site's weather station will be used to provide additional site information in association with weather forecasts to provide adequate warning of likely strong winds to assist with management of wind-blown dust and assist in the minimisation of dust generation. - In the event of excessive dust generation the following measures are to be implemented, including where appropriate: - Increased use of water sprays. - Reduction of speed on roads. - Halting of work in the area generating the dust until effective dust control measures can be applied	Construction Supervisor	Construction

6.3.2 Vehicle Management

When undertaking site works and construction activities, the following mitigation methods should be considered to reduce the impacts of vehicle emissions.

Table 4 Vehicle generated Emission Management Control Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
Where possible, construction vehicle traffic will use existing sealed roads or dust suppression measures will be implemented.	Construction Supervisor	Construction
Loads will be covered when transporting material off-site.	Contractor Supervisor	Construction
Where there is material build-up, trucks associated with the project will wash down tyres prior to leaving site.	Contractor Supervisor	Construction
Speed restrictions to be limited to 15km/h on site.	Construction Supervisor	Construction
Vehicles will be inspected prior to exiting the site to ensure they have been covered.	Security Personnel	Construction
Internal roads and exit points will be swept to control the accumulation of dust generating material	Environment Representative, Construction Supervisor	Construction
Excessively smoky vehicles will be removed from site.	Construction Supervisor	Construction
All construction vehicles and machinery will be operated and maintained in accordance with the manufacturers' guidelines in relation to exhaust emissions.	Construction Supervisor	Construction

6.3.3 Odour Management

Controlling odours is an important consideration for protecting the environment and our community amenity. When undertaking construction and maintenance activities involving odorous chemicals, the following mitigation methods should be considered

Table 5 Odour Management Control Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
Water sprays and other appropriate odour reducing surfactants will be utilised when undertaking activities that generate odour.	Environment Representative, Construction Supervisor	Construction
Monitor for odours more frequently in more sensitive weather conditions. Use odour and volatile suppressing agents to eliminate or reduce odours as required.	Construction Supervisor	Construction

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6.3.4 Check sheet to assess job compliance:

Project Consideration	Construction Consideration
What activities are likely to generate dust during construction?	Do I need a water truck? How am I going to monitor weather conditions? What contingencies are in place to prevent dust generation during high wind event? What level of training on dust reduction strategies are required for project personnel? How can I minimise the duration in activities that potentially generate dust are performed? Who else is working adjacent to my work area?
Is stockpiling of soil required for the project	How long is the stockpile required for? How can I minimise the use or duration that stockpiling is required? Do I need to cover the stockpile? Do I need to regularly apply water or grass it?
How are vehicles going to access the construction area?	How can I utilise existing site sealed roads? Do I need a wheel wash station? How can I prevent material being tracked onto neighbouring roads? How often do I need to inspect vehicles and roads?
Are any activities performed during the Project likely to generate odour?	Who else is operating in the area? Can I apply water sprays to minimise odour?

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7 WATER

7.1 OBJECTIVES

Whilst undertaking construction activities, there is a greater potential to impact the site's water quality. Water sources can be contaminated from accidental spills and poor construction management practices. Throughout construction, it is important that works maintain the environmental standard to minimise potential cross contamination of construction areas and receiving water bodies.

The following objectives apply to all works on the KI site to manage and minimise potential water quality impacts:

- ▶ Ensure compliance with the site's effluent discharge EPL requirements;
- ▶ Maintain stormwater quality being discharged from the site; and
- ▶ Ensure groundwater extraction regulatory obligations are achieved.

7.2 RELEVANT LEGISLATION/REGULATORY REQUIREMENTS

The management of potential water quality impacts on Orica's KI site is to comply with the following legislation and regulations.

- ▶ **Water Management Act 2000:** - In accordance with the Water Management Act 2000, works which occur within 40m of a river, lake or estuary (e.g. the Hunter River) require approval to ensure appropriate mitigation measures are in place to control impacts to surrounding watercourses. Prior to any works occurring approval would be gained from the NSW Department of Primary Industries Office of Water for works to be completed within the vicinity of Hunter River (south arm) and for groundwater extraction for dewatering purposes if it was found that dewatering was required for the project;
- ▶ **NSW Protection of the Environment Operations Act 1997 (POEO).**(see section 2.4.2)
- ▶ **Minister for Planning's Conditions of Approval** - The Minister for Planning's Conditions of Approval (08_0129) requires that the Project meet the following requirements in relation to construction water quality:
- ▶ **Environmental protection Licence 828** – Works and activities must be carried out in accordance with the proposal contained in the licence. All activities relating to water quality management must be carried out in a competent manner. Of relevance to construction activities are:
 - o Effluent concentration limits and monitoring requirements;
 - o Stormwater monitoring requirements;
 - o Consideration of the management of sewerage volumes from the project to comply with transpiration area volume requirements; and
 - o Requirement to comply with section 120 of the POEO Act.

7.3 PROPOSED CONTROLS AND RESPONSIBILITIES

The following tables outline the recommended measures to manage water quality in regards to:

- ▶ Dewatering Management - **Table 6**;
- ▶ Surface water/erosion and sediment management control measures - **Table 7** and **Table 8**;
- ▶ Site Effluent Control Measures - **Table 9**; and
- ▶ Construction Sewerage - **Table 10**.

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7.3.1 Dewatering

The following objectives apply to all dewatering works on the KI site to manage and minimise potential water quality impacts:

Table 6 Dewatering Management Control Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
All extracted groundwater is required to be laboratory tested and disposed of appropriately depending on groundwater quality, in accordance with the Groundwater Monitoring Plan (Appendix J).	Construction Supervisor	Construction
Groundwater Management / Excavation Pump-Out	Project Manager	Construction
▶ Where necessary a licence from the NSW Office of Water, under Part 5 of the Water Management Act 2000, shall be obtained for work involving groundwater extraction. ▶ All excavation pump-out water shall be analysed periodically during the pump-out. Analytes should include suspended solids, pH, ammonium (NH4+), nitrates (NO3-), phosphate and heavy metals including but not limited to arsenic, chromium and zinc, ▶ A dewatering plan will be developed based on the results of the pre-construction testing. The plan will be developed for each excavation requiring dewatering to identify the approach to be implemented to manage the groundwater. ▶ Options for extracted water disposal include; - Discharge to the site effluent system if the water quality meets the requirements of the EPL and any associated regulatory requirements, - Offsite disposal by a licensed liquid waste transporter for treatment/disposal at an appropriate waste treatment / processing facility. ▶ Extracted water disposal method requires approval from site environmental representative prior to commencement of dewatering	Construction Supervisor	
	Environmental Representative	Pre-construction



Figure 8 *Excavation with installed dewatering system*

7.3.2 Stormwater Management

The following control measures will be designed to minimise the impact associated with construction activities on the quality of stormwater discharged from the site.

Table 7 Stormwater Management Control Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
Installation, inspection and maintenance of stormwater infrastructure: ▶ The location of existing stormwater drains located in the facility of project work areas should be identified prior to undertaking any construction works. ▶ Stormwater drains should be clear of debris and sediment prior to commencing construction activities. If construction activities are being undertaken in close proximity to stormwater drains, erosion and sediment controls should be installed prior to commencing the work (See Section 7.3.3) ▶ Stormwater quality from a construction area should be monitored during discharge	Project Manager Project Environment Representative	Pre-Construction
Contaminated Stormwater Management In the event of identification of contaminants in stormwater discharge during the works the site's stormwater isolation valves will be closed to prevent the stormwater from discharging to the river. All work is to cease and an investigation undertaken to identify the material and any actions required to address the issue.	Construction Supervisor Environmental Representative	Construction



Figure 9 Stormwater management and pollution

7.3.3 Surface water /erosion and sediment control

Land disturbance associated with the construction, installation or maintenance of buildings, roads, sewerage or other infrastructure creates the potential for increased levels of soil erosion and consequent sediment pollution of waterways. Reducing these impacts requires awareness and a coordinated effort on all site personnel to mitigate these issues. The following section outlines the control measures to prevent soil erosion and to manage sediment successfully.

Table 8 Surface water/erosion and sediment management control measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
A sediment and erosion control plan shall be prepared for each stage of the Project where stockpiling of soil or land disturbance is undertaken detailing the sediment and erosion control measures. The requirements shall be documented in a project specific Erosion and Sediment Control Plan.	Project Manager Project Environment Representative	Pre-Construction
Land Disturbance: The soil erosion and sedimentation hazard on the site shall be managed so as to keep as low as possible and practical. To this end, works shall be undertaken in the following general sequence: - Construction of sediment and erosion controls; - Phase construction works so that land disturbance is confined to areas of workable size; and - Rehabilitation of any disturbed lands within 20 working days from completion of construction activities.	Project Environment Rep Construction Supervisor	Construction
Disturbed Land Sediment Control: - Clean water flow shall be diverted around land disturbance works using sandbags, earth bunds or other methods, to prevent contamination by sediments; - Where required, sediment loss from disturbed land shall be minimised by installing sediment fences, or other similar control measures, on their downstream side; - Where required, measures shall be installed around kerb inlet pits to minimise the potential for discharge of sediment into the drainage system. Measures to be implemented could include the use of sandbags or netting/gravel sausage sand bags; and - Temporary sediment and erosion control structures shall be removed only after the disturbed lands they are protecting are rehabilitated and stable against erosion.	Project Environment Rep Contractor Supervisor	Construction
Erosion Control: - Temporary protection from wind and water erosion shall be undertaken on stockpiles and disturbed land where work is unlikely to proceed for periods of at least two months and final shaping has not been completed; and - Traffic shall be kept away from any rehabilitated areas.	Project Environment Rep Construction Supervisor	Construction
Internal roads and exit points will be swept to control the accumulation of dust generating material	Environment Representative, Construction Supervisor	Construction

Vehicles will be inspected prior to exiting the site to ensure they have been covered.	Security Personnel	Construction
Internal roads and exit points will be swept to control the accumulation of dust generating material	Environment Representative, Construction Supervisor	Construction

7.3.4 Site Effluent Management

The following controls outlines below relate to site effluent management.

Table 9 Site Effluent Management Control Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
No wash-down, construction process water or equipment decontamination liquor will be discharged into the site's effluent system without the approval of a site environmental representative.	Environment Representative Construction Supervisor	Construction
Excavation pump-out water is only permitted to be discharged to the site's effluent system if the water quality meets the requirements of the EPL. Approval from site environment representative and operations personnel is required prior to undertaking the task.	Environment Representative Construction Supervisor	Construction

7.3.5 Management of Amenity System Waste

Waste generated from construction amenity systems must be managed to ensure that the volume of sewerage does not exceed the site transpiration system capacity or is disposed of offsite in accordance with regulatory requirements. The following section outlines the control measures to manage this material successfully.

Table 10 *Amenity system waste management control measures*

Environmental Management Control/Mitigation Measures	Responsibility	Timing
Where construction personnel are to use existing site amenities the site environment representative is to be advised of the number of people to assess whether the arrangements will affect compliance with the EPL transpiration area volume limit	Project Manager Project Environment Representative	Pre-Construction
Where temporary amenities are provided the waste from these will be transported from site using a licenced waste transport company and disposed of at appropriately licenced facilities.	Project Manager Project Environment Representative	Pre-Construction Construction

7.3.6 Check sheet to audit job compliance

Pre-Construction	Pre-Construction
Does the project require dewatering? Does the project need to apply for a dewatering licence from NSW Office of Water?	How long is dewatering required? Can the schedule be compressed to minimise the duration of dewatering? Can infrastructure be pre-manufactured?
Is the groundwater located within a known groundwater contaminated area?	Is there historical groundwater quality data available for the project area? Can testing be undertaken prior to commencing the work to confirm groundwater quality?
What is the extracted groundwater disposal strategy?	Does the groundwater quality allow for disposal via the site's effluent system? Does groundwater require disposal offsite?
Is the project going to disturb soil? Do I need to reinstate the area when the project is completed?	How long will the area be exposed? Can the length of time that soil is exposed be reduced? Where are the nearest stormwater drains and pits? Have sediment and erosion controls been installed? What is the quality of runoff water likely to be from the project site? Are stormwater drains clear of debris at the commencement of the project? Will the runoff flow through contaminated soil or material and are particular control measures required?
Is the project going to generate and process water requiring disposal?	Can I discharge waste water into site effluent? Do I need to arrange for the waste water to be disposed offsite?
Are vehicles driving on unsealed areas	Is material likely to be tracked onto roads? What vehicle decontamination controls need to be installed?
Is the project going to generate significant sewerage as a result of construction?	Can the site sewerage system manage the additional volume? Does the waste require offsite disposal?

8 NOISE

8.1 OBJECTIVES

Whilst undertaking construction activities it is important that they do not cause any potential noise impacts on nearby work areas or within the community. Workers need to make all reasonable efforts to minimise noise such as limiting construction works to the appropriate construction hours and by promoting good work practices.

The following objectives apply for all works on the KI site to manage and minimise potential noise impacts:

- ▶ Outline measures to minimise the impact of noise and vibration associated with construction activities;
- ▶ Highlight measures to protect the acoustic amenity of nearby sensitive noise receivers (including local residents);
- ▶ Allow the works to be planned, carried out and maintained to minimise noise impacts on the surrounding area; and
- ▶ Prevent excessive noise generated by truck and vehicle movements.

8.2 RELEVANT LEGISLATION/REGULATORY REQUIREMENTS

The management of potential noise quality impacts on Orica's KI site is to comply with the following legislation and regulations.

- ▶ **NSW Protection of the Environment Operations (POEO) Act 1997 and regulations.** – Noise pollution is regulated through the POEO act;
- ▶ **Industrial Noise Policy (INP) 2000.** - The policy is specifically aimed at assessing noise from industrial noise sources scheduled under the new Protection of the Environment Operations Act 1997;
- ▶ **NSW Interim Construction Noise Guideline 2009** – The Objectives are to promote a clear understanding of ways to identify and minimise noise from construction works. Focus on applying all feasible and reasonable work practices to minimise noise from construction noise impacts. Encourage construction to be undertaken only during the recommended standard hours unless approval is given for works that cannot be undertaken during these hours. Streamline the assessment and approval stages and reduce time spent dealing with complaints at the project implementation stage and to provide flexibility in selecting site-specific feasible and reasonable work practices in order to minimise noise impacts;
- ▶ **NSW DECCW Assessing Vibration: A Technical Guideline, 2006**

8.3 CONSTRUCTION TIMES

Project personnel are restricted to operate within the days and times shown below in **Table 11**. As this CEMP is not project specific, **Table 11** should be used as a framework for all future site works.

Table 11 Construction and Operation Times

Activity	Day	Time
Construction	Monday-Friday	7:00am to 6:00pm
	Saturday	8:00am to 1:00pm
	Sunday and Public Holidays	Nil
Operation	All days	24 hours

(Source: Project Approval, Orica Ammonium Nitrate Expansion Project. NSW Government Department of Planning 2014)

Construction works outside of the work hours identified in the table above may be undertaken in the following circumstances (taken from the Project Approval Development Consent).

- Works (excluding piling) generating airborne noise that is inaudible at any residence beyond the accordance with the Interim Construction Noise Guideline;
- Works that are consistent with the Proponent's existing maintenance procedures and are in accordance with the existing EPL;
- For the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons;
- Where it is required in an emergency to avoid the loss of life, property and/or to prevent environmental harm; or,
- Exceptional circumstances with the written agreement of the Secretary.

8.4 PROPOSED CONTROLS AND RESPONSIBILITIES

The following tables outline the recommended measures in regards to:

- ▶ Construction Noise Management Control Measures - **Table 12**; and
- ▶ Construction House Management Control Measures - **Table 13**

8.4.1 Construction Noise Requirements

The following requirements need to be considered in order to prevent excess and unnecessary noise which could potentially affect the surrounding communities. Although some noise may be unavoidable, the following control measures will assist in reducing any noise related impacts and issues.

Table 12 Construction Noise Management Control Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
All construction vehicles and machinery fitted with manufacturer supplied noise suppression devices will be operated and maintained in accordance with the manufacturers' guidelines.	Construction Supervisor	Construction
Details of the community liaison phone number and permanent site contact will be displayed and listed so that noise and/or vibration related complaints, if any, can be received and addressed in a timely manner.	Construction Supervisor	Construction
Work methods will be reviewed with a preference for quieter and non-vibration generating methods, particularly when planning any for any out-of-hours and night-time activities.	Construction Supervisor	Construction
When selecting plant and equipment low noise rated equipment will be investigated for use where practicable.	Construction Supervisor	Construction
Restrict levels of reversing alarms and audible warning devices.	Construction Supervisor	Construction
Orica's complaint management procedure will be used in the event of a noise and/or vibration complaint. The complaint will be recorded, investigated and where required corrective actions implemented.	Project Manager	Pre-Construction
Where possible, no plant or equipment will be left idling.	Construction Supervisor	Construction
Should evidence of excessive noise be identified then targeted monitoring may be recommended to identify the source/s of the offensive noise and the management measures would be reviewed to include any additional noise mitigation measures required.	Environment Representative, Construction Supervisor	Construction
Where required or requested, noise monitoring will be undertaken upon receipt of a noise complaint. The results of any monitoring will be recorded.	Project Environment Representative Orica Construction Supervisor	Construction

Any noise related complaints will be reviewed to confirm the effectiveness of any recommended corrective actions resulting from the investigation	Project Environment Representative	Construction
	Orica Construction Supervisor	

8.4.2 Construction hours

Although some construction activities are inherently noisy, the impact can be minimised by good work practices. An option is to minimise noisy activities undertaken outside of nominated construction hours.

Table 13 Construction Hours Management Control Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
Where practicable, all typically noisy construction activities will be kept within the daytime working hours (Monday to midday Saturday).	Construction Supervisor	Construction
Where work outside approved construction hours, which could be audible at any residence, is undertaken a noise assessment will be completed and a plan developed to manage the works, including notification of potentially affected residents and monitoring where required.	Project Manager	Construction
	Project Environment Representative	
	Construction Supervisor	
Work methods will be reviewed with a preference for quieter and non-vibration generating methods, particularly when planning for any out-of-hours or night-time activities.	Environment Representative,	Construction
	Construction Supervisor	

8.4 CHECK SHEET TO AUDIT JOB COMPLIANCE

Project Consideration	Construction Consideration
Will the project generate noise during construction?	Can I use alternative construction machinery to limit noise generation? Have noise requirements been broadly communicated to the project team? Who else is operating in the vicinity of the construction area that may be affected by elevated noise generation?
Does construction work need to be undertaken outside the permitted construction work hours?	Will noise generated at the community interface be audible? What noise monitoring needs to be undertaken to confirm compliance with noise restrictions? What contingencies are in place if a noise complaint is received?



Figure 10 Noise generating equipment

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9 LAND

9.1 OBJECTIVES

Whilst undertaking construction activities it is important that impact on the receiving environment is minimised. This includes ensuring that the appropriate erosion and sediment controls are implemented and that any contaminated soils are managed.

The following objectives apply for all works on the KI site to manage and minimise potential land quality impacts:

- ▶ Minimise the volume of soil required to be disturbed;
- ▶ Minimise the duration for which soil is disturbed;
- ▶ Ensure that there are adequate controls in place to prevent soil losses due to runoff and dust; and
- ▶ Avoid cross contamination of soils and other wastes.

9.2 RELEVANT LEGISLATION/REGULATORY REQUIREMENTS

The management of potential land quality impacts on Orica's KI site is to comply with the following legislation and regulations.

- ▶ **Contaminated Land Management Act 1997** - The Contaminated Lands Management Act 1997 establishes an investigation and remediation (if appropriate process where contamination presents a significant risk of harm to human health or the environment;
- ▶ **Protection of the Environment Operations Act 1997 (POEO Act).**
- ▶ **Environment Protection Licence 828** – Works and activities must be carried out in accordance with the proposal contained in this licence. All activities relating to land quality management must be carried out in a competent manner.

9.3 PROPOSED CONTROLS AND RESPONSIBILITIES

The following tables outline the recommended measures in regards to:

- ▶ Soil Management - **Table 14**;



Figure 11 Soil stockpile

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9.3.1 Soil Disposal (onsite reuse and offsite disposal)

The following soil disposal control measures will need to be considered and implemented on all site works

Table 14 Soil Disposal Management Controls/Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
Preliminary Soil and Groundwater Contamination Assessment Where possible, a preliminary investigation shall be undertaken prior to the commencement of construction excavation activities to identify whether soil or groundwater contamination is likely to be encountered. This shall include the sampling of soil and/or groundwater in the area to be excavated, analysis of the samples and comparison of the results with National Environment Protection Council's investigation levels detailed in Schedule B(1) Guideline on the Investigation Levels for Soil and Groundwater National Environment Protection (NEPC, 1999a).	Project Manager Environmental Representative	Pre-Construction
Management of Waste Soil - Excavated material is tested and classified to determine its suitability for reuse onsite. All material not suitable for reuse onsite must be disposed of to a licensed facility offsite. Wherever practicable materials would be reused onsite. - Soil and/or rock material proposed to be re-used on site in areas where it was not originally excavated from are to be tested to determine whether it is suitable for the proposed land use. The potential contaminants of concern are to be determined following a review of land use activities in the area. - Where soil wastes are to be removed from site, they shall be classified for waste disposal purposes in accordance with the NSW EPA Waste Classification Guidelines, 2014 (NSW EPA, 2014), and disposed in accordance with the requirements of the Protection of the Environment Operations (Waste) Regulation 2014.	Environmental Representative Environmental Representative Environmental Representative	Construction
Stockpile Management - All stockpiles of soil or other materials shall be placed away from drainage lines, gutters or stormwater pits or inlets. - Where required, controls shall be implemented to minimise the potential for erosion or sedimentation of the stockpiles, including covering of stockpiles or use of sediment fences - Stockpiles of any contaminated soils shall be placed on a sealed area or similar impermeable material (e.g. plastic) with appropriate controls as above implemented to minimise the potential for erosion or sedimentation.	Environmental Representative Contractor Supervisor	Construction
Contaminated Soil Management - In the event of identification of previously unidentified types of contaminants or waste materials during the works all work is to cease and an investigation undertaken to identify the material and any actions required to address the issue. - All work is to cease and the Project Manager, Construction Supervisor and Project Environment Representative would all be notified.	Environmental Representative Construction Supervisor	Construction

▶ In the event that potentially contaminated soil is identified a management plan will be developed to ensure that the material is managed in accordance with regulatory requirements. ▶ The management plan should consider the following control measures; – The construction area (excavation and stockpile zones) to be secured and appropriately defined and controlled to manage access to the work area or stockpiles. – Access arrangements to the work area shall be identified and shall include a specific induction/ equivalent briefing, on any specific access requirements. – A review of erosion and sediment control measures, as identified in the Erosion and Sediment Control Plan prior to the commencement of excavations in the given area. – Measures to ensure that all excavation works are carried out in a manner that minimises the mixing of different material types, i.e. contaminated fill and “clean” underlying natural soils. – Potentially contaminated material shall be segregated and stockpiled separately. – Removal of any in-ground or underground structures should be undertaken in conjunction with, or following excavation of contaminated soil, to avoid potentially mixing contaminated and uncontaminated materials. In addition removal of these structures may reveal additional areas of contamination requiring remediation. – Upon completion of the excavation the plant and equipment shall be cleaned and decontaminated – All stockpiles shall be sampled and analysed for potential contaminants of concern which may include nitrate/nitrite, ammonia, total petroleum hydrocarbons (TPH), heavy metals (As, Cd, Cr, Cu Ni, Pb, Zn),. Sampling and analysis shall be undertaken in accordance with the EPA Sampling Design Guidelines (EPA 1995) and NEPM 1999. Sampling will generally be at a rate of one sample per 25 m³, or a minimum of 3 samples per “batch” of material.		
Importation of Fill ▶ All fill material required to be imported on to the site shall be assessed, classified and managed in accordance with the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (<i>NSW EPA 2014</i>) for virgin excavated natural material. ▶ Imported fill should be accompanied by documentation from the supplier which certifies that the material is not contaminated based upon analyses of the material or the known past history of the site where the material is obtained. ▶ The Sampling and analysis of fill material should be in accordance with the EPA <i>Sampling Design Guidelines</i> (1995) to ensure that the material is not contaminated, with samples analysed for chemicals of concern based on the previous site usage / site history of the source site.	Environmental Representative Contractor Supervisor	Construction
Hazardous Materials Hazardous wastes arising from the construction works shall be removed and disposed of in accordance with the regulatory requirements	Construction Supervisor Environmental Representative	Construction Pre-Construction

Potential Acid Sulfate Soil (PASS) acid water treatment and management

- ▶ Prior to construction a soil sampling program will be employed to assist in characterising the potential extent and severity of ASS at the Site in accordance with the ASSMAC guidelines (1998).
- ▶ A management plan, including a contingency plan shall be developed if the preliminary investigation or assessment during excavation identifies the presence of PASS that acid sulphate soils are potentially present in the work area. The requirements for the plan are detailed in Section 6.1 and 6.2 of the Site Soil Management Plan. (**Appendix I**), including:
 - Securing site access to only approved persons
 - Personnel working in the designated area have been properly inducted regarding PASS and its management
 - Keep accurate records of inducted personal and personal accessing the site
- ▶ Details of proposed acid soil and water treatments and proposed lime dosing rates to neutralise acids and stockpiles methods including:
 - Placing the stockpile on an impervious surface.
 - Establishing diversion banks upslope to prevent run-off water.
 - Stockpile liming areas should be appropriately bunded with non-acidic soils to prevent the migration of leachate and stormwater runoff.
 - Establishing catch drains down slope to capture any runoff water.
 - Establishing basin or enclosed storage tank to ensure all potentially contaminated water is contained.
 - Pumping water that has accumulated at the bottom of excavations to an adjacent basin or enclosed storage tanks and treating with hydrated lime (or equivalent) prior to release back to the water table.
 - The pH, EC and turbidity of all runoff and leachate water collected from the stockpiles and excavation areas shall be monitored. Water will be treated, where required, to achieve acceptable water quality before being released.
 - If the quality of water collected from excavations or dewatering spears is within the required water quality parameters set for discharge, this water can be released without the need for treatment or storage.
- ▶ A monitoring program would be put in place in accordance with Section 6.2.4 of **Appendix I** for the monitoring of PASS and water or leachate generated from PASS.
- ▶ Measures for the appropriate handling and management of lime in accordance with Safety Data Sheet and product requirements.
- ▶ A contingency plan shall be prepared that includes remedial actions to be implemented in the event that monitoring indicates management measures are not meeting performance requirements and includes measures for restoration of areas if soil or waters become impacted by acid.

Construction supervisor

Construction

Environmental
Representative

Pre-Construction

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9.4 PROJECT CONSIDERATIONS AND AUDITING REQUIREMENTS

Project Considerations for Land

Project Consideration	Construction Consideration
Does soil need to be disturbed/excavated?	1. Can the soil quantity be reduced through an alternative design?
Is the soil contaminated?	1. Has soil been tested previously in the area? 2. Can soil sampling be undertaken prior to excavation? 3. How many soil samples are required to be taken? 4. What do I need to test for?
What is the end use of excavated soil?	1. Is the soil to be reused onsite? 2. Is the soil able to be disposed offsite? 3. If disposed offsite where and are they approved to accept the soil
Is the soil required to be stockpiled onsite?	1. What controls are required to prevent stockpile losses eg dust and stormwater runoff 2. Does the stockpile required to be isolated from other stockpiles? 3. How long is the stockpile material required onsite? 4. Can soil be directly transferred to a truck?
What is the excavation period?	1. Can soil be directly transferred to a truck? 2. What is the impact on surrounding work areas? 3. Are there any stormwater drains or pits located in the area? 4. Can the excavation period be shortened?
What chemicals is the project likely to handle	1. Do I need to organise temporary bunding 2. Are the chemicals approved to enter the site 3. Do I have a current MSDS for the Chemical
Do I need to decontaminate equipment or vessels?	1. Where am I going to undertake the decontamination process? 2. How is waste water going to be managed



Figure 12 Sediment and erosion control in place

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10 WASTE

10.1 OBJECTIVES

Whilst undertaking construction activities it is important that impact on the receiving environment is minimised through the appropriate management of waste, including chemical waste which needs to be handled separately to general waste and stored correctly.

The following objectives apply for all works on the KI site to manage and minimise potential impacts as a result of waste generation and management:

- ▶ Minimise waste creation;
- ▶ Minimise waste related impacts during construction activities;
- ▶ Recycling of solid and liquid waste materials where possible;
- ▶ Classification of all non-recyclable wastes; and
- ▶ Monitor of recycling and waste disposal systems to assess the overall effectiveness of the plan;

10.2 RELEVANT LEGISLATION/REGULATORY REQUIREMENTS

The management of potential waste management impacts on Orica's KI site is to comply with the following legislation and regulations.

- ▶ **Protection of the Environment Operations Act 1997 (POEO Act).**
- ▶ **Protection of the Environment Operations (Waste) Regulation 2014** - Provides for contributions to be paid by occupiers of scheduled waste facilities for each tonne of waste received at the facility or generated in a particular area; exempts certain occupiers or types of waste from these contributions; and allows deductions to be claimed in relation to certain types of waste;
- ▶ **Waste Avoidance and Resource Recovery Act 2001 (WARR Act)** – Objectives of this act are to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development. To ensure that resource management options are considered by avoiding unnecessary resource consumption, promoting resource recovery and using disposal methods correctly;
- ▶ **NSW EPA Waste Classification Guidelines 2014;**
- ▶ **Environment Protection Licence 828** – Works and activities must be carried out in accordance with the proposal contained in this licence. All activities relating to waste management must be carried out in a competent manner.
 - **Waste Management:**
 - o The licensee must ensure that any liquid and/or non liquid waste generated and/or stored at the premises is assessed and classified in accordance with the EPA's Waste Classification Guidelines as in force from time to time.
 - o The licensee must ensure that waste identified for recycling is stored separately from other waste.
 - o The licensee must ensure that the level of sewage within the AN Despatch Collection Tank is maintained at a level to prevent overflow; and, pumped out by a licensed waste transporter.
 - o L5.1 the licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.

- o L5.2 this condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require an environment protection licence.
- ▶ **NSW Work Health and Safety Act 2011 and associated regulation** – Includes requirements for the management of asbestos, lead based paint and demolition activities.

10.3 PROPOSED CONTROLS AND RESPONSIBILITIES

The following tables outline the recommended measures in regards to:

- ▶ Waste Management Control Measures - **Table 15**; and
- ▶ Chemical Management Control Measures - **Table 16**.

10.3.1 Waste management

All site works need to implement a waste management plan that includes the details of each type of waste that will be generated and the management action proposed for each type of waste. There also need to be the relevant transportation regulatory requirements that ensure the waste is transported to a facility that is able to lawfully accept it. Although different projects will create different waste types, the following control measures will still need to be considered.

Table 15 Waste Management Controls/Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
Recyclable and waste materials: - Recycling of solid and liquid waste materials should be undertaken where possible; - Classification of all non-recyclable wastes in accordance with EPA Waste Classification Guidelines and disposed of to an approved waste disposal facilities by licensed contractors; - Monitoring of recycling and waste disposal systems to assess the overall effectiveness of the plan should be undertaken during the project activities; - Demolition waste materials are to be recycled and/or reused on site, or transported to an approved recycling or waste management facility, as appropriate; - Construction materials would be sourced and ordered in appropriate quantities to avoid the creation of excess waste; - Suitable waste bins/receptacles would be provided throughout the work site to capture all waste/recycling streams; and - Waste would be transported from the site when storage facilities are filled. The waste storage area would be kept tidy and well maintained.	Site Project Manager. Project Environment Representative. Construction Supervisor.	Construction
Waste Disposal Disposal of materials shall be undertaken by licensed contractors and materials taken to an approved waste disposal / recycling facilities.	Project Environment Representative	Construction
Waste Transport - Wastes shall only be removed for off-site treatment or disposal after the material has been classified. Written approval shall be required from the receiving facility for the disposal of any contaminated soil at the nominated treatment or disposal site and is to be provided by the site waste contractor. - Waste tracking shall be undertaken in accordance with NSW EPA requirements (under the requirements of the POEO Act 1997), i.e. where any waste is transported offsite, a copy of the waste depot's weight-bridge docket (and corresponding EPA docket - if relevant) for each load delivered shall be retained by the Site Waste Coordinator.	Project Environment Representative Orica Construction Supervisor Construction Supervisor	Construction

- ▶ Where any contaminated material is transported offsite test records and precise quantities must be kept together with all other waste transport tracking records.
- ▶ Any vehicles used to transport contaminated materials from the site must be operated by a waste transporter who is licensed in accordance with NSW EPA licensing requirements for the class of waste transported.
- ▶ Where necessary drivers transporting contaminated materials from the site shall be given a safety instruction brief, detailing the procedures to be followed should spillage of loads or other incidents occur.



Figure 13 Correct waste segregation and storage

10.3.2 Temporary bunding of chemicals

The risk of chemical spills also needs to be minimised through the management of storage locations. Some control measures regarding the storage and handling of chemicals are outlined below.

Table 16 Chemical Management Controls/Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
SDS's for all chemicals utilised on the relevant construction stages of the project shall be reviewed and approved prior to being brought onsite in accordance with the site procedure for chemical assessment. A copy of the SDS will be retained in the project SDS Register	Construction Supervisor	Pre-commencement of work
Approved chemicals will be stored within a labelled bunded area in accordance with the requirements of the Storing and Handling Liquids: Environment Protection Participant's Manual (DECC, 2007), the product's Safety Data Sheet and any relevant OH&S requirements	Project Manager Construction Supervisor	Pre-commencement of work
Each project should have access to an appropriately sized spill kit for emergency spills of fuel, oil and other chemicals. The location of spill kits should be communicated to the construction team.		
All personnel are to be trained in procedures for the management of fuel and chemical spills and the location of spill kits		
The Project should audit spill kits located in their work area prior to undertaking work.		
Lead Paint Management ▶ All items of plant or machinery likely to contain lead based paint will be tested. ▶ If found to contain lead any paint removal works will be carried out on a sealed surface with protection for nearby drains in accordance with AS 4361.1- 1995 Guide to Lead Paint Management. ▶ All material captured will be disposed of in accordance with the waste classification guidelines	Project Environment Representative Construction Supervisor	Pre-construction Construction
Demolition and Equipment Decontamination Management ▶ Decontamination is required when process equipment (e.g. Process Vessels, pumps, pipes) is removed from process areas for modification, storage, transport, sale or disposal. ▶ These items should be identified prior to works commencing ▶ Prior to removal from a plant, each item of equipment must be assessed for potential contamination. The site decontamination procedure is to be used for all assessments and management of equipment requiring decontamination.	Project Manager Environmental Representative Construction Supervisor	Pre-Construction Construction

- ▶ The decontamination process is to consider:
 - Disposal of waste generated during the decontamination process. For example wash water collected in temporary bunds during water blasting.
 - Location where the decontamination is to be undertaken and its suitability in preventing land or water contamination. Approval from relevant operations personnel is required prior to use of the area for decontamination activities.



Figure 14 Temporary chemical bunding

10.4 PROJECT CONSIDERATIONS AND AUDITING REQUIREMENTS

Project Considerations for Waste

Project Consideration	Construction Consideration
What chemicals is the project likely to handle	Do I need to organise temporary bunding? Are the chemicals approved to be used in the proposed area on site? Do I have a current SDS for the chemical?
Do I need to decontaminate equipment or vessels?	Where am I going to undertake the decontamination process? How is waste water going to be managed

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11 GENERAL

11.1 OBJECTIVE

Detailed in the site's numerous approvals and licences are several general requirements that need to be satisfied. These relate to the following areas:

- ▶ Heritage Management;
- ▶ Site Security;
- ▶ Aviation Management;
- ▶ Transport Management Lighting Management; and
- ▶ Weeds and vegetation management.

The following objectives apply:

- ▶ Outline measures to ensure appropriate management of any items of heritage significance identified during construction activities (Heritage Management Plan);
- ▶ Prevent entrance of unauthorised people to site during construction activities (Site Security Plan);
- ▶ Detail the procedures to gain approval to erect a crane or other tall structure within the vicinity of Newcastle Airport in order to protect aviation activities, both civilian and military, at this aerodrome. (Aviation);
- ▶ Ensure that road users are not inconvenienced and the road network is kept at a satisfactory level of performance; and
- ▶ Ensure access to adjacent premises is maintained.

11.2 RELEVANT LEGISLATION/REGULATORY REQUIREMENTS

The management of potential heritage, aviation and safety quality impacts on Orica's KI site is to comply with the following legislation and regulations.

- ▶ **The National Parks and Wildlife Act 1974** – The objectives of this act are the conservation of nature (habitats, landforms, ecosystems, and biological diversity), the conservation of objects, places or features of cultural value within the landscape and providing for the management of land reserved under this Act in accordance with the management principles applicable for each type of reservation;
- ▶ **Aboriginal and Torres Strait Islander Heritage Protection Act 1984** – the Objectives of this act include the preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters, being areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition;
- ▶ **Heritage Act 1977** - To conserve the State's environmental heritage. It provides for the identification and registration of items of State heritage significance, provides for the interim protection of items of State heritage significance, constitutes the Heritage Council of New South Wales and confers on it functions relating to the State's heritage;
- ▶ **Roads Act 1993:** In accordance with the *Roads Act 1993*, works which may impact a road, including carrying out work in, on, or over a road or disturbing the surface of a road can only be undertaken with the consent of the applicable roads authority;
 - o Prior to any works which may disturb a road the appropriate authority shall be contacted and any necessary approvals sought;

- ▶ ***Procedures for use in the preparation of a Traffic Management Plan (RTA, 2001);***
- ▶ ***Noxious Weeds Act 1993;***
- ▶ ***The Australian Weeds Strategy;***
- ▶ ***RTA Travel Restrictions Vehicle Use;*** and
- ▶ **Minister for Planning's Conditions of Approval**
 - o Condition 45 – Visual impacts; and
 - o Condition 46 – Lighting.

11.2.1 Proposed Controls and responsibilities

The following tables outline the recommended measures in regards to:

- ▶ Heritage Management Control Measures - **Table 17**;
- ▶ Site Security Management Control Measures - **Table 18**;
- ▶ Aviation Management Control Measure's - **Table 19**;
- ▶ Transport Management Control Measures - **Table 20**;
- ▶ Lighting Management Control Measures - **Table 21**; and
- ▶ Weeds and vegetation Management - **Table 22**

11.2.2 Heritage Management Plan

Kooragang Island has been identified as having cultural heritage significance to the Aboriginal community, however, no specific cultural values have been identified on the site and the site is considered as having a low archaeological potential due to the history of land reclamation activities on the Island and the industrial nature of the area to be impacted by the proposed works. It is considered that the Aboriginal heritage significance of the site is low. Although the significant impacts in respect of Aboriginal heritage are unlikely, in the event that items are identified the following control measures are to be implemented.

Table 17 Heritage Management Controls/Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
Aboriginal Heritage: In the event that heritage items are identified the following activities will be undertaken • No further material will be removed from the area and work in the vicinity of the find shall promptly cease. • Temporary fencing or similar will be installed to mark the location of the artefact/ site; • Appropriate signage would be installed to ensure that inadvertent impacts do not occur; • All relevant personnel would be made aware of the location of the artefact/ site; • As soon as practicable, the finds shall be reported to the OEH (National Parks and Wildlife Service) and advice sought as to the appropriate course of action (OEH (National Parks and Wildlife Service) ph: 02 4908 6810); and • A qualified archaeologist will be engaged to ensure that the heritage item(s) are managed in accordance with OEH and Aboriginal stakeholder requirements.	Environment Representative	Construction
• The relevant procedures and safeguards will be included in a site construction induction or similar with contractors to ensure they are aware of their responsibilities in identifying of any items of aboriginal heritage significance and adhering to procedures of the management of these items.	Environment Representative	Pre-Construction
• Upon identification of any previously unrecorded Aboriginal heritage evidence, including Aboriginal sites or objects (other than skeletal), all work in the immediate vicinity shall immediately cease and the Orica Construction Supervisor and Contractor Supervisor and Project Manager are notified immediately.	All Personnel.	Construction
Skeletal Remains: • Should any skeletal remains be detected during the course of construction, work in that location shall cease immediately and the finds would be reported to the appropriate authorities, including NSW Police, OEH and Local Aboriginal Land Council. • Orica will facilitate, in cooperation with the Police, LALC and OEH, the identification of the skeletal remains by an appropriately qualified person.	Project manager	Construction

Non-Aboriginal Heritage: The relevant procedures and safeguards will be included in a site construction induction or similar with contractors to ensure they are aware of their responsibilities in identifying of any items of heritage significance and adhering to procedures for the management of these items.	Environment Representative	Pre-construction
Should any previously unrecorded non-Aboriginal heritage items be detected during construction, the following activities will be undertaken: - Work in the immediate vicinity of the find shall promptly cease; - As soon as practicable, the find will be reported to the NSW Heritage Office/ Department of Planning (Heritage Branch) ph: 9873 8500; - A qualified archaeologist will be engaged to ensure that the heritage item(s) are managed in accordance with Department of Planning (Heritage Branch); and - Works in the vicinity shall only continue following consultation with Heritage Branch and the implementation of required actions and approvals.	Environment Representative Construction Supervisor.	Construction

11.2.2 Site Security plan

A security plan has been developed for the site and it is important that is understood by site personnel. The following controls are to be included in the plan.

Table 18 Site Security Management Controls/Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
All work areas will be appropriately signposted, fenced and locked when not in use to prevent unauthorised access.	Construction Supervisor	Pre-Construction Construction
All entry/exit points should be monitored / controlled while the Site is open to prevent entry of unauthorised persons / vehicles.	Construction Supervisor	Construction
All workers at must undergo a site induction and a project specific induction which includes the security arrangements for access to the site and work area.	Construction Supervisor	Construction

11.2.3 Aviation Safety

Restrictions are placed on the airspace surrounding Newcastle Airport. To ensure safety is not compromised and to limit restrictions to aircraft operations, a process of requesting permission to erect cranes or tall structures is in place. This process is detailed in the *Operation of Cranes and Tall Structures in the Vicinity of Newcastle Airport* document. A copy is attached at **Appendix E**. It is recommended that individual project owners contact Newcastle Airport for the most recent version of this document prior to use. The following controls outline the requirements for structures on site as detailed in the document.

Table 19 Aviation Management Controls/Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
Permanent Obstruction: Proposed structures exceeding 30 m AHD within a 15 km radius from Newcastle Airport, are to be processed locally through the Air Base Command Post (ABCP) for compilation on a local task register. ABCP will provide a response advising if approval is granted and any operating restrictions, if appropriate.	Construction Supervisor	Construction
Temporary Obstruction: Temporary obstructions, dependent on the height and location, are to be processed locally through the Air Base Command Post (ABCP) for compilation on a local task register. ABCP will provide a response advising if approval is granted and any operating restrictions, if appropriate.	Construction Supervisor	Construction

11.2.4 Transport

The following table outlines the control measures relevant towards transport management.

Table 20 Transport Management Controls/Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
Construction Vehicle access: ▶ A work activity traffic management plan and risk assessment shall be prepared for key activities associated with the project to ensure that traffic both offsite and onsite is managed to ensure appropriate management of vehicles associated with construction work; and ▶ Port of Newcastle, adjacent affected neighbours, and cycling clubs who utilise Kooragang Island shall be advised of the proposed significant construction traffic periods during the development of the traffic management plan. Confirmation of the timing of the activities shall occur prior to the commencement of the activities.	Site Project Manager	Pre-commencement of activity One week prior to commencement of activity, where possible.
Heavy and oversize vehicles: ▶ A work activity traffic management plan and risk assessment shall be prepared for oversize and/or overweight loads; ▶ The plan shall be prepared in accordance with RTA requirements and RTA approval shall be obtained prior to the loads being transported; ▶ Consultation with Port of Newcastle, adjacent affected neighbours and cycling clubs who utilise Kooragang Island shall be undertaken; and ▶ All oversized and special loads will travel along approved routes only in accordance with the RTA approval.	Project Manager	Pre-commencement of relevant activity
Internal Traffic Routes: ▶ Where construction activities will require modification to the existing traffic routes, such as blocking of roads, a risk assessment shall be undertaken to ensure that appropriate controls are implemented to minimise risk and identify any environmental risks; and ▶ The existing site processes for the control of change (Plant Modification Process) shall be used to assess the proposed changes.	Construction Supervisor	Pre-commencement of activity

Pedestrian access to site and car parking Options for additional parking shall be investigated to accommodate during peak construction periods to manage expected additional construction contractor staff.	Project Environment Representative	Construction
Emergencies and incidents - Access to Gates 1, 2, 3, or 6 could be required in the event of an emergency and access to these gates shall be maintained during the construction period. - If access to one of these gates is restricted then a risk assessment will be undertaken to identify any controls required to ensure emergency access to the site is maintained. The Plant Modification Process and site risk assessment systems will be used to assess the proposed change to documents such as the site Emergency Response Plan.	Construction Supervisor	Pre-commencement of activity

11.2.5 Lighting Requirements

Lighting is required to comply with Australian standards and to avoid nuisance to surrounding land users and roadways.

Table 21 *Lighting Management Controls/Measures*

Environmental Management Control/Mitigation Measures	Responsibility	Timing
Locate lights to avoid nuisance to neighbours if lights are required for night-time security/work.	Construction Supervisor	Construction

11.2.6 Weed and Vegetation Removal:

Construction works can result in the spread of weeds, dependent on the type of weeds present on site, and the activities being undertaken. Appropriate weed management and disposal minimises the risk of spreading weeds to surrounding areas.

Table 22 Weed and Vegetation Management Controls/Measures

Environmental Management Control/Mitigation Measures	Responsibility	Timing
Tree Removal - Where existing trees which are to remain are located in the construction areas, they shall be protected with fencing or similar to define “No go” areas under the drip zone of the canopy of the trees - No stockpiling of material is to occur in the no go zone defining the drip zone of trees - An arborist shall be present onsite during the removal of council nominated significant trees to ensure appropriate management. - No trees shall be removed unless council approval is granted	Construction Supervisor Environmental Representative	Construction
Weed Management - Identify all noxious weed populations in the areas to be cleared prior the works being undertaken - Remove from site the top 100mm of topsoil in these areas to prevent spread of weed contaminated topsoil - If stockpiling of this material is required ensure that this material is stored separately	Construction Supervisor Environmental Representative	Construction

12 MONITORING, REPORTING AND REVIEW

12.1 MONITORING

Monitoring the implementation of environmental mitigation measures is vital to ensure that these measures are effective, and to examine methods that may be employed to further improve the performance of the control measures.

The following monitoring is to be undertaken during the construction programme.

Table 23 Overall Mitigation Requirements

Monitoring Requirement	Responsibility
Daily inspection of the construction site to ensure ongoing compliance with the mitigation measures required in the CEMP.	Construction Supervisor
Regular weekly inspection of the site's construction activities to ensure ongoing compliance with the mitigation measures detailed above. An example of a weekly inspection checklist is provided in Appendix D	Construction Supervisor Project Environment Representative
Internal audits of compliance with a selected component of the SHEC management system shall be undertaken on a fortnightly basis as a minimum during construction periods. An audit programme shall be developed detailing the systems to be assessed and the personnel undertaking the audits.	Construction Supervisor Project Environment Representative
Information collected during the Behavioural Safety Programme shall be periodically reviewed to identify any issues that require additional focus.	Project Environment Representative
Review to confirm the effectiveness of any recommended corrective actions resulting from a complaint, incident or near miss.	Project Environment Representative
Failures in compliance with the requirements of the CEMP shall be reported in Enablon and investigated in accordance with Orica and Contractor procedures.	All Personnel
Auditing of compliance with the CEMP shall be undertaken on at least a six monthly basis. During peak construction periods the frequency may be increased.	Project Manager Project Environment Representative

12.2 REPORTING

11.2.1 Monthly Project Reports

Monthly reports shall be prepared by individual Project Managers and include information on environmental performance of the construction activities, including, where appropriate, details on:

- ▶ Non-compliance with environmental obligations and incidents;
- ▶ Non-conformances as a result of work place inspections;
- ▶ Complaints associated with the construction activities; and
- ▶ Any other relevant issues.

The Project Manager is responsible for the preparation of this report.

12.2.2 Sustainability Reporting

The existing site sustainability reporting on energy consumption, greenhouse gas emissions, waste generation, recycling, and water consumption will include data associated with the construction activities.

12.3 INCIDENT MANAGEMENT

Orica's procedure (MP-SG-026) details the requirements for immediate action, investigation and reporting of incidents including those events which cause, or have the potential to cause injury, illness or damage to personnel offsite, damage to the environment, cause concern to the public or are reportable to statutory agencies, including non-compliances with statutory approvals.

Additional requirements for the investigation of SHEC issues and management of corrective actions is also detailed in a procedure (BG-06) as outlined below:

- ▶ The undertaking of immediate action to minimise the severity of an incident;
- ▶ Reporting of the initial incident details, any "quick fixes" undertaken and the longer term actions;
- ▶ Initial assessment of the severity of an incident and notification of key personnel including the site General Manager, Operations Manager and Environment and Community Manager;
- ▶ Investigation of the incident and development of corrective actions in accordance with the requirements of BG-06;
- ▶ Records of the incident are retained indefinitely.

Incidents are reviewed on a regular basis by the site Management Team and the progress of actions is monitored to ensure that identified corrective actions are implemented. Any project specific incident management systems developed will be consistent with this document.

12.4 EMERGENCY MANAGEMENT

In the event that variations to the existing Site Emergency Response Plan (ERP) (KIW-1020) are required to address specific construction related issues they will be incorporated into the Department of Planning and Environment and Fire and Rescue NSW approved site specific Emergency Plan. The requirements of the ERP shall be regarded as overarching and shall apply to all construction areas, with all personnel involved receiving instruction in the actions they must take in the event of an emergency.

The Emergency Management Plan covers:

- ▶ Types of emergencies that could occur;
- ▶ How to raise an emergency;
- ▶ Emergency Procedures;

- ▶ Liaison protocols with external agencies, neighbours and community;
- ▶ Emergency Resources; and
- ▶ Emergency Exercises.

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13 COMMUNICATION, CONSULTATION & PARTICIPATION

13.1 INTERNAL SITE COMMUNICATION

13.1.1 General

Regular structured meetings are required to ensure that effective communication occurs between project management, contractor management and the project's workforce on health safety and environmental matters as this is one of the key elements in achieving compliance.

13.1.2 Safety Health, & Environment Meetings

Where appropriate, a project SHEC team will be established to determine strategic planning, assisting and working constructively with site management representing the health and safety interests of the project workforce. The team will include a senior person, an employee representative from each contractor, and representatives from the Orica and construction management team. The team will meet weekly and deal with overall site safety, health and environmental management issues and procedures.

Day-to-day SHEC management issues will be addressed immediately through the site leadership structure. The project and contractors' management will ensure that team representatives allocate sufficient time to devote to matters related to the team's activities.

Minutes of the team meetings will be made available and distributed to all participants and non-represented contractors involved in projects for communication throughout the sites.

13.1.3 Toolbox Meetings

Each project will hold toolbox meetings at weekly intervals or more frequently if necessary. All site personnel will be involved in these meetings where issues arising at other management and health and safety meetings will be communicated. Toolbox meetings will focus discussion on hazards specific to the relevant area of the projects, as well as any recent incidents in the workplace. They may be used as a forum for SHEC-related training. Toolbox meetings will be minuted.

Members of the Principal's and Contractor's management team will periodically attend contractors' toolbox meetings to reinforce commitment to health, safety and environment, as well as providing an opportunity for direct contact with personnel and monitor that the quality of the meetings is adequate.

13.1.4 SHEC Alerts

SHEC Alerts will be the official means of notification to site personnel for the reporting of significant hazards, incidents or accidents that have occurred and any site activities that have the potential to affect and safety, health, or the environment. All SHEC alerts will be co-ordinated by the Contractor's project team, and displayed on SHEC notice boards and distributed electronically, as required.

13.1.5 Pre- Start Meetings

Contractors will be required to conduct brief, pointed job safety awareness and planning meetings with their work crew at the start of every shift and job. Hazards specific to the day's work and their control measures are to be discussed, including review of any JSERA's that apply.

13.1.6 JSERA Preparation

All JSERA's shall be prepared in conjunction with representatives of personnel undertaking the activity. All personnel shall sign the JSERA to acknowledge that they have reviewed the hazards and understand the controls to be utilised during the activity.

13.2 EXTERNAL COMMUNICATION & COMMUNITY CONSULTATION

A communication and consultation process will advise and liaise with the community regarding relevant projects via the Kooragang Island Community Reference Group. The group meets four times per year. This group consists of representatives from nearby residential suburbs such as Stockton, Fern Bay, Mayfield, Maryville and Carrington. Where relevant information will also be included in the bi-monthly newsletter or website. All external communications will be coordinated by the site Senior Communications Advisor.

14 TRAINING AWARENESS & COMPETENCE

13.1 INDUCTIONS

All personnel who are required to work on the projects, except occasional or short duration visitors (visitor induction), will attend the formal induction program described below prior to commencing work on the site. The purpose of induction is to ensure that all employees who will be actively involved on the project sites, including those of sub-contractor organisations, are provided with the information and advice necessary to integrate the relevant environmental controls into all of their operations and activities.

13.1.1 Orica Site Induction

Prior to commencing any work on the site, all contractors shall attend the Kooragang Island Site Induction.

13.1.2 Plant Specific Induction

Where appropriate, all personnel must complete a job specific induction prior to working on the site, which will cover health, safety and environmental matters. The purpose of these inductions is to ensure that all construction personnel are familiar with the construction specific site rules, project risk management processes, project environmental requirements, local cultural heritage and community relations aspects. These inductions expire after 12 months requiring refresher inductions to be done.

14.2 COMPETENCE

13.2.1 General

All personnel engaged to carry out work at Orica KI must have the necessary skills and knowledge, and be competent to perform the tasks for which they have been employed. Contractors and new employees will be required to furnish proof by way of licences, permits, certificates or by recognition of prior learning (RPL) and/or by written certification by a qualified assessor of their skills, competencies and knowledge of their work tasks.

13.2.2 Records

At the completion of all induction and training, the facilitator or trainer will validate competency of individuals. This will be by means of an examination (written, oral or practical) or an assessment of the person's performance during the training. A record of attendance and training undertaken will be documented and retained.

Records of the environmental monitoring and actions taken in regards to the CEMP will be kept to enable possible auditing. The records will allow auditing and encourage the use of preventative action as well as corrective action following non-compliance. The environmental records will be kept as objective evidence of compliance with environmental requirements. The records will be maintained according to Orica's record keeping procedure. Monitoring for each value located in Sections 5, 6, 7, 8 and 9 is to include details of the implementation of management and corrective actions. Orica environmental staff may use this information to verify the implementation of the CEMP.

14.3 COMMUNITY, COMPLAINTS AND ENQUIRIES MANAGEMENT

Orica's complaints and enquiries management processes will be applied to all site works and is generally outlined below.

Orica has in place a procedure to ensure that community or regulatory agency complaints regarding operation at the site are investigated, corrective actions implemented and records of the complaint retained within Enablon, the site's SHEC Reporting and Management Information System. Complaint records are retained for at least 7 years.

The procedure involves the notification of key plant, environment and site management personnel, if required, to enable investigation of the complaint to commence. Where provided, the complainant's details are obtained to enable Orica to provide details of the outcome of the investigation to the complainant.

The results of the investigation are included in Enablon and, where required, actions to minimise the recurrence of the incident are identified and included in the SHEC Action Management Database and referred to appropriate site personnel.

A 24 hour contact number is operated to ensure that members of the public are able to contact the site to discuss issues of concern. The number is publicised in the Community Calendar, on the site's website and the phone directory. In addition Orica maintains an Emergency Response Service for all of its operations, with the number published in the local directory.

Contact can be made through Orica's 24 hour feedback line regarding construction by:

Telephone: 1800 789 044

Email: kooragang@orica.com

14.4 CONTINUOUS IMPROVEMENT

CEMPs require ongoing review and will be amended, as necessary, to allow new or changing environmental risks relating to the projects to be addressed.

As part of Orica's overall environmental management system, feedback systems will be in place for the duration of the Projects to enable the CEMP to be updated and responsive to learning from any incidents and complaints.

This CEMP will be reviewed and updated to reflect knowledge gained during the course of construction and to reflect new knowledge and changed community standards (values). Changes to the CEMP may be developed and implemented in consultation with relevant authorities and stakeholders over time as required.

Other triggers for CEMP review may include:

- ▶ Findings and recommendations of Contractors' EMPs and/ or work procedures;
- ▶ Changes to organisational structure, roles and responsibilities;
- ▶ Changes in environmental legislation and/or policies; and
- ▶ New technologies/innovation relevant to applied methods and controls that provide innovative means of executing work in order to meet performance criteria.

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APPENDICES

APPENDIX A SHECMS POLICY AND PROCEDURES

APPENDIX B ENVIRONMENTAL MANAGEMENT STRATEGY

APPENDIX C INCIDENT INVESTIGATION

APPENDIX D ENVIRONMENTAL MANAGEMENT INSPECTION CHECKLIST

APPENDIX E CRANES & TALL STRUCTURES APPROVAL

APPENDIX F PERMIT TO WORK

APPENDIX G JOB SAFETY AND ENVIRONMENTAL RISK ANALYSIS

APPENDIX H EMERGENCY RESPONSE PLAN

APPENDIX I SOIL MANAGEMENT PLAN

APPENDIX J GROUNDWATER MONITORING PLAN

Attachment 3: Excerpt from Orica Workplace Health and Safety Plan

7.2 Permit to Work System

All work will be controlled by the Orica Permit to Work (PTW) System. Contractors will be obliged to present SWMSs in order to obtain a PTW.

The following procedures will be used:

PW-01	Permit to Work
PW-02	Isolation of Plant and Equipment from Hazardous Materials and Stored Mechanical Energy
PW-04	Excavation/Break-in Authority
PW-05	Electrical Isolation and Permits
PW-06:	Work at Heights/Work on Roofs and the use of Scaffolding, Ladders and Portable Steps
PW-08	Decontamination of Process Equipment

7.3 Safe Work Method Statements

Orica and its contractors will be responsible for developing SWMSs in consultation with workers for high risk tasks, including the following:

- Decontamination of personnel
- Decontamination of plant
- Excavations
- Taking samples in excavations
- Working with mobile plant
- Loading of reagents
- General earthworks

7.4 Arsenic Exposure

Exposure to arsenic will be managed as described below but no special occupational health issues are foreseen.

Site Access

The project area will be fenced to minimise the potential for unauthorised access to the Site from the facility. In addition, the impacted area exclusion zone will be fenced or bunded to clearly demarcate areas where there is potential for arsenic exposure.

Access arrangements will be implemented, including a Site specific induction which will include information on the controls to minimise exposure to arsenic. All personnel working on the remediation site will undertake this induction. Visitors to the Site will be escorted at all times and will receive an area specific induction prior to entering the site.

Safety Data

Safety Data Sheets for arsenic-contaminated soil and arsenic-contaminated water will be kept on site and made available to workers.

Respiratory Protection

Respiratory protection may be required depending upon the activities being undertaken and the potential for exposure to arsenic contaminated soil and groundwater. Occupational monitoring will be undertaken to assist in the assessment of respiratory protection requirements.

Personal Protective Equipment (PPE)

Standard PPE for the project will include steel capped boots, hard hat and safety glasses, long sleeved shirts and long pants. In addition, personnel will be required to wear disposable chemical overalls when working in the construction area.

Chemical resistant disposable gloves will be required to be worn when undertaking any tasks where arsenic contaminated soil or groundwater could be encountered. Gloves will be required to be worn for all other tasks as detailed in SWMSs or JSERAs.

Hearing protection may be required to be worn in the vicinity of operating plant and equipment and an assessment of noise levels will be undertaken to determine any hearing protection zones.

Personal Decontamination

To minimise potential exposure of personnel to arsenic contamination the work area will be divided into two zones – the construction area and the amenity area. Personnel will be required to undertake a decontamination process when moving from the construction area to the amenity area.

This will include the following:

- Scraping boots to remove contaminated soil
- Removal of boots and disposable overalls, with clean boots to be changed into
- Washing of face and hands

Appropriate amenities will be provided to enable the decontamination procedure to be implemented.

Ingestion Minimisation

To minimise the already low risk of arsenic ingestion, food must only be eaten in the clean meal room provided after undergoing the above decontamination procedure.

Food must not be taken into operational areas but arrangements will be made to provide water in the construction area under a work instruction as a control measure for heat stress.

Air Quality Monitoring

Occupational exposure monitoring will be undertaken to assess the potential for airborne arsenic exposure in accordance with a program developed in conjunction with the site's Safety, Health and Risk team.

The results of the monitoring will provide assurance both to personnel working in the construction area but also be available for discussion with adjacent industrial neighbours.

Health Monitoring Programme

The NSW *Work Health and Safety Regulation 2011* requires health monitoring for work involving hazardous chemicals. A biological monitoring programme will be developed in consultation with the site medical personnel and Safety, Health and Risk team to monitor for arsenic. The program will include monitoring prior to the commencement of personnel working in the remediation area, as well as periodic monitoring during the cut-off wall and initial capping stages of the project. The program will generally be in accordance with SafeWork Australia's arsenic (Inorganic) health monitoring guidance.

Decontamination for Maintenance

Any necessary decontamination of plant and equipment for maintenance will be by physical cleaning and water washing. Once decontaminated, the Permit to Work Authority will issue a decontamination tag and associated documentation stating that it is clean and fit to be removed from the contamination areas for maintenance. A procedure for decontamination of equipment will be developed to manage contaminated water, soil and other materials.

7.5 Excavation Work

Planned excavation work on this project consists of trenching to a depth of 12 metres with a long-arm excavator or a crane with a clamshell grab in order to create the cut-off wall as described in section 3.3 above.

This is considered to be "High Risk Construction Work" as defined in Clause 291 of Work Health and Safety Regulation 2011 and an SWMS will be prepared prior to the excavation work by the cut-off wall contractor.

Mechanical plant, vehicles and other heavy loads are not to be located in the 'zone of influence' of an excavation. Orica will rely on the experience of the cut-off wall contractor and Orica's geotechnical consultants to determine this zone of influence.

Orica's model procedures for excavation clearance are to be used to ensure safety with respect to underground services and other potential hazards.

Exclusion zones will be enforced around open trenches, supplemented by barricading, safety fencing or covering, if appropriate. The construction site will also be fenced to prevent intruders falling into open trenches.

7.6 Mobile Plant, Equipment and Vehicles – Contact with Workers

The separation of plant and persons will be addressed with barriers and procedures as required. Communication with plant operators will be enhanced by the use of two-way radios to minimise the need for persons to approach operating plant.

Contractors will ensure that operators of earthmoving machinery are competent to operate the specific type of plant as well as any attachments required.