

Major Project 05\_0174  
Final Project Report  
Extractive Industry

Coxs Lane, Fullerton Cove



Prepared For  
Buldev Properties Pty Ltd

28 January 2009



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**Environmental Planning, Assessment and Management**

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Orogen Pty Ltd and the authors responsible for the preparation and compilation of this report declare that we do not have, nor expect to have a beneficial interest in the study area of this project and will not benefit from any of the recommendations outlined in this report.

The preparation of this report has been in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

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Orogen Pty Ltd accepts no responsibility for any loss, damage suffered or inconveniences arising from, any person or entity using the plans or information in this study for purposes other than those stated above.

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# Introduction

## 1.1 Background

The Environmental Assessment for operation of an extractive industry at Coxs Lane, Fullerton Cove was placed on exhibition during June–July 2008 and referred to a number of Government Authorities for review and comment. During the exhibition and referral period the following submissions were received:

- Department of Water and Energy (DWE), dated 18 July 2008;
- NSW Roads and Traffic Authority (RTA), dated 1 August, 2008;
- Department of Primary Industries (DPI), dated 4 August 2008;
- Department of Environment and Climate Change (DECC), August 2008;
- Department of Planning (DoP), dated 2 September 2008; and
- Private submissions communicated in DoP correspondence, dated 2 September 2008.

A copy of these submissions is provided in **Appendix A**.

As a consequence of the response to issues raised in this correspondence and in subsequent communications (phone calls and emails) with several of the Government Authorities, there have been some minor amendments to the project. This report presents the details of the amended project and details the environmental impacts of these amendments.

## 1.2 Scope of this Report

This report constitutes the Final Project Report (FPR). This FPR includes:

- A detailed response to the issues raised in the submissions;
- A detailed response to the issues raised in subsequent communications;
- Detailed description of the project and its elements;
- Plans of the proposed development with design variations; and
- Revised Statement of Commitments.

## Keys Issues

### 2.1 Key Issues Identification

Based on the submissions made by various Government Authorities to the exhibited EA document, the following key issues were identified as requiring further consideration:

- Effect of extraction on the Stockton Groundwater Source. Details of the response to this issue is provided in **Table 2.1** and **Appendix B**;
- Noise impacts from Nelson Bay Road. Additional modelling has been requested by DoP and DECC in relation to this issue. A detailed response is provided in **Appendix C** and summarised in **Section 2.2.3**; and
- Additional surveys for the Threatened orchids *Diuris arenaria* and *Diuris praecox*. Details are provided in **Appendix D**.

### 2.2 Issues Summary and Responses

**Table 2.1** presents summary information in relation to the submissions received and the issues raised during and after the public exhibition period and the response to the issue. It is proposed to address these issues in detail in this report. Some of the issues have been addressed in responses to the Department of Water and Energy, which are detailed in **Appendix B**. In summary, a detailed response has been provided to each of the issues raised. We submit that that the response to each of these issues has been adequate.

A summary of responses to issues raised is provided in this section of the report. It includes issues raised by DoP, DWE, DECC and the general public.

#### 2.2.1 Department of Planning

Issues raised by the DoP and a response to these issues are detailed as follows:

- *Identify plans to alter scope of project.* **Section 3** of this report provides details on proposed amendments to the project.
- *Nelson Bay Road traffic noise review.* A detailed assessment is provided in **Appendix C**.
- *Post extraction final landform at boundaries with residences.* A detailed assessment is provided in **Appendix C**.



**Table 2.1 - Summary of Issues Raised By Authorities/General Public and Responses**

Issue Raised By	Date	Summary Issues	Response Details
Department of Water and Energy	18.07.2008  23.09.2008	<ul style="list-style-type: none"> <li>• Stockton water source yield effects</li> <li>• Interception of water table</li> <li>• Groundwater dependant ecosystems</li> <li>• Additional modelling of groundwater impacts</li> </ul>	<p>Orogen email dated 22.09.2008 (attached in <b>Appendix B</b>)</p> <p>Orogen letter dated 29.10.2008 (attached in <b>Appendix B</b>)</p>
NSW Roads and Traffic Authority	01.08.2008	<ul style="list-style-type: none"> <li>• Upgrade of relevant section of Coxs Lane to accommodate haul trucks</li> </ul>	Accepted as a condition of consent
Department of Primary Industries	04.08.2008	<ul style="list-style-type: none"> <li>• Provision of annual extraction data to DPI</li> </ul>	Accepted as a condition of consent
Department of Environment and Climate Change	08.2008	<ul style="list-style-type: none"> <li>• Noise assessment – additional information requested</li> <li>• Information from additional surveys for Threatened <i>Diuris</i> orchids</li> </ul>	<p>Information requested included in this report (<b>Appendix C</b>)</p> <p>Information requested included in this report (<b>Appendix D</b>)</p>
Department of Planning	02.09.2008	<ul style="list-style-type: none"> <li>• Identify plans to alter scope of project</li> <li>• Protection of drinking water</li> <li>• Traffic noise review</li> <li>• Post extraction final landform at boundaries with residences</li> </ul>	<p>Refer <b>Section 3</b></p> <p>Refer <b>Section 2.2</b></p> <p>Information requested included in this report (<b>Appendix C</b>)</p> <p>Information requested included in this report (<b>Appendix C</b>)</p>
General Public	Letter DoP 02.09.2008	<ul style="list-style-type: none"> <li>• Various issues</li> </ul>	Refer <b>Section 2.2.4</b>

- *Protection of drinking water from dust.* As detailed in the EA (and confirmed by the DECC in their response) the absence of fine particles in the material to be extracted would result in PM10 impacts being well below the criteria at all receptors under Scenario 1 (worst case scenario of all material extracted in one year). Dust generation as a result of the extraction activity is therefore unlikely to affect drinking water collected from nearby residences. Rather, dust generation may be associated with road haulage within the site. DECC have recommended conditions to deal with dust suppression which would be included in an Environmental Protection Licence (EPL) for the site. These measures are detailed as proposed operating conditions O1.1 – O1.3 in the draft EPL provided in the DECC response. Further, ground water will not be used in dust suppression. Dust suppression on the haulage route will be undertaken using water carts.

### 2.2.2 Department of Water and Energy

In response to the exhibition of the EA, the DWE raised a number of issues, detailed as follows:

- Effects on Stockton water source yield;
- Interception of water table;
- Groundwater dependant ecosystems; and
- Additional modelling of groundwater impacts.

Correspondence between the DWE and Orogen is provided in **Appendix B**. In particular, Orogen queried the DWE's condition that the extraction be limited to 40 m from any groundwater dependent ecosystems (GDE's). This issue in particular was not able to be resolved with the DWE, due to the DWE being unable to commit resources to addressing the issues within a reasonable timeframe. As such, the lack of response from the DWE resulted in unacceptable delays to the submission of this FPR.

In summary, the DWE recommended a 40 m exclusion from the GDE's on the basis that the extraction would affect groundwater in the vicinity of these GDE's. As discussed in our response to the DWE (for which we have not receive a reply), extraction is proposed is to a maximum graded level of 3 m AHD, which is 1.34 m higher than the predicted groundwater table on the site. This exceeds the DWE's requirement of a 1 m minimum clearance between the depth of extraction and the highest predicted groundwater level on the site.

It is therefore requested that the Department give consideration to this matter, based on the response provided by Orogen in **Appendix B**. In our view, it is detailed quite clearly in the EA and in our response to DWE that extraction on the site will not interfere with the groundwater table. Therefore any restriction imposed on the extent of the extraction area that is justified (by the DWE) by an implied effect of the extraction operations on groundwater, is clearly not supported by examination of the data presented in the EA. The effect of this restriction would be to reduce the extraction volume from 635,050 m<sup>3</sup> to 538,260 m<sup>3</sup>. This equates to a reduction of approximately \$2.4M in resource value (assuming \$25 m<sup>3</sup>).

It is therefore requested that this condition of the DWE not be imposed on the project for the following reasons:

- There is no scientific justification for the condition;
- The high economic impact on the project and consequent effects on the Hunter region economy; and
- The unnecessary quarantining of a valuable resource in a supply-deficit market.

### 2.2.3 Department of Environment and Climate Change

Issues raised by the DECC and a response to these issues is detailed as follows:

- *Noise assessment – additional information requested.* A report detailing the findings is provided in **Appendix C**. In summary, the noise modelling recommended that the mounds be raised to 8.5 m AHD (western mound adjacent to residence R4) and 8 m AHD (eastern mound, adjacent to Nelson Bay Road). This would result in a relative increase in traffic noise from Nelson Bay Road of between 0.6 dB and 1.3 dB, which is considered to be acceptable.
- *Information from additional surveys for Threatened Diuris orchids.* A report on the surveys for the Threatened *Diuris* orchids is provided in *Appendix D*. In summary, the targeted surveys did not detect the presence of either *Diuris arenaria* and *Diuris praecox* in the extraction area or surrounding vegetation.

### 2.2.4 Public Submissions

A total of 16 public submissions were received by the DoP. A response to the issues raised in each of the public submissions received is provided in **Table 2.2**. For reasons of privacy, details of the identity of each submission have been omitted. In summary, it is submitted that each of the issues raised in the public submissions has been addressed adequately.

**Table 2.2 - Response to Issues Raised in Public Submissions**

Submission #	Issues Raised	Response
1	<ul style="list-style-type: none"> <li>Questions the use of term “waste material” for the sand in EA.</li> <li>Allegation regarding clearing of the site.</li> <li>Proposes use of Nelson Bay Road as an emergency exit.</li> <li>EA implied that it was acceptable to destroy the lifestyle of residents because the population in the area is low.</li> <li>Increased noise impacts from Nelson Bay Road as a result of sand removal</li> <li>Vibration effects</li> <li>Contamination of roof water collection from dust</li> <li>Inconsistent with the objectives of the 1(a) Rural zone</li> </ul>	<ul style="list-style-type: none"> <li>Use of the term is justified. The EA did not infer anything regarding the potential use of the site for any other purposes.</li> <li>The allegation is not a matter for discussion in this report.</li> <li>Suggested use of Nelson Bay Rd for emergency access is not practical or appropriate, being an arterial road. Being for emergency access only, the use of George St by the operation would be rare.</li> <li>The EA made no such inference.</li> <li>Addressed in this report (<b>Appendix C</b>).</li> <li>The vibrations referred to were generated by a heavy vibrating roller working on the construction of an entrance road for an approved dwelling on the site. This machinery would not be used during the extraction operations.</li> <li>Addressed in this report (<b>Section 2.2.1</b>).</li> <li>As indicated in Section 3.4.1 of the EA, the proposal is not prohibited in the zone. The EA concludes that the proposal would not have significant adverse effects on the environment.</li> </ul>
2 and 3	<ul style="list-style-type: none"> <li>Contamination of roof water collection from dust.</li> <li>Use of George St for emergency access.</li> <li>Site will be at 1:100 year flood level.</li> <li>Increased noise impacts from Nelson Bay Road. as a result of sand removal.</li> </ul>	<ul style="list-style-type: none"> <li>Addressed in this report (<b>Section 2.2.1</b>).</li> <li>Being for emergency access only, the use of George St by the operation would be rare. George St will not become an alternative route for access to the site.</li> <li>The 1:100 year flood level for the site is 2.5 m AHD. It is proposed to extract material for the site to 3.0 m AHD. This is 0.5 m above the 1:100 year flood level.</li> <li>Addressed in this report (<b>Appendix C</b>).</li> </ul>

**Table 2.2 - Response to Issues Raised in Public Submissions**

Submission #	Issues Raised	Response
	<ul style="list-style-type: none"> <li>Proposed mounds cannot be easily stabilised.</li> </ul>	<ul style="list-style-type: none"> <li>The revegetation plan will detail the methods to vegetate the mounds and enhance the existing vegetated areas on the site that are outside of the extraction area.</li> </ul>
4	<ul style="list-style-type: none"> <li>Contamination of roof water collection from dust.</li> <li>Increased noise impacts from Nelson Bay Road as a result of sand removal.</li> <li>Site will be at 1:100 year flood level.</li> </ul>	<ul style="list-style-type: none"> <li>Addressed in this report (<b>Section 2.2.1</b>).</li> <li>Addressed in this report (<b>Appendix C</b>).</li> <li>The 1:100 year flood level for the site is 2.5 m AHD. It is proposed to extract material for the site to 3.0 m AHD. This is 0.5 m above the 1:100 year flood level.</li> </ul>
5	<ul style="list-style-type: none"> <li>Contamination of roof water collection from dust.</li> <li>Vibration from recent bulldozer on site.</li> <li>Site will be at 1:100 year flood level.</li> <li>Noise testing based on smaller machinery and therefore misleading.</li> <li>Stability of batters.</li> </ul>	<ul style="list-style-type: none"> <li>Addressed in this report (<b>Section 2.2.1</b>).</li> <li>A vibrating heavy roller was used recently on site as part of access road construction in relation to a separate dwelling DA on the site. This machinery will not be used during the extraction operation.</li> <li>The 1:100 year flood level for the site is 2.5 m AHD. It is proposed to extract material for the site to 3.0 m AHD. This is 0.5 m above the 1:100 year flood level.</li> <li>Machinery assumed for purposes of noise assessment is similar in size and sound power output to machinery that will be used on site. Noise assessment is not misleading.</li> <li><b>Appendix E</b> shows the revised design of the batters/noise mounds. The slope of these batters is 4:1 (ie. 14°). The angle of response of dry sand is 34°. The batters will therefore be 20° flatter than what is considered to be the upper limit of stability for dry sand, notwithstanding the proposed revegetation of these areas. There will be no issue regarding the stability of these mounds.</li> </ul>

**Table 2.2 - Response to Issues Raised in Public Submissions**

Submission #	Issues Raised	Response
	<ul style="list-style-type: none"> <li>• Use of George St for emergency access.</li> <li>• Nelson Bay Road access.</li> </ul>	<ul style="list-style-type: none"> <li>• Being for emergency access only, the use of George St by the operation would be rare. George St will not become an alternative route for access to the site.</li> <li>• The RTA did not raise any issue with access from Cox's Lane to Nelson Bay Road.</li> </ul>
6	<ul style="list-style-type: none"> <li>• Vibration from recent bulldozer on site.</li> <li>• Contamination of roof water collection from dust.</li> <li>• Flora and fauna affected</li> <li>• Use of George St for emergency access.</li> <li>• Nelson Bay Road access.</li> </ul>	<ul style="list-style-type: none"> <li>• A vibrating heavy roller was used recently on site as part of access road construction in relation to a separate dwelling DA on the site. This machinery will not be used during the extraction operation.</li> <li>• Addressed in this report (<b>Section 2.2.1</b>).</li> <li>• A detailed flora and fauna report was prepared for the project. Additional surveys undertaken for Threatened orchids. No significant impacts on flora and fauna predicted.</li> <li>• Being for emergency access only, the use of George St by the operation would be rare. George St will not become an alternative route for access to the site.</li> <li>• The RTA did not raise any issue with access from Cox's Lane to Nelson Bay Road.</li> </ul>
7	<ul style="list-style-type: none"> <li>• Site will be at 1:100 year flood level.</li> <li>• Effect on water table levels.</li> <li>• Stability of batters.</li> <li>• Increased noise impacts from Nelson Bay Rd as a result of sand</li> </ul>	<ul style="list-style-type: none"> <li>• The 1:100 year flood level for the site is 2.5 m AHD. It is proposed to extract material for the site to 3.0 m AHD. This is 0.5 m above the 1:100 year flood level.</li> <li>• Extraction will not intercept the water table and any effects on the water table on the site will be negligible. Addressed in this report (<b>Appendix B</b>).</li> <li>• <b>Appendix E</b> shows the revised design of the batters/noise mounds. The slope of these batters is 4:1 (ie. 14°). The angle of response of dry sand is 34°. The batters will therefore be 20° flatter than what is considered to be the upper limit of stability for dry sand, notwithstanding the proposed revegetation of these areas. There will be no issue regarding the stability of these mounds.</li> <li>• Addressed in this report (<b>Appendix C</b>).</li> </ul>

**Table 2.2 - Response to Issues Raised in Public Submissions**

Submission #	Issues Raised	Response
	<p>removal.</p> <ul style="list-style-type: none"> <li>Traffic safety issues.</li> <li>Noise assessment incorrect.</li> <li>Mounds only on Nelson Bay Road.</li> <li>Contamination of roof water collection from dust.</li> <li>Vibration from recent bulldozer on site.</li> </ul>	<ul style="list-style-type: none"> <li>The RTA did not raise any issue with access from Cox's Lane to Nelson Bay Road.</li> <li>Addressed in this report (<b>Appendix C</b>).</li> <li>Mounds are located both along the eastern and western margins of the site.</li> <li>Addressed in this report (<b>Section 2.2.1</b>).</li> <li>A vibrating heavy roller was used recently on site as part of access road construction in relation to a separate dwelling DA on the site. This machinery will not be used during the extraction operation.</li> </ul>
8	<ul style="list-style-type: none"> <li>Contamination of roof water collection from dust.</li> <li>Vibration from recent bulldozer on site.</li> <li>Use of groundwater.</li> <li>Increased noise impacts from Nelson Bay Rd as a result of sand removal.</li> <li>Traffic safety issues.</li> </ul>	<ul style="list-style-type: none"> <li>Addressed in this report (<b>Section 2.2.1</b>).</li> <li>A vibrating heavy roller was used recently on site as part of access road construction in relation to a separate dwelling DA on the site. This machinery will not be used during the extraction operation.</li> <li>There is no proposal to utilise groundwater resources on the site.</li> <li>Addressed in this report (<b>Appendix C</b>).</li> <li>The RTA did not raise any issue with access from Cox's Lane to Nelson Bay Road.</li> </ul>
9	<ul style="list-style-type: none"> <li>Vibration from recent bulldozer on site.</li> </ul>	<ul style="list-style-type: none"> <li>A vibrating heavy roller was used recently on site as part of access road construction in relation to a separate dwelling DA on the site. This machinery will not be used during the extraction operation.</li> </ul>

**Table 2.2 - Response to Issues Raised in Public Submissions**

Submission #	Issues Raised	Response
	<ul style="list-style-type: none"> <li>Noise assessment incorrect.</li> <li>Hours of Operation</li> <li>Contamination of roof water collection from dust.</li> <li>Control of dust.</li> <li>Visual impacts/noise impacts mitigation.</li> <li>Protection of existing mature trees on boundary.</li> </ul>	<ul style="list-style-type: none"> <li>Addressed in this report (<b>Appendix C</b>).</li> <li>Conditions set by DECC in respect of operating hours.</li> <li>Addressed in this report (<b>Section 2.2.1</b>).</li> <li>Mitigation (refer <b>Section 4.1</b>) will be in place to prevent sand deposition on adjacent properties.</li> <li>Addressed in this report (<b>Appendix C</b>).</li> <li>Earthworks will not be undertaken within the root zone of these trees. Addressed in <b>Section 4.1</b> of this report.</li> </ul>
10	<ul style="list-style-type: none"> <li>Air quality.</li> <li>Vibration effects.</li> <li>Groundwater.</li> <li>Noise.</li> <li>Traffic safety.</li> </ul>	<ul style="list-style-type: none"> <li>Addressed in this report (<b>Section 2.2.1</b>).</li> <li>A vibrating heavy roller was used recently on site as part of access road construction in relation to a separate dwelling DA on the site. This machinery will not be used during the extraction operation.</li> <li>There is no proposal to utilise groundwater resources on the site.</li> <li>Addressed in this report (<b>Appendix C</b>).</li> <li>Addressed in EA. The RTA did not raise any issue with access from Cox's Lane to Nelson Bay Road.</li> </ul>
11	<ul style="list-style-type: none"> <li>Stability of batters.</li> </ul>	<ul style="list-style-type: none"> <li><b>Appendix E</b> shows the revised design of the batters/noise mounds. The slope of these batters is 4:1 (ie. 14°). The angle of repose of dry sand is 34°. The batters will therefore be 20° flatter than what is considered to be the upper limit of stability for dry sand, notwithstanding the proposed revegetation of these areas. There will be no issue regarding the stability of these mounds.</li> </ul>



**Table 2.2 - Response to Issues Raised in Public Submissions**

Submission #	Issues Raised	Response
	<ul style="list-style-type: none"> <li>Contamination of roof water collection from dust.</li> <li>Groundwater</li> <li>Vibration effects</li> <li>Increased noise impacts from Nelson Bay Rd as a result of sand removal.</li> </ul>	<ul style="list-style-type: none"> <li>Addressed in this report (<b>Section 2.2.1</b>).</li> <li>There is no proposal to utilise groundwater resources on the site.</li> <li>A vibrating heavy roller was used recently on site as part of access road construction in relation to a separate dwelling DA on the site. This machinery will not be used during the extraction operation.</li> <li>Addressed in this report (<b>Appendix C</b>).</li> </ul>
12	<ul style="list-style-type: none"> <li>Impacts on ecology.</li> <li>Impacts on adjoining residents.</li> <li>Difficult to restore native vegetation.</li> <li>Batter stability.</li> <li>Vehicle effects on local roads.</li> <li>Loss of amenity to local residents.</li> </ul>	<ul style="list-style-type: none"> <li>Ecological issues were addressed in the EA. Additional information has been provided to the DECC and with this report (<b>Appendix D</b> and <b>Appendix F</b>).</li> <li>Impacts on adjoining residents were addressed in the EA.</li> <li>A revegetation plan will be prepared for those areas of the site nominated for restoration/habitat enhancement.</li> <li><b>Appendix E</b> shows the revised design of the batters/noise mounds. The slope of these batters is 4:1 (ie. 14°). The angle of repose of dry sand is 34°. The batters will therefore be 20° flatter than what is considered to be the upper limit of stability for dry sand, notwithstanding the proposed revegetation of these areas. There will be no issue regarding the stability of these mounds.</li> <li>A traffic report was prepared and submitted with the EA. Haulage will only occur east of the intersection of the proposed site entrance and Cox's Lane (approx 100 m length of Cox's Lane). Road will be upgraded according to Council's specifications.</li> <li>Impacts on adjoining residents were addressed in the EA.</li> </ul>

**Table 2.2 - Response to Issues Raised in Public Submissions**

Submission #	Issues Raised	Response
	<ul style="list-style-type: none"> <li>Change to topography, create a swamp area.</li> <li>Filling of local natural drainage course.</li> </ul>	<ul style="list-style-type: none"> <li>The water table will be located 1 – 1.5 m below the finished ground level. The site will be not turned into a swamp.</li> <li>There is no proposal to fill any local drainage course.</li> </ul>
13	<ul style="list-style-type: none"> <li>Safety concerns.</li> <li>5 tonne limit on Coks Lane.</li> <li>Contamination of roof water collection from dust.</li> <li>Vibration effects</li> <li>Site will be at 1:100 year flood level.</li> <li>Acid sulfate soils.</li> </ul>	<ul style="list-style-type: none"> <li>Site entrance has been moved away from this house, further towards Nelson Bay Road to the east (refer <b>Appendix E</b>).</li> <li>Road will be upgraded to Council's specifications.</li> <li>Addressed in this report (<b>Section 2.2.1</b>).</li> <li>A vibrating heavy roller was used recently on site as part of access road construction in relation to a separate dwelling DA on the site. This machinery will not be used during the extraction operation.</li> <li>The 1:100 year flood level for the site is 2.5 m AHD. It is proposed to extract material for the site to 3.0 m AHD. This is 0.5 m above the 1:100 year flood level.</li> <li>Acid sulfate soils addressed in EA. No issues for the site.</li> </ul>
14	<ul style="list-style-type: none"> <li>Impacts on ecology.</li> <li>Batter stability.</li> <li>Contamination of roof water collection from dust.</li> </ul>	<ul style="list-style-type: none"> <li>Ecological issues were addressed in the EA. Additional information has been provided to the DECC and with this report (<b>Appendix D</b> and <b>Appendix F</b>).</li> <li><b>Appendix E</b> shows the revised design of the batters/noise mounds. The slope of these batters is 4:1 (ie. 14°). The angle of repose of dry sand is 34°. The batters will therefore be 20° flatter than what is considered to be the upper limit of stability for dry sand, notwithstanding the proposed revegetation of these areas. There will be no issue regarding the stability of these mounds.</li> <li>Addressed in this report (<b>Section 2.2.1</b>).</li> </ul>

**Table 2.2 - Response to Issues Raised in Public Submissions**

Submission #	Issues Raised	Response
	<ul style="list-style-type: none"> <li>Noise impacts.</li> <li>Traffic safety.</li> <li>Pollution of groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>Addressed in this report (<b>Appendix C</b>).</li> <li>Addressed in EA. The RTA did not raise any issue with access from Cox's Lane to Nelson Bay Road.</li> <li>Measures to protect groundwater addressed in EA.</li> </ul>
15	<ul style="list-style-type: none"> <li>Impacts on ecology.</li> <li>Site will be at 1:100 year flood level.</li> <li>Proposal will affect local drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Ecological issues were addressed in the EA. Additional information has been provided to the DECC and with this report (<b>Appendix D</b> and <b>Appendix F</b>).</li> <li>The 1:100 year flood level for the site is 2.5 m AHD. It is proposed to extract material for the site to 3.0 m AHD. This is 0.5 m above the 1:100 year flood level.</li> <li>The proposal will have no impacts on local drainage.</li> </ul>
16	<ul style="list-style-type: none"> <li>Site will be at 1:100 year flood level.</li> <li>Acid sulfate soils.</li> </ul>	<ul style="list-style-type: none"> <li>The 1:100 year flood level for the site is 2.5 m AHD. It is proposed to extract material for the site to 3.0 m AHD. This is 0.5 m above the 1:100 year flood level.</li> <li>Acid sulfate soils addressed in EA. No issues for the site.</li> </ul>

## Project Details and Design Changes

### 3.1 Project Details as Submitted in Environmental Assessment

In summary, the original proposal was for an extractive industry over the following land at Coxs Lane, Fullerton Cove (hereafter referred to as the 'site'):

- Lot 991 DP627179;
- Lot 1910 DP 557701;
- Lot 1 DP 1006307;
- Lot 3 DP 11519;
- Lot 1 DP 794575; and
- Lot 201 DP 39968.

The site has a total area of 25.3 ha. The extraction area, including construction of noise and visual mitigation mounds, extends over an area of 14.9 ha. The proponent has identified the site as having a sand resource that would be suitable for use in a range of construction projects managed by the proponent. The development of an extractive industry on site would provide resource security for the proponent.

Plans showing the existing and final proposed landform of the site are provided in **Appendix E**. It is proposed to extract sand to a graded level of 3 m AHD across the site, with visual and acoustic barriers being constructed by re-contouring the site along the Nelson Bay Road frontage (eastern boundary), and along the site boundary where it adjoins existing residential areas (**Appendix E**).

### 3.2 Amendments to the Project and Impacts Summary

Amendments/clarifications to the project and the assessment of potential impacts associated with these changes are provided in **Table 3.1**. All other impacts of the project as described in the EA remain unchanged.

In summary, the assessment of the project amendments indicates that there will be no increase in the anticipated impact of the project. While the amendments are minor, additional assessment has been undertaken. Referral of this documentation may be required to the DECC, though it submitted that the changes/impacts are minor and do not warrant re-exhibition of the documentation.

**Table 3.1 - Project Amendments/Clarification and Impact Assessment**

Project Element	Amendment/Clarification	Impact Assessment
Site entrance, Coxs Lane	<ul style="list-style-type: none"> <li>Relocation of the site entrance from Zircon Lane. Proposed new entrance located 150 m to the east on Coxs Lane (<b>Appendix E</b>).</li> <li>Entrance/exit split as two separate carriageways. The site exit is located at the site boundary with Nelson Bay Road road reserve. The entrance is located approximately 20 m to the west on Coxs Lane.</li> <li>Trucks will now only utilise approximately 45 m of Coxs Lane between Nelson Bay Road and the site entrance.</li> </ul>	<ul style="list-style-type: none"> <li>The relocation of the entrance will reduce the potential impacts to the residence located at the Coxs Lane/Zircon Lane intersection (Lot 1 DP 1006307). The proposed new entrance requires the removal of up to 23 trees.</li> <li>The removal of these trees was not considered in the EA. A flora and fauna assessment incorporating a Section 5A Assessment has been undertaken for the removal of this vegetation. This report is provided in <b>Appendix F</b>.</li> <li>The report concludes that this clearing will not have a significant impact on Threatened species, populations or ecological communities and that mitigation for the loss of this vegetation can be incorporated into the revegetation proposed for the project.</li> <li>Assessment of potential traffic impacts associated with the revised entrance location is provided in the revised Traffic Assessment (<b>Appendix G</b>).</li> </ul>
Extraction extents	<ul style="list-style-type: none"> <li>Revised extraction extents shown in <b>Appendix E</b>.</li> <li>Area of proposed Extraction Cell No. 1 now excluded from proposal.</li> <li>Revised mound/batter design.</li> <li>Extraction limited to 40 m from Groundwater Dependent Ecosystems on the site based on DWE proposed condition. (Note details on this issue in <b>Section 2.2.2</b>).</li> <li>Extraction area reduced from 14.9 ha to 13.9 ha. Volume reduced from 750,000 m<sup>3</sup> to 538,260 m<sup>3</sup>.</li> </ul>	<ul style="list-style-type: none"> <li>Area proposed for extraction reduced. The overall impact of the proposal is therefore reduced. A revised extraction Staging Plan is provided in <b>Appendix F</b>.</li> <li>In response to comments from adjoining neighbours, the mound/batter design on the western side has been amended.</li> <li>This includes increasing the distance between the top of the mound and residential boundaries (from 6 m to 12 m), thereby increasing the distance between adjacent residences and the extraction operations.</li> <li>Batter height has also been increased adjacent to residence R4 (western mound) and adjacent to Nelson Bay Road (eastern mound). This is in response to the potential for an increase in traffic noise from Nelson Bay Road on residences R4 and R1, as a result of the removal of the sand on site.</li> </ul>

**Table 3.1 - Project Amendments/Clarification and Impact Assessment**

Project Element	Amendment/Clarification	Impact Assessment
		<ul style="list-style-type: none"> <li>Noise modelling recommended that the height of the western mound be raised to a maximum of 8.5 m AHD and the eastern mound be raised to 8 m AHD. This would result in a relative increase in traffic noise from Nelson Bay Road of between 0.6 dB and 1.3 dB for these residences. Details are provided in <b>Appendix C</b>.</li> </ul>
Traffic movements	<ul style="list-style-type: none"> <li>Reduction in truck movements as a result of reduced volume.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced traffic movements clarified in revised Traffic Assessment (<b>Appendix G</b>) #.</li> </ul>

# Should the DoP (in the absence of a DWE response to this issue) determine that it is not necessary to restrict the extraction from within 40 m of GDE's on the site, the Traffic Assessment modelled the resultant higher volume (635,050 m<sup>3</sup>) of material that would be extracted.

## Statement of Commitments

### 4.1 Statement of Commitments

A revised Statement of Commitments has been prepared based on the amendments to the project and responses provided by Orogen to submissions on the project. Details are provided in **Table 4.1**.

**Table 4.1 - Statement of Commitments**

Impacts	Mitigation Measures
Air Quality	<ul style="list-style-type: none"> <li>Disturb only the minimum area necessary for extraction. Reshape, topsoil and rehabilitate completed extraction areas as soon as practicable after the completion of extraction.</li> <li>Maintain exposed working face in a moist condition using water carts to minimise wind-blown and traffic-generated dust.</li> <li>All roads and trafficked areas will be watered as required using water trucks/carts to minimise the generation of dust.</li> <li>All haul roads will have edges clearly defined with marker posts or equivalent to control their locations.</li> <li>Obsolete roads will be ripped and re-vegetated. There will be no obsolete roads.</li> <li>All loads leaving the site are adequately covered to prevent wind blowing dust from trucks during transit.</li> <li>To prevent windblown movement of sand across the ground surface, a 2 m high shade cloth barrier will be erected at the crest of mounds located on the western side of the site.</li> <li>Construction of mounds will not disturb the root zone of any vegetation located adjacent to the boundary with residential dwellings to the west of the site.</li> </ul>
Soils	<ul style="list-style-type: none"> <li>Site surface drainage should be installed where required to intercept up-slope overland surface run-off flows and to restrict overland surface flows from flowing on to areas adjacent to structures.</li> <li>Active extraction areas will be protected with appropriately designed and constructed silt fencing.</li> <li>Following cessation of extraction from each cell, the soil should be immediately stabilised with ground cover vegetation such as fast growing sterile rye grass.</li> <li>An erosion control plan will be developed in accordance with relevant guidelines prior to the commencement of construction.</li> <li>All excavation and fill batter slopes will be battered at a maximum gradient of 2H:1V (temporary batters).</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>Areas adjacent to the low lying areas in the south-western portions of the site will be protected from the potential for off-site surface discharge of sediment through the construction of</li> </ul>

**Table 4.1 - Statement of Commitments**

Impacts	Mitigation Measures
	<p>mounds (primarily for noise and visual amenity). While the mounds will be re-vegetated, the base of the lee-side of the mounds will be screened with silt fencing, to prevent the export of material off the mounds in the event of extreme rainfall events.</p> <ul style="list-style-type: none"> <li>• Vehicles operating on site will be regularly checked and maintained to prevent the loss of oil/grease from machinery. Any repairs/maintenance and parking of machinery should be undertaken on a dedicated compacted road base pad to be constructed on the site.</li> <li>• A Soil and Water Management Plan (SWMP) will form part of the Environmental Management Strategy for the project. The SWMP will specifically provide contingency plans for events that have the potential to contaminate the aquifer, in accordance with Department of Water and Energy requirements.</li> </ul>
Bushfire	<p>Precautions be undertaken to protect demountable office building on the site from risk of airborne embers that may originate from bushfires in the vicinity of the site. These include:</p> <ul style="list-style-type: none"> <li>• Demountable building to comply with Level 1 construction in accordance with AS 3959-1999.</li> </ul>
Terrestrial Ecology	<ul style="list-style-type: none"> <li>• The extent of the extraction area, including the noise/visual mounds must be accurately surveyed and marked in the field with marker pegs by a registered surveyor.</li> <li>• Machinery, sand and any other materials associated with the sand extraction works must not be stored or stockpiled within any areas outside the defined boundaries for the extraction area.</li> <li>• No machinery or other items (other than the entrance fencing) associated with the sand extraction are to be parked, driven or located within any areas outside the defined boundaries for the extraction area.</li> <li>• Sediment fencing should be established around the boundaries of the proposed extraction area.</li> <li>• Retain large trees including any Koala feed trees or those containing hollows located within the areas proposed to be re-contoured.</li> <li>• Vegetation removal for each 'cell' should be undertaken in progressive manner, with no more than two cells operational (ie. one extraction, one cleared) at any one time.</li> <li>• Upon completing the extraction of one 'cell', the soil should be immediately stabilised with ground cover vegetation such as fast growing sterile rye grass.</li> <li>• The removal of any hollow bearing trees must be undertaken with the presence of a qualified ecologist. Any injured fauna should be captured where possible and taken to the local wildlife carer.</li> <li>• Any trees requiring ecological supervision must be marked in the field with flagging tape, and the relevance of this communicated to the supervisor responsible for the clearing contractors.</li> <li>• The hollow bearing trees will need to be checked for their suitability for re-erection (eg.</li> </ul>



**Table 4.1 - Statement of Commitments**

Impacts	Mitigation Measures
	<p>damage upon felling).</p> <ul style="list-style-type: none"> <li>Any trees to be cleared, and those within the vicinity of the tree being felled must be checked for inhabiting fauna immediately prior to felling. In particular, the crowns will need to be inspected for occupation by Koalas prior to removal. This may be undertaken by the machinery operators or site manager.</li> <li>Any trees found to contain a Koala, or trees within felling distance of any tree with a Koala in the crown must not be removed until the Koala has vacated the area by its own free will.</li> <li>All vegetation to be removed, particularly large trees, must be felled away from the adjoining retained vegetation.</li> <li>An ecological site induction notice will need to be prepared and signed by all relevant personnel involved with the clearing operations.</li> <li>A Revegetation Plan will be prepared as a component of the Environmental Management Strategy (EMS), which outlines a revegetation program for the Dry Woodland/Open Forest and Dry Woodland/Shrubland. The revegetation will contain 1.92 ha of replanting to offset the vegetation to be cleared for the project.</li> <li>The Revegetation Plan will contain a commitment to manage the offset planting in perpetuity through the implementation of a restrictive covenant over the revegetated areas of the site.</li> <li>A weed management program will be prepared and implemented for the site as part of the Revegetation Plan.</li> <li>The hollow bearing trees requiring removal are to be re-erected within the retained communities, preferable the Dry Woodland/Open Forest. If the hollow trees are found to be not suitable for re-erection upon felling, then suitable nest boxes must be installed as an alternative.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Construction is to occur in DECC approved hours.</li> <li>No truck haulage outside of normal working hours.</li> <li>Avoid compression braking in proximity of residences.</li> <li>Cover loads, ensure all tailgates are secured to eliminate rattling noises.</li> <li>Construction of noise mound as indicated on development plans. Western mound to be 8.5 m AHD adjacent to residence R4. Eastern mound to be 8.0 m AHD adjacent to Nelson Bay Road.</li> <li>Selection of low noise emission plant.</li> <li>Use of 'duck quaker' style reverse beepers. This style of reverse beep is less intrusive;</li> <li>Locating the tub grinder on the eastern side of the site with no direct line of sight to nearest residences (if possible).</li> <li>Operators not to leave plant idling when not in use.</li> <li>Temporary noise barriers (erect hoarding adjacent to work areas as required).</li> <li>Educate contractors about quieter work practices (this can be particularly useful with regard to</li> </ul>

**Table 4.1 - Statement of Commitments**

Impacts	Mitigation Measures
	<p>limiting maximum noise levels).</p> <ul style="list-style-type: none"> <li>• Undertake liaison with local residences identified in the Noise Impact Assessment, preferably by direct contact.</li> </ul>
Indigenous Cultural Heritage	<ul style="list-style-type: none"> <li>• Aboriginal Cultural Heritage management strategies, including mitigation measures and active consultation with the relevant local Aboriginal communities will be undertaken throughout the development process.</li> <li>• The persons responsible for the management of any works on site will ensure that all staff, contractors and others involved in construction and maintenance related activities are made aware of the statutory legislation protecting sites and places of significance.</li> <li>• The collection of artefacts will occur prior to all works on the site and will be undertaken using a systematic pedestrian methodology. Worimi LALC and Mu-roo-ma Inc. representatives will undertake this work.</li> <li>• Should any items of indigenous cultural heritage be uncovered during the project, work in the area would cease immediately and the area cordoned off. Representatives of the Worimi LALC/Mu-roo-ma Inc. and a NPWS representative would be contacted to provide advice regarding appropriate action.</li> <li>• If human remains are located during the project, all works are to halt in the immediate area to prevent any further impacts to the find or finds. The local Police and the DECC are to be notified. If the remains are found to be of Aboriginal origin and the Police consider the site not an investigation site for criminal activities, the DECC is to be contacted and notified of the situation. Works are not to resume in the designated area until approval in writing from the Police and the DECC.</li> <li>• A 'care and control' agreement will be negotiated with the relevant Aboriginal Communities for any salvaged objects removed (and resited) from the project area.</li> </ul>
Traffic	<ul style="list-style-type: none"> <li>• All trucks will access the site via Coxs Lane.</li> <li>• Weight limit on Coxs Lane between Nelson Bay Road and the site entrance to be upgraded in accordance with Council's specifications.</li> <li>• As part of the development, a truck shakedown will be required within the site boundary.</li> <li>• An internal haul road will be constructed as part of the development.</li> <li>• The layout of the main access/Coxs Lane intersection will be designed in accordance with RTA and Council requirements, taking into account the traffic flows and the speed environment.</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• Environmental Management Strategy prepared incorporating details of all proposed safeguards and mitigation measures.</li> </ul>

## Appendix A

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GOVERNMENT AUTHORITY AND PUBLIC SUBMISSIONS RECEIVED

## Appendix B

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RESPONSE TO DWE SUBMISSION

## Appendix C

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### ADDITIONAL INFORMATION – NOISE MODELLING

## Appendix D

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ADDITIONAL INFORMATION – THREATENED ORCHIDS SURVEYS

## Appendix E

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REVISED EXTRACTION DESIGN  
REVISED SITE ENTRANCE DESIGN

## Appendix F

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FLORE AND FAUNA ASSESSMENT – REVISED SITE ENTRANCE



## Appendix G

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### REVISED TRAFFIC ASSESSMENT