

# URS

## Report

### ABH Compliance Assessment Report (EPBC 2008/4506)

AUSTRALIA



## Augusta Boat Harbour 2014 Compliance Assessment Report (EPBC 2008/4506)

17 December 2014  
42908044 : M&C3883/R1771/0

Prepared for:  
Department of Transport

Prepared by URS Australia Pty Ltd





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(EPBC 2008/4506)

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Compliance Assessment Report  
(EPBC 2008/4506)

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## ABBREVIATIONS

<b>Abbreviation</b>	<b>Description</b>
CCTV	Closed circuit television
db	decibels
DEC	Department of Environment and Conservation
DoE	Department of Environment
DoT	Department of Transport
DPaW	Department of Parks and Wildlife
DRF	Declared Rare Flora
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EP Act	<i>Environmental Protection Act 1986</i>
EPA	Environmental Protection Authority
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
ha/s	Hectare/s
m	metres
MFO	Marine fauna observer
NGIA	Nursery and Garden Industry of Australia
MNES	Matters of National Environmental Significance
MNMP	Marine Noise Management Plan
OEC	Onshore Environmental Consultants
URS	URS Australia
SREMP	Site Rehabilitation Environmental Management Plan
WA	Western Australia

## EXECUTIVE SUMMARY

In October 2008, the Shire of Augusta Margaret River (the Shire) submitted the Augusta Boat Harbour Proposal to Department of Environment (DoE), formally known as Department of Sustainability, Environment, Water, Population and Communities, for consideration and assessment under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). On 22 August 2011 the Shire was granted approval under the EPBC Act (EPBC 2008/4506) to construct a boating facility at Flat Rock Augusta, Western Australia.

Under a management order of the Western Australian Department of Regional Development and Lands, the Augusta Boat Harbour reserve 51096 was established for the designated purpose of "Boat Launching Facility", and proclaimed in January 2012. The Shire transferred ownership of the EPBC Approval (EPBC 2008/4506) to the Department of Transport (DoT) under Section 145B of the EPBC Act on 9 August 2012 (DoE 2012). The DoT is the responsible agency to whom the care, control and management of the reserve lies.

Under Condition 3 of EPBC 2008/4506, a compliance assessment report is required to be published on the Proponent's (DoT's) website by 27 December each year. Condition 3 also requires DoT to report any non-compliance with any conditions of approval to DoE at the same time the compliance report is published.

The compliance report addresses the status and compliance of the Augusta Boat Harbour Project against the conditions referred to in EPBC 2008/4506 for works carried out during the reporting period 27 September 2013 to 26 September 2014. Accordingly, this is the third compliance report to be prepared under EPBC 2008/4506 for the Augusta Boat Harbour Project.

The DoT complied with all conditions referred to in approval EPBC 2008/4506 for the current reporting period. The complete audit findings have been provided in the Compliance Assessment Audit Table (Appendix F), including reference to supporting evidence where applicable. Any change in commitment status from the previous report period (2012/2013) has been summarised within this report.

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## 1 INTRODUCTION

### 1.1 Background

The Augusta Boat Harbour is a State funded initiative to provide recreational and commercial boating facilities to the State's South West region. The project is community driven, arising from the need for a boating facility to provide safe navigation and mooring in the Southern Ocean waters off Augusta, Western Australia.

The Augusta Boat Harbour proposal was initially referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986* (EP Act) in accordance with Section 38(1) in October 2007, to determine the level of assessment required. In October 2008, the EPA set the level of assessment as "Not Assessed – Public Advice Given and Managed Under Part V of the EP Act".

In October 2008 the Augusta Boat Harbour proposal was referred to the Department of Environment (DoE), previously known as Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), for approval under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). In November 2008, the proposal was deemed a controlled action under the EPBC Act, requiring assessment and approval under that Act.

The controlling provisions were identified as Listed Threatened Species and Communities (Sections 18 and 18a). Project approval was granted by DoE in August 2011 (EPBC 2008/4506), pending the approval of two management plans; the Site Rehabilitation Environmental Management Plan (SREMP) (Onshore Environmental Consultants [OEC] 2011) and Marine Noise Management Plan (MNMP) (Oceanica 2011). The original management plans were approved by DoE on 20 September 2011. More recently the SREMP was revised to include an expansion to the site quarry. The SREMP has undergone two revisions since the original approval, including Version 11 which was approved by DoE on 23 November 2011, and Version 12 (quarry expansion), approved on 17 October 2012.

Following the approval of the project and the required management plans, construction of the boat harbour commenced on 27 September 2011. As required under EPBC Approval (EPBC2008/4506) Condition 1, the Proponent notified DoE within 30 days of the commencement of the action.

The Shire of Augusta (the Shire), as the Proponent of the Augusta Boat Harbour Project at the time, was issued with an approval under the EPBC Act (EPBC 2008/4506) to construct a boating facility at Flat Rock, Augusta on 22 August 2011 (DSEWPaC 2011). Under a management order of the Western Australian Department of Regional Development and Lands, the Augusta Boat Harbour Reserve 51096 was established for its designated purpose of "Boat Launching Facility" and proclaimed in January 2012. The purpose was subsequently amended to "Harbour Purposes" in July 2012. The Shire transferred the ownership of the EPBC 2008/4506 to the Department of Transport (DoT) under Section 145B of the EPBC Act on 9 August 2012 (DSEWPaC 2012). The DoT is the responsible agency to whom the care, control and management of the Augusta Boat Harbour Reserve lies.

## **1.2 Purpose of this Document**

This report addresses the status and compliance of the Augusta Boat Harbour Project with the conditions referred to in EPBC 2008/4506 (Appendix A). Specifically, this compliance report has been prepared for the purpose of meeting the requirements of Condition 3 of EPBC 2008/4506.

Condition 3 of EPBC 2008/4506 requires DoT (as the Proponent) to submit a compliance report by 27 December each year, addressing compliance against the conditions referred to in EPBC 2008/4506 for works carried out during the reporting period 27 September 2013 to 26 September 2014, including implementation of any actions associated with the management plans as specified in the conditions.

## **1.3 Statutory Approvals**

### ***1.3.1 Environmental Protection Act 1986***

As described in Section 1.1, the EPA set a level of assessment for the project as “Not Assessed – Public Advice Given and Managed Under Part V of the EP Act”. The Proponent is therefore not required to audit or report to the EPA.

#### ***1.3.1.1 Clearing Permit (CPS 3990/2) Annual Reporting Requirements***

The DoT was granted a clearing permit (CPS 3990/1) on 7 July 2011 from the Department of Parks and Wildlife (DPaW), previously known as Department of Environment and Conservation (DEC). DoT sought a new clearing permit, which superseded the initial clearing permit to reflect a slight modification to the project disturbance footprint. An amended permit was issued on 3 October 2011 (CPS 3990/2) which permitted the removal of 3.7 hectares (ha) of native vegetation over a period of five years. A third amendment to this clearing permit was approved on 20 September 2012 (CPS 3990/3) to incorporate the expansion to the quarry and allowed for the clearing of up to 3.82 ha of native vegetation. The clearing permit contains several conditions of approval such as record keeping and annual reporting. The permit stipulates an annual written report is required before 30 June of each year for clearing activities undertaken at the Augusta Boat Harbour site, covering the period January to December of the previous year. The DoT submitted the third Clearing Permit Annual Report accordingly in June 2014 for activities undertaken in the previous year (Appendix B).

## **1.4 Environmental Protection and Biodiversity Conservation Act 1999**

### ***1.4.1 EPBC Approval***

The Flat Rock Boating Facility was approved by the Commonwealth Minister for DoE on 22 August 2011 (EPBC 2008/4506).

In accordance with Condition 4 of the Approval (EPBC 2008/4506), if the Proponent wishes to carry out any activity otherwise than in accordance with the management plans, and as specified in the conditions, the Proponent must seek approval from the Environment Minister.

During construction of the harbour an area of hard rock was encountered that was unable to be removed by the approved methods of excavation and drilling (methods specified in the



approved management plans). Alternatives for rock removal were investigated and a short program of underwater explosive detonations was proposed (activity not described in management plans).

An environmental assessment of the potential impacts of noise and vibration generated through blasting on marine fauna was undertaken and provided to the DoE on 10 December 2013 (Appendix C). The outcome of the assessment was that most of the noise and vibration generated during blasting would be contained within the harbour breakwaters and therefore unlikely to have a significant impact to marine fauna in the area (considered to be matters of national environmental significance). No further assessment was required by the DoE.

There have been no further activities carried out otherwise than in accordance with the management plans and there has been no request for changes to either management plans.

#### **1.4.2 Performance and Compliance Reporting**

Condition 3 requires the preparation of compliance reports to address the status of implementation of management plans and evidence of compliance with the conditions of approval. This is the third performance and compliance report for the project. As stated in Section 1.3.1, the report details the status of compliance with the conditions and commitments outlined in the EPBC Approval (EPBC 2008/4506) that needs to be reported within three months of every 12 month anniversary of the action.

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## 2 PROJECT CURRENT STATUS

### 2.1 Project Description

DoT is the Proponent and the organisation undertaking the action to construct and operate a boat harbour south of the Augusta town site, Western Australia. The harbour will service both the public and a small component of the commercial fishing industry, providing boat-launching facilities, boat pens, tourist information and cafés/shops. The harbour is located south of the Augusta town site along Leeuwin Road, opposite Skippy Rock Road.

Preliminary site works commenced at the harbour site on 27 September 2011, and harbour construction activities were completed in late November 2014.

Figure 2-1 shows the location of the harbour site, approximately five kilometres south of the town of Augusta.

### 2.2 Current Project Activities

The construction and rehabilitation activities that were completed during the reporting period (27 September 2013 to 26 September 2014) include:

#### *Construction*

The construction activities during the reporting period included the delivery of the Civil Works, Maritime Structures and Landscape and Building Works contracts. The key activities under each contract are summarised below:

- Civil Works – car and trailer parking for 160 vehicles, car parking for 80 vehicles, earthworks, roads, drainage, paths, CCTV, lighting, power, water, sewer treatment facility.
- Maritime Structures – four lane boat launching facility with floating finger jetties, 50 metres (m) land-backed wharf, 40 boat pens for commercial and recreational vessels, and navigation aids.
- Landscape and Building Works – amenities building including public toilets, pavilion, waste oil storage shed, paths, soft and hard landscaping and retaining walls.
- Other minor works completed included fencing and services installation.

#### *Rehabilitation*

An assessment of the rehabilitation progress was completed by OEC between 15 and 16 November 2013, and reported in the Augusta Boat Harbour 2013 Annual Rehabilitation Assessment Report (OEC 2014) provided in Appendix D. At the time of the rehabilitation assessment (November 2013) with rehabilitation aged 17 months, all targets for completion criteria associated with the planning, pre-clearing, pre-rehabilitation and establishment stages of the 2012 rehabilitation block were achieved and compliant.

Weed management over the whole harbour site was undertaken during the reporting period, including targeted spraying for arum lily and broad-scale spraying for grass species.

Vermin control was undertaken in November and December 2013. The Rabbit Haemorrhagic Disease Virus (RHDV) was released in November, a time when flies (vectors) were abundant, to allow for the spread of the disease to surrounding areas, reducing the instance of re-ingression to site. Pindone baiting and warren fumigation was undertaken in a three part program to target any remnant population of rabbits on site.

Two native rehabilitation blocks were completed in mid-2014. Block 1, an area either side of the entry gate adjacent to Leeuwin Road and Block 2, an area adjoining the 2012 rehabilitation where site offices were originally positioned.

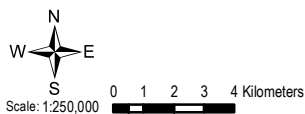
The rehabilitation of Block 1 included re-contouring of a landform around the entry road and redirecting surface water along a drainage channel to prevent flooding.

At both sites, replacement of subsoil and topsoil, planting and direct seeding was undertaken. All plant stock was purchased from Carramar Coastal Nursery, a member of the Nursery and Garden Industry of Australia (NGIA) and adheres to the NGIA policies with respect to purchase and use of soil media and dieback management.

At the request of DPaW, a health assessment of the Declared Rare Flora (DRF) *Kennedia lateritia* was undertaken. This report has been provided in Appendix E for information only, as it was not at the request of DoE.



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DEPARTMENT  
OF  
TRANSPORT

**AUGUSTA BOAT HARBOUR**

**REGIONAL  
LOCATION**

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## 3 COMPLIANCE

### 3.1 Compliance Assessment Method

An audit of the Augusta Boat Harbour site was conducted on 13 November 2014 to facilitate the assessment of compliance against EPBC 2008/4506 Approval Conditions and the implementation of required management plans (SREMP and MNMP). The audit was conducted by Arnica Di Lollo and Tanya Carpenter of URS Australia Pty Ltd (URS).

The following personnel were interviewed by URS during the site audit:

- Stephen Smith (DoT Project Manager);
- Peter Walker (DoT Site Supervisor); and
- Pui Mun Shum (DoT Site Engineer)
- Darren Brearley of Onshore Environmental Consultants (OEC)

The terminology used during the site audit to define the level of compliance is listed below:

1. Compliant: Implementation of the proposal has been carried out in accordance with the requirements of the audit element.
2. Not Applicable /Not Required: The requirements of the audit element were not triggered during the reporting period or were no longer applicable to the reporting period.
3. Partially non-compliant: Implementation of the proposal has been partially implemented, however has not been carried out in accordance with all of the requirements of the audit element.
4. Non-compliant: Implementation of the proposal has not been carried out in accordance with the requirements of the audit element.

The information reviewed and the evidence obtained during this audit has been presented within the Compliance Assessment Audit Table (Appendix F), along with additional information gathered during a desktop study/investigation.

### 3.2 Summary Audit Table

Further details on compliance with the conditions and management plans are presented within the summary audit table (Table 3-1). There were no items previously reported as non-compliant or partially non-compliant during the 2012/2013, therefore only relevant reference items such as the approval conditions have been included in the summary table. A comprehensive Compliance Assessment Audit Table is provided in Appendix F.

A large number of the activities/commitments associated with implementation of the MNMP and the SREMP were not relevant for the current reporting period as they were either completed during the previous years' activities, or were not part of the current year's work schedule. These items were reported as Not Applicable.

**Table 3-1 Summary Audit Table**

Ref	Compliance Reference	Subject	Requirement	Status	Comments
1	EPBC Approval Instrument (EPBC2008/4506)	Notification of commencement	Within 30 days after commencement of the action, the person taking the action must advise the Department in writing of the actual date of commencement.	Compliant	Letter from Oceanica on behalf of DoT dated 14 October 2011 to DoE, advising that works to implement the Augusta Boat Harbour commenced on 27 September 2011 at which time temporary fencing was installed around the designated site access road area.
2	EPBC Approval Instrument (EPBC2008/4506)	Maintenance of records	Maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plan required by this approval and make them available to the Department. May be subject to auditing by the Department.	Compliant / Not required at this stage	Accurate records are maintained and evidence provided in each annual compliance report, annual report for DEC clearing permits.  No requests were made by the Department during the compliance assessment reporting period for records substantiating activities associated with, or relevant to, the conditions of approval.
3	EPBC Approval Instrument (EPBC2008/4506)	Compliance reporting	Within 3 months of every 12 month anniversary - a report must be published on the website addressing compliance with approval. Must include date of publication and non-compliance with any condition.	Compliant	This report is the third annual compliance report to be prepared under EPBC Statement No. 2008/4506.  No non-compliances were recorded against any of the conditions of the approval EPBC 2008/4506.
4	EPBC Approval Instrument (EPBC2008/4506)	Revisions to Ministerial Deliverables	If DoT wish to carryout activates other than in management plans - must submit to DSEWPaC written approval and revised management plan.	Compliant	DoT provided DoE with an environmental impact assessment for a minor underwater blasting campaign within the harbour. The findings of the assessment and DoE's view was that the proposed blasting was unlikely to have a significant impact to matters of national environmental significance (MNES).
5	EPBC Approval Instrument (EPBC2008/4506)	Threatened species and communities	If minister believes it necessary for better protection of threatened species and communities, they may request revision of management plans.	Not required at this stage	No such requests were received by DoT during the compliance assessment reporting period.
6	EPBC Approval Instrument	Commencement	If, work has not commenced within 5 years of approval issued, then the	Not required	Letter from Oceanica on behalf of DoT dated 14 October 2011 to DoE, advising that works to implement the Augusta Boat Harbour commenced



Ref	Compliance Reference	Subject	Requirement	Status	Comments
	(EPBC2008/4506)	of action	proponent must seek written approval from Minister.	at this stage	on 27 September 2011 at which time temporary fencing was installed around the designated site access road area.
7	EPBC Approval Instrument (EPBC2008/4506)	Conservation of significant vegetation and rehabilitation	<p>Develop a SREMP to mitigate impact to <i>Kennedia Lateritia</i> must include:</p> <p>Overview of existing environment objectives:</p> <ul style="list-style-type: none"> <li>• Clearing Protocols</li> <li>• Perimeter fencing / security of rehabilitation areas and existing locations of Augusta –Kennedia</li> <li>• Rehabilitation activities / program, including figures showing rehabilitation sites</li> <li>• Maintenance of site incl. vermin control, fire management, pest management and weed control</li> <li>• Timing and implementation of the above monitoring and reporting.</li> </ul>	Compliant	DoT in consultation with OEC developed the SREMP to address the criteria specified within the approval conditions. The original SREMP was submitted to DoE and approved on 20 September 2011, the most recent revision (Version 12), was approved by DoE on 17 October 2012.
8	EPBC Approval Instrument (EPBC2008/4506)	Ministerial deliverable	The SREMP must be submitted to and approved by the minister prior to construction commencing	Compliant	Both the MNMP and the original SREMP were approved by DoE 20 September 2011. First ground works commenced on 27 September 2011.
9	EPBC Approval Instrument (EPBC2008/4506)	Conservation of significant vegetation	Only 12 peppermint trees of 1.5 m or greater are to be cleared.	Compliant	Clearing of vegetation occurred on 5 October 2011. DEC WRP Clearing procedures were complied with. Letter report from Green Iguana confirms clearing of 12 peppermint trees (Report dated 26 October 2011).
10	EPBC Approval Instrument (EPBC2008/4506)	Conservation of marine fauna	<p>Develop a MNMP that includes:</p> <ul style="list-style-type: none"> <li>• Exclusion Zone and mitigation measures during the months of April - November during blasting activities</li> </ul>	Compliant	DoT in consultation with Oceanica developed a MNMP to address the criteria specified within the approval conditions. The MNMP was submitted to DoE and approved on 20 September 2011. The most recent revision was approved by DoE on 7 September 2012.

Ref	Compliance Reference	Subject	Requirement	Status	Comments
			<ul style="list-style-type: none"> <li>Blasting time restrictions</li> <li>Exclusion zones and mitigation measures during drilling, if breakwater has not been constructed prior to drilling commences</li> <li>Drilling methodology</li> <li>Post blast / drill fauna inspection reporting of dead fauna</li> <li>Timing and implementation of above measure</li> </ul>		
11	EPBC Approval Instrument (EPBC2008/4506)	Ministerial deliverable	MNMP must be submitted and approved by the Minister prior to construction	Compliant	Both the MNMP and the initial SREMP were approved by DoE 20 September 2011. First ground works commenced on 27 September 2011.
12	EPBC Approval Instrument (EPBC2008/4506)	Publication of Ministerial Deliverables	Publish all management plans on the website within one month of being approved.	Compliant	<p>Management plans are available on the DoT website (refer to link).</p> <p>Project Manager confirmed that management plans were available on the website within one month of approval, and that each revision of the management plans have also been made available, following approval by regulators.</p> <p><a href="http://www.transport.wa.gov.au/imate/australia-boat-harbour.asp">http://www.transport.wa.gov.au/imate/australia-boat-harbour.asp</a></p>

### **3.3 Reporting on Instances of Non-compliance**

Condition 3 of EPBC 2008/4506 requires that the annual compliance report addresses compliance and non-compliance with the conditions of EPBC 2008/4506. There were no identified instances of non-compliance with EPBC 2008/4506 during the reporting period. The compliance status of all conditions is presented within the summary table above (Table 3-1).

Many of the commitments made within the MNMP were not relevant to this reporting period as no land-based blasting was undertaken. One round of underwater blasting was carried out within the harbour to remove an area of hard rock. This was completed in accordance with the MNMP and relevant impact mitigation measures, including having a marine fauna observer (MFO) on site prior to blasting (MFO sighting form Appendix C).

Based on the information received and reviewed, the Proponent has demonstrated compliance with the conditions of Approval EPBC 2008/4506 and all of the commitments listed within the SREMP and those relevant commitments listed in the MNMP.

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## 4 PUBLIC AVAILABILITY OF THE REPORT

In accordance with Condition 3 of EPBC 2008/4506 DoT must publish an annual compliance report on the DoT website by 27 December of each year following the commencement of the project.

Accordingly, this is the third compliance report addressing compliance with EPBC 2008/4506 to be added to the DoT website.

A copy of the most recent compliance report will be placed on the DoT website until the subsequent annual compliance report is placed on the website.

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## REFERENCES

DSEWPaC 2011, *Approval Flat Rock Boating Facility, Augusta, WA (EPBC2008/4506)*. Department of Sustainability, Environment, Water, Population and Communities.

DSEWPaC 2012, *Notice of Transfer of Approval. Flat Rock Boating Facility, Augusta, WA (EPBC 2008/4506)*. Dated 9 August 2012. Department of Sustainability, Environment, Water, Population and Communities.

OEC 2011, *Augusta Boat Harbour, Site Rehabilitation and Environmental Management Plan (SREMP) Version 11*. Prepared for Department of Transport by Onshore Environmental Consultants Pty Ltd.

OEC 2012, *Augusta Boat Harbour, Site Rehabilitation and Environmental Management Plan (SREMP) Version 12*. Prepared for Department of Transport by Onshore Environmental Consultants Pty Ltd.

OEC 2014, *Augusta Boat Harbour, 2013 Annual Rehabilitation Assessments*. Prepared for Department of Transport by Onshore Environmental Consultants Pty Ltd.

Oceanica 2011, *Augusta Boat Harbour, Marine Noise Management Plan*. Prepared for Shire of Augusta-Margaret River by Oceanica Consultants Pty Ltd, Report No. 458\_004/1.

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## 6 LIMITATIONS

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Department of Transport and only those third parties who have been authorised in writing by URS to rely on this Report.

It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this Report.

It is prepared in accordance with the scope of work and for the purpose outlined in the contract dated 15 March 2012 No. 0043/06.

Where this Report indicates that information has been provided to URS by third parties, URS has made no independent verification of this information except as expressly stated in the Report. URS assumes no liability for any inaccuracies in or omissions to that information.

This Report was prepared between October and December 2014, and is based on the conditions encountered and information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This Report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This Report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

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It is the responsibility of third parties to independently make inquiries or seek advice in relation to their particular requirements and proposed use of the site.

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**Approval**

**Flat Rock Boating Facility, Augusta, WA (EPBC2008/4506)**

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

**Proposed action**

**person to whom the approval is granted**

Chief Executive Officer - Shire of Augusta-Margaret River

**proponent's ACN (if applicable)**

13 643 296 019

**proposed action**

The construction of a boating facility at Flat Rock, 5km south of Augusta, WA, comprising dual-lane boat ramps, boat pens, a service wharf for vessels over 20m, breakwaters extending into Flinders Bay, and land-side facilities including a car park, toilet block, water and lighting. [See EPBC Act referral 2008/4506].

**Approval decision**

<b>Controlling Provision</b>	<b>Decision</b>
Listed threatened species and communities (sections 18 & 18A)	Approved

**conditions of approval**

This approval is subject to the conditions specified below.

**expiry date of approval**

This approval has effect until 31 December 2021.

**Decision-maker**

**name and position**

Barbara Jones  
Assistant Secretary  
Environment Assessment Branch

**signature**

**date of decision**

22 August 2011

## Conditions attached to the approval

---

1. Within 30 days after the commencement of the action, the person taking the action must advise **the Department** in writing of the actual date of commencement.
2. The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plan(s) required by this approval, and make them available upon request to **the Department**. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the **EPBC Act**, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on **the Department's** website. The results of audits may also be publicised through the general media.
3. Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to **the Department** at the same time as the compliance report is published.
4. If the person taking the action wishes to carry out any activity otherwise than in accordance with the management plan(s) as specified in the Conditions, the person taking the action must submit to **the Department** for the **Minister's** written approval a revised version of that management plan(s). The varied activity shall not commence until the Minister has approved the varied management plan(s) in writing. The **Minister** will not approve a varied management plan(s) unless the revised management plan(s) would result in an equivalent or improved environmental outcome over time. If the **Minister** approves the revised plan(s), that management plan(s) must be implemented in place of the management plan(s) originally approved.
5. If the **Minister** believes that it is necessary or convenient for the better protection of listed threatened species and communities to do so, the **Minister** may request that the person taking the action make specified revisions to the management plan(s) specified in the Conditions and submit the revised management plan(s) for the **Minister's** written approval. The person taking the action must comply with any such request. The revised approved management plan(s) must be implemented. Unless the **Minister** has approved the revised management plan(s), then the person taking the action must continue to implement the management plan(s) originally approved, as specified in the conditions.
6. If, at any time after five years from the date of this approval, the person taking the action has not substantially commenced the action, then the person taking the action must not substantially commence the action without the written agreement of the **Minister**.
7. The person taking the action must develop a Site Rehabilitation and Environmental Management Plan to mitigate the impacts to Augusta Kennedia (*Kennedia lateritia*).

The Site Rehabilitation and Environmental Management Plan must include but not be limited to:

- Overview of existing environment;
- Objectives;
- Clearing Protocols;
- Perimeter fencing/security of rehabilitation areas and existing locations of Augusta Kennedia;

- Rehabilitation activities/program, including figures showing rehabilitation sites;
- Maintenance of site including: vermin control, fire management, pest management and weed control;
- Timing and implementation of the above measures; and
- Monitoring and reporting.

The Site Rehabilitation and Environmental Management Plan must be submitted to and approved by the **Minister** prior to **construction** commencing.

8. The person taking the action must ensure that no Peppermint Trees greater than 1.5 m in height are cleared from the site, apart from twelve Peppermint Trees located within the proposed access road at the southern area of the site as shown in Attachment A.
9. The person taking the action must develop a Marine Noise Management Plan to mitigate impacts to **Cetaceans** during quarry blasting and marine drilling operations.

The Marine Noise Management Plan must include but not be limited to:

- Exclusion zones and mitigation measures during the months of April- November during blasting activities;
- Blasting time restrictions;
- Exclusion zones and mitigation measures during drilling, if the breakwater has not been constructed prior to drilling commencing;
- Drilling methodology;
- Post blast/drill fauna inspection;
- Reporting of injured or dead fauna; and
- Timing and implementation of the above measures.

The Marine Noise Management Plan must be submitted to and approved by the **Minister** prior to construction commencing.

10. Unless otherwise agreed to in writing by the **Minister**, the person taking the action must publish all management plans referred to in these conditions of approval on their website. Each Management Plan must be published on the website within 1 month of being approved.

### **Definitions**

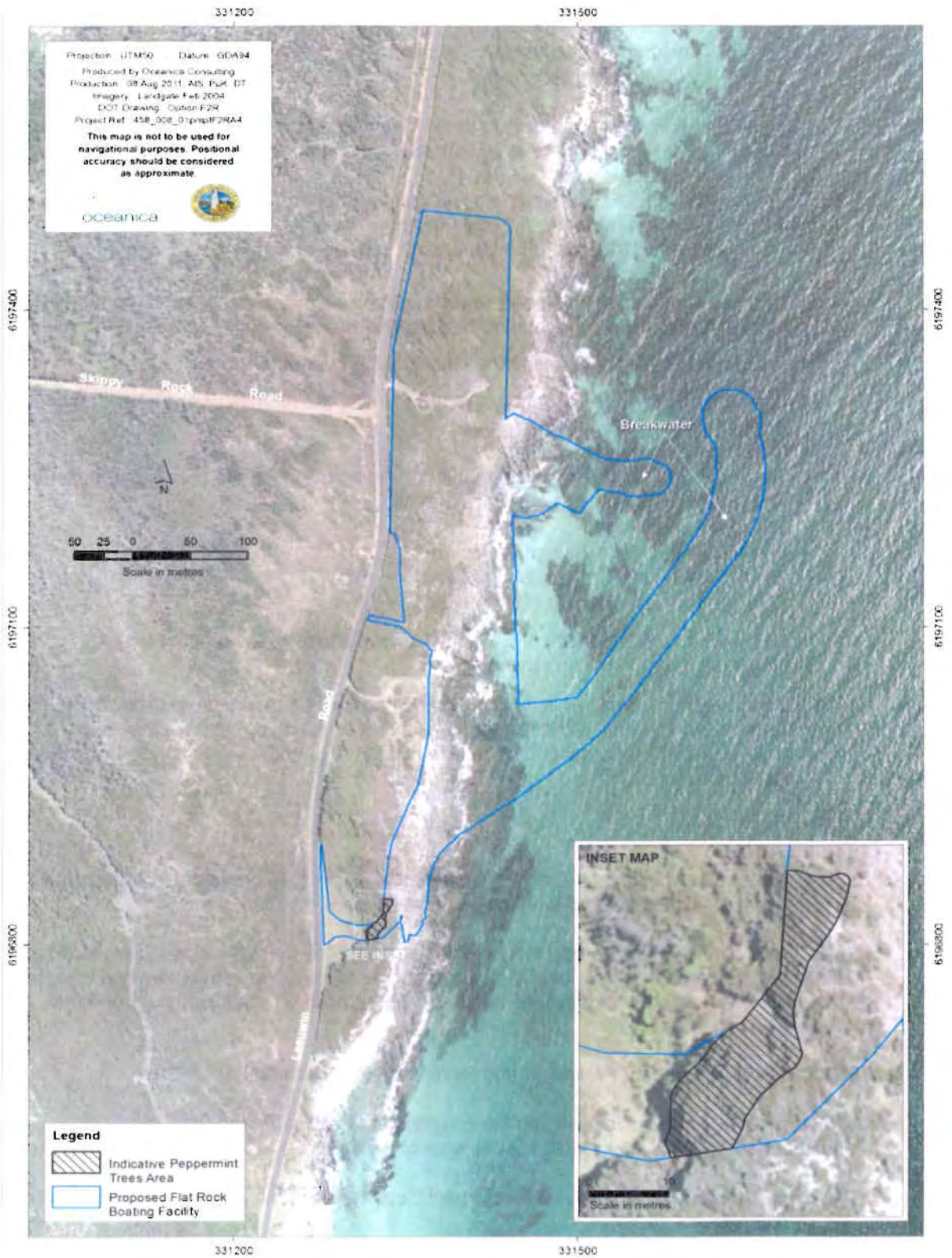
**Cetaceans** are the whales and dolphins identified as vulnerable, endangered and/or migratory under the *Environment Protection and Biodiversity Conservation Act 1999*.

**Construction** includes any preparatory works required to be undertaken including clearing vegetation, the erection of any fences, signage or on-site temporary structures and the use of construction or excavation equipment on site for the purpose of breaking the ground for buildings or infrastructure.

**EPBC** is the *Environment Protection and Biodiversity Conservation Act 1999*.

**Minister** is the Minister administering the *Environment Protection and Biodiversity Conservation Act 1999* and includes a delegate of the Minister.

**The Department** is the Australian Government Department administering the *Environment Protection and Biodiversity Act 1999*.







**APPENDIX B      CLEARING PERMIT ANNUAL REPORT**

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Report

Augusta Boat  
Harbour

AUSTRALIA



## ABH - CPS 3990/3 Clearing Permit Annual Report 2013

23 June 2014  
42908044 : R1744/M&C3810/0

Prepared for:  
Department of Transport

Prepared by URS Australia Pty Ltd



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Appendix C	OEC Site Inspection Reports
Appendix D	Augusta Boat Harbour Photographic Log

## ABBREVIATIONS

<b>Abbreviation</b>	<b>Description</b>
DER	Department of Environment and Regulation
DoT	Department of Transport
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
SREMP	Site Rehabilitation and Environmental Management Plan
GDA	Geocentric Datum Australia
GPS	Global Positioning System
ha	hectares
SREMP	Site Rehabilitation and Environmental Management Plan

## 1 INTRODUCTION

### 1.1 Clearing Permit background

In July 2011 a Clearing Permit application for the Augusta Boat Harbour was submitted by the Shire of Augusta-Margaret River (the Shire) and approved by the Department of Environment and Regulation (DER) (formerly known as the Department of Environment and Conservation). The permit allowed for the clearance of up to 3.6 hectares (ha) of native vegetation on Lot 4126, Leeuwin Rd for the harbour development. Following this, the Shire submitted an amendment to the clearing permit to allow for an increase of clearing by 0.1 ha. This was approved by the DER (CPS 3990/2). The purpose of this increase was to facilitate the implementation of the Site Rehabilitation and Environmental Management Plan (SREMP) and allow for temporary truck laydown and turnaround areas.

During the initial phase of the Augusta Boat Harbour project the Shire was the proponent, working in collaboration with the Department of Transport (DoT). Under a management order of the Western Australian Department of Regional Development and Lands, the *Augusta Boat Harbour Reserve 51096* was established for the designated purpose of “Boat Launching Facility”, and proclaimed in January 2012. The DoT was made the responsible agency with whom the care, control and management of the reserve was vested; this includes complying with the conditions of the Clearing Permit. On 9 August 2012 ownership of the site and the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) Approval (EPBC 2008/4506) was transferred from the Shire to DoT under Section 145B of the EPBC Act.

The DoT submitted an additional clearing permit amendment to the DER for the expansion of the Augusta Boat Harbour Quarry. This amendment was approved on 20 September 2012 (CPS 3990/3) and increased the area allowed for clearing to 3.82 ha (in total) of native vegetation at the harbour site.

### 1.2 Purpose of this report

This Clearing Permit Annual Report delivers the annual reporting requirements for clearing native vegetation in accordance with the conditions set by the DER in Clearing Permit CPS 3990/3 (file number: 2010/007577-3) for the Augusta Boat Harbour project. The permit approves clearing of up to 3.82 ha native vegetation on Lot 4126 on Plan 7032 (Reserve 25141), subject to a number of conditions. The permit requires that DoT report annually on any clearing activities undertaken at the Augusta Boat Harbour site within the reporting period of 1 January to 31 December for each year following the commencement of the Clearing Permit conditions on 1 August 2011. The first Clearing Permit Annual Report was submitted to the DER accordingly on 29 June 2012.

This Clearing Permit Annual Report is for activities undertaken within the reporting period of 1 January 2013 to 31 December 2013.

## 1.3 Clearing Permit conditions

The DoT must comply with the seven conditions provided in Clearing Permit CPS 3990/3, the conditions that require reporting are Conditions 6 and 7, regarding record keeping and reporting (see Appendix A). Section 2 of this report provides evidence that the DoT is in compliance with these conditions, including compliance with the SREMP.



## 2 COMPLIANCE WITH CLEARING PERMIT CONDITIONS

### 2.1 Clearing Permit Condition 6

Condition 6 of Clearing Permit CPS 3990/3 states the following:

*The Permit Holder must maintain the following records for activities done pursuant to this Permit.*

- a) *In relation to the clearing of native vegetation authorised under this Permit:*
  - I. *The species composition, structure and density of the cleared area;*
  - II. *The location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA 94), expressed the geographic coordinates in Eastings and Northings;*
  - III. *The date the area was cleared; and*
  - IV. *The size of the area cleared (in hectares)*
- b) *In relation to the site rehabilitation and environmental management plan pursuant to Condition 4 (see Appendix A), a description of the site rehabilitation and environmental management plan activities undertaken, in accordance with that site rehabilitation and environmental management plan.*

#### 2.1.1 Summary of compliance

##### *Condition 6a*

There was no clearing of vegetation undertaken at the Augusta Boat Harbour site during the reporting period (1 January to 31 December 2013), and therefore no records or details have been provided within this report. A cumulative total of 3.31 ha have been cleared at the site since the approval of the initial Clearing Permit in August 2011. This is less than the 3.82 ha area permitted for clearance (CPS 3990/3).

##### *Condition 6b*

A summary of all rehabilitation activities undertaken at the harbour site within the reporting period have been summarised in Table 2-1.

No spraying was undertaken during the reporting period as weeds represent only a minor component of the revegetation. The spraying program will recommence in early June 2014.

An assessment of the rehabilitation progress was completed by Onshore Environmental Consultants (OEC) between 15<sup>th</sup> and 16<sup>th</sup> November 2013 and reported in the Augusta Boat Harbour 2013 Annual Rehabilitation Assessment Report (OEC 2014), provided in Appendix B. At the time of the rehabilitation assessment (November 2013) with rehabilitation aged 17 months, all targets for completion criteria associated with the planning, pre-clearing, pre-rehabilitation and establishment stages of the 2012 rehabilitation block have been achieved and are compliant.

Three site inspections were conducted by OEC during the reporting period (Appendix C) and a photographic log has been prepared to document the rehabilitation activities undertaken during this reporting period (Appendix D).

**Table 2-1 Rehabilitation and Monitoring Log and Record of Associated Activities**

Date	Location	Activity	Comment	Reference
01/02/2013	Rehabilitation zones	Installation of manual irrigation system	A manual irrigation system (with potable mains water) was installed to supplement water requirements for establishing revegetation during summer.	Appendix C – Site Inspection Reports
12/02/2013	Augusta Boat Harbour Site, including rehab areas	Site Inspection	<p>OEC conducted a site inspection, including:</p> <ul style="list-style-type: none"> <li>• An assessment of the rehabilitation progress, vegetation recruitment, species richness</li> <li>• Judging the effectiveness of shade cloth fencing and soil bunding to protect revegetation</li> <li>• A health assessment of DRF;</li> </ul> <p>and noting that:</p> <ul style="list-style-type: none"> <li>– Soil stability has increased due to vegetation debris spread across rehabilitation site</li> <li>– Weeds continue to represent a minor component</li> <li>– There is minor evidence of grazing from pests.</li> </ul>	Appendix C – Site Inspection Reports

Date	Location	Activity	Comment	Reference
1/07/2013	Augusta Boat Harbour – Rehabilitation site	Site inspection	<p>OEC carried out a site inspection of the rehabilitation sites, approximately 12 months following planting and sowing of the first phase. The inspection report notes:</p> <ul style="list-style-type: none"> <li>• The success of the rabbit control program</li> <li>• That weeds continue to be a minor component, no herbicide program is planned</li> <li>• That DRF is prolific and healthy on the site</li> </ul>	Appendix C – Site Inspection Reports
15/11/2013	Augusta Boat Harbour – Rehabilitation site	Site inspection	<p>OEC completed a site inspection of the rehabilitation area, approximately 16 months following direct sowing and planting of the first phase. The inspection report notes that:</p> <ul style="list-style-type: none"> <li>• Revegetation cover increased significantly and supports a high diversity</li> <li>• Shade cloth has been effective in protecting developing plants</li> </ul>	Appendix C – Site Inspection Reports

Date	Location	Activity	Comment	Reference
15 – 16/11/2013	Augusta Boat Harbour – Rehabilitation site	Annual assessment of rehabilitation	<p>OEC conducted an annual review of the rehabilitation block and the adjacent analogue site. The progress of the rehabilitation block was assessed against completion criteria described within the report, enabling progress to be measured and assessed.</p> <p>Some of the criteria assessed:</p> <ul style="list-style-type: none"> <li>• Species richness (30 species were recorded in 2013)</li> <li>• Plant density (10.09 plants m<sup>2</sup> in 2013)</li> <li>• Revegetation cover (118% in 2013)</li> <li>• Dominant plant taxa</li> </ul> <p>Overall the rehabilitation block has improved and completion criteria have been achieved.</p>	Appendix B – ABH Annual Rehabilitation Assessment (OEC 2013)
2012-2013	Augusta Boat Harbour – Rehabilitation site	Photographic log of rehabilitation progress	A photographic log has been prepared to document the rehabilitation progress from 2012 to 2013	Appendix D – photographic log

## 2.2 Clearing Permit Condition 7

Condition 7 of Clearing Permit CPS 3990/3 states the following:

*a) The Permit Holder must provide to the Chief Executive Officer (CEO) on or before 30 June of each year, a written report:*

- I. Of records required under Condition 6 of this permit; and*
- II. Concerning activities done by the Permit Holder under this Permit between 1 January and 31 December of the preceding year.*

*b) Prior to June 2016, the Permit Holder must provide to the CEO a written report of records required under Condition 6 of this Permit where these records have not been provided under Condition 7 (a) of this Permit.1 .*

### 2.2.1 Summary of compliance

#### *Condition 7a*

This report contains a description of activities undertaken during the reporting period (in accordance with *Condition 6*) and has been submitted prior to the due date, which demonstrates compliance with *Condition 7* of CPS3990/3. There were no concerning activities undertaken by the Permit Holder within this reporting period.

#### *Condition 7b*

This condition is not applicable at this time.

## REFERENCES

Onshore Environmental Consultants (2014). Augusta Boat Harbour 2013 Annual Rehabilitation Assessments. Prepared for Department of Transport February 2014.

## 4 LIMITATIONS

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Department of Transport and only those third parties who have been authorised in writing by URS to rely on this Report.

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It is the responsibility of third parties to independently make inquiries or seek advice in relation to their particular requirements and proposed use of the site.





**APPENDIX A      CLEARING PERMIT CPS 3990/3**



## CLEARING PERMIT

*Granted under section 51E of the Environmental Protection Act 1986*

### PERMIT DETAILS

Area Permit Number: CPS 3990/3

File Number: 2010/007577-3

Duration of Permit: From 1 August 2011 to 1 August 2016

### PERMIT HOLDER

Department of Transport

### LAND ON WHICH CLEARING IS TO BE DONE

Lot 331 on Deposited Plan 71864 (Crown Reserve 51096), Leeuwin

### AUTHORISED ACTIVITY

The Permit Holder shall not clear more than 3.82 hectares of native vegetation within the area hatched yellow on attached Plan 3990/3.

### CONDITIONS

#### 1. Purpose for which clearing may be done

Clearing for the purpose of the Augusta boat harbour development.

#### 2. Application

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

#### 3. Avoid, minimise etc clearing

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:

- (a) avoid the clearing of native vegetation;
- (b) minimise the amount of native vegetation to be cleared; and
- (c) reduce the impact of clearing on any environmental value.

#### 4. Site Rehabilitation and Environmental Management Plan

- (a) By 1 January 2013 the Permit Holder must, prepare and submit to the CEO for the CEO's approval a revised Site Rehabilitation and Environmental Management Plan for Lot 331 on Deposited Plan 71864.
- (b) The Permit Holder shall implement the Site Rehabilitation and Environmental Management Plan approved by the CEO.
- (c) If it is necessary to modify the Site Rehabilitation and Environmental Management Plan, then the Permit Holder must provide that modified Site Rehabilitation and Environmental Management Plan to the CEO for the CEO's approval.

#### 5. Weed control

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

## 6. Records must be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit.

- (a) In relation to the clearing of native vegetation authorised under this Permit:
  - (i) the species composition, structure and density of the cleared area;
  - (ii) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings;
  - (iii) the date that the area was cleared; and
  - (iv) the size of the area cleared (in hectares).
- (b) In relation to the Site Rehabilitation and Environmental Management Plan pursuant to condition 4, a description of the Site Rehabilitation and Environmental Management Plan activities undertaken, in accordance with that Site Rehabilitation and Environmental Management Plan.

## 7. Reporting

- (a) The Permit Holder must provide to the CEO on or before 30 June of each year, a written report:
  - (i) of records required under condition 6 of this Permit; and
  - (ii) concerning activities done by the Permit Holder under this Permit between 1 January and 31 December of the preceding year.
- (b) Prior to 1 June 2016, the Permit Holder must provide to the CEO a written report of records required under condition 6 of this Permit where these records have not already been provided under condition 7(a) of this Permit.

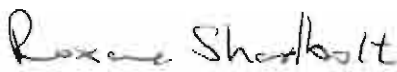
## DEFINITIONS

The following meanings are given to terms used in this Permit:

*fill* means material used to increase the ground level, or fill a hollow;

*mulch* means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation; and

*weed/s* means a species listed in Appendix 3 of the "Environmental Weed Strategy" published by the Department of Conservation and Land Management (1999), and plants declared under section 37 of the *Agriculture and Related Resources Protection Act 1976*.



Roxane Shadbolt  
A/MANAGER  
NATIVE VEGETATION CONSERVATION BRANCH

*Officer delegated under Section 20  
of the Environmental Protection Act 1986*

4 October 2012

# Plan 3990/3



## LEGEND

- Road Centrelines
- Cadastre
- Clearing Instruments
- Areas Approved to Clear
- Local Government Authorities

Augusta Township 29cm  
Orthomosaic - Landgrid  
2004



Scale 1:5000  
(Approximate when reproduced at A4)

Geocentric Datum Australia 1994

Note: the data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies

*R. Shadbolt* Date 4/10/12  
R. Shadbolt

Officer with delegated authority under Section 20 of the Environmental Protection Act 1986

Information derived from this map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.



Department of Environment and Conservation

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## 1. Application details

### 1.1. Permit application details

Permit application No.: 3990/3

Permit type: Area Permit

### 1.2. Proponent details

Proponent's name: Department of Transport

### 1.3. Property details

Property: LOT 331 ON PLAN 71864 (Lot No. 331 LEEUWIN LEEUWIN 6290)

Local Government Area: Shire of Augusta - Margaret River

Colloquial name: Augusta Boat Harbour

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
3.82		Mechanical Removal	Building or Structure

### 1.5. Decision on application

Decision on Permit Application: GRANT

Decision Date: 4 October 2012

## 2. Site Information

### 2.1. Existing environment and information

#### 2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Beard Vegetation Association 1109 : Shrublands, peppermint scrub, Agonis flexuosa (Shepherd et al. 2001)	The application is to clear 3.82 hectares of native vegetation for the construction of Flat Rock Boating Facility.	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994)	The condition rating of the application area was established through aerial photography and a site visit conducted by Department of Environment and Conservation (DEC) officers in October 2010 (DEC 2010) and April 2011 (DEC 2011).
Mattiske Vegetation Complex: Wr Woodland of <i>Corymbia calophylla</i> - <i>Eucalyptus marginata</i> subsp. <i>marginata</i> with closed heath of Myrtaceae- Proteaceae - Papilionaceae spp. On steep rocky slopes in the hyper humid zone (Mattiske 1998).	The vegetation under application consists of four vegetation types:  The majority of the application area consisted of <i>Agonis flexuosa</i> , <i>Spyridium globulosum</i> , <i>Hakea oleifolia</i> low scrub over <i>Scaevola crassifolia</i> , <i>Hakea oleifolia</i> , <i>Chorilaena quercifolia</i> , <i>Leucopogon parviflorus</i> , <i>Bosslaea disticha</i> , <i>Pimelea ferruginea</i> , <i>Dodonaea ceratocarpa</i> heath over <i>Lepidosperma gladiatum</i> , <i>Desmodcladus flexuosa</i> , <i>Lepidosperma squamatum</i> and occurs in a predominately excellent (Keighery 1994) condition.  A linear portion along the eastern side of the application area consisted of <i>Olearia axillaris</i> , <i>Rhagodia baccata</i> , <i>Leucopogon parviflorus</i> , <i>Pimelea ferruginea</i> , <i>Dodonaea ceratocarpa</i> , <i>Leucophyta brownii</i> scrub over <i>Poa poliformis</i> , <i>Sporobolus virginicus</i> and <i>Ficinia nodosa</i> and occurs in an excellent (Keighery, 1994) condition.		
As above	<i>Olearia axillaris</i> , <i>Spyridium globulosum</i> and <i>Agonis flexuosa</i> open low scrub over <i>Scaevola crassifolia</i> , <i>Leucopogon parviflorus</i> , <i>Pimelea ferruginea</i> , <i>Acanthocarpus preissii</i> dense low heath over <i>Lepidosperma gladiatum</i> and <i>Poa poliformis</i> occurs in a small portion in the southern area of the application area and occurs in a good (Keighery, 1994) condition	Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994)	As above
As above	<i>Agonis flexuosa</i> open scrub over <i>Rhagodia baccata</i> , <i>Pteridium esculentum</i> scrub over <i>Muehlenbeckia adpressa</i> , <i>Kennedia lateritia</i> and <i>Lepidosperma gladiatum</i> occurs at the beginning of the access road and occurs in a	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management	As above

	degraded (Keighery, 1994) condition.	(Keighery, 1994)	
As above	Low coastal scrub of <i>Hakea oleifolia</i> , <i>Acacia pulchella</i> , <i>Pimelea ferruginea</i> , <i>Bossiaea disticha</i> (P3), <i>Rhagodia baccata</i> , <i>Agonis flexuosa</i> , <i>Leucopogon parviflorus</i> , <i>Scaevola crassifolia</i> , <i>Spyridium globulosum</i> , <i>Hibbertia amplexicaulis</i> , <i>Chorilaena quercifolia</i> , <i>Banksia seminuda</i> , <i>Phyllanthus calycinus</i> , <i>Dodonaea aptera</i> occurs in the 0.12 hectare additional application area under consideration and is in very good (Keighery, 1994) condition (DEC, 2012).	Very Good; Vegetation structure altered; obvious signs of disturbance (Keighery, 1994)	The description and condition rating of this area was established through a site visit conducted by DEC officers on 7 September 2012 (DEC, 2012).

### 3. Assessment of application against clearing principles

#### Comments

The permit holder has applied to increase the area covered by Clearing Permit CPS 3990/2 from 3.7 hectares to 3.82 hectares.

The additional 0.12 hectare area is to the north of an area approved to be cleared under the existing permit. A site inspection conducted by the Department of Environment and Conservation (DEC) on 7 September 2012 noted that a population of the rare flora species *Kennedia lateritia* is located approximately 20 metres south of this area (DEC, 2012).

DEC's site inspection identified the priority 3 flora species *Bossiaea disticha*, which is common although geographically restricted on the Leeuwin-Naturaliste Ridge from Ellensbrook to Augusta, and *Banksia seminuda*, which is at the western end of its range, within the additional proposed clearing area (DEC, 2012). A revised Site Rehabilitation and Environmental Management Plan will aid in managing the environmental impacts identified.

A review of current environmental information revealed no additional new information. Therefore the assessment against the clearing principles can be found in the Clearing Permit Decision Report CPS 3990/1 and CPS 3990/2.

#### Methodology

References:  
 DEC, 2012  
 GIS databases:  
 - Clearing Regulations, Environmentally Sensitive Areas  
 - Maltiske Vegetation  
 - SAC Biodatasets (accessed 20/08/2012)  
 - Soils, Statewide

### Planning instrument, Native Title, Previous EPA decision or other matter.

#### Comments

The permit holder has applied to increase the area covered by Clearing Permit CPS 3990/2 from 3.7 hectares to 3.82 hectares. This is required to expand the quarry area (for rock required for the construction of the breakwaters and major earthworks) and for an electrical services padmount (DoT, 2012).

The permit holder waived the statutory notification period for the proposed amendment in writing on 3 October 2012.

No submissions from the public have been received.

The area proposed to be included in the clearing permit is designated as a block for vegetation rehabilitation in the Site Rehabilitation and Environmental Management Plan 2011. A revised Site Rehabilitation and Environmental Management Plan is required.

#### Methodology

References:  
 DoT, 2012

### 4. References

- DEC (2010) Site Inspection Report for Clearing Permit Application CPS 3990/1, Lot 4126 on Plan 7032, Leeuwin. Site Inspection undertaken 14/10/2010. Department of Environment and Conservation, Western Australia. (DEC Ref: A343201)
- DEC (2012) Site visit for Clearing Permit Application CPS 3990/3, Conducted 07/09/2012. Department of Environment and Conservation, Western Australia. DEC Ref: A545585
- DoT (2012) Application to Amend Clearing Permit CPS 3990/2 and Supporting Documentation. Department of Transport, Western Australia. DEC Ref: A527284; A531996
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of

WA (Inc). Nedlands, Western Australia.

Mattiske, E.M. and Havel, J.J. (1998) Vegetation Complexes of the South-west Forest Region of Western Australia. Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.

Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.

## 5. Glossary

Term	Meaning
BCS	Biodiversity Coordination Section of DEC
CALM	Department of Conservation and Land Management (now BCS)
DAFWA	Department of Agriculture and Food
DEC	Department of Environment and Conservation
DEP	Department of Environmental Protection (now DEC)
DoE	Department of Environment
DoIR	Department of Industry and Resources
DRF	Declared Rare Flora
EPP	Environmental Protection Policy
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
TEC	Threatened Ecological Community
WRC	Water and Rivers Commission (now DEC)



**APPENDIX B      AUGUSTA BOAT HARBOUR 2013 ANNUAL REHABILITATION ASSESSMENT**





# Augusta Boat Harbour 2013 Annual Rehabilitation Assessments

Prepared for Department of Transport  
February 2014



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## EXECUTIVE SUMMARY

The first stage of native rehabilitation was completed at the Augusta Boat Harbour between the 25<sup>th</sup> and 29<sup>th</sup> June 2012, and included approximately 0.56 ha situated in the south-east corner of the project area. A native seed mix collected from site prior to clearing and comprising a total of 54 plant taxa was hand broadcast at a rate of 4,310 grams per ha. In addition, a total of 23 taxa were planted as nine month old seedlings at a rate of 6,455 seedlings per ha equivalent.

The second annual monitoring assessment of rehabilitation development within the 2012 rehabilitation area at the Augusta Boat Harbour was completed between the 15<sup>th</sup> and 16<sup>th</sup> November 2013. Rehabilitation was aged 17 months. The adjacent analogue (reference) site situated on the coastal ridge above Granny's Pool was assessed on the 11<sup>th</sup> December 2013; data from the analogue site provided a comparison for the developing rehabilitation site.

To enable rehabilitation development to be quantified, a number of completion criteria have been developed. For each criterion, performance indicators have been identified to enable progress to be measured and assessed. The targets are both qualitative (audit of design implementation during early stages to ensure maximum likelihood of a positive outcome), and quantitative (direct measure of performance outcomes).

Following below average annual rainfall during 2011 and 2012 (870 mm and 770 mm respectively), the 2013 annual total of 983 mm was above the long-term average (967.5 mm). The growing season broke in May 2013 and was followed by consistent winter falls and above average spring and early summer falls for the months of September, October, November and December. The late season falls are known to be beneficial during early stages of rehabilitation development.

The total number of native plant taxa recorded in the rehabilitation area at November 2013 was 57, which is higher in comparison to the 47 species recorded 12 months earlier. Along with an increase in native species, the number of introduced weed species also increased from six to 15 taxa over the same time. Native species richness for the adjacent analogue site remained unchanged at 18 species at December 2013, with one introduced weed species recorded.

The mean native plant density for the rehabilitation at November 2013 was 10.09 plants m<sup>-2</sup> representing an increase from 6.45 plants m<sup>-2</sup> recorded twelve months earlier. Plant density was lower at the analogue site; 2.88 plants m<sup>-2</sup>.

The mean native revegetation cover for the rehabilitation block was 118% at November 2013, representing a significant increase from the 18% cover recorded twelve months earlier. Introduced weed species provided a further 4.2% ground cover at November 2013, decreasing from 5.6% at November 2012. In comparison, native vegetation cover at the analogue site remained at 85.7% at December 2013, with introduced weeds providing a further 0.6% cover.

The dominant plant taxa represented in the 2012 rehabilitation area were the Threatened Flora *Kennedia lateritia*, *Lepidosperma gladiatum*, *Stypandra glauca*, *Hakea oleifolia*, *Muehlenbeckia adpressa*, *Melaleuca incana*, *Agonis flexuosa* and the Priority 4 flora *Bossiaea disticha*. Five revegetation taxa were represented at mean density greater than 0.6 plants m<sup>-2</sup>; *Hakea oleifolia*, *Bossiaea disticha*, *Agonis flexuosa*, *Melaleuca incana* and *Hibbertia amplexicaulis*. A total of 19 plant taxa provided greater than 1% ground cover in the rehabilitation at November 2013, compared to three plant taxa at November 2012; this represents a high diversity site. The four species providing the highest ground coverage were *Stypandra glauca* (25%), *Kennedia lateritia* (18%), *Lepidosperma gladiatum* (13%) and *Muehlenbeckia adpressa* (10%).

The dominant plant species recorded at the analogue site was *Spyridium globulosum*, *Dodonaea ceratocarpa*, *Agonis flexuosa*, *Leucopogon parviflora*, *Stypandra glauca*, *Acacia pulchella* and *Hakea oleifolia*. There were only two plant taxa providing individual mean plant density greater than 0.4 plants m<sup>-2</sup>; *Dodonaea ceratocarpa* and *Lepidosperma pubisquameum*. Eight plant taxa provided ground cover greater than 1%; *Spyridium globulosum* (30%), *Agonis flexuosa* (12%), *Hakea oleifolia* (9%), *Stypandra glauca* (8 %), *Dodonaea ceratocarpa* (7%), *Lepidosperma pubisquameum* (5%), *Leucopogon parviflora* (4%) and *Loxocarya cinerea* (1%).

At November 2013 with rehabilitation aged 17 months, all targets for completion criteria associated with the planning, pre-clearing, pre-rehabilitation and establishment stages of the 2012 rehabilitation block have been achieved and are compliant.

It will be appropriate to continue annual monitoring of rehabilitation to ensure future compliance with the 'development criteria' as the revegetation develops. This will provide an accurate indication of the likelihood for longer term rehabilitation success and resilience.

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# 1. INTRODUCTION

## 1.1 Preamble

The proposed Augusta Boat Harbour is a community-driven project, arising from the need for safe navigation and mooring in the Southern Ocean off the Augusta coast. The proposed Project area is located on the newly proclaimed Augusta Boat Harbour Reserve 51096 (January 2012), and occurs on the lower side of the Leeuwin-Naturaliste National Park. The project will necessitate the clearing of approximately 3.72 ha of native vegetation.

The concept plan for the boat harbour was redesigned in April 2011 as a result of the state environmental impact assessment process and negotiations regarding native vegetation clearing. Alterations were made to the quarry boundary and native vegetation clearing boundary in the northern area of the site at the request of the Department of Parks and Wildlife (DPaW). The new concept plan (concept design F2R) for the boat harbour has further buffered the direct impact area from the threatened *Kennedia lateritia*, which was identified at the northern end of the site, adjacent to the proposed quarry area, as well as the southern area of the project site during the baseline flora and vegetation survey (Onshore Environmental Consultants (OEC) 2007; OEC 2008). The F2R concept design provides a greater buffer between the proposed quarry site and the northern population of the DRF *Kennedia lateritia*, as requested by DPaW.

In addition to reducing and redesigning the clearing footprint to conserve populations of *Kennedia lateritia*, the revised plan also identified areas where remedial rehabilitation could be undertaken to improve the *in situ* vegetation condition and incorporating revegetation of the Threatened Flora.

## 1.2 Location

The Augusta Boat Harbour site is located within the Shire of Augusta Margaret River, midway between the Augusta town site and Cape Leeuwin Lighthouse on the eastern side of Leeuwin Road. The site is opposite the Skippy Rock Road turnoff and adjacent the Leeuwin Naturaliste National Park (Figure 1).

## 1.3 Climate

The Project area experiences a Mediterranean climate with hot, dry summers and mild, wet winters. Average rainfall of 967.4 mm is recorded at the nearest meteorological station of Cape Leeuwin, 6 km south west of the Augusta Boat Harbour site, with approximately 90 percent of this total received between April and October. The maximum 100 year annual rainfall recorded is 1,464.4 mm. Average maximum temperatures range from 23.3 C in February to 16.4 C in July and August. Average minimum temperatures range from 11.2 C in August to 17.2 C in February. Strong winds are predominantly from the west. Winter storms bring squally winds from the north-west to south-west. During summer, prevailing hot dry winds are from the east and south-east. Strong onshore winds are evidenced by the stunted habit of existing vegetation on elevated points at the site.

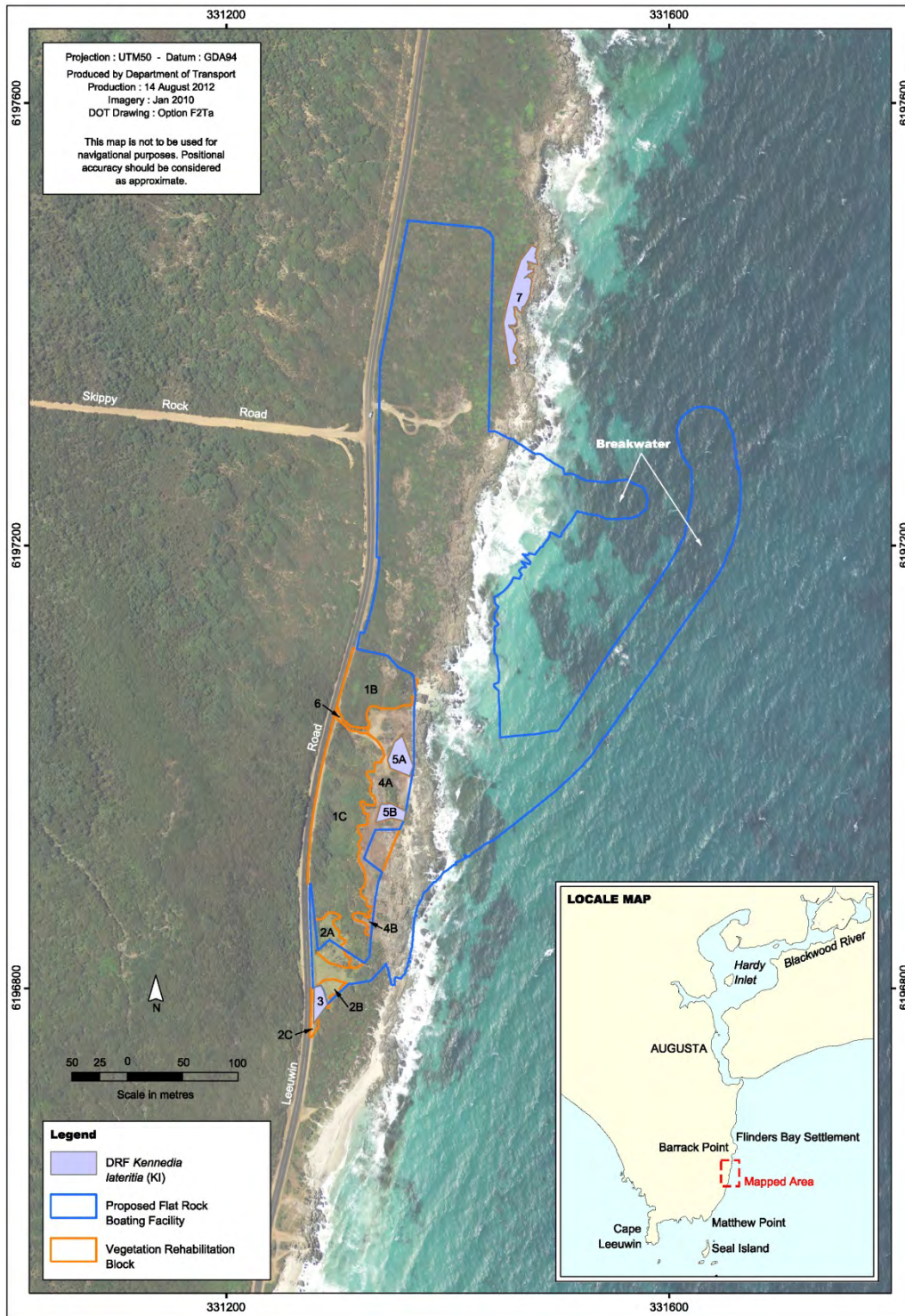


Figure 1 Location of the Augusta Boat Harbour, including rehabilitation blocks.



## 1.4 Current Condition of the Environment

The project area is part of the Boranup vegetation system, situated in the Warren Botanical District of the South West Botanical Province (as described by Beard 1981). The Boranup system extends from Cape Naturaliste in the north to Irwin Inlet in the south, and covers the Leeuwin-Naturaliste Ridge and coastal dunes of the Scott River Plain.

The Leeuwin-Naturaliste Ridge is a north-south trending horst of Precambrian granite and granulite forming hills rising to 200 m. Most of the outcrop is obscured by laterite and sand on the eastern side, and by dune sand and calcarenite on the western, seaward side. The seaward slopes are exposed to prevailing storm winds and sea spray. Vegetation is an intricate mosaic controlled by the factors of soil and exposure (Beard 1981). The coast has a rugged retrograding shoreline with small sandy bays between promontories of granite and limestone. Soils are calcareous sands on the seaward slope and acidic grey earths on the inland side.

There were five broad vegetation complexes recorded during a two season Level 2 flora and vegetation survey of the Flat Rock survey area in February 2007 and October 2008 (Onshore Environmental Consultants 2007 and 2008). Vegetation at the Flat Rock site is strongly associated with five distinct landforms:

1. Primary Sand Dune;
2. Humic Granitic/ Sandy Swale;
3. Granitic Coastal Hill Slope;
4. Granitic/ Sandy Foreshore; and
5. Humic Granitic Platforms.

In addition, there is bare sand (beach sand) and bare rock (exposed granite) landform features represented that are devoid of vegetation.

Two flora species of conservation significance were recorded from the proposed Augusta Boat Harbour study area during the above survey:

- *Kennedia lateritia* is listed as 'Endangered' under the EPBC Act (Federal), and as Declared Rare Flora (DRF) under the Wildlife Conservation Act (State); and
- *Bossiaea disticha* is listed as Priority 4 flora by DPaW.

The Flat Rock site does not show visual evidence of being significantly impacted by disease or pests, and surrounding vegetation generally remains in good health. Glevan Consulting (2011) conducted an assessment for the presence of the disease caused by *Phytophthora cinnamomi* within remnant vegetation of the Augusta Boat Harbour Project area in September 2011. The threat of *P. cinnamomi* was considered to be low, as site conditions were thought to be unfavourable for the pathogen. Grazing by rabbits and snails has also been observed in areas of reduced vegetation condition.

The proposed Augusta Boat Harbour Project area includes previously disturbed sites that support established populations of environmental weed species. Flat Rock is also sited adjacent to a major local road (Leeuwin Road) that increases the likelihood of new species being introduced or spreading.

A total of 25 environmental weeds were recorded during the baseline flora and vegetation survey (Onshore Environmental Consultants 2007). None are listed as Declared Weeds under the *Agriculture and Related Resources Protection Act, 1976* (ARRP Act). The majority of weeds were recorded at locations that have been subject to historical ground disturbance including road verges, the southern end of the 'Humic Granitic / Sandy Swale' vegetation association, and the granite platform along the eastern fringe of the Project area supporting skeletal sandy soils with high exposure to prevailing winds. Few weeds were recorded from 'intact' vegetation types.

## 2. REHABILITATION OBJECTIVES

The following rehabilitation objectives are stated in the Site Rehabilitation and Environmental Management Plan (SREMP):

- Propose a conceptual land-use plan for the Project area;
- Minimise disturbance impacts where ever practicable;
- Integrate infrastructure development and rehabilitation schedules to maximise environmental outcomes;
- Provide a description of the development process and how it will be integrated with rehabilitation, reinforcing effective management of rehabilitation resources;
- Maximise the use of rehabilitation resources available on site;
- Address provenance issues such as seed and cutting / root propagule collection;
- Provide prescriptions for restoration of landforms and associated vegetation;
- Ensure that populations of any significant flora and vegetation communities are not compromised by the project;
- Adopt controlled approaches towards the management of existing threatening processes such as weed control, fire and feral animals;
- Assess a reference (analogue) site in tandem with developing rehabilitation to provide an accurate comparison on the success or otherwise; and
- Outline a program for monitoring landform reconstruction and revegetation, environmental impacts and compliance with the Site Rehabilitation and Environmental Management Plan (SREMP).

This report deals specifically with undertaking annual monitoring of the 2012 rehabilitation block and adjacent analogue (reference) site. This is a requirement of the SREMP and has been referenced as a formal condition in the approved Native Vegetation Clearing Permit (NVCP).

## 3. METHODOLOGY

### 3.1 Preamble

An annual monitoring program designed to assess rehabilitation development success and the requirement for additional management strategies will be undertaken for three years following completion of rehabilitation, and at a three year interval from then onwards. Monitoring will continue until it has been proven that revegetation is self-sustaining and can be integrated with the surrounding undisturbed vegetation, as determined by an appropriately qualified botanist appointed by the DoT. Monitoring will be the responsibility of an appropriately qualified botanist appointed by the DoT, and will be conducted in accordance with the procedures outlined below. DoT will accept final responsibility for the rehabilitation works until such time as the completion criteria, from Augusta Boat Harbour SREMP (Onshore Environmental 2012) have been met.

In addition to the rehabilitation areas, a reference (analogue) site will be selected for annual monitoring. The analogue site will be selected on the basis of having similar soil-landform-vegetation associations to corresponding rehabilitation areas to allow for appropriate comparison of parameters. The analogue site chosen for assessment is situated north of the proposed Augusta Boat Harbour (along the same section of the ridge), in close proximity to Granny's Pool. It comprises coastal heath vegetation and provides a direct comparison to the vegetation cover being established in rehabilitation areas at the Augusta Boat Harbour.

Monitoring will use a series of plant biodiversity parameters such as species richness and diversity, plant density and percentage cover as indicators of ecosystem development and stability, which is endorsed by the EPA (EPA 2006). Qualitative assessment of the developing rehabilitation will be undertaken on a regular basis during the first growing season following establishment, and up to 15 months of age. Seed germination, plant establishment and survival, species diversity and weed establishment will be key parameters monitored during this period. Quantitative monitoring of rehabilitation will commence in the second spring (September/October) following rehabilitation (15 months), and will continue on an annual basis until the third assessment at which time the monitoring interval will be extended to a triennial basis (once every three years)<sup>1</sup>.

Rehabilitation blocks will be sampled with adequate replication to ensure the data is representative of the vegetation present. This will be demonstrated via graphing of 'species-area curves' for the understorey vegetation.

A monitoring report outlining annual results will be submitted annually to the DoT by the 31<sup>st</sup> March following annual assessments. The report will be provided to documented stakeholders and will be otherwise publicly available on request. This annual report will also be made available to DPaW upon request. A copy of the annual monitoring report will also be provided to Department of Environment (DoE) by 31<sup>st</sup> March each year.

The 2013 rehabilitation assessment represents the second annual reporting period and follows the first monitoring program completed late 2012.

### 3.2 Monitoring Protocol

The 2012 rehabilitation block was assessed on the 15<sup>th</sup> and 16<sup>th</sup> of November 2013 aged 17 months. The adjacent analogue site was assessed on the 11<sup>th</sup> December 2013.

---

<sup>1</sup> On the provision that stakeholders are satisfied with rehabilitation development to this stage; annual rehabilitation monitoring will continue otherwise.

The monitoring procedure involved assessment of four permanent belt transects of twenty contiguous one metre square quadrats within the rehabilitation, and two transects at the analogue site. A GPS location of the commencement point and orientation of each transect was recorded and photo-monitoring point established. The twenty 1 m<sup>2</sup> quadrats along each transect line were assessed individually. For each species within a quadrat the number present, percentage ground cover, and maximum plant height was recorded. Summarised data provided mean density values (no. plants m<sup>-2</sup>), mean percentage ground cover, and mean maximum plant height.

An importance value index (IVI), (Mueller-Dombois & Ellenberg 1974) which considers frequency, density, and cover was calculated for each species recorded along a transect line. For all species recorded along each transect line the total IVI value is 300; the larger an individual IVI, the greater the dominance of that species. Species diversity was measured by the Shannon-Wiener diversity Index, with higher values representing a greater level of diversity. The spread of individuals between the species recorded is defined by the 'Evenness' value (J). Evenness ranges between 0 and 1, with the maximum value indicating the same number of individuals being recorded for all species (Zar 1996, Magurran 1988). Lower J values reflect the dominance of one or a few species within the revegetation.

### 3.3 Completion Criteria

To enable the assessment of rehabilitation progress towards objectives a number of completion criteria have been developed. For each criterion, performance indicators have been identified to enable progress to be measured and assessed. The targets are both qualitative (audit of design implementation during early stages to ensure maximum likelihood of a positive outcome), and quantitative (direct measure of performance outcomes).

The completion criteria will be assessed during the following five stages of the project:

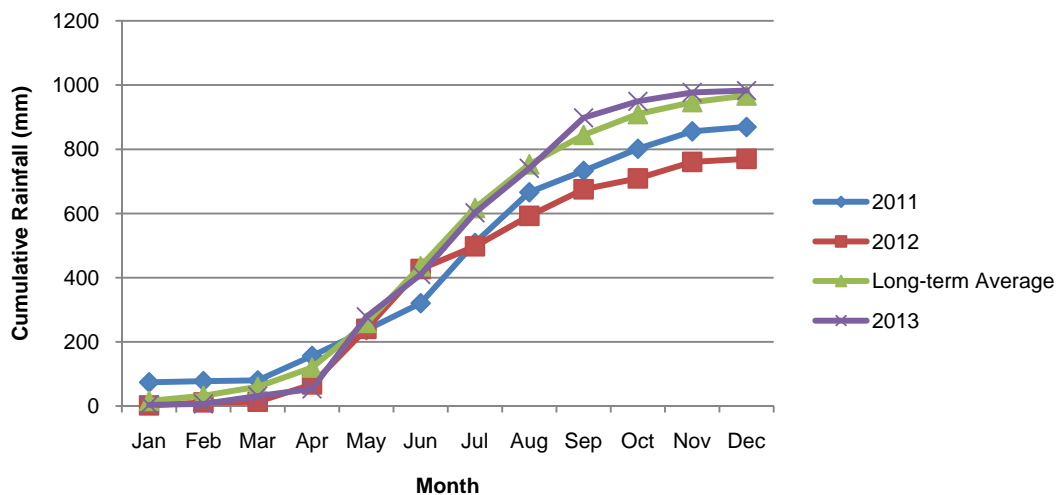
- Planning;
- Pre-clearing;
- Pre-rehabilitation;
- Establishment (0 – 15 months); and
- Development (15 months onwards).

## 4. RESULTS

### 4.1 Rainfall

The year prior to rehabilitation commencing (2011), as well as the year that rehabilitation at the Augusta Boat Harbour was completed (2012) both received below average rainfall with annual totals of 870 mm and 770 mm respectively (Figure 2). The long-term average is 967.5 mm.

The 2013 rainfall total of 982.8 mm was above the long term average. The summer and early autumn monthly totals were predictably low before the season broke in May 2013, when 277.8 mm was recorded. The winter months during 2013 received monthly rainfall close to the long-term average, while the spring and early summer months of September, October, November and December received monthly falls above the long-term average. The late season falls are known to be beneficial during early stages of rehabilitation development.



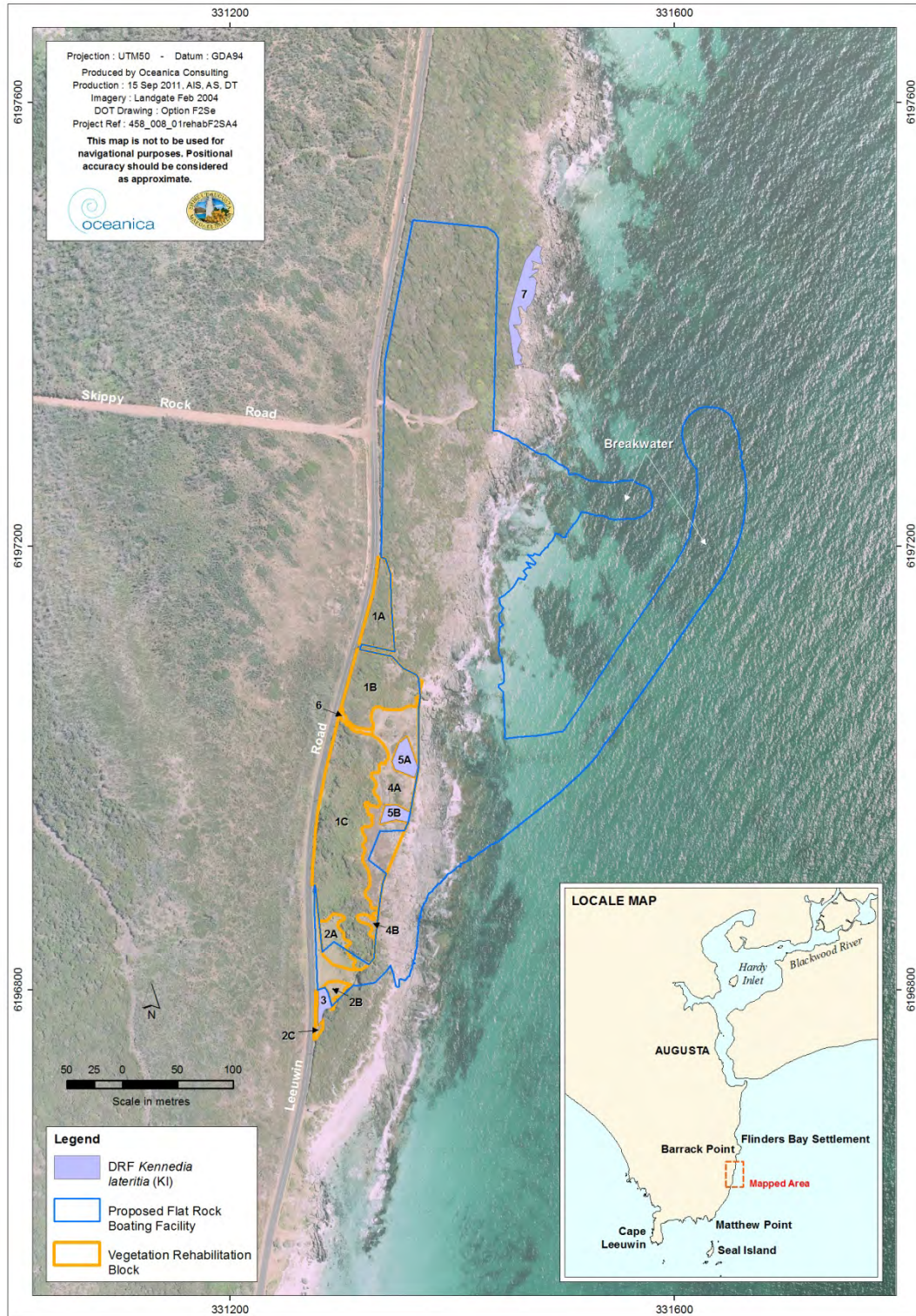
**Figure 2** Cumulative monthly rainfall totals for the nearby Cape Leeuwin weather station (approximately 6 km south-west of the Augusta Boat Harbour Project area) for 2011, 2012 and 2013.

### 4.2 Rehabilitation Implementation

The first stage of native rehabilitation was completed at the Augusta Boat Harbour between the 25<sup>th</sup> and 29<sup>th</sup> June 2012. This included approximately 0.56 ha contained within Rehabilitation blocks 4a, 4b, 5a and 5b (see Figure 3).

The native seed mix was hand broadcast at a rate of 4,310 grams per ha (Appendix 1). It comprised a total of 54 plant taxa that had been collected from site prior to clearing, and from local Shire reserves.

A total of 23 taxa were planted at a rate of 6,455 seedlings per ha equivalent (Appendix 2). The majority of planting stock was nine month old seedlings contained in a combination of cell packs and forestry tubes. The two *Lepidosperma* sedges were planted as advanced stock; *L. gladiatum* was planted from a combination of 255 mm and 140 mm pots, and *L. pubisquamum* was planted from 70 mm x 100 mm pots.



**Figure 3 Rehabilitation blocks identified for management at the Augusta Boat Harbour (from SREMP).**

### 4.3 Species Richness

The mean native species richness for the 2012 rehabilitation block at the second assessment in November 2013 was 30 species, an increase from 28 species recorded in 2012. The total number of native plant taxa recorded in 2013 was 57, higher in comparison to the 47 species recorded 12 months earlier during the November 2012 assessment. Along with an increase in native species, introduced weed species also increased from six taxa to 15 taxa over the same time period (see Table 1).

Native species richness for the adjacent analogue site remained at 18 species at December 2013, with one introduced weed species recorded.

### 4.4 Plant Density

The mean native plant density recorded in the 2012 rehabilitation block at November 2013 was 10.09 plants m<sup>-2</sup> representing an increase from 6.45 plants m<sup>-2</sup> recorded twelve months earlier. Plant density in the rehabilitation block was higher than the analogue site at 2.88 plants m<sup>-2</sup> (Table 1).

**Table 1 Summary of plant biodiversity parameters recorded at the 2012 rehabilitation block and neighbouring analogue site, October 2012.**

Assessment	Native Species Richness	Plant Density (# plants m <sup>-2</sup> )	% Cover
Rehabilitation aged 5 months (Nov 12)	47	6.45	17.8
Rehabilitation aged 17 months (Nov 13)	57	10.09	118.1
Analogue	18	2.88	85.7

### 4.5 Revegetation Cover

The mean native revegetation cover for the rehabilitation block was 118% at November 2013, representing a significant increase from the 18% cover recorded twelve months earlier (Plates 1-4). Introduced weed species provided a further 4.2% ground cover at November 2013, decreasing from 5.6% at November 2012 (see Table 1).

In comparison, native vegetation cover at the analogue site remained constant averaging 85.7% at December 2013, with introduced weeds providing a further 0.6% cover (Plate 5).

### 4.6 Dominant Plant Taxa

The dominant plant taxa represented in the 2012 rehabilitation block assessed at November 2013 were the Threatened Flora *Kennedia lateritia* (IVI 27.56), *Lepidosperma gladiatum* (IVI 22.99), *Stypantra glauca* (IVI 19.98), *Hakea oleifolia* (IVI 17.78), *Muehlenbeckia adpressa* (IVI 15.92), *Melaleuca incana* (IVI 15.71), *Agonis flexuosa* (IVI 15.49) and the Priority 4 Flora *Bossiaea disticha* (IVI 14.26). Five revegetation taxa were represented at mean density greater than 0.6 plants m<sup>-2</sup>; *Hakea oleifolia*, *Bossiaea disticha*, *Agonis flexuosa*, *Melaleuca incana* and *Hibbertia amplexicaulis* (Appendix 3).

A total of 19 plant taxa provided greater than 1% ground cover in the rehabilitation at November 2013, compared to three plant taxa at November 2012; this represents a high diversity site. The four species providing the highest ground coverage were *Stypantra glauca* (24.8%), *Kennedia lateritia* (18.1%), *Lepidosperma gladiatum* (13.0%) and *Muehlenbeckia adpressa* (10.2%).

The dominant plant species recorded at the analogue site was *Spyridium globulosum* (IVI 61.95), *Dodonaea ceratocarpa* (IVI 38.37), *Agonis flexuosa* (IVI 32.98), *Leucopogon*

*parviflora* (IVI 28.72), *Stypandra glauca* (IVI 22.24), *Acacia pulchella* (IVI 19.16) and *Hakea oleifolia* (IVI 15.97) (Appendix 4). There were only two plant taxa providing individual mean plant density greater than 0.4 plants m<sup>-2</sup>; *Dodonaea ceratocarpa* and *Lepidosperma pubisquameum*. Eight plant taxa provided ground cover greater than 1%; *Spyridium globulosum* (30.3%), *Agonis flexuosa* (11.9%), *Hakea oleifolia* (8.8%), *Stypandra glauca* (8.5%), *Dodonaea ceratocarpa* (6.8%), *Lepidosperma pubisquameum* (5.2%), *Leucopogon parviflora* (4.5%) and *Loxocarya cinerea* (1.1%).

#### 4.7 Rehabilitation Indices

The Shannon-Wiener diversity index (H) for transects in the 2012 rehabilitation block ranged from 2.88 to 3.53 (mean 3.21) at November 2013, compared to a range of 2.16 to 2.93 (mean 2.59) recorded at November 2012. The Evenness value (E) ranged from 0.83 to 0.91 (mean 0.87) at December 2013, compared to a range of 0.71 to 0.96 (mean 0.85) recorded at November 2012. The H mean value for the two analogue sites remained lower (2.01) than the rehabilitation block reflecting the significantly lower species richness. The E value for the analogue transects was comparable to the rehabilitation area (0.80).



Plate 1 Transect 1, 2012 rehabilitation – comparison at 5 and 17 months old.

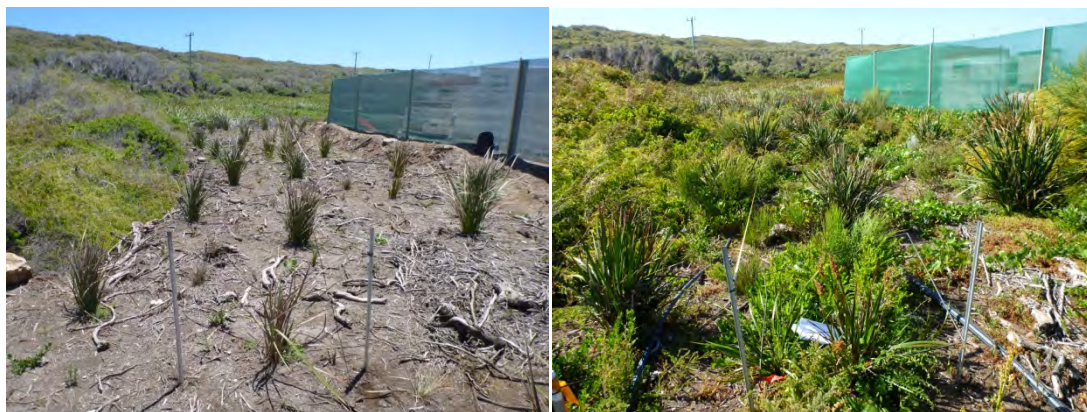


Plate 2 Transect 2, 2012 rehabilitation – comparison at 5 and 17 months old.



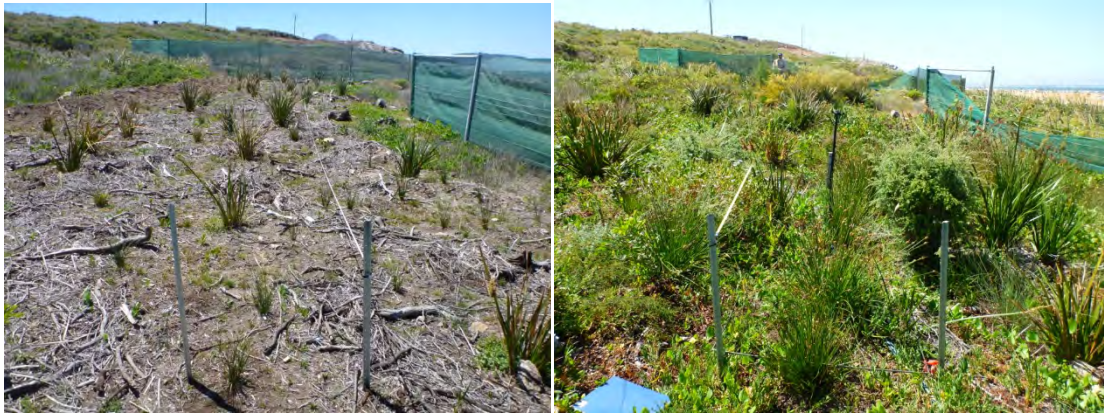


Plate 3 Transect 3, 2012 rehabilitation – comparison at 5 and 17 months old.



Plate 4 Transect 4, 2012 rehabilitation – comparison at 5 and 17 months old.



Plate 5 Transect 1, Analogue Site – comparison between November 2012 and 2013.



Plate 6 Transect 2, Analogue Site – comparison between November 2012 and 2013.

#### 4.8 Compliance to Criteria

At November 2013 with rehabilitation aged 17 months, all targets for completion criteria associated with the planning, pre-clearing, pre-rehabilitation and establishment stages of the 2012 rehabilitation block have been achieved and are compliant (Table 2).

It will be appropriate to continue annual monitoring of rehabilitation to ensure future compliance with the 'development criteria' as the revegetation develops. This will provide an accurate indication of the likelihood for longer term rehabilitation success and resilience.

**Table 2 Completion Criteria for rehabilitation at the Augusta Boat Harbour - compliance for 2012 rehabilitation block at November 2013.**

ASPECT	COMPLETION CRITERION	PERFORMANCE INDICATOR	Compliant
	<b>1. PLANNING</b>		
Access	1. Stakeholders have been consulted with proposed boat harbour access plans	Emails, letters, minutes of meetings	Yes
Fire	2. Fire management strategies are incorporated into the SREMP aimed at protecting developing rehabilitation	SREMP approved, Fire is excluded from developing rehabilitation for a minimum period of ten years following rehabilitation.	Yes
Land use	3. Area meets land use purpose as defined by land owner / manager	Shire of Augusta Margret River formally approves & adopts the end land use for the project area	Yes
Flora Vegetation and Fauna	4. Baseline flora & vegetation and fauna surveys have been completed	Management strategies for flora, vegetation and fauna of conservation significance are developed, as evidenced by correspondence.	Yes
	<b>2. PRE-CLEARING</b>		
Hydrology Landform and soils	5. Prior to commencement of clearing, surface drainage plan developed for areas earmarked for clearing	Surface drainage plan sighted by Project Manager	Yes
Clearing	6. Disturbance boundaries delineated with white sighter wire	Site inspection, photographs	Yes
Clearing	7. Machinery operators informed of clearing measures	Meeting minutes, correspondence	Yes
Vegetation and flora	8. Search for DRF (and other conservation significant flora) completed prior to clearing	Flora & vegetation survey report, photographs of flagged DRF	Yes
Vegetation and flora	9. Seed and plant material required for propagation removed and appropriately stored	Site inspection, photographs, invoices/receipts from seed merchants & nurseries	Yes
Vegetation and flora	10. Infrastructure and stockpile areas approved for clearing surveyed and pegged	Site inspection, photographs, survey/site plans, approval documents	Yes
	<b>3. PRE-REHABILITATION</b>		
Landform and soils	11. Native vegetation topsoil stripped in two layers: 0 – 50 mm and 50 – 150 mm, with clear signage delineating the two resources to prevent later confusion	Site inspection, photographs	Yes
Landform and soils	12. Native vegetation topsoil stripped during dry conditions wherever practicable	Site inspection, photographs	Yes

ASPECT	COMPLETION CRITERION	PERFORMANCE INDICATOR	Compliant
Landform and soils	13. Upper topsoil stripped with a grader (or similar) and stockpiled into pre-determined locations	Site inspection, photographs	Yes
Landform and soils	14. Native vegetation topsoil stockpiled over cleared native vegetation areas to a maximum height of 1 m	Site inspection, photographs, site plan	Yes
Landform and soils	15. Landform design is integrated with existing landscape	Survey plan for proposal area (showing contours before and after development)	Yes
Vegetation and flora	16. Clear and stockpile understorey vegetation	Site inspection, photographs	Yes
			Yes
Landform and soils	17. Topsoil spread over 100% of the rehabilitated areas	Site plan, schedule, site inspection, photographs	Yes
Landform and soils	18. Aim to direct return 100% of the upper (top 50 mm) topsoil resource over disturbed rehabilitation areas	Site plan, schedule, site inspection, photographs	Yes
Landform and soils	19. Post-disturbance surfaces re-contoured with a grader following survey	Survey report (including pre- and post-disturbance contours), site inspection, photographs	Yes
Landform and soils	20. Re-contoured surface deep ripped / scarified with appropriate machine (grader or small dozer)	Site inspection, photographs	Yes
Landform and soils	21. 'Lower topsoil' material replaced at 150 mm depth	Monitoring (survey) results, site inspection, photographs	Yes
Landform and soils	22. 'Upper topsoil' material replaced at 50 mm	Monitoring (survey) results, site inspection, photographs	Yes
Landform and soils Hydrology	23. No uncontrolled surface runoff or soil erosion that is unstable and degrading, and/or compromises end land use objectives	Site inspection, photographs, monitoring results	Yes
Vegetation and flora	24. Perimeter of rehabilitation fenced	Invoice/ receipt from fencing contractor, site plan, site inspection, photographs	Yes
<b>4. ESTABLISHMENT</b>			
Vegetation and flora	25. Prepared rehabilitation areas direct seeded with a native species mix	Seed list outlining volume of seed utilised for each species, area direct-seeded, site inspection, photographs	Yes
Vegetation and flora	26. Nursery propagated seedlings (from a mixture of seed, cuttings, root divisions, and tissue culture) replanted throughout the rehabilitation area at a density >1,000 seedlings ha <sup>-1</sup>	Species list showing seedling numbers for each species, area of rehabilitation, site inspection, photographs, monitoring results	Yes

ASPECT	COMPLETION CRITERION	PERFORMANCE INDICATOR	Compliant
Vegetation and flora	27. At 15 months total number of <i>Kennedia lateritia</i> plants at the site to be 150% of the number recorded prior to development	Site inspection, photographs, monitoring results	Yes
Vegetation and flora	28. At 15 months species richness to be at least 80% of that recorded at the analogue site, with not more than 10 percent of the annual assessment plots failing to record this level of diversity	Monitoring results confirm species richness at least 80% of that recorded at the analogue site, with not more than 10 percent of the annual assessment plots failing to record this level of diversity	Yes
Landform and soils	29. Surfaces stable with no evidence of surface erosion that is likely to limit establishment of a native vegetation cover	Monitoring results (erosion and vegetation) confirming that erosion is not limiting plant establishment in the rehabilitation	Yes
Vegetation and flora	30. No areas greater than 0.01 ha without understorey	Monitoring results, site inspection to confirm there are no areas greater than 0.01 ha without understorey	Yes
<b>5. DEVELOPMENT</b>			
Vegetation and flora	31. Longer term species richness to be at least 80% of that recorded at the analogue site, with not more than 10 percent of the annual assessment plots failing to record this level of diversity	Monitoring results confirm species richness at least 80% of that recorded at the analogue site, with not more than 10 percent of the annual assessment plots failing to record this level of diversity	Not relevant
Vegetation and flora	32. For Peppermint trees ( <i>Agonis flexuosa</i> ) planted to consolidate the existing southernmost clump of taller trees at the project site, a minimum number of 15 trees have survived 5 years following commencement of rehabilitation.	Annual monitoring results confirm survival of at least 15 Peppermint trees ( <i>Agonis flexuosa</i> ) at 5 years.	Not relevant
Vegetation and flora	33. No Declared Plants (weeds) as defined by DAFWA (2007) present within rehabilitation areas.	Monitoring results, site inspection confirm no Declared Plants present in the rehabilitation	Not relevant
Access	34. The agreed access plan has been implemented	Access plan, site inspection, correspondence from regulatory authorities	Not relevant
Land use	35. The site meets the agreed end land use	Site inspection, photographs, correspondence from regulatory agencies	Not relevant
Landform and soils	36. The rehabilitation surface is stable and vegetated, with no uncontrolled run-off	Monitoring results, site inspection, photographs	Not relevant

## 5. REFERENCES

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# APPENDIX 1

Native seed mix and individual sowing rates for the 2012 rehabilitation block

Species	Location	Batch #	Collection Season	2012 Seed Rate (g)
<i>Acacia alata</i>	Res39156	KMV400	2010/11	49
<i>Acacia alata</i>	Res39156	KMV-453	2011/12	
<i>Acacia littorea</i>	Res25141	KMV401	2010/11	100
<i>Acacia myrtifolia</i>	Res39156	KMV-454	2011/12	20
<i>Acacia pulchella var goadbyi</i>	Res 20761	KMV-456	2011/12	25
<i>Acacia pulchella var pulchella</i>	Res25141	KMV402	2010/11	25
<i>Acanthocarpus preissii</i>	Res25141	KMV403	2010/11	350
<i>Acrotriche cordata</i>	Res25141	KMV404	2010/11	100
<i>Agonis flexuosa</i>	Res25141	KMV405	2010/11	150
<i>Anthocercis littorea</i>	Res25141	KMV406	2010/11	5
<i>Baumea juncea</i>	Res25141	KMV407	2010/11	5
<i>Boronia alata</i>	Res25141	KMV-455	2011/12	30
<i>Boronia alata</i>	Res25141	KMV408	2010/11	
<i>Bossiaea distichea*</i>	Res25141	KMV-462	2011/12	150
<i>Bossiaea linophylla</i>	Res 20761	KMV-457	2011/12	150
<i>Carpobrotus virescens</i>	Res25141	KMV409	2010/11	90
<i>Carpobrotus virescens</i>	Res25141	KMV410	2010/11	
<i>Chorilaena quercifolia</i>	Res25141	KMV411	2010/11	0.5
<i>Chorizema diversifolium</i>	Res39156	KMV412	2010/11	0.4
<i>Clematis pubescens</i>	Res25141	KMV413	2010/11	120
<i>Comosperma confertum</i>	Res25141	KMV414	2010/11	0.1
<i>Daucus glochidiatus</i>	Res 27432	KMV-461	2011/12	3
<i>Dodonaea ceratocarpa</i>	Res25141	KMV415	2010/11	
<i>Eutaxia obovata</i>	Res25141	KMV416	2010/11	350
<i>Exocarpus sparteus</i>	Res25141	KMV417	2010/11	24
<i>Ficinia nodosa</i>	Res25141	KMV418	2010/11	30
<i>Hakea oleifolia</i>	Res25141	KMV-452	2011/12	
<i>Hardenbergia comptoniana</i>	Res25141	KMV419	2010/11	300
<i>Hovea elliptica</i>	Res20761	KMV420	2010/11	22
<i>Hovea elliptica</i>	Res39156	KMV421	2010/11	
<i>Kennedia carinata</i>	Res25141	KMV422	2010/11	1.3
<i>Kennedia coccinea</i>	Res39156	KMV423	2010/11	6
<i>Kennedia macrophylla*#1</i>	Res25141	KMV-447	2011/12	280
<i>Kennedia macrophylla*#2</i>	Res25141	KMV-448	2011/12	
<i>Kennedia macrophylla*#3</i>	Res25141	KMV-449	2011/12	
<i>Kennedia macrophylla*#4</i>	Res25141	KMV-450	2011/12	
<i>Kennedia prostrata</i>	Res25141	KMV424	2010/11	5
<i>Kennedia prostrata</i>	Res25141	KMV-458	2011/12	
<i>Leucophyta brownii</i>	Res25141	KMV425	2010/11	30
<i>Leucopogon parviflorus</i>	Res25141	KMV426	2010/11	300
<i>Linum marginale</i>	Res 27432	KMV-460	2011/12	1.3
<i>Lobelia anceps</i>	Res25141	KMV427	2010/11	3



Species	Location	Batch #	Collection Season	2012 Seed Rate (g)
<i>Logania vaginalis</i>	Res20761	KMV428	2010/11	10
<i>Melaleuca incana ssp incana</i>	Res9658/25141	KMV-451	2011/12	50
<i>Patersonia occidentalis</i>	Res25141	KMV429	2010/11	15
<i>Patersonia umbrosa var xantha</i>	Res25141	KMV430	2010/11	7
<i>Philotheca spicata</i>	Res25141	KMV431	2010/11	0.1
<i>Phyllanthus calycinus</i>	Res25141	KMV432	2010/11	11
<i>Pimelia ferruginea</i>	Res25141	KMV433	2010/11	60
<i>Rhagodia baccata</i>	Res25141	KMV434	2010/11	250
<i>Scaevola crassifolia</i>	Res25141	KMV435	2010/11	16
<i>Sollya heterophylla</i>	Res25141	KMV436	2010/11	40
<i>Sphenotoma capitatum</i>	Res25141	KMV437	2010/11	1.6
<i>Sporobolus virginicus</i>	Res25141	KMV438	2010/11	3
<i>Spyridium globosum</i>	Res25141	KMV439	2010/11	200
<i>Stylidium adnatum</i>	Res 27432	KMV-459	2011/12	
<i>Stylidium adnatum var adnatum</i>	Res25141	KMV440	2010/11	0.05
<i>Templetonia retusa</i>	Res25141	KMV441	2010/11	0.7
<i>Threlkeldia diffusa</i>	Res25141	KMV442	2010/11	50
<i>Viminaria juncea</i>	Res20761	KMV443	2010/11	220
<i>Viminaria juncea</i>	Res25141	KMV444	2010/11	
<i>Xanthorrhoea preissii</i>	Res 27432	KMV445	2010/11	650
<i>Xanthosia candida</i>	Res25141	KMV446	2010/11	0.7
<b>TOTAL</b>				<b>4310.75</b>

# APPENDIX 2

Native seedling mix and individual planting rates for the 2012 rehabilitation block

<b>Species</b>	<b>Planting Rate (no. per ha)</b>
<i>Lepidosperma gladiatum</i> 255mm	815
<i>Lepidosperma squamatum</i> 140mm	300
<i>Lepidosperma squamatum</i> 70 x 100mm	200
<i>Conostylis aculeata</i>	500
<i>Banksia littoralis</i>	50
<i>Acacia littorera</i>	50
<i>Carpobrotus virescens</i>	250
<i>Dodonea ceratocarpa</i>	250
<i>Ficinia nodosa</i>	250
<i>Hardenbergia comptoniana</i>	250
<i>Rhagodia baccata</i>	500
<i>Scaevola crassifolia</i>	250
<i>Sollya heterophylla</i>	100
<i>Spyridium globulosum</i>	150
<i>Templetonia retusa</i>	50
<i>Viminaria juncea</i>	100
<i>Hakea oleifolia</i>	500
<i>Melaleuca incana</i>	250
<i>Juncus kraussii</i>	200
<i>Olearia axillaris</i>	250
<i>Leucophyta brownii</i>	250
<i>Kennedia laterita</i>	775
<i>Agonis flexuosa</i>	100
<i>Anthocercis littorea</i>	65
<b>TOTAL</b>	<b>6,455</b>

# APPENDIX 3

Plant biodiversity parameters recorded from four 20m by 1m transects  
within the 2012 rehabilitation block at November 2013

SPECIES	IVI	DENS	COV	HT
* <i>Arctotheca calendula</i>	0.05	0	0.06	
* <i>Avena barbata</i>	0.01	0	0.01	
* <i>Briza minor</i>	0.03	0	0.03	
* <i>Bromus diandrus</i>	0.01	0	0.01	
* <i>Centaurium erythraea</i>	0.14	0	0.15	
* <i>Centaurium tenuiflorum</i>	0.14	0	0.15	
* <i>Cynodon dactylon</i>	0.02	0	0.02	
* <i>Ehrharta calycinus</i>	0.11	0	0.14	
* <i>Euphorbia terracina</i>	0.01	0	0.01	
* <i>Hypochaeris glabra</i>	0.07	0	0.08	
* <i>Lotus angustissimus</i>	1.23	0	1.47	
* <i>Lysmachia arvensis</i>	2.91	0	3.15	
* <i>Solanum nigrum</i>	0.01	0	0.01	
* <i>Sonchus asper</i>	0.18	0	0.22	
* <i>Sonchus oleraceus</i>	0.02	0	0.02	
<i>Acacia alata</i>	1.26	0.05	0.24	44
<i>Acacia extensa</i>	3.18	0.13	0.61	49
<i>Acacia littorea</i>	1.31	0.04	0.32	33
<i>Acacia myrtifolia</i>	0.77	0.01	0.48	90
<i>Acacia pulchella</i>	8.91	0.31	2.82	38
<i>Acrotriche cordata</i>	2.61	0.13	0.07	11
<i>Agonis flexuosa</i>	15.49	0.75	2.82	30
<i>Anarthria prolifera</i>	0.07	0	0.08	
<i>Anthocercis littorea</i>	1.48	0.04	0.63	27
<i>Anthocercis littorea</i>	0.86	0.04	0.08	20
<i>Austrodanthonia setacea</i>	0.04	0	0.04	
<i>Austrostipa flavescens</i>	0.35	0.01	0.13	85
<i>Baumea juncea</i>	0.31	0.01	0.04	10
<i>Billardiera heterophylla</i>	5.89	0.31	0.63	18
<i>Bossiaea disticha</i>	14.26	0.78	2.18	23
<i>Bossiaea linophylla</i>	1.75	0.06	0.10	35
<i>Carpobrotus virescens</i>	0.34	0.01	0.01	10
<i>Centella asiatica</i>	0.37	0.01	0.09	20
<i>Chorilaena quercifolia</i>	1.15	0.05	0.14	15
<i>Conostylis serrulata</i>	0.37	0.01	0.05	40
<i>Conostylis setigera</i>	1.56	0.06	0.33	33
<i>Dodonaea ceratocarpa</i>	7.87	0.30	2.30	30
<i>Eutaxia myrtifolia</i>	7.87	0.43	1.08	35
<i>Ficinia nodosa</i>	4.14	0.11	1.74	37
<i>Geranium retrorsum</i>	1.21	0.05	0.09	6
<i>Hakea oleifolia</i>	17.78	0.79	4.61	25
<i>Hardenbergia comptoniana</i>	1.45	0.05	0.26	53
<i>Hibbertia amplexicaulis</i>	9.97	0.68	2.05	14
<i>Hypolaena pubescens</i>	2.70	0.10	0.15	35
<i>Juncus kraussii</i>	3.45	0.10	1.21	91
<i>Kennedia lateritia</i>	27.56	0.58	18.09	33
<i>Kennedia prostrata</i>	0.34	0.01	0.01	5
<i>Lepidosperma gladiatum</i>	22.99	0.56	12.95	96
<i>Lepidosperma pubisquameum</i>	0.88	0.03	0.56	60
<i>Lepidosperma squamatum</i>	2.33	0.09	0.65	22

<b>SPECIES</b>	<b>IVI</b>	<b>DENS</b>	<b>COV</b>	<b>HT</b>
<i>Leucophyta brownii</i>	6.41	0.28	0.55	22
<i>Leucopogon parviflorus</i>	1.67	0.08	0.65	29
<i>Logania vaginalis</i>	1.30	0.05	0.13	35
<i>Lyginia barbata</i>	0.07	0	0.08	
<i>Marianthus candidus</i>	3.74	0.14	0.45	36
<i>Melaleuca incana</i>	15.71	0.74	3.25	53
<i>Muehlenbeckia adpressa</i>	15.92	0.41	10.19	34
<i>Neurachne alopecuroidea</i>	0.29	0.01	0.03	10
<i>Olearia axillaris</i>	4.05	0.13	0.91	39
<i>Patersonia occidentalis</i>	0.79	0.03	0.11	28
<i>Phyllanthus calycinus</i>	1.65	0.06	0.31	24
<i>Pimelea ferruginea</i>	11.69	0.56	1.29	27
<i>Rhagodia baccata</i>	7.19	0.23	1.95	15
<i>Scaevola crassifolia</i>	9.26	0.21	5.61	44
<i>Scaevola nitida</i>	2.47	0.13	0.15	15
<i>Spyridium globulosum</i>	4.75	0.23	0.65	21
<i>Stypandra glauca</i>	19.98	0.10	24.78	6
<i>Templetonia retusa</i>	0.43	0.01	0.08	35
<i>Tetrraria capillaris</i>	2.29	0.11	0.47	30
<i>Tetrrarrhena laevis</i>	0.55	0.01	0.30	5
<i>Viminaria juncea</i>	11.77	0.21	9.73	103
<i>Xanthosia candida</i>	0.69	0.04	0.08	5
<b>Total IVI</b>	<b>300</b>			
<b>All Species</b>	<b>80</b>	<b>10.43</b>	<b>124.82</b>	
<b>Native Species</b>	<b>54</b>	<b>10.09</b>	<b>118.09</b>	

# APPENDIX 4

Plant biodiversity parameters recorded from two 20m by 1m transects situated at an analogue site adjacent to the Augusta Boat Harbour site – November 2013

<b>SPECIES</b>	<b>IVI</b>	<b>DENS</b>	<b>COV</b>	<b>HT</b>
<i>Acacia puchella</i>	19.16	0.175	4.375	35
<i>Agonis flexuosa</i>	32.98	0.175	11.875	83
<i>Billardiera heterophylla</i>	3.35	0.025	0.375	35
<i>Cassythia racemosa</i>	1.59	0	1.625	
<i>Chorilaena quercifolia</i>	10.68	0.075	1.575	50
<i>Crytandra arbutiflora</i>	1.69	0.025	0.225	15
<i>Dodonaea ceratocarpa</i>	38.37	0.4	6.75	34
<i>Hakea oleifolia</i>	15.96	0.125	8.75	79
<i>Hibbertia cunninghamii</i>	4.24	0.05	0.05	10
<i>Lepidosperma pubisquameum</i>	37.64	0.75	5.175	45
<i>Lepidosperma gladiatum</i>	5.89	0.05	0.175	120
<i>Leucopogon parviflora</i>	28.71	0.25	4.475	76
<i>Loxocarya cinerea</i>	11.18	0.2	1.075	28
<i>Muehlenbeckia adpressa</i>	1.72	0.025	0.2	
* <i>Ammophila arenaria</i>	0.88	0	0.625	
<i>Olearia axillaris</i>	0.17	0	0.125	
<i>Phyllanthus calycinus</i>	1.52	0.025	0.05	30
<i>Spyridium globulosum</i>	61.95	0.275	30.35	85
<i>Stypandra glauca</i>	22.23	0.25	8.475	30
<b>TOTAL</b>	<b>300.00</b>	<b>2.88</b>	<b>86.33</b>	



## **APPENDIX C      OEC SITE INSPECTION REPORTS**

- C.1      Augusta Boat Harbour –Rehabilitation site inspection, February 2013**
- C.2      Augusta Boat Harbour –Rehabilitation site inspection, July 2013**
- C.3      Augusta Boat Harbour –Rehabilitation site inspection, November 2013**

Stephen Smith  
Project Manager  
Department of Transport  
Marine House 1 Essex Street  
Fremantle WA 6160

12<sup>th</sup> February 2013

### **Augusta Boat Harbour -Rehabilitation site inspection, February 2013**

Dear Stephen

A site inspection of rehabilitation areas at the Augusta Boat Harbour was completed on the 12<sup>th</sup> February 2013. The following points provide an overview of field notes made on the day.

- There has been excellent native vegetation recruitment within the 2012 rehabilitation area from a variety of sources including topsoil, direct sowing and planted seedlings. Productivity is very high given the relatively young age of 7 months.
- Native species richness is very high and includes a variety of life forms that are well represented in surrounding undisturbed vegetation along the coastal ridge. Importantly, the keystone species present at reference sites are well represented in the developing revegetation, and there are no vigorous short-lived plant species dominating.
- The shade cloth fencing and perimeter soil bund walls have been effective in protecting the developing revegetation from prevailing south-easterly winds over the summer. Construction of the southern breakwater has provided further protection by increasing the distance between rehabilitation and the ocean, and reducing the potential impact from salt spray.
- Native seedlings losses within the rehabilitation block are minor and generally restricted to the outer eastern perimeter; these areas will be incorporated into adjacent rehabilitation proposed for mid 2014.
- The DRF *Kennedia lateritia* has established prolifically in the ground cover to 7 months, with individual plants present up to 1 m in diameter and showing high productivity. Established *Kennedia* plants from the adjacent intact reserve are spreading rapidly into the rehabilitation block. The intact retained blocks of *Kennedia lateritia* remain healthy at February 2013 and show no signs of the seasonal decline noted at the same period in 2011 and 2012. The techniques used to protect developing rehabilitation have also been beneficial for the established *Kennedia* population.
- *Lepidosperma gladiatum* and *L. pubisquameum* seedlings provide an established sedge layer in the developing rehabilitation at 7 months, with very high survival rates to February 2013.
- A manual irrigation system (with potable mains water) has been erected during the first week of February 2013, and provides the ability to supplement water requirements for establishing revegetation during summer as required. It is

recommended that this resource be used sparingly to maximise longer term species richness.

- Vegetation debris spread across the rehabilitation site has increased surface soil stability at the site; there is no surface erosion present and the debris is providing a micro-climate for developing seedlings.
- Weeds continue to represent a minor component of the revegetation, with scattered plants generally restricted to fleabane and nightshade, with isolated patches of couch grass and kikuyu also noted. The previous recommendation not to undertake selective spraying pre-summer 2012 has not had any detrimental impacts at site, and likely contributed to current high plant density. Weeds will continue to be monitored qualitatively on a monthly basis, with hand pulling within the establishing rehabilitation recommended in coming weeks along with selective spraying using the grass selective fusillade over patches supporting couch grass and kikuyu.
- There was minor evidence of grazing along the western boundary of the block by rabbits and kangaroos, but this is having negligible impact on the developing revegetation. The Rabbit Measurorrhagic Disease Virus (RMDH) was released in late November 2012 and appears to have reduced local rabbit numbers; treatment will be ongoing.

In summary, the revegetation has shown significant development in a positive direction in the seven months since rehabilitation establishment in late June 2012, and currently shows elevated plant density and high species richness with the keystone plant species well represented. The preparation and execution of topsoil and subsoil handling at the site has provided a solid foundation for successful plant establishment. The summer drought conditions and prevailing winds have been well addressed as part of rehabilitation implementation and there are no detrimental impacts currently evident. These measures, including shade cloth fencing and perimeter soil bunding, have also had a positive impact on established vegetation within the conservation area, including populations of the DRF *Kennedia lateritia*.

If you require any further detail on points listed above, please do not hesitate to make contact.

Yours sincerely



Darren Brearley  
**Managing Director**



ABN 41 095 837 120

PO Box 227

Yallingup WA 6282

Stephen Smith  
Project Manager  
Department of Transport  
Marine House 1 Essex Street  
Fremantle WA 6160

1<sup>st</sup> July 2013

### Augusta Boat Harbour -Rehabilitation site inspection, July 2013

Dear Stephen

A site inspection of rehabilitation areas at the Augusta Boat Harbour was completed on the 1<sup>st</sup> July 2013, approximately 12 months following planting and direct sowing of the first phase. The revegetation has established vigorously and there is no evidence of nutrient deficiency or dieback. The rabbit control program has been successful in significantly reducing numbers within the pre-development rabbit population, and there is only scattered evidence of rabbits, and no significant grazing impact on the developing native cover. Weeds represent a minor component of the rehabilitation cover and no herbicide programs are planned in the short to medium term, to prevent indirect impact on native seedlings and maximise native species richness during the development stage. The Threatened Flora taxon *Kennedia lateritia* has established prolifically throughout the rehabilitation during the first growing season and the establishing population is in good health at the time of assessment.

At early July 2013 there are no issues identified within the establishing rehabilitation and current management should continue.

If you require any further detail on points listed above, please do not hesitate to make contact.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Darren Brearley', is written over a light blue horizontal line.

Darren Brearley  
*Managing Director*

Stephen Smith  
Project Manager  
Department of Transport  
Marine House 1 Essex Street  
Fremantle WA 6160

15<sup>th</sup> November 2013

### Augusta Boat Harbour -Rehabilitation site inspection, November 2013

Dear Stephen

A site inspection of rehabilitation areas at the Augusta Boat Harbour was completed on the 15<sup>th</sup> November 2013, approximately 16 months following direct sowing and planting.

The revegetation cover increased significantly during the second growing season and supports high diversity, including elevated numbers of the Threatened Flora *Kennedia lateritia*. Across the larger area the rehabilitated areas are indistinguishable from the surrounding *in situ* vegetation. Existing disjunct populations of *Kennedia lateritia* have been consolidated. Vegetation structure is developing, with distinctive low shrub and mid shrub strata evident. Shade cloth fencing has been effective in protecting developing plants from prevailing south-easterly winds.

The sumpland at the entrance gateway supports surface water to a maximum 10cm depth at the time of assessment. The period of inundation is likely longer in comparison the past two years resulting from higher winter rainfall, but impact on native vegetation present is determined to be minimal and short-term. A monitoring program following procedures recommended by Department of Parks and Wildlife will be implemented.

The nearby sand pit was visited with Site Supervisor, Peter Walker. The following recommendations were provided for rehabilitation earthworks proposed for February 2014:

- Batter down angle of repose slopes present around the perimeter of the excavated sand pit. May require relocation of clay material to achieve recommended maximum of 20 degrees and preferred 14 degrees. Any relocated clay should be capped with *in situ* subsoil and topsoil to provide a growing medium.
- A "weedy" area is present at the southern end of the sand pit, adjacent to the previous rubbish tip. This material should be pushed into the base of the sand pit and buried below the new profile, reconstructed using subsoil/topsoil from northern sections.
- The clay stockpile at the northern end of the sand pit should be battered down to the south, with any wet clay relocated to the pit floor to dry. The stockpile should subsequently be recontoured with the surrounding rehabilitation area further south, i.e. preference for maximum slope angles at 20 degrees. Subsoil relocated from the boat harbour and stockpiled along the northern fringe should then be respread to provide a rehabilitation medium, noting that plant establishment is currently occurring in this material.

- The existing pit floor should be contour ripped prior to relocating rehabilitation materials - to prevent creating a duplex that inhibits downward penetration of tree roots.
- Subsoil should be relocated across a maximum area of the recontoured surfaces and to a maximum depth with volumes available.
- Topsoil will be the key to rehabilitation success and should be respread as sparingly as possible to achieve maximum cover across the largest proportion of the disturbed surfaces as possible.
- A significant volume of mulch has been generated on site. This must be carefully respread sparingly at shallow depth (so that soil is visible in parts across the final cover). A deeper mulch cover is acceptable in close proximity to the buried tip zone in the south, where weeds are expected to volunteer onto open rehabilitation surfaces.
- Cleared timber debris from the site should be replaced in discrete piles with soil mixed / covered, to act as fauna habitat.

If you require any further detail on points listed above, please do not hesitate to make contact.

Yours sincerely



Darren Brearley  
*Managing Director*



# Department of Transport Clearing Permit CPS 3990/3 Annual Reporting

## Appendix D: Site Photo Log


Client:	Project:	Title:	
Department of Transport	Clearing Permit CPS 3990/3 Annual Reporting	PHOTO LOG	
	Appendix D: Photographic Record	25/06/2013	Plate:
	Job No. 42908044	File No.	Rev. A
			A4





PLATE 1                    Transect 1 in the 2012 rehabilitation block - at 5 months old (Jun 2012)



PLATE 2                    Transect 1 in the 2012 rehabilitation block - at 17 months old (Nov 2013)


Client: Department of Transport	Project: Clearing Permit CPS 3990/3 Annual Reporting	Title: PHOTO LOG		
	Appendix D: Photographic Record	25/06/2013	Plate: 1 & 2	Rev. A
	Job No. 42908044	File No.	A4	



PLATE 3                      Transect 2 in the 2012 rehabilitation block at 5 months old (Jun 2012)



PLATE 4                      Transect 2 in the 2012 rehabilitation block - at 17 months old (Nov 2013)


Client: Department of Transport	Project: Clearing Permit CPS 3990/3 Annual Reporting	Title: PHOTO LOG	
	Appendix D: Photographic Record	25/06/2013	Plate: 3 & 4
	Job No. 42908044	File No.	Rev. A A4



PLATE 5                      Transect 3 in the 2012 rehabilitation block – at 5 months old (Jun 2012)



PLATE 6                      Transect 3 in the 2012 rehabilitation block – at 17 months old (Nov 2013)


Client: Department of Transport	Project: Clearing Permit CPS 3990/3 Annual Reporting	Title: PHOTO LOG		
	Appendix D: Photographic Record	25/06/2013	Plate: 5 & 6	Rev. A
	Job No. 42908044	File No.	A4	



PLATE 7                      Transect 4 in the 2012 rehabilitation - at 5 months old (Jun 2012)



PLATE 8                      Transect 4 in the 2012 rehabilitation block - at 17 months old (Nov 2013)


Client: Department of Transport	Project: Clearing Permit CPS 3990/3 Annual Reporting	Title: PHOTO LOG		
	Appendix D: Photographic Record	25/06/2013	Plate: 7 & 8	Rev. A
	Job No. 42908044	File No.	A4	



PLATE 9

Transect 1, Analogue Site - Nov 2012



PLATE 10

Transect 1, Analogue Site - Nov 2013


Client: Department of Transport	Project: Clearing Permit CPS 3990/3 Annual Reporting	Title: PHOTO LOG		
	Appendix D: Photographic Record	25/06/2013	Plate: 9 & 10	Rev. A
	Job No. 42908044	File No.	A4	



PLATE 11      Transect 2, Analogue Site - Nov 2012



PLATE 12      Transect 2, Analogue Site - Nov 2013



Client: Department of Transport	Project: Clearing Permit CPS 3990/3 Annual Reporting	Title: PHOTO LOG		
	Appendix D: Photographic Record	25/06/2013	Plate: 11 & 12	Rev. A
	Job No. 42908044	File No.	A4	



PLATE 13      Subsoil and topsoil stockpiles



PLATE 14      Subsoil and topsoil stockpiles

Client: Department of Transport	Project: Clearing Permit CPS 3990/3 Annual Reporting	Title: PHOTO LOG		
	Appendix D: Photographic Record	25/06/2013	Plate: 13 & 14	Rev. A
	Job No. 42908044	File No.	A4	

## **APPENDIX C      AUGUSTA BOAT HARBOUR COMPLIANCE AUDIT EVIDENCE**

- C.1      Augusta Boat Harbour Underwater Detonations Environmental Noise Assessment**
- C.2      Photographic log of compliance Audit**
- C.3      Marine fauna observation form**



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10 December 2013  
Project No. 42908044 : M&C3753

Department of the Environment  
GPO Box 787, Canberra ACT 2601

Attention: Sam Wagstaff  
Monitoring and Auditing Section

Dear Sir

**Subject: EPBC 2008/4506 Augusta Boat Harbour - Underwater Detonations**

The Department of Transport (DoT) wishes to conduct a limited program of underwater explosive detonations within a small area, approximately 75m<sup>2</sup>, of the seabed in the Augusta Boat Harbour. This is required in order to achieve the appropriate water depth for vessels at the service wharf, and is considered to be the only available option to remove rock which has proven unyielding to other methods such as excavation and drilling.

The purpose of this letter is to advise the Department of the Environment (DoE) of this requirement and to seek to include the environmental risk mitigation management for the underwater detonations within the existing, approved conditions and associated control measures. Accordingly, this letter provides background information pertaining to the need for and proposed methods for underwater detonations, location and timing, and why underwater detonations are necessary. DoT wishes to demonstrate to DoE that alternative methods have been tried with little success and a decision to pursue underwater detonations has been made carefully, with consideration of the potential for effects to sensitive marine fauna. Furthermore, given the location of the subject area within the harbour breakwaters and the additional control measures to reduce exposure risks, it is considered unlikely that the area of seawater affected to any tangible extent by the detonations (referred to hereafter as the 'blast footprint') will extend beyond the breakwaters and therefore beyond the footprint of the current approved Project.

To provide some context, the Augusta Boat Harbour is a community driven project arising from the need for safe navigation and mooring in the Southern Ocean off the Augusta coast in the south west of Western Australia (WA). Ultimately the Harbour will provide 52 boat pens, a service wharf, boat ramp, small commercial precinct, and other harbour related facilities, for public use. The project is scheduled for completion in late 2014.

In August 2011, the Project was given environmental approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), by the DoE (formerly known as DSEWPaC). The DoT is the proponent for this Project and is responsible for delivering the Project in accordance with the activities and conditions of the approval. Two management plans were required to be developed to manage potential project related impacts on matters of National Environmental Significance, these plans being: the Site Rehabilitation and Environmental Management Plan (SREMP) and the Marine Noise Management Plan (MNMP). The SREMP was developed to mitigate the potential impact of

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J:\PER\42908044\5 Works\Augusta Boat Harbour Site\Underwater blasting\42908044 Augusta Boat Harbour - Underwater Detonations (Letter) final 131210.docx

harbour construction on a threatened flora species, whilst the MNMP was developed to manage noise impacts from onshore detonations on marine fauna within the area.

The first phase of the Project was completed in August 2013; this comprised the construction of two breakwaters, using rock sourced from the onsite quarry, and completion of the bulk earthworks. Onshore detonations within the quarry were undertaken from November 2012 through to July 2013 in accordance with the MNMP, including the deployment of dedicated marine mammal observers. Over this period a total of four sightings of marine fauna (all dolphins, generally in pods) were recorded within the detonation exclusion zones. These observations were recorded as required by the MNMP and detonation procedures were followed.

The second phase of the Project will include construction of the maritime structures (boat pens, service wharf, navigation aids, boat launching ramps, jetties.) and the civil works (roads, car parks, drainage and services). DoT has encountered a raised area of the seabed in the south-west corner of the harbour comprising hard granite bedrock, the existence of which will impede large vessels berthing at the service wharf. DoT has assessed and tried other methods of removing this rock, including the construction of a bund out into the harbour and excavation using a 100 tonne long reach excavator. However, success has been limited due to the seabed's hard impervious nature. To complete the construction of the boat pens it will be necessary to drill and blast the hard raised rock platform to ensure adequate water depth.

The raised area of the seabed is approximately 75 m<sup>2</sup> and is located within the two breakwaters (Attachment A). The potential dates for detonations are highly dependent on the progress of construction works on site, but underwater detonations will occur between February to April 2014.

The proposed method of rock removal will involve divers drilling small holes into the rock of up to 32 mm in diameter and 900 mm in depth. Each hole will be filled with a maximum of five 25 g individual charges (a total of 125 g) of a low order explosive (Autostem) and the drill holes will be placed up to 800 mm apart. The specific details, such as the number of holes drilled, and hence charges, per detonation event, will vary depending on the conditions encountered on site. The envisaged program of drilling and detonations is estimated to take up to 15 days, with one to two blasts each day, reducing the area of rock at a rate of approximately 5-10 m<sup>2</sup> per day.

Underwater noise analysis conducted on the proposed blasting configuration has indicated a minimal likelihood of the explosive detonations having discernible or substantive effect upon sensitive marine fauna. This is due to factors related to the area concerned and the intended conduct of the activity, specifically related to factors including the:

- confined water area;
- shallow water depth;
- surrounding rock walls;
- limited size and number of individual charges in any single detonation event;
- limited total number of detonation events;
- intervals between separate detonation events; and
- intended exposure reduction and risk mitigation measures.

DoT has evaluated the possibilities and merits of undertaking some indicative in-water modelling of the predicted effects of the proposed detonations. The advice from a number of independent in-water acoustic specialists is that no reliable or realistic modelling could be undertaken, and that no meaningful results would be generated. This is due to the complexity of the surrounding walls (effectively hybrid acoustic barriers and multi-facet absorption and reflection surfaces), compounded by the shallow water and limited spatial extent of the area. Nevertheless, the consensus is that the majority of the blast footprint will be contained within the breakwaters, and the risk of noise related impacts to sensitive marine fauna in the area beyond the breakwaters is consequently considered to be low.

The most damaging component of an underwater detonation event is the initial fast rise in pressure; the 'impulsive' element which expresses as a shock wave. The area over which this has a significant impact is limited due to the rapid loss of the component frequencies which form the sharp leading edge of the pulse. After propagation through the water column these higher frequency components diminish such that the initial shockwave rapidly attenuates into a broad spectrum of frequencies with most energy in the sub 1 kHz range. Risk of physical injury or mortality does exist for large fauna, but these effects are only probable in the immediate zone around the point of detonation. These risks are reduced by standard marine fauna observation and clearance procedures of no more than a few hundred metres (Lewis 1996). The clearance procedures or exclusion zones that have been implemented throughout the onshore blasting program are sufficient to manage the potential noise impacts of underwater detonations, and will be adhered to as described in the MNMP. An exclusion zone of 1,000 m and 1,500 m will be maintained at all times and a marine fauna observer will keep a look out to ensure no sensitive marine fauna enter the 1,000 m exclusion zone during detonations.

The shallow water depth at the points of detonations will limit both the amount of energy, and hence noise, which will transfer into the water column, as well as reducing its propagation potential. This is because the shallow water will result in a significant amount of reflection, absorption and scattering, which collectively attenuate signal strength and thus restrict propagation ranges.

As shown in Figure 1 (Attachment A), the location of the detonation site is confined within the two breakwaters of the Boat Harbour. These breakwaters are composed of granite boulders, presenting walls of hard, irregular, angular surfaces of heterogeneous orientation interspersed by interstitial spaces of varying size. Thus, noise generated from the detonation will be reflected from these hard irregular surfaces and scattered to a significant extent. The effect of this will be to render the sound front as incoherent, resulting in its attenuation to a significant extent, and by extension further ameliorating noise exposure risks.

The narrow opening presented for any direct path transmission of noise and impulse from the detonation to waters outside of the boat harbour (Attachment A) will further limit marine fauna exposure risks. Thus, not taking account of the attenuation resulting from the intervening shallow waters and signal interference from the scattered reflections from the rock walls, the physical dimensions of any direct path of exposure will be so small as to render it very unlikely that any marine fauna of concern would be within this narrow zone at the time of any detonation.

The effects of underwater detonations can be further reduced by implementing small timing delays between the detonation of individual charges set in any single detonation event (i.e. the impulse effect from the detonation, with small intervening time delays, of 10 individual 125 g charges is less than that

of a single 1 kg charge). The size and type of charge sets proposed for use will generate a sequence of less pronounced peak pressure levels than would occur if all the individual component charges were detonated simultaneously, or if a single aggregate charge of the same net explosive content was detonated (Keevin 1998).

Further risk reduction measures which may be employed by DoT including stacking sandbags around the blast holes. These act to direct more energy upwards, and thus into the air, than would otherwise propagate sideways into the water column.

The proposed pattern and tempo of detonations, with no more than one or two detonation events on any day over a period of around two weeks, also contributes to minimising risk exposures and the possible consequences. This is because any disturbance to sensitive marine fauna would be irregular, transient and spasmodic events, of truncated duration, limited in total number and confined to a short period of time. These factors suggest only low likelihood of any effects upon individual animals and life processes as a result of any behavioural responses.

When the following factors are considered; limited noise at source, rapid attenuation, the intended additional risk mitigation measures and confined area of possible effect, it is evident that the likelihood of adverse effects upon sensitive marine fauna is low. Also, given that onshore blasting was undertaken from November 2012 through to July 2013 and, only four observations of marine fauna of concern were made, the duration of the proposed underwater blasting program (10-15 days) further supports the assessment of inherently low risk.

On the basis of the demonstrated inconsequential risks to marine fauna from the proposed modest, and unavoidable program of underwater detonations, and the suggested adoption of the same mitigation measures as used for the onshore detonation program, it is requested that DoE concur with DoT's proposal to subsume the management of the underwater detonation program into the existing MNMP.

Yours faithfully  
**URS Australia Pty Ltd**

---

Arnica Di Lollo  
Marine Environmental Scientist

---

Stephen Smith  
Department of Transport - Project Manager

#### Attachments

Keevin, T.M. 1998, A review of natural resource agency recommendations for mitigating the impacts of underwater blasting. Reviews in Fisheries Science 6: 281-13.

Lewis, J.A. 1996, Effects of Underwater Explosions on Life in the Sea. Defence Science and Technology Organisation. (DSTO-GD-0080).



**Australian Government**  
**Department of the Environment**

**Contact Officer:** Sam Wagstaff  
**Telephone:** (02) 6274 2741

**Our reference:** EPBC 2008/4506  
**Email:** sam.wagstaff@environment.gov.au

Mr Stephen Smith  
Project Manager  
Coastal Infrastructure  
WA Department of Transport  
1 Essex Street  
FREMANTLE WA 6160

Dear Mr Smith

Following your letter dated 10 December 2013 to Sam Wagstaff of this department, I am writing to inform you of the department's conclusion regarding WA Department of Transport's proposed underwater detonations as part of the construction of the Augusta Boat Harbour, Augusta WA.

As you are aware, the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects matters of national environmental significance. Matters of national environmental significance which are relevant in the Augusta Boat Harbour area include nationally listed migratory species and listed threatened species and ecological communities.

Based on the information in your letter, the department is of the view that the proposed underwater detonations were not considered during the assessment of the Augusta Boat Harbour project (EPBC 2008/4506) and as such the actions as per your letter have no legal certainty under the current EPBC 2008/4506 approval. However, and based solely upon the information you have provided to the department, the department is of the view that the proposed underwater detonations, confined within the existing bund wall and undertaken with marine fauna observers and shut-down zones, is unlikely to have a significant impact on the matters of national environmental significance referred to in your letter.

Please note that this document does not constitute legal or other professional advice or any approval or decision by the Department under the *Environment Protection and Biodiversity Conservation Act 1999* and you remain responsible at all times for compliance with the law. This document is intended for use by you and should not be relied on by any third party. The Commonwealth does not accept liability for any loss or damage that may be suffered, either directly or indirectly, arising out of your use of, or reliance on, this document.

Should you have any queries about the matters raised in this letter please contact Sam Wagstaff on (02) 6274 2741. Alternatively, if you would like further information about the referral process, you may contact the relevant assessment section director, Con Voutas on (02) 6274 2363.

Yours sincerely

Ben Corbett  
Director  
Approvals Monitoring South Section  
Compliance and Enforcement Branch

20 December 2013

# Notification of Blasting Times

Blasting operations will be carried out at the following locations:

UNDERWATER AT BOAT PEN ABUTMENT

At the following times:

FRIDAY 25 JULY 2014

09:00 - 12:00

FOR A PERIOD OF 10 MINUTES

People are reminded that blasting is hasarous.  
All unauthorised Personnel are required to keep out of the area.

For Further information contact:

Operations 0419 968 736

Shotfire Phone 0412 974 053

Shotfirer in Charge BOB GILDARE

**Department of Transport  
Compliance Assessment Report EPBC 2008/4506**


Client: Department of Transport	Project: Compliance Assessment Report EPBC 2008/4506	Title: PHOTO LOG	
	Appendix F: Photographic Record	17/12/2014	Plate:
	Job No. 42908044	File No.	Rev. 0 A4





PLATE 1 Front Gate of Site 2014



PLATE 2 2014 Rehabilitation Block - Old Site Office


Client: Department of Transport	Project: Compliance Assessment Report EPBC 2008/4506	Title: PHOTO LOG	
	Appendix F: Photographic Record Job No. 42908044	17/12/2014 File No.	Plate: 1 & 2 Rev. A A4



PLATE 3

2014 Rehabilitation Block - Old Site Office



PLATE 4

2014 Rehabilitation Block - Front Gate


Client: Department of Transport	Project: Compliance Assessment Report EPBC 2008/4506	Title: PHOTO LOG	
	Appendix F: Photographic Record	17/12/2014	Plate: 3 & 4
	Job No. 42908044	File No.	Rev. A A4



PLATE 5      Surface Water Drainage



PLATE 6      Surface Water Drainage


Client: Department of Transport	Project: Compliance Assessment Report EPBC 2008/4506	Title: PHOTO LOG		
	Appendix F: Photographic Record	17/12/2014	Plate: 5 & 6	Rev. A
	Job No. 42908044	File No.	A4	



PLATE 7            2012 Rehabilitation Block



PLATE 8            Declare Rare Flora - *Kennedia lateritia*


Client: Department of Transport	Project: Compliance Assessment Report EPBC 2008/4506	Title: PHOTO LOG	
	Appendix F: Photographic Record Job No. 42908044	17/12/2014 File No.	Plate: 7 & 8 Rev. A A4



PLATE 9

Declare Rare Flora - *Kennedia lateritia*



PLATE 10

2012 Rehabilitation Block - *Kennedia lateritia*


Client: Department of Transport	Project: Compliance Assessment Report EPBC 2008/4506	Title: PHOTO LOG	
	Appendix F: Photographic Record Job No. 42908044	17/12/2014 File No.	Plate: 9 & 10 Rev. A A4



PLATE 11      Rock wall along Rehabilitaiton Block - preventing access



PLATE 12      Harbour Site 2014


Client: Department of Transport	Project: Compliance Assessment Report EPBC 2008/4506	Title: PHOTO LOG		
	Appendix F: Photographic Record	17/12/2014	Plate: 11 & 12	Rev. A
	Job No. 42908044	File No.	A4	




PLATE 13

Harbour Construction Site - 2014



PLATE 14

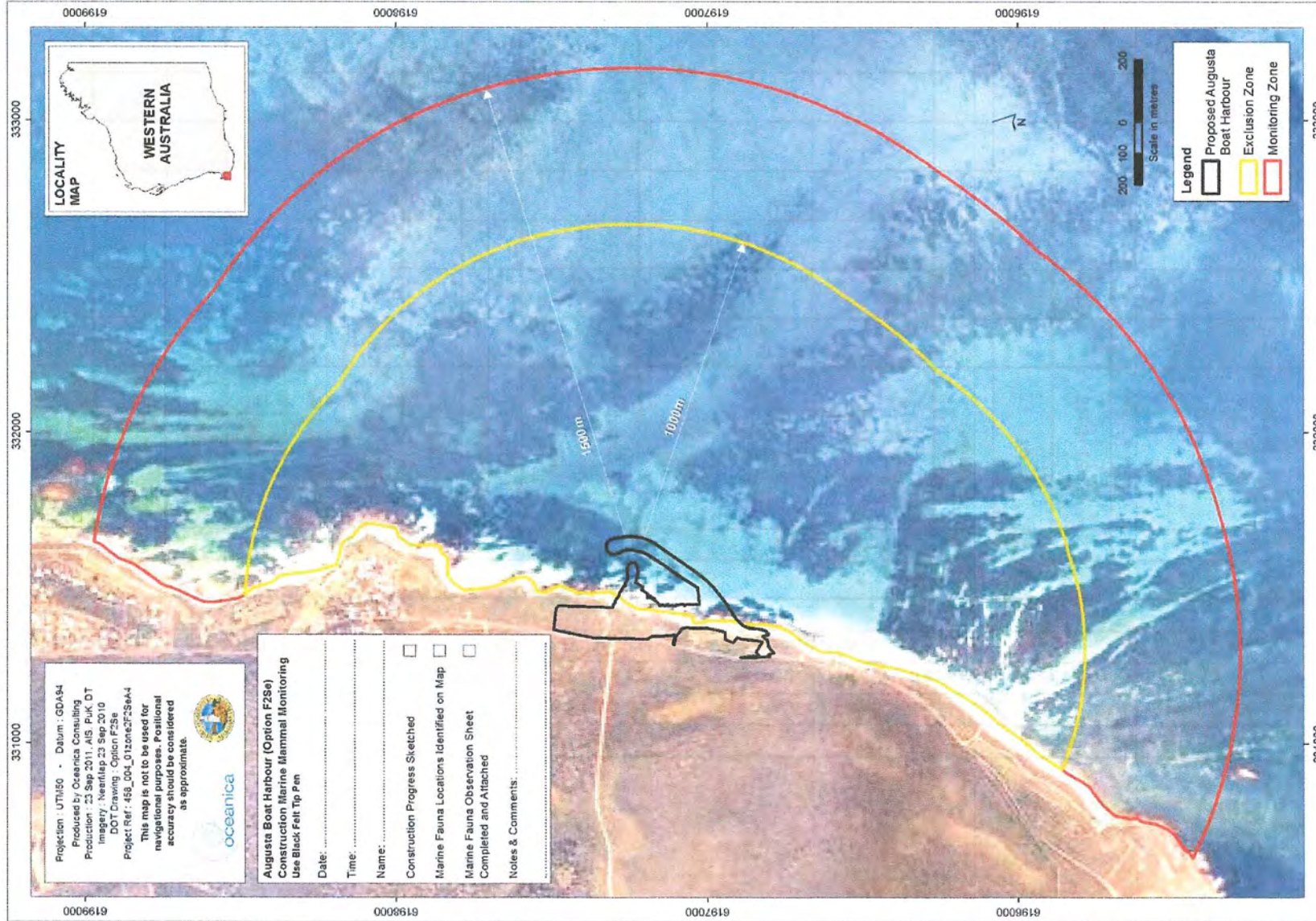
Harbour Boat Ramp - 2014

Client: Department of Transport	Project: Compliance Assessment Report EPBC 2008/4506	Title: PHOTO LOG	
	Appendix F: Photographic Record Job No. 42908044	17/12/2014 File No.	Plate: 13 & 14 Rev. A A4





# Marine Fauna Observation Sheet



**APPENDIX D      ONSHORE ENVIRONMENTAL CONSULTANTS LETTER REPORTS AND ANNUAL ASSESSMENT**

- D.1      OEC Augusta Boat Harbour 2013 Annual Rehabilitation Assessments**
- D.2      OEC Letter Report: Augusta Boat Harbour –Rehabilitation site inspection, November 2013**
- D.3      OEC Letter Report: Augusta Boat Harbour –Rehabilitation site inspection, February 2014**
- D.4      OEC Letter Report: Augusta Boat Harbour –Rehabilitation site inspection, April 2014**
- D.5      OEC Letter Report: Augusta Boat Harbour –Rehabilitation site inspection, September 2014**

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Stephen Smith  
Project Manager  
Department of Transport  
Marine House 1 Essex Street  
Fremantle WA 6160

15<sup>th</sup> November 2013

### Augusta Boat Harbour -Rehabilitation site inspection, November 2013

Dear Stephen

A site inspection of rehabilitation areas at the Augusta Boat Harbour was completed on the 15<sup>th</sup> November 2013, approximately 16 months following direct sowing and planting.

The revegetation cover increased significantly during the second growing season and supports high diversity, including elevated numbers of the Threatened Flora *Kennedia lateritia*. Across the larger area the rehabilitated areas are indistinguishable from the surrounding *in situ* vegetation. Existing disjunct populations of *Kennedia lateritia* have been consolidated. Vegetation structure is developing, with distinctive low shrub and mid shrub strata evident. Shade cloth fencing has been effective in protecting developing plants from prevailing south-easterly winds.

The sumpland at the entrance gateway supports surface water to a maximum 10cm depth at the time of assessment. The period of inundation is likely longer in comparison the past two years resulting from higher winter rainfall, but impact on native vegetation present is determined to be minimal and short-term. A monitoring program following procedures recommended by Department of Parks and Wildlife will be implemented.

The nearby sand pit was visited with Site Supervisor, Peter Walker. The following recommendations were provided for rehabilitation earthworks proposed for February 2014:

- Batter down angle of repose slopes present around the perimeter of the excavated sand pit. May require relocation of clay material to achieve recommended maximum of 20 degrees and preferred 14 degrees. Any relocated clay should be capped with *in situ* subsoil and topsoil to provide a growing medium.
- A "weedy" area is present at the southern end of the sand pit, adjacent to the previous rubbish tip. This material should be pushed into the base of the sand pit and buried below the new profile, reconstructed using subsoil/topsoil from northern sections.
- The clay stockpile at the northern end of the sand pit should be battered down to the south, with any wet clay relocated to the pit floor to dry. The stockpile should subsequently be recontoured with the surrounding rehabilitation area further south, i.e. preference for maximum slope angles at 20 degrees. Subsoil relocated from the boat harbour and stockpiled along the northern fringe should then be respread to provide a rehabilitation medium, noting that plant establishment is currently occurring in this material.

- The existing pit floor should be contour ripped prior to relocating rehabilitation materials - to prevent creating a duplex that inhibits downward penetration of tree roots.
- Subsoil should be relocated across a maximum area of the recontoured surfaces and to a maximum depth with volumes available.
- Topsoil will be the key to rehabilitation success and should be respread as sparingly as possible to achieve maximum cover across the largest proportion of the disturbed surfaces as possible.
- A significant volume of mulch has been generated on site. This must be carefully respread sparingly at shallow depth (so that soil is visible in parts across the final cover). A deeper mulch cover is acceptable in close proximity to the buried tip zone in the south, where weeds are expected to volunteer onto open rehabilitation surfaces.
- Cleared timber debris from the site should be replaced in discrete piles with soil mixed / covered, to act as fauna habitat.

If you require any further detail on points listed above, please do not hesitate to make contact.

Yours sincerely



Darren Brearley  
*Managing Director*



ABN 41 095 837 120  
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Stephen Smith  
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Fremantle WA 6160

7<sup>th</sup> February 2014

### Augusta Boat Harbour -Rehabilitation site inspection, February 2014

Dear Stephen

A site inspection of rehabilitation areas at the Augusta Boat Harbour and adjacent sand pit was completed on the 7<sup>th</sup> February 2014 by Dr Darren Brearley of Onshore Environmental.

Rabbit baiting was completed in November 2013 by Alpha Pest Management and there was only sparse evidence of rabbits in the rehabilitation at February 2014, along with low numbers of kangaroos. The rabbit baiting program has been an important management tool during rehabilitation development.

The revegetation coverage has stabilised since end of the spring growing season, with localised exposed pockets visually impacted by the prevailing south-easterly winds; these areas are more pronounced where shade cloth has been dislodged from screen fencing. It is strongly recommended that shade cloth be reattached to screen fencing to improve protection to rehabilitation over the remaining summer period. Impacts include low numbers of plants deaths in previously densely populated areas. While this trend is expected in developing rehabilitation during the first three years, close inspection over remaining summer months will be required to ensure appropriate management is implemented to prevent further decline in keystone species.

The Threatened Flora *Kennedia lateritia* remains prominent throughout the rehabilitation. Plants do show evidence of decline within exposed areas of the site, as is expected, with plants located at sheltered environments showing no signs of leaf discolouration. Similarly, fresh growth on the tops of taller shrubs such as *Viminaria juncea* has been burnt from prevailing winds, pruning plants to a similar height as surrounding vegetation. Existing populations of *Kennedia lateritia* adjacent to the rehabilitation remain in excellent condition and have benefitted from screen fencing and increased distance from salt spray.

Dust from adjacent site works has settled across the rehabilitation site, and weekly surface irrigation is recommended over the coming two months (as required) to remove dust from plant leaves and reduce stress.

There is evidence of localised Arum Lily (senescent), Couch Grass, Deadly Nightshade and scattered Thistle along the interface of rehabilitation and existing vegetation. It is proposed that targeted herbicide spraying re-commences following break of season in

May 2014. Kikuyu is re-establishing along the verge of Leeuwin Road, and treatment will be completed at this location using grass-selective herbicide.

Surface water was absent from the sumpland fronting Leeuwin Road in February 2014 and there was no evidence of vegetation decline reported by the Department of Parks and Wildlife in November 2013.

Rehabilitation earthworks of the nearby sand pit had recently commenced and a site tour was completed with Site Supervisor, Peter Walker. Previous recommendations had been implemented and the landform recontouring and soil reconstruction was rated as excellent; site supervision of the project area is commended. Procedures noted were perimeter slope angles battered to less than 20 degrees, weedy areas at the southern extent adjacent to the tip site had been buried and covered with a dense layer of mulch to reduce subsequent reestablishment of weeds, the clay stockpile at the northern end of the sand pit had been reshaped to integrate with the surrounding landform, subsoil and topsoil had been relocated across a maximum area of the recontoured surfaces, and mulch had been stockpiled in readiness from spreading sparsely over the topsoil cap.

If you require any further detail on points listed above, please do not hesitate to make contact.

Yours sincerely



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13<sup>th</sup> May 2014

**Augusta Boat Harbour -Rehabilitation site inspection, April 2014**

Dear Stephen

A site inspection of rehabilitation areas at the Augusta Boat Harbour and adjacent sand pit was completed on the 16<sup>th</sup> April 2014 by Dr Darren Brearley of Onshore Environmental.

Rehabilitation at the boat harbour site remained in excellent health with evidence of continued development of vegetation structure and cover. The prevailing south-easterly winds over summer have now subsided, and vegetation has again persisted. There was increasing evidence of rabbit and kangaroo activity throughout the rehabilitation areas, and rabbit baiting has been scheduled for early May 2014 to reduce any escalating impacts. There are approximately five well established tracks formed by large kangaroos entering the rehabilitation from the national park via Leeuwin Road. The kangaroos may have been attracted by surface water on exposed granite during irrigation late in the summer period. An effort should be made to block entry along these tracks using pruned native vegetation such as peppermint tree limbs. There was also small localised areas of Couch Grass (*Cynodon dactylon*) and Arum Lily (*Zantedeschia aethiopica*) that will require targeted spraying over coming months. Kikuyu Grass (*Pennisetum clandestinum*) is also re-establishing along the verge of Leeuwin Road and will require broadscale spraying with a grass selective herbicide over coming months.

Surface water was absent from the sumpland fronting Leeuwin Road at April 2014 and there was no evidence of vegetation decline reported by the Department of Parks and Wildlife in November 2013. Vegetation within this area remains stable.

Rehabilitation earthworks at the nearby sand pit were completed at April 2014. There is evidence of germination by weeds at southern sectors of the sand pit, bordering the old tip site, and these areas will require appropriate broadscale herbicide spraying over coming months. There is evidence of native species germination at the site.

If you require any further detail on points listed above, please do not hesitate to make contact.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Darren Brearley'.

Darren Brearley  
*Managing Director*



Stephen Smith  
Project Manager  
Department of Transport  
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8<sup>th</sup> September 2014

### **Augusta Boat Harbour –Rehabilitation site inspection, September 2014**

Dear Stephen

A site inspection of rehabilitation areas at the Augusta Boat Harbour and adjacent sand pit was completed on the 3rd September 2014 by Dr Darren Brearley of Onshore Environmental.

The 2012 rehabilitation areas at the boat harbour site have developed to provide high species diversity and a vegetation structure and ground cover that is nearing comparison with surrounding *in situ* vegetation; this will be confirmed during quantitative annual rehabilitation assessments later this month. The Threatened Flora taxon *Kennedia lateritia* has established successfully across the rehabilitation area and consolidated the previous disjunct and at risk populations that were present at the site. There are localised patches of the weeds species Arum Lily and Kikuyu present, and it is anticipated that they will be removed by targeted spot spraying to be undertaken in late September 2014.

There were two native rehabilitation blocks completed during mid 2014:

- 1) Two blocks either side of the entry gate adjacent to Leeuwin Road; and
- 2) One block adjoining the 2012 rehabilitation area where site offices were originally positioned.

Block 1 - The rehabilitation on the south side of the entry road is establishing in line with expectations. Good surface soil preparation and drainage have contributed to high seedling survival over the six week period following revegetation. Recent warmer days have triggered the commencement of seed germination. There is a minimum of weed establishment at this early stage and the preferred position is to hold off any spray treatment while the native cover is in the establishment phase.

Rehabilitation on the north side of the entry road is similar to the south side, however the soil profile is shallower on the south-east shoulders resulting from the requirement to recontour the remade landform around the entry road and re-direct surface water along a drainage channel into a soak well positioned further east to prevent flooding following high intensity rainfall events. The inability to scarify the surface following preparation due to wet soil conditions has resulted in minor rilling of upper surfaces at early September 2014. The current development of revegetation at six weeks does not appear to be impacted by this aspect and it is anticipated that revegetation will stabilise these areas over coming months.

Block 2 - Rehabilitation within the area that originally supported the site offices is establishing in line with expectations at six weeks of age. Although the area was not scarified/ripped prior to planting and direct seeding, the application of generous subsoil and topsoil depth and absence of compaction has been beneficial to plant establishment. The current weed loading is higher than anticipated and will require close monitoring during the early establishment phase of natives at the site. There may be a requirement to undertake hand weeding within the rehabilitation block over coming weeks.

## *Sand Pit*

Native revegetation is establishing from planted seedlings and seed (topsoil and direct sown varieties) across the majority of the sand pit rehabilitation area. The lowest point of the pit in the south-west corner of the site was inundated to approximately 30cm at the time of assessment. The water is from controlled internal drainage within the pit, and there is no evidence of erosion.

The south-east corner of the sand pit is situated adjacent to the old tip site and a variety of weeds species have volunteered onto prepared rehabilitation surfaces within this sector, as expected. This area of rehabilitation was initially sprayed, and follow-up control work is required to minimise establishment. The weed control program should be extended to spot establishing plants on adjacent batters.

It is proposed that the annual rehabilitation assessments will be completed in early October 2014. A further site assessment report will be prepared at this time.

If you require any further detail on points listed above, please do not hesitate to make contact.

Yours sincerely



Darren Brearley  
**Managing Director**



# Augusta Boat Harbour 2013 Annual Rehabilitation Assessments

Prepared for Department of Transport  
February 2014



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## EXECUTIVE SUMMARY

The first stage of native rehabilitation was completed at the Augusta Boat Harbour between the 25<sup>th</sup> and 29<sup>th</sup> June 2012, and included approximately 0.56 ha situated in the south-east corner of the project area. A native seed mix collected from site prior to clearing and comprising a total of 54 plant taxa was hand broadcast at a rate of 4,310 grams per ha. In addition, a total of 23 taxa were planted as nine month old seedlings at a rate of 6,455 seedlings per ha equivalent.

The second annual monitoring assessment of rehabilitation development within the 2012 rehabilitation area at the Augusta Boat Harbour was completed between the 15<sup>th</sup> and 16<sup>th</sup> November 2013. Rehabilitation was aged 17 months. The adjacent analogue (reference) site situated on the coastal ridge above Granny's Pool was assessed on the 11<sup>th</sup> December 2013; data from the analogue site provided a comparison for the developing rehabilitation site.

To enable rehabilitation development to be quantified, a number of completion criteria have been developed. For each criterion, performance indicators have been identified to enable progress to be measured and assessed. The targets are both qualitative (audit of design implementation during early stages to ensure maximum likelihood of a positive outcome), and quantitative (direct measure of performance outcomes).

Following below average annual rainfall during 2011 and 2012 (870 mm and 770 mm respectively), the 2013 annual total of 983 mm was above the long-term average (967.5 mm). The growing season broke in May 2013 and was followed by consistent winter falls and above average spring and early summer falls for the months of September, October, November and December. The late season falls are known to be beneficial during early stages of rehabilitation development.

The total number of native plant taxa recorded in the rehabilitation area at November 2013 was 57, which is higher in comparison to the 47 species recorded 12 months earlier. Along with an increase in native species, the number of introduced weed species also increased from six to 15 taxa over the same time. Native species richness for the adjacent analogue site remained unchanged at 18 species at December 2013, with one introduced weed species recorded.

The mean native plant density for the rehabilitation at November 2013 was 10.09 plants m<sup>-2</sup> representing an increase from 6.45 plants m<sup>-2</sup> recorded twelve months earlier. Plant density was lower at the analogue site; 2.88 plants m<sup>-2</sup>.

The mean native revegetation cover for the rehabilitation block was 118% at November 2013, representing a significant increase from the 18% cover recorded twelve months earlier. Introduced weed species provided a further 4.2% ground cover at November 2013, decreasing from 5.6% at November 2012. In comparison, native vegetation cover at the analogue site remained at 85.7% at December 2013, with introduced weeds providing a further 0.6% cover.

The dominant plant taxa represented in the 2012 rehabilitation area were the Threatened Flora *Kennedia lateritia*, *Lepidosperma gladiatum*, *Stypandra glauca*, *Hakea oleifolia*, *Muehlenbeckia adpressa*, *Melaleuca incana*, *Agonis flexuosa* and the Priority 4 flora *Bossiaea disticha*. Five revegetation taxa were represented at mean density greater than 0.6 plants m<sup>-2</sup>; *Hakea oleifolia*, *Bossiaea disticha*, *Agonis flexuosa*, *Melaleuca incana* and *Hibbertia amplexicaulis*. A total of 19 plant taxa provided greater than 1% ground cover in the rehabilitation at November 2013, compared to three plant taxa at November 2012; this represents a high diversity site. The four species providing the highest ground coverage were *Stypandra glauca* (25%), *Kennedia lateritia* (18%), *Lepidosperma gladiatum* (13%) and *Muehlenbeckia adpressa* (10%).

The dominant plant species recorded at the analogue site was *Spyridium globulosum*, *Dodonaea ceratocarpa*, *Agonis flexuosa*, *Leucopogon parviflora*, *Stypandra glauca*, *Acacia pulchella* and *Hakea oleifolia*. There were only two plant taxa providing individual mean plant density greater than 0.4 plants m<sup>-2</sup>; *Dodonaea ceratocarpa* and *Lepidosperma pubisquameum*. Eight plant taxa provided ground cover greater than 1%; *Spyridium globulosum* (30%), *Agonis flexuosa* (12%), *Hakea oleifolia* (9%), *Stypandra glauca* (8 %), *Dodonaea ceratocarpa* (7%), *Lepidosperma pubisquameum* (5%), *Leucopogon parviflora* (4%) and *Loxocarya cinerea* (1%).

At November 2013 with rehabilitation aged 17 months, all targets for completion criteria associated with the planning, pre-clearing, pre-rehabilitation and establishment stages of the 2012 rehabilitation block have been achieved and are compliant.

It will be appropriate to continue annual monitoring of rehabilitation to ensure future compliance with the 'development criteria' as the revegetation develops. This will provide an accurate indication of the likelihood for longer term rehabilitation success and resilience.

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# 1. INTRODUCTION

## 1.1 Preamble

The proposed Augusta Boat Harbour is a community-driven project, arising from the need for safe navigation and mooring in the Southern Ocean off the Augusta coast. The proposed Project area is located on the newly proclaimed Augusta Boat Harbour Reserve 51096 (January 2012), and occurs on the lower side of the Leeuwin-Naturaliste National Park. The project will necessitate the clearing of approximately 3.72 ha of native vegetation.

The concept plan for the boat harbour was redesigned in April 2011 as a result of the state environmental impact assessment process and negotiations regarding native vegetation clearing. Alterations were made to the quarry boundary and native vegetation clearing boundary in the northern area of the site at the request of the Department of Parks and Wildlife (DPaW). The new concept plan (concept design F2R) for the boat harbour has further buffered the direct impact area from the threatened *Kennedia lateritia*, which was identified at the northern end of the site, adjacent to the proposed quarry area, as well as the southern area of the project site during the baseline flora and vegetation survey (Onshore Environmental Consultants (OEC) 2007; OEC 2008). The F2R concept design provides a greater buffer between the proposed quarry site and the northern population of the DRF *Kennedia lateritia*, as requested by DPaW.

In addition to reducing and redesigning the clearing footprint to conserve populations of *Kennedia lateritia*, the revised plan also identified areas where remedial rehabilitation could be undertaken to improve the *in situ* vegetation condition and incorporating revegetation of the Threatened Flora.

## 1.2 Location

The Augusta Boat Harbour site is located within the Shire of Augusta Margaret River, midway between the Augusta town site and Cape Leeuwin Lighthouse on the eastern side of Leeuwin Road. The site is opposite the Skippy Rock Road turnoff and adjacent the Leeuwin Naturaliste National Park (Figure 1).

## 1.3 Climate

The Project area experiences a Mediterranean climate with hot, dry summers and mild, wet winters. Average rainfall of 967.4 mm is recorded at the nearest meteorological station of Cape Leeuwin, 6 km south west of the Augusta Boat Harbour site, with approximately 90 percent of this total received between April and October. The maximum 100 year annual rainfall recorded is 1,464.4 mm. Average maximum temperatures range from 23.3 C in February to 16.4 C in July and August. Average minimum temperatures range from 11.2 C in August to 17.2 C in February. Strong winds are predominantly from the west. Winter storms bring squally winds from the north-west to south-west. During summer, prevailing hot dry winds are from the east and south-east. Strong onshore winds are evidenced by the stunted habit of existing vegetation on elevated points at the site.

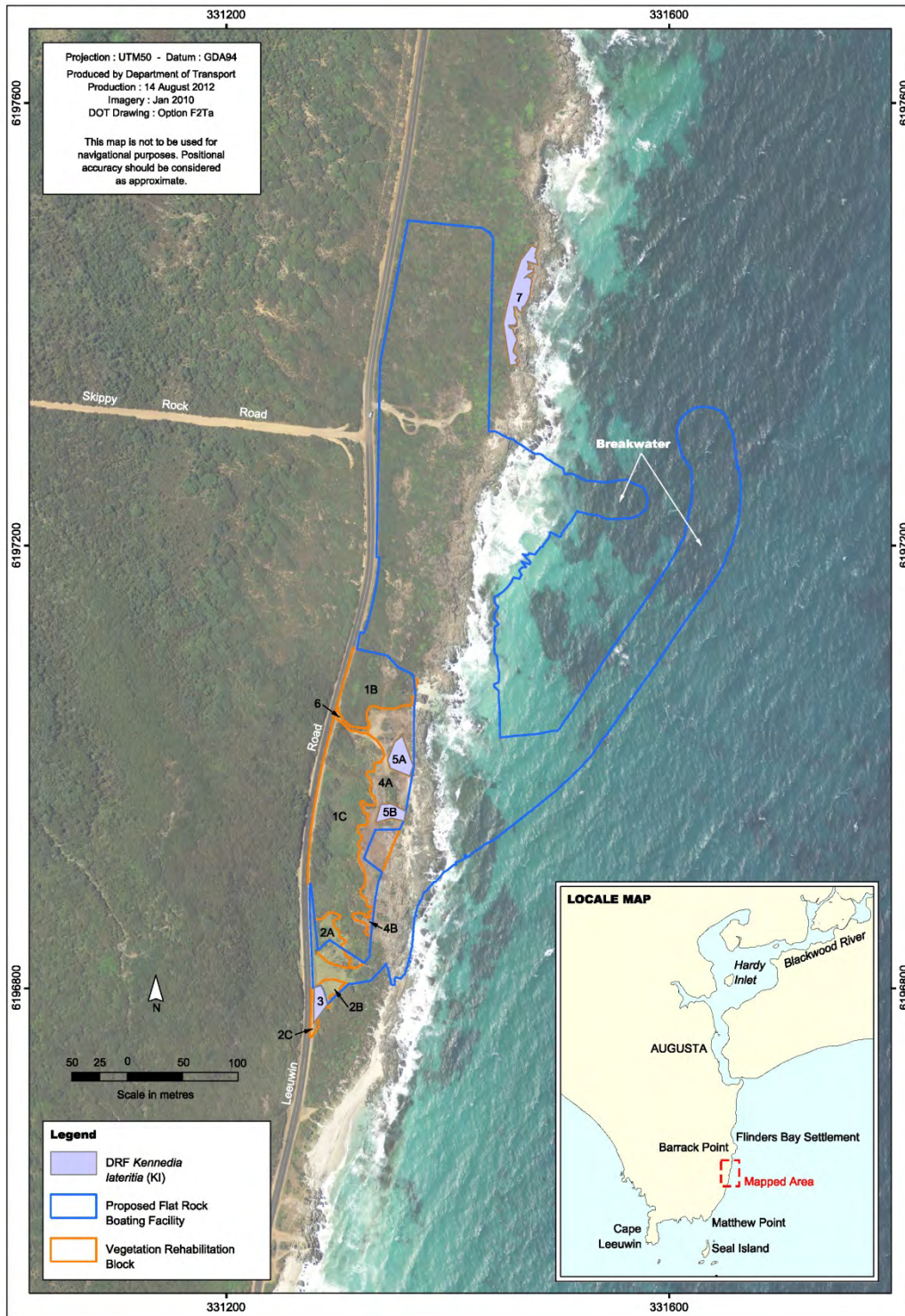


Figure 1 Location of the Augusta Boat Harbour, including rehabilitation blocks.

## 1.4 Current Condition of the Environment

The project area is part of the Boranup vegetation system, situated in the Warren Botanical District of the South West Botanical Province (as described by Beard 1981). The Boranup system extends from Cape Naturaliste in the north to Irwin Inlet in the south, and covers the Leeuwin-Naturaliste Ridge and coastal dunes of the Scott River Plain.

The Leeuwin-Naturaliste Ridge is a north-south trending horst of Precambrian granite and granulite forming hills rising to 200 m. Most of the outcrop is obscured by laterite and sand on the eastern side, and by dune sand and calcarenite on the western, seaward side. The seaward slopes are exposed to prevailing storm winds and sea spray. Vegetation is an intricate mosaic controlled by the factors of soil and exposure (Beard 1981). The coast has a rugged retrograding shoreline with small sandy bays between promontories of granite and limestone. Soils are calcareous sands on the seaward slope and acidic grey earths on the inland side.

There were five broad vegetation complexes recorded during a two season Level 2 flora and vegetation survey of the Flat Rock survey area in February 2007 and October 2008 (Onshore Environmental Consultants 2007 and 2008). Vegetation at the Flat Rock site is strongly associated with five distinct landforms:

1. Primary Sand Dune;
2. Humic Granitic/ Sandy Swale;
3. Granitic Coastal Hill Slope;
4. Granitic/ Sandy Foreshore; and
5. Humic Granitic Platforms.

In addition, there is bare sand (beach sand) and bare rock (exposed granite) landform features represented that are devoid of vegetation.

Two flora species of conservation significance were recorded from the proposed Augusta Boat Harbour study area during the above survey:

- *Kennedia lateritia* is listed as 'Endangered' under the EPBC Act (Federal), and as Declared Rare Flora (DRF) under the Wildlife Conservation Act (State); and
- *Bossiaea disticha* is listed as Priority 4 flora by DPaW.

The Flat Rock site does not show visual evidence of being significantly impacted by disease or pests, and surrounding vegetation generally remains in good health. Glevan Consulting (2011) conducted an assessment for the presence of the disease caused by *Phytophthora cinnamomi* within remnant vegetation of the Augusta Boat Harbour Project area in September 2011. The threat of *P. cinnamomi* was considered to be low, as site conditions were thought to be unfavourable for the pathogen. Grazing by rabbits and snails has also been observed in areas of reduced vegetation condition.

The proposed Augusta Boat Harbour Project area includes previously disturbed sites that support established populations of environmental weed species. Flat Rock is also sited adjacent to a major local road (Leeuwin Road) that increases the likelihood of new species being introduced or spreading.

A total of 25 environmental weeds were recorded during the baseline flora and vegetation survey (Onshore Environmental Consultants 2007). None are listed as Declared Weeds under the *Agriculture and Related Resources Protection Act, 1976* (ARRP Act). The majority of weeds were recorded at locations that have been subject to historical ground disturbance including road verges, the southern end of the 'Humic Granitic / Sandy Swale' vegetation association, and the granite platform along the eastern fringe of the Project area supporting skeletal sandy soils with high exposure to prevailing winds. Few weeds were recorded from 'intact' vegetation types.

## 2. REHABILITATION OBJECTIVES

The following rehabilitation objectives are stated in the Site Rehabilitation and Environmental Management Plan (SREMP):

- Propose a conceptual land-use plan for the Project area;
- Minimise disturbance impacts where ever practicable;
- Integrate infrastructure development and rehabilitation schedules to maximise environmental outcomes;
- Provide a description of the development process and how it will be integrated with rehabilitation, reinforcing effective management of rehabilitation resources;
- Maximise the use of rehabilitation resources available on site;
- Address provenance issues such as seed and cutting / root propagule collection;
- Provide prescriptions for restoration of landforms and associated vegetation;
- Ensure that populations of any significant flora and vegetation communities are not compromised by the project;
- Adopt controlled approaches towards the management of existing threatening processes such as weed control, fire and feral animals;
- Assess a reference (analogue) site in tandem with developing rehabilitation to provide an accurate comparison on the success or otherwise; and
- Outline a program for monitoring landform reconstruction and revegetation, environmental impacts and compliance with the Site Rehabilitation and Environmental Management Plan (SREMP).

This report deals specifically with undertaking annual monitoring of the 2012 rehabilitation block and adjacent analogue (reference) site. This is a requirement of the SREMP and has been referenced as a formal condition in the approved Native Vegetation Clearing Permit (NVCP).

## 3. METHODOLOGY

### 3.1 Preamble

An annual monitoring program designed to assess rehabilitation development success and the requirement for additional management strategies will be undertaken for three years following completion of rehabilitation, and at a three year interval from then onwards. Monitoring will continue until it has been proven that revegetation is self-sustaining and can be integrated with the surrounding undisturbed vegetation, as determined by an appropriately qualified botanist appointed by the DoT. Monitoring will be the responsibility of an appropriately qualified botanist appointed by the DoT, and will be conducted in accordance with the procedures outlined below. DoT will accept final responsibility for the rehabilitation works until such time as the completion criteria, from Augusta Boat Harbour SREMP (Onshore Environmental 2012) have been met.

In addition to the rehabilitation areas, a reference (analogue) site will be selected for annual monitoring. The analogue site will be selected on the basis of having similar soil-landform-vegetation associations to corresponding rehabilitation areas to allow for appropriate comparison of parameters. The analogue site chosen for assessment is situated north of the proposed Augusta Boat Harbour (along the same section of the ridge), in close proximity to Granny's Pool. It comprises coastal heath vegetation and provides a direct comparison to the vegetation cover being established in rehabilitation areas at the Augusta Boat Harbour.

Monitoring will use a series of plant biodiversity parameters such as species richness and diversity, plant density and percentage cover as indicators of ecosystem development and stability, which is endorsed by the EPA (EPA 2006). Qualitative assessment of the developing rehabilitation will be undertaken on a regular basis during the first growing season following establishment, and up to 15 months of age. Seed germination, plant establishment and survival, species diversity and weed establishment will be key parameters monitored during this period. Quantitative monitoring of rehabilitation will commence in the second spring (September/October) following rehabilitation (15 months), and will continue on an annual basis until the third assessment at which time the monitoring interval will be extended to a triennial basis (once every three years)<sup>1</sup>.

Rehabilitation blocks will be sampled with adequate replication to ensure the data is representative of the vegetation present. This will be demonstrated via graphing of 'species-area curves' for the understorey vegetation.

A monitoring report outlining annual results will be submitted annually to the DoT by the 31<sup>st</sup> March following annual assessments. The report will be provided to documented stakeholders and will be otherwise publicly available on request. This annual report will also be made available to DPaw upon request. A copy of the annual monitoring report will also be provided to Department of Environment (DoE) by 31<sup>st</sup> March each year.

The 2013 rehabilitation assessment represents the second annual reporting period and follows the first monitoring program completed late 2012.

### 3.2 Monitoring Protocol

The 2012 rehabilitation block was assessed on the 15<sup>th</sup> and 16<sup>th</sup> of November 2013 aged 17 months. The adjacent analogue site was assessed on the 11<sup>th</sup> December 2013.

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<sup>1</sup> On the provision that stakeholders are satisfied with rehabilitation development to this stage; annual rehabilitation monitoring will continue otherwise.

The monitoring procedure involved assessment of four permanent belt transects of twenty contiguous one metre square quadrats within the rehabilitation, and two transects at the analogue site. A GPS location of the commencement point and orientation of each transect was recorded and photo-monitoring point established. The twenty 1 m<sup>2</sup> quadrats along each transect line were assessed individually. For each species within a quadrat the number present, percentage ground cover, and maximum plant height was recorded. Summarised data provided mean density values (no. plants m<sup>-2</sup>), mean percentage ground cover, and mean maximum plant height.

An importance value index (IVI), (Mueller-Dombois & Ellenberg 1974) which considers frequency, density, and cover was calculated for each species recorded along a transect line. For all species recorded along each transect line the total IVI value is 300; the larger an individual IVI, the greater the dominance of that species. Species diversity was measured by the Shannon-Wiener diversity Index, with higher values representing a greater level of diversity. The spread of individuals between the species recorded is defined by the 'Evenness' value (J). Evenness ranges between 0 and 1, with the maximum value indicating the same number of individuals being recorded for all species (Zar 1996, Magurran 1988). Lower J values reflect the dominance of one or a few species within the revegetation.

### 3.3 Completion Criteria

To enable the assessment of rehabilitation progress towards objectives a number of completion criteria have been developed. For each criterion, performance indicators have been identified to enable progress to be measured and assessed. The targets are both qualitative (audit of design implementation during early stages to ensure maximum likelihood of a positive outcome), and quantitative (direct measure of performance outcomes).

The completion criteria will be assessed during the following five stages of the project:

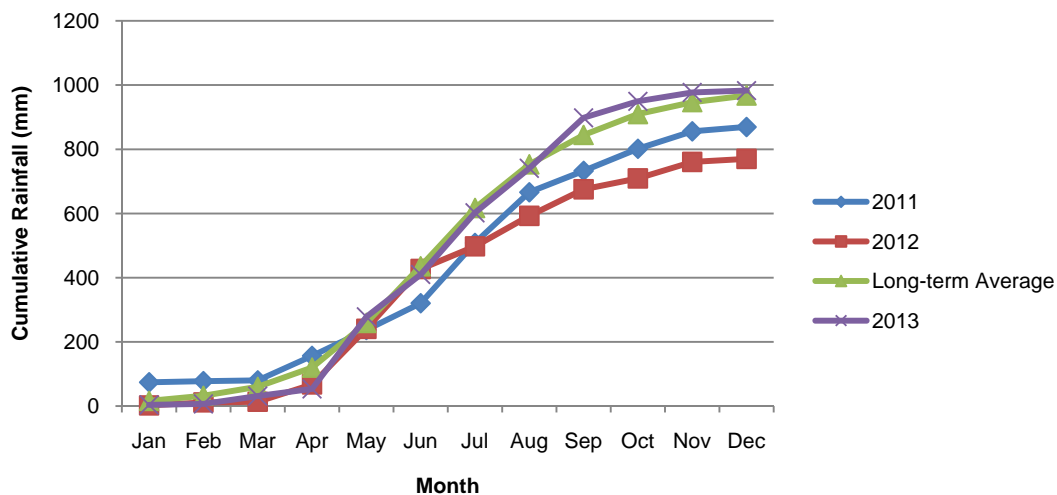
- Planning;
- Pre-clearing;
- Pre-rehabilitation;
- Establishment (0 – 15 months); and
- Development (15 months onwards).

## 4. RESULTS

### 4.1 Rainfall

The year prior to rehabilitation commencing (2011), as well as the year that rehabilitation at the Augusta Boat Harbour was completed (2012) both received below average rainfall with annual totals of 870 mm and 770 mm respectively (Figure 2). The long-term average is 967.5 mm.

The 2013 rainfall total of 982.8 mm was above the long term average. The summer and early autumn monthly totals were predictably low before the season broke in May 2013, when 277.8 mm was recorded. The winter months during 2013 received monthly rainfall close to the long-term average, while the spring and early summer months of September, October, November and December received monthly falls above the long-term average. The late season falls are known to be beneficial during early stages of rehabilitation development.



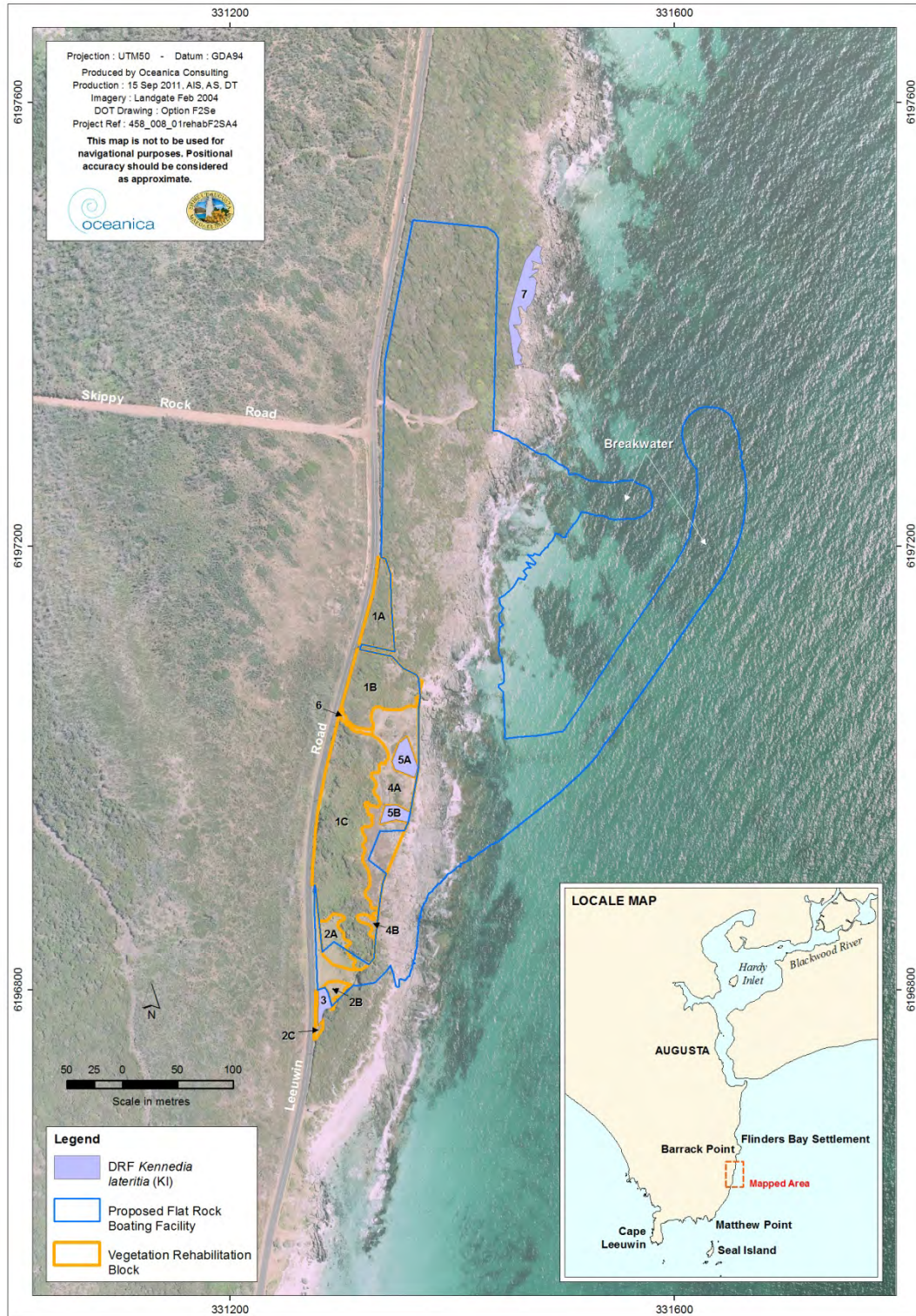
**Figure 2** Cumulative monthly rainfall totals for the nearby Cape Leeuwin weather station (approximately 6 km south-west of the Augusta Boat Harbour Project area) for 2011, 2012 and 2013.

### 4.2 Rehabilitation Implementation

The first stage of native rehabilitation was completed at the Augusta Boat Harbour between the 25<sup>th</sup> and 29<sup>th</sup> June 2012. This included approximately 0.56 ha contained within Rehabilitation blocks 4a, 4b, 5a and 5b (see Figure 3).

The native seed mix was hand broadcast at a rate of 4,310 grams per ha (Appendix 1). It comprised a total of 54 plant taxa that had been collected from site prior to clearing, and from local Shire reserves.

A total of 23 taxa were planted at a rate of 6,455 seedlings per ha equivalent (Appendix 2). The majority of planting stock was nine month old seedlings contained in a combination of cell packs and forestry tubes. The two *Lepidosperma* sedges were planted as advanced stock; *L. gladiatum* was planted from a combination of 255 mm and 140 mm pots, and *L. pubisquamum* was planted from 70 mm x 100 mm pots.



**Figure 3 Rehabilitation blocks identified for management at the Augusta Boat Harbour (from SREMP).**



### 4.3 Species Richness

The mean native species richness for the 2012 rehabilitation block at the second assessment in November 2013 was 30 species, an increase from 28 species recorded in 2012. The total number of native plant taxa recorded in 2013 was 57, higher in comparison to the 47 species recorded 12 months earlier during the November 2012 assessment. Along with an increase in native species, introduced weed species also increased from six taxa to 15 taxa over the same time period (see Table 1).

Native species richness for the adjacent analogue site remained at 18 species at December 2013, with one introduced weed species recorded.

### 4.4 Plant Density

The mean native plant density recorded in the 2012 rehabilitation block at November 2013 was 10.09 plants m<sup>-2</sup> representing an increase from 6.45 plants m<sup>-2</sup> recorded twelve months earlier. Plant density in the rehabilitation block was higher than the analogue site at 2.88 plants m<sup>-2</sup> (Table 1).

**Table 1 Summary of plant biodiversity parameters recorded at the 2012 rehabilitation block and neighbouring analogue site, October 2012.**

Assessment	Native Species Richness	Plant Density (# plants m <sup>-2</sup> )	% Cover
Rehabilitation aged 5 months (Nov 12)	47	6.45	17.8
Rehabilitation aged 17 months (Nov 13)	57	10.09	118.1
Analogue	18	2.88	85.7

### 4.5 Revegetation Cover

The mean native revegetation cover for the rehabilitation block was 118% at November 2013, representing a significant increase from the 18% cover recorded twelve months earlier (Plates 1-4). Introduced weed species provided a further 4.2% ground cover at November 2013, decreasing from 5.6% at November 2012 (see Table 1).

In comparison, native vegetation cover at the analogue site remained constant averaging 85.7% at December 2013, with introduced weeds providing a further 0.6% cover (Plate 5).

### 4.6 Dominant Plant Taxa

The dominant plant taxa represented in the 2012 rehabilitation block assessed at November 2013 were the Threatened Flora *Kennedia lateritia* (IVI 27.56), *Lepidosperma gladiatum* (IVI 22.99), *Stypandra glauca* (IVI 19.98), *Hakea oleifolia* (IVI 17.78), *Muehlenbeckia adpressa* (IVI 15.92), *Melaleuca incana* (IVI 15.71), *Agonis flexuosa* (IVI 15.49) and the Priority 4 Flora *Bossiaea disticha* (IVI 14.26). Five revegetation taxa were represented at mean density greater than 0.6 plants m<sup>-2</sup>; *Hakea oleifolia*, *Bossiaea disticha*, *Agonis flexuosa*, *Melaleuca incana* and *Hibbertia amplexicaulis* (Appendix 3).

A total of 19 plant taxa provided greater than 1% ground cover in the rehabilitation at November 2013, compared to three plant taxa at November 2012; this represents a high diversity site. The four species providing the highest ground coverage were *Stypandra glauca* (24.8%), *Kennedia lateritia* (18.1%), *Lepidosperma gladiatum* (13.0%) and *Muehlenbeckia adpressa* (10.2%).

The dominant plant species recorded at the analogue site was *Spyridium globulosum* (IVI 61.95), *Dodonaea ceratocarpa* (IVI 38.37), *Agonis flexuosa* (IVI 32.98), *Leucopogon*

*parviflora* (IVI 28.72), *Stypandra glauca* (IVI 22.24), *Acacia pulchella* (IVI 19.16) and *Hakea oleifolia* (IVI 15.97) (Appendix 4). There were only two plant taxa providing individual mean plant density greater than 0.4 plants m<sup>-2</sup>; *Dodonaea ceratocarpa* and *Lepidosperma pubisquameum*. Eight plant taxa provided ground cover greater than 1%; *Spyridium globulosum* (30.3%), *Agonis flexuosa* (11.9%), *Hakea oleifolia* (8.8%), *Stypandra glauca* (8.5%), *Dodonaea ceratocarpa* (6.8%), *Lepidosperma pubisquameum* (5.2%), *Leucopogon parviflora* (4.5%) and *Loxocarya cinerea* (1.1%).

#### 4.7 Rehabilitation Indices

The Shannon-Wiener diversity index (H) for transects in the 2012 rehabilitation block ranged from 2.88 to 3.53 (mean 3.21) at November 2013, compared to a range of 2.16 to 2.93 (mean 2.59) recorded at November 2012. The Evenness value (E) ranged from 0.83 to 0.91 (mean 0.87) at December 2013, compared to a range of 0.71 to 0.96 (mean 0.85) recorded at November 2012. The H mean value for the two analogue sites remained lower (2.01) than the rehabilitation block reflecting the significantly lower species richness. The E value for the analogue transects was comparable to the rehabilitation area (0.80).



Plate 1 Transect 1, 2012 rehabilitation – comparison at 5 and 17 months old.

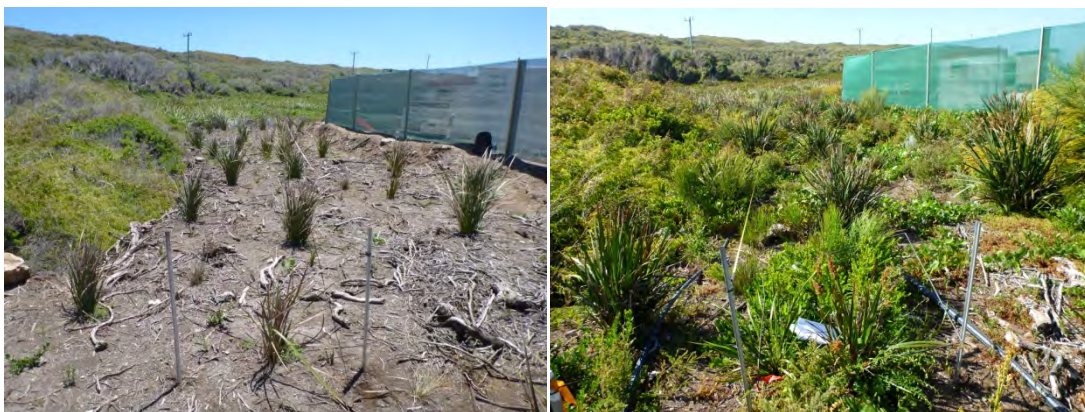


Plate 2 Transect 2, 2012 rehabilitation – comparison at 5 and 17 months old.

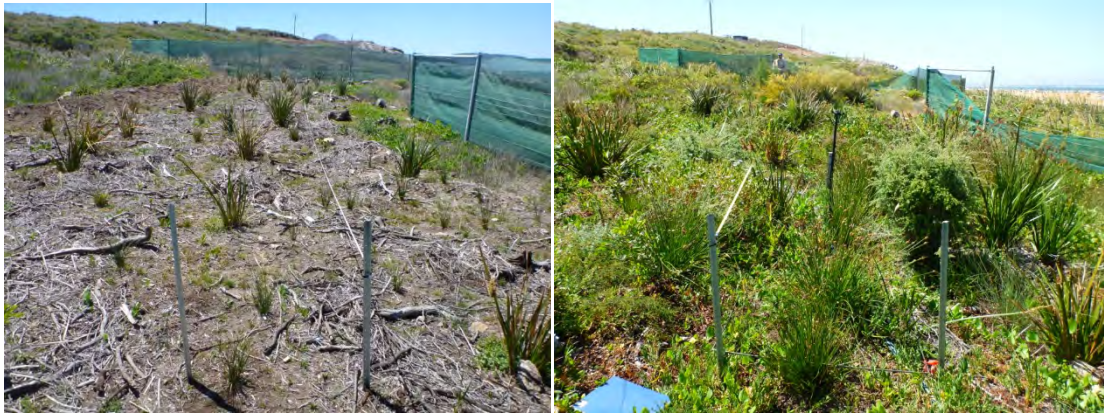


Plate 3 Transect 3, 2012 rehabilitation – comparison at 5 and 17 months old.



Plate 4 Transect 4, 2012 rehabilitation – comparison at 5 and 17 months old.



Plate 5 Transect 1, Analogue Site – comparison between November 2012 and 2013.



Plate 6 Transect 2, Analogue Site – comparison between November 2012 and 2013.

#### 4.8 Compliance to Criteria

At November 2013 with rehabilitation aged 17 months, all targets for completion criteria associated with the planning, pre-clearing, pre-rehabilitation and establishment stages of the 2012 rehabilitation block have been achieved and are compliant (Table 2).

It will be appropriate to continue annual monitoring of rehabilitation to ensure future compliance with the 'development criteria' as the revegetation develops. This will provide an accurate indication of the likelihood for longer term rehabilitation success and resilience.

**Table 2 Completion Criteria for rehabilitation at the Augusta Boat Harbour - compliance for 2012 rehabilitation block at November 2013.**

ASPECT	COMPLETION CRITERION	PERFORMANCE INDICATOR	Compliant
	<b>1. PLANNING</b>		
Access	1. Stakeholders have been consulted with proposed boat harbour access plans	Emails, letters, minutes of meetings	Yes
Fire	2. Fire management strategies are incorporated into the SREMP aimed at protecting developing rehabilitation	SREMP approved, Fire is excluded from developing rehabilitation for a minimum period of ten years following rehabilitation.	Yes
Land use	3. Area meets land use purpose as defined by land owner / manager	Shire of Augusta Margret River formally approves & adopts the end land use for the project area	Yes
Flora Vegetation and Fauna	4. Baseline flora & vegetation and fauna surveys have been completed	Management strategies for flora, vegetation and fauna of conservation significance are developed, as evidenced by correspondence.	Yes
	<b>2. PRE-CLEARING</b>		
Hydrology Landform and soils	5. Prior to commencement of clearing, surface drainage plan developed for areas earmarked for clearing	Surface drainage plan sighted by Project Manager	Yes
Clearing	6. Disturbance boundaries delineated with white sighter wire	Site inspection, photographs	Yes
Clearing	7. Machinery operators informed of clearing measures	Meeting minutes, correspondence	Yes
Vegetation and flora	8. Search for DRF (and other conservation significant flora) completed prior to clearing	Flora & vegetation survey report, photographs of flagged DRF	Yes
Vegetation and flora	9. Seed and plant material required for propagation removed and appropriately stored	Site inspection, photographs, invoices/receipts from seed merchants & nurseries	Yes
Vegetation and flora	10. Infrastructure and stockpile areas approved for clearing surveyed and pegged	Site inspection, photographs, survey/site plans, approval documents	Yes
	<b>3. PRE-REHABILITATION</b>		
Landform and soils	11. Native vegetation topsoil stripped in two layers: 0 – 50 mm and 50 – 150 mm, with clear signage delineating the two resources to prevent later confusion	Site inspection, photographs	Yes
Landform and soils	12. Native vegetation topsoil stripped during dry conditions wherever practicable	Site inspection, photographs	Yes

ASPECT	COMPLETION CRITERION	PERFORMANCE INDICATOR	Compliant
Landform and soils	13. Upper topsoil stripped with a grader (or similar) and stockpiled into pre-determined locations	Site inspection, photographs	Yes
Landform and soils	14. Native vegetation topsoil stockpiled over cleared native vegetation areas to a maximum height of 1 m	Site inspection, photographs, site plan	Yes
Landform and soils	15. Landform design is integrated with existing landscape	Survey plan for proposal area (showing contours before and after development)	Yes
Vegetation and flora	16. Clear and stockpile understorey vegetation	Site inspection, photographs	Yes
			Yes
Landform and soils	17. Topsoil spread over 100% of the rehabilitated areas	Site plan, schedule, site inspection, photographs	Yes
Landform and soils	18. Aim to direct return 100% of the upper (top 50 mm) topsoil resource over disturbed rehabilitation areas	Site plan, schedule, site inspection, photographs	Yes
Landform and soils	19. Post-disturbance surfaces re-contoured with a grader following survey	Survey report (including pre- and post-disturbance contours), site inspection, photographs	Yes
Landform and soils	20. Re-contoured surface deep ripped / scarified with appropriate machine (grader or small dozer)	Site inspection, photographs	Yes
Landform and soils	21. 'Lower topsoil' material replaced at 150 mm depth	Monitoring (survey) results, site inspection, photographs	Yes
Landform and soils	22. 'Upper topsoil' material replaced at 50 mm	Monitoring (survey) results, site inspection, photographs	Yes
Landform and soils Hydrology	23. No uncontrolled surface runoff or soil erosion that is unstable and degrading, and/or compromises end land use objectives	Site inspection, photographs, monitoring results	Yes
Vegetation and flora	24. Perimeter of rehabilitation fenced	Invoice/ receipt from fencing contractor, site plan, site inspection, photographs	Yes
<b>4. ESTABLISHMENT</b>			
Vegetation and flora	25. Prepared rehabilitation areas direct seeded with a native species mix	Seed list outlining volume of seed utilised for each species, area direct-seeded, site inspection, photographs	Yes
Vegetation and flora	26. Nursery propagated seedlings (from a mixture of seed, cuttings, root divisions, and tissue culture) replanted throughout the rehabilitation area at a density >1,000 seedlings ha <sup>-1</sup>	Species list showing seedling numbers for each species, area of rehabilitation, site inspection, photographs, monitoring results	Yes

ASPECT	COMPLETION CRITERION	PERFORMANCE INDICATOR	Compliant
Vegetation and flora	27. At 15 months total number of <i>Kennedia lateritia</i> plants at the site to be 150% of the number recorded prior to development	Site inspection, photographs, monitoring results	Yes
Vegetation and flora	28. At 15 months species richness to be at least 80% of that recorded at the analogue site, with not more than 10 percent of the annual assessment plots failing to record this level of diversity	Monitoring results confirm species richness at least 80% of that recorded at the analogue site, with not more than 10 percent of the annual assessment plots failing to record this level of diversity	Yes
Landform and soils	29. Surfaces stable with no evidence of surface erosion that is likely to limit establishment of a native vegetation cover	Monitoring results (erosion and vegetation) confirming that erosion is not limiting plant establishment in the rehabilitation	Yes
Vegetation and flora	30. No areas greater than 0.01 ha without understorey	Monitoring results, site inspection to confirm there are no areas greater than 0.01 ha without understorey	Yes
<b>5. DEVELOPMENT</b>			
Vegetation and flora	31. Longer term species richness to be at least 80% of that recorded at the analogue site, with not more than 10 percent of the annual assessment plots failing to record this level of diversity	Monitoring results confirm species richness at least 80% of that recorded at the analogue site, with not more than 10 percent of the annual assessment plots failing to record this level of diversity	Not relevant
Vegetation and flora	32. For Peppermint trees ( <i>Agonis flexuosa</i> ) planted to consolidate the existing southernmost clump of taller trees at the project site, a minimum number of 15 trees have survived 5 years following commencement of rehabilitation.	Annual monitoring results confirm survival of at least 15 Peppermint trees ( <i>Agonis flexuosa</i> ) at 5 years.	Not relevant
Vegetation and flora	33. No Declared Plants (weeds) as defined by DAFWA (2007) present within rehabilitation areas.	Monitoring results, site inspection confirm no Declared Plants present in the rehabilitation	Not relevant
Access	34. The agreed access plan has been implemented	Access plan, site inspection, correspondence from regulatory authorities	Not relevant
Land use	35. The site meets the agreed end land use	Site inspection, photographs, correspondence from regulatory agencies	Not relevant
Landform and soils	36. The rehabilitation surface is stable and vegetated, with no uncontrolled run-off	Monitoring results, site inspection, photographs	Not relevant

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# APPENDIX 1

Native seed mix and individual sowing rates for the 2012 rehabilitation block

Species	Location	Batch #	Collection Season	2012 Seed Rate (g)
<i>Acacia alata</i>	Res39156	KMV400	2010/11	49
<i>Acacia alata</i>	Res39156	KMV-453	2011/12	
<i>Acacia littorea</i>	Res25141	KMV401	2010/11	100
<i>Acacia myrtifolia</i>	Res39156	KMV-454	2011/12	20
<i>Acacia pulchella var goadbyi</i>	Res 20761	KMV-456	2011/12	25
<i>Acacia pulchella var pulchella</i>	Res25141	KMV402	2010/11	25
<i>Acanthocarpus preissii</i>	Res25141	KMV403	2010/11	350
<i>Acrotriche cordata</i>	Res25141	KMV404	2010/11	100
<i>Agonis flexuosa</i>	Res25141	KMV405	2010/11	150
<i>Anthocercis littorea</i>	Res25141	KMV406	2010/11	5
<i>Baumea juncea</i>	Res25141	KMV407	2010/11	5
<i>Boronia alata</i>	Res25141	KMV-455	2011/12	30
<i>Boronia alata</i>	Res25141	KMV408	2010/11	
<i>Bossiaea distichea*</i>	Res25141	KMV-462	2011/12	150
<i>Bossiaea linophylla</i>	Res 20761	KMV-457	2011/12	150
<i>Carpobrotus virescens</i>	Res25141	KMV409	2010/11	90
<i>Carpobrotus virescens</i>	Res25141	KMV410	2010/11	
<i>Chorilaena quercifolia</i>	Res25141	KMV411	2010/11	0.5
<i>Chorizema diversifolium</i>	Res39156	KMV412	2010/11	0.4
<i>Clematis pubescens</i>	Res25141	KMV413	2010/11	120
<i>Comosperma confertum</i>	Res25141	KMV414	2010/11	0.1
<i>Daucus glochidiatus</i>	Res 27432	KMV-461	2011/12	3
<i>Dodonaea ceratocarpa</i>	Res25141	KMV415	2010/11	
<i>Eutaxia obovata</i>	Res25141	KMV416	2010/11	350
<i>Exocarpus sparteus</i>	Res25141	KMV417	2010/11	24
<i>Ficinia nodosa</i>	Res25141	KMV418	2010/11	30
<i>Hakea oleifolia</i>	Res25141	KMV-452	2011/12	
<i>Hardenbergia comptoniana</i>	Res25141	KMV419	2010/11	300
<i>Hovea elliptica</i>	Res20761	KMV420	2010/11	22
<i>Hovea elliptica</i>	Res39156	KMV421	2010/11	
<i>Kennedia carinata</i>	Res25141	KMV422	2010/11	1.3
<i>Kennedia coccinea</i>	Res39156	KMV423	2010/11	6
<i>Kennedia macrophylla*#1</i>	Res25141	KMV-447	2011/12	280
<i>Kennedia macrophylla*#2</i>	Res25141	KMV-448	2011/12	
<i>Kennedia macrophylla*#3</i>	Res25141	KMV-449	2011/12	
<i>Kennedia macrophylla*#4</i>	Res25141	KMV-450	2011/12	
<i>Kennedia prostrata</i>	Res25141	KMV424	2010/11	5
<i>Kennedia prostrata</i>	Res25141	KMV-458	2011/12	
<i>Leucophyta brownii</i>	Res25141	KMV425	2010/11	30
<i>Leucopogon parviflorus</i>	Res25141	KMV426	2010/11	300
<i>Linum marginale</i>	Res 27432	KMV-460	2011/12	1.3
<i>Lobelia anceps</i>	Res25141	KMV427	2010/11	3

Species	Location	Batch #	Collection Season	2012 Seed Rate (g)
<i>Logania vaginalis</i>	Res20761	KMV428	2010/11	10
<i>Melaleuca incana ssp incana</i>	Res9658/25141	KMV-451	2011/12	50
<i>Patersonia occidentalis</i>	Res25141	KMV429	2010/11	15
<i>Patersonia umbrosa var xantha</i>	Res25141	KMV430	2010/11	7
<i>Philotheca spicata</i>	Res25141	KMV431	2010/11	0.1
<i>Phyllanthus calycinus</i>	Res25141	KMV432	2010/11	11
<i>Pimelia ferruginea</i>	Res25141	KMV433	2010/11	60
<i>Rhagodia baccata</i>	Res25141	KMV434	2010/11	250
<i>Scaevola crassifolia</i>	Res25141	KMV435	2010/11	16
<i>Sollya heterophylla</i>	Res25141	KMV436	2010/11	40
<i>Sphenotoma capitatum</i>	Res25141	KMV437	2010/11	1.6
<i>Sporobolus virginicus</i>	Res25141	KMV438	2010/11	3
<i>Spyridium globosum</i>	Res25141	KMV439	2010/11	200
<i>Stylidium adnatum</i>	Res 27432	KMV-459	2011/12	
<i>Stylidium adnatum var adnatum</i>	Res25141	KMV440	2010/11	0.05
<i>Templetonia retusa</i>	Res25141	KMV441	2010/11	0.7
<i>Threlkeldia diffusa</i>	Res25141	KMV442	2010/11	50
<i>Viminaria juncea</i>	Res20761	KMV443	2010/11	220
<i>Viminaria juncea</i>	Res25141	KMV444	2010/11	
<i>Xanthorrhoea preissii</i>	Res 27432	KMV445	2010/11	650
<i>Xanthosia candida</i>	Res25141	KMV446	2010/11	0.7
<b>TOTAL</b>				<b>4310.75</b>

# APPENDIX 2

Native seedling mix and individual planting rates for the 2012 rehabilitation block

<b>Species</b>	<b>Planting Rate (no. per ha)</b>
<i>Lepidosperma gladiatum</i> 255mm	815
<i>Lepidosperma squamatum</i> 140mm	300
<i>Lepidosperma squamatum</i> 70 x 100mm	200
<i>Conostylis aculeata</i>	500
<i>Banksia littoralis</i>	50
<i>Acacia littorera</i>	50
<i>Carpobrotus virescens</i>	250
<i>Dodonea ceratocarpa</i>	250
<i>Ficinia nodosa</i>	250
<i>Hardenbergia comptoniana</i>	250
<i>Rhagodia baccata</i>	500
<i>Scaevola crassifolia</i>	250
<i>Sollya heterophylla</i>	100
<i>Spyridium globulosum</i>	150
<i>Templetonia retusa</i>	50
<i>Viminaria juncea</i>	100
<i>Hakea oleifolia</i>	500
<i>Melaleuca incana</i>	250
<i>Juncus kraussii</i>	200
<i>Olearia axillaris</i>	250
<i>Leucophyta brownii</i>	250
<i>Kennedia laterita</i>	775
<i>Agonis flexuosa</i>	100
<i>Anthocercis littorea</i>	65
<b>TOTAL</b>	<b>6,455</b>

# APPENDIX 3

Plant biodiversity parameters recorded from four 20m by 1m transects  
within the 2012 rehabilitation block at November 2013

SPECIES	IVI	DENS	COV	HT
* <i>Arctotheca calendula</i>	0.05	0	0.06	
* <i>Avena barbata</i>	0.01	0	0.01	
* <i>Briza minor</i>	0.03	0	0.03	
* <i>Bromus diandrus</i>	0.01	0	0.01	
* <i>Centaurium erythraea</i>	0.14	0	0.15	
* <i>Centaurium tenuiflorum</i>	0.14	0	0.15	
* <i>Cynodon dactylon</i>	0.02	0	0.02	
* <i>Ehrharta calycinus</i>	0.11	0	0.14	
* <i>Euphorbia terracina</i>	0.01	0	0.01	
* <i>Hypochaeris glabra</i>	0.07	0	0.08	
* <i>Lotus angustissimus</i>	1.23	0	1.47	
* <i>Lysmachia arvensis</i>	2.91	0	3.15	
* <i>Solanum nigrum</i>	0.01	0	0.01	
* <i>Sonchus asper</i>	0.18	0	0.22	
* <i>Sonchus oleraceus</i>	0.02	0	0.02	
<i>Acacia alata</i>	1.26	0.05	0.24	44
<i>Acacia extensa</i>	3.18	0.13	0.61	49
<i>Acacia littorea</i>	1.31	0.04	0.32	33
<i>Acacia myrtifolia</i>	0.77	0.01	0.48	90
<i>Acacia pulchella</i>	8.91	0.31	2.82	38
<i>Acrotriche cordata</i>	2.61	0.13	0.07	11
<i>Agonis flexuosa</i>	15.49	0.75	2.82	30
<i>Anarthria prolifera</i>	0.07	0	0.08	
<i>Anthocercis littorea</i>	1.48	0.04	0.63	27
<i>Anthocercis littorea</i>	0.86	0.04	0.08	20
<i>Austrodanthonia setacea</i>	0.04	0	0.04	
<i>Austrostipa flavescens</i>	0.35	0.01	0.13	85
<i>Baumea juncea</i>	0.31	0.01	0.04	10
<i>Billardiera heterophylla</i>	5.89	0.31	0.63	18
<i>Bossiaea disticha</i>	14.26	0.78	2.18	23
<i>Bossiaea linophylla</i>	1.75	0.06	0.10	35
<i>Carpobrotus virescens</i>	0.34	0.01	0.01	10
<i>Centella asiatica</i>	0.37	0.01	0.09	20
<i>Chorilaena quercifolia</i>	1.15	0.05	0.14	15
<i>Conostylis serrulata</i>	0.37	0.01	0.05	40
<i>Conostylis setigera</i>	1.56	0.06	0.33	33
<i>Dodonaea ceratocarpa</i>	7.87	0.30	2.30	30
<i>Eutaxia myrtifolia</i>	7.87	0.43	1.08	35
<i>Ficinia nodosa</i>	4.14	0.11	1.74	37
<i>Geranium retrorsum</i>	1.21	0.05	0.09	6
<i>Hakea oleifolia</i>	17.78	0.79	4.61	25
<i>Hardenbergia comptoniana</i>	1.45	0.05	0.26	53
<i>Hibbertia amplexicaulis</i>	9.97	0.68	2.05	14
<i>Hypolaena pubescens</i>	2.70	0.10	0.15	35
<i>Juncus kraussii</i>	3.45	0.10	1.21	91
<i>Kennedia lateritia</i>	27.56	0.58	18.09	33
<i>Kennedia prostrata</i>	0.34	0.01	0.01	5
<i>Lepidosperma gladiatum</i>	22.99	0.56	12.95	96
<i>Lepidosperma pubisquameum</i>	0.88	0.03	0.56	60
<i>Lepidosperma squamatum</i>	2.33	0.09	0.65	22

<b>SPECIES</b>	<b>IVI</b>	<b>DENS</b>	<b>COV</b>	<b>HT</b>
<i>Leucophyta brownii</i>	6.41	0.28	0.55	22
<i>Leucopogon parviflorus</i>	1.67	0.08	0.65	29
<i>Logania vaginalis</i>	1.30	0.05	0.13	35
<i>Lyginia barbata</i>	0.07	0	0.08	
<i>Marianthus candidus</i>	3.74	0.14	0.45	36
<i>Melaleuca incana</i>	15.71	0.74	3.25	53
<i>Muehlenbeckia adpressa</i>	15.92	0.41	10.19	34
<i>Neurachne alopecuroidea</i>	0.29	0.01	0.03	10
<i>Olearia axillaris</i>	4.05	0.13	0.91	39
<i>Patersonia occidentalis</i>	0.79	0.03	0.11	28
<i>Phyllanthus calycinus</i>	1.65	0.06	0.31	24
<i>Pimelea ferruginea</i>	11.69	0.56	1.29	27
<i>Rhagodia baccata</i>	7.19	0.23	1.95	15
<i>Scaevola crassifolia</i>	9.26	0.21	5.61	44
<i>Scaevola nitida</i>	2.47	0.13	0.15	15
<i>Spyridium globulosum</i>	4.75	0.23	0.65	21
<i>Stypandra glauca</i>	19.98	0.10	24.78	6
<i>Templetonia retusa</i>	0.43	0.01	0.08	35
<i>Tetrraria capillaris</i>	2.29	0.11	0.47	30
<i>Tetrrarrhena laevis</i>	0.55	0.01	0.30	5
<i>Viminaria juncea</i>	11.77	0.21	9.73	103
<i>Xanthosia candida</i>	0.69	0.04	0.08	5
<b>Total IVI</b>	<b>300</b>			
<b>All Species</b>	<b>80</b>	<b>10.43</b>	<b>124.82</b>	
<b>Native Species</b>	<b>54</b>	<b>10.09</b>	<b>118.09</b>	



# APPENDIX 4

Plant biodiversity parameters recorded from two 20m by 1m transects situated at an analogue site adjacent to the Augusta Boat Harbour site – November 2013

<b>SPECIES</b>	<b>IVI</b>	<b>DENS</b>	<b>COV</b>	<b>HT</b>
<i>Acacia puchella</i>	19.16	0.175	4.375	35
<i>Agonis flexuosa</i>	32.98	0.175	11.875	83
<i>Billardiera heterophylla</i>	3.35	0.025	0.375	35
<i>Cassythia racemosa</i>	1.59	0	1.625	
<i>Chorilaena quercifolia</i>	10.68	0.075	1.575	50
<i>Crytandra arbutiflora</i>	1.69	0.025	0.225	15
<i>Dodonaea ceratocarpa</i>	38.37	0.4	6.75	34
<i>Hakea oleifolia</i>	15.96	0.125	8.75	79
<i>Hibbertia cunninghamii</i>	4.24	0.05	0.05	10
<i>Lepidosperma pubisquameum</i>	37.64	0.75	5.175	45
<i>Lepidosperma gladiatum</i>	5.89	0.05	0.175	120
<i>Leucopogon parviflora</i>	28.71	0.25	4.475	76
<i>Loxocarya cinerea</i>	11.18	0.2	1.075	28
<i>Muehlenbeckia adpressa</i>	1.72	0.025	0.2	
* <i>Ammophila arenaria</i>	0.88	0	0.625	
<i>Olearia axillaris</i>	0.17	0	0.125	
<i>Phyllanthus calycinus</i>	1.52	0.025	0.05	30
<i>Spyridium globulosum</i>	61.95	0.275	30.35	85
<i>Stypandra glauca</i>	22.23	0.25	8.475	30
<b>TOTAL</b>	<b>300.00</b>	<b>2.88</b>	<b>86.33</b>	

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**APPENDIX E**

**ONSHORE ENVIRONMENTAL CONSULTANTS 'KENNEDIA LATERITIA' HEALTH  
MONITORING LETTER REPORT TO DPAW**

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Stephen Smith  
Project Manager  
Department of Transport  
Marine House 1 Essex Street  
Fremantle WA 6160

25<sup>th</sup> February 2014

### **Augusta Boat Harbour – *Kennedia lateritia* Health Monitoring**

#### *Background*

In early November 2013 the Department of Parks and Wildlife (DPaW) requested Department of Transport (DoT) to undertake a two month health monitoring program aimed at Threatened *Kennedia lateritia* plants situated within a small seasonally inundated swale in the south-west corner of the Augusta Boat Harbour project area. It was envisaged that monitoring results would allow DoT and DPaW to better understand the ecology of the seasonally inundated zone and potentially implementation of management actions to improve the health and condition of *Kennedia lateritia*.

#### *Methodology*

The monitoring procedure implemented was recommended by Mr Andrew Webb of DPaW in an email to Department of Transport on 7<sup>th</sup> November 2013. Due to the intermingling growth form of *Kennedia lateritia* and the associated difficulty in determining health of individual plants, DPaW recommended a transect-based photo-monitoring approach as detailed below.

1) Transects to extend from dry healthy plants on/near the roadside through the inundated area and back up into dry ground and/or healthy plants on the ocean side.

2) Along each transect install permanent droppers at 2m spacing, so that a photo-point can be taken over each 2m interval between the droppers (taken in a manner so that the photo is directed at the base of the furthest of the two droppers with the top of the nearest dropper visible in the photo) i.e. looking down into the vegetation canopy of each 2m interval.

3) For each 2m interval and approximately 1m either side of the transect, i.e. within a 2x2m area, score the average health of the *Kennedia lateritia* cover by assigning a health score based on the five point scale below:

- 1 – *Kennedia lateritia* cover of the interval is 100% health
- 2 - up to 25% of the intervals *Kennedia lateritia* cover is stressed/dead
- 3 - 25-50% of the intervals *Kennedia lateritia* cover is stressed/dead

4 – 50-75% of the intervals *Kennedia lateritia* cover is stressed/dead

5 – 100% of the intervals *Kennedia lateritia* cover is stressed/dead

0 – no *Kennedia lateritia* cover in interval

4) The 2m interval photo points were taken from the lowest contour point thereby improving the angle at which each photo was captured. As such, monitoring commenced in the middle of each transect and worked out to each side.

5) A minimum of 3 transects were to be established including:

- one transect across the core area of inundation in approximately a NW to SE direction which would be across an area where stressed/dead plants are clearly visible either side of the inundation from the sealed road edge;
- another transect just to the north of the above site where there is an extension of stressed plants into an otherwise relatively healthy area of the species; and
- a third transect across the area of plants on the south side of the harbour access road to act as a control.

6) The transects were to be monitored as soon as possible and again two months following at which point a copy of the photo's and the health score data would be provided to DPaW.

Onshore Environmental was commissioned by DoT to undertake the assessments in early November 2013. A total of four belt transects were established at site. Three transects between 24 m and 30 m in length were established across the area of seasonal inundation (Transects 1-3). A fourth transect was established on elevated ground on the south side of the access road to act as a 'control'; Transect 4 was 10 m in length. The four transects were monitored on two occasions at the 15<sup>th</sup> November 2013 and 5<sup>th</sup> February 2014.

### Results

A total of 47 quadrats along the four transects were monitored on two occasions at the 15<sup>th</sup> November 2013 and 5<sup>th</sup> February 2014. Health scores and representative photographs are provided as Attachment 1.

The health score improved for one of the 47 quadrats over the period of the two assessments (from a score of 4 to a score of 3); health scores for the remaining quadrats remained stable (Table 1).

The mean health scores for the four quadrats were 1.50, 1.60, 0.53 and 1.80 at November 2013 respectively, with the mean score for Transect 1 changing to 1.42 at February 2014 (Table 1). The variation in mean health scores reflected position in the landscape and more specifically, the length of each transect within the zone of seasonal inundation. *Kennedia lateritia* plants were largely absent from the lowest points within the zone, reflecting their intolerance for extended period of inundation. This would have been emphasised if quantitative assessment of foliage cover was made along each transect. Scattered *Kennedia lateritia* plants were observed where relief increased around the perimeter of the seasonally inundated zone, with the larger population (and higher ground coverage) occurring on adjacent elevated ground outside the area of seasonal inundation.

Table 1 *Kennedia lateritia* health scores rated during the 15<sup>th</sup> November 2013 and 5<sup>th</sup> February 2014 assessments. NOTE: Shaded cells represent change in score between the two assessments.

Interval (m)	Transect 1		Transect 2		Transect 3		Transect 4	
	Nov13	Feb14	Nov13	Feb14	Nov13	Feb14	Nov13	Feb14
28-30			2	2	1	1		
26-28			2	2	5	5		
24-26			5	5	0	0		
22-24	0	0	5	5	0	0		
20-22	2	2	2	2	0	0		
18-20	0	0	0	0	0	0		
16-18	0	0	0	0	0	0		
14-16	0	0	0	0	0	0		
12-14	0	0	0	0	0	0		
10-12	5	5	0	0	0	0		
8-10	4	3	0	0	0	0	1	1
6-8	2	2	2	2	0	0	1	1
4-6	1	1	3	3	0	0	2	2
2-4	2	2	2	2	1	1	2	2
0-2	2	2	1	1	1	1	3	3
Mean	1.50	1.42	1.60	1.60	0.53	0.53	1.80	1.80

### Discussion

Prior to commencement of the Augusta Boat Harbour, large areas in the southern sector of the project area were heavily disturbed and unmanaged; this included the area impacted by seasonal inundation that is currently being investigated. Photographs take during the baseline flora and vegetation survey (Plates 1 and 2) and during development of the integrated rehabilitation and management plan (Plate 3) confirm the absence of native vegetation at this location, and 100% ground cover provided by Kikuyu Grass (Plates 1-3).

The treatment and removal of the Kikuyu Grass occurred ahead of remedial sowing and planting of native plant taxa in July 2012, with subsequent selective treatment of exotic grasses. It is noted that *Kennedia lateritia* was included in the seed mixture, and existing plants have likely established from this source. The resultant vegetation composition within the area of inundation reflects the landform, and seasonal inundation.

While there can be no argument that the current state of the seasonally inundated zone is an improvement on the previous cover of exotic grasses, there is an opportunity to reduce the potential impact of surface water expression on vegetation by integrating rehabilitation of adjacent areas proposed for mid 2014, i.e. access road, humus stockpile, and car park situated south of the access road. This will likely reduce the depth and duration of pooling surface water across the larger area. It should be emphasised that annual rainfall for Cape Leeuwin during 2013 totalled 982.8 mm; this was the wettest of the past 17 years (since 1996) and was the major contributing factor to seasonal inundation encroaching 1-2 m outside of the zone evidenced in recent years.





Plate 1 The seasonally inundated zone prior to rehabilitation and management by Department of Transport.



Plate 2 The seasonally inundated zone prior to rehabilitation and management by Department of Transport.



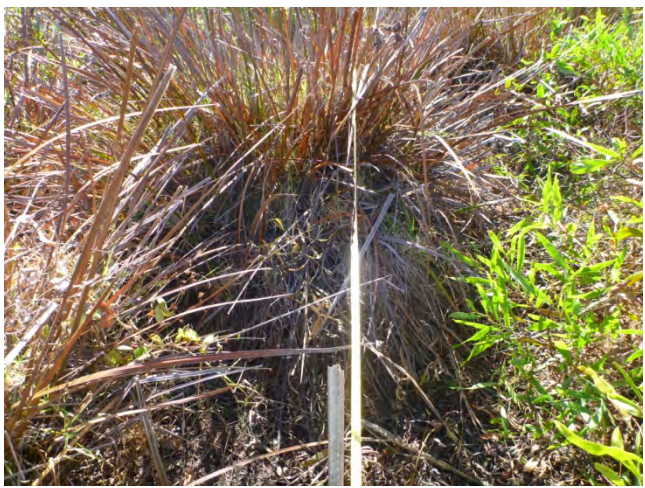







Plate 3 The seasonally inundated zone prior to rehabilitation and management by Department of Transport.



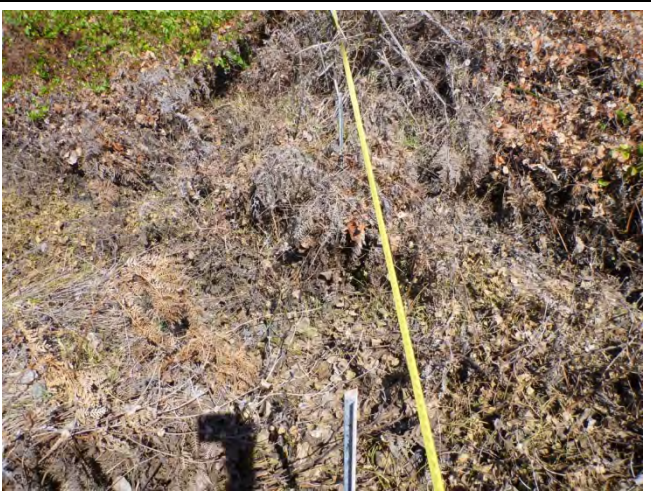

A handwritten signature in blue ink, appearing to read "Darren Brearley".





Dr Darren Brearley





**Director**





Interval (m) T1	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
22-24	0		0	
20-22	2		2	

Interval (m) T1	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
18-20	0		0	
16-18	0		0	





Interval (m) T1	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
14-16	0		0	
12-14	0		0	





Interval (m) T1	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
10-12	5		5	
8-10	4		3	





Interval (m) T1	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
6-8	2		2	
4-6	1		1	





Interval (m) T1	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
2-4	2		2	
0-2	2		2	











Interval (m) T2	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
28-30	2		2	
26-28	2		2	





Interval (m) T2	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
24-26	5		5	
22-24	5		5	



Interval (m) T2	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
20-22	2		2	
18-20	0		0	

Interval (m) T2	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
16-18	0		0	
14-16	0		0	



Interval (m) T2	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
12-14	0		0	
10-12	0		0	





Interval (m) T2	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
8-10	0		0	
6-8	2		2	





Interval (m) T2	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
4-6	3		3	
2-4	2		2	





Interval (m) T2	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
0-2	1		1	











Interval (m) T3	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
28-30	1		1	No photo taken
26-28	5		5	





Interval (m) T3	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
24-26	0		0	
22-24	0		0	

Interval (m) T3	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
20-22	0		0	
18-20	0		0	

Interval (m) T3	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
16-18	0		0	
14-16	0		0	





Interval (m) T3	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
12-14	0		0	
10-12	0		0	





Interval (m) T3	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
8-10	0		0	
6-8	0		0	

Interval (m) T3	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
4-6	0		0	
2-4	1		1	

Interval (m) T3	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
0-2	1		1	



Interval (m) T4	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
8-10	1		1	
6-8	1		1	

Interval (m) T4	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
4-6	2		2	
2-4	2		2	

Interval (m) T4	Health Score Nov13	Representative Photograph 15/11/13	Health Score Feb14	Representative Photograph 05/02/14
0-2	3		3	

**APPENDIX F      AUGUSTA BOAT HARBOUR EPBC APPROVAL 2008/4506 COMPLIANCE  
ASSESSMENT AUDIT TABLE**

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Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
1	EPBC Approval Instrument (EPBC2008/45 06)	Notification of commencement	Within 30 days after commencement of the action, the person taking the action must advise the Department in writing of the actual date of commencement.	Construction	Compliant	Letter from Oceanica on behalf of DoT dated 14 October 2011 to DoE, advising that works to implement the Augusta Boat Harbour commenced on 27 September 2011 at which time temporary fencing was installed around the designated site access road area.	Letter from DoT dated; 14 October 2011
2	EPBC Approval Instrument (EPBC2008/45 06)	Maintenance of records	<b>Maintain accurate records</b> substantiating <b>all activities</b> associated with or relevant to the conditions of approval, including measures taken to implement the management plan required by this approval and make them available to DSEWPaC. May be subject to auditing by DSEWPaC.	Overall	Compliant / Not required at this stage	Accurate records are maintained and evidence provided in each annual compliance report, annual report for DEC clearing permits.  No requests were made by the Department during the compliance assessment reporting period for records substantiating activities associated with, or relevant to, the conditions of approval.	This Report, DEC CP 3990/2 Annual Report
3	EPBC Approval Instrument (EPBC2008/45 06)	Compliance reporting	Within 3 months of every 12 month anniversary - a report must be published on the website addressing compliance with approval. Must include date of publication and non-compliance with any condition.	Overall	Compliant	This report is the third annual compliance report to be prepared under EPBC Statement No. 2008/4506.  No non-compliances were recorded against any of the conditions of the approval EPBC 2008/4506.	This Report
4	EPBC Approval Instrument (EPBC2008/45 06)	Revisions to Ministerial Deliverables	If DoT wish to carryout activates other than in management plans - must submit to	Overall	Compliant	DoT provided DoE with an environmental impact assessment for a minor underwater blasting campaign within the harbour. The findings of the assessment and DoE's view was that the	Letter to DoE on 10/12/2013. Response letter from DoE on 20/12/2013

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
			DSEWPaC written approval and revised management plan.			proposed blasting was unlikely to have a significant impact to MNES.	Letter from DoT dated: 7 July 2012
5	EPBC Approval Instrument (EPBC2008/45 06)	Threatened species and communities	If minister believes it necessary for better protection of <b>threatened species and communities</b> , they may <b>request revision of management plans</b> .	Overall	Not required at this stage	No such requests were received by DoT during the compliance assessment reporting period.	
6	EPBC Approval Instrument (EPBC2008/45 06)	Commencement of action	If, work has not commenced within 5 years of approval issued, then the proponent must seek written approval from Minister.	Pre-construction	Not required at this stage	Letter from Oceanica on behalf of DoT dated 14 October 2011 to DoE, advising that works to implement the Augusta Boat Harbour commenced on 27 September 2011 at which time temporary fencing was installed around the designated site access road area.	Letter from DoT dated: 14 October 2011
7	EPBC Approval Instrument (EPBC2008/45 06)	Conservation of significant vegetation and rehabilitation	Develop a SREMP to mitigate impact to <i>Kennedia lateritia</i> must include: <ul style="list-style-type: none"> <li>• Overview of existing environment Objectives</li> <li>• Clearing Protocols</li> <li>• Perimeter fencing/security of rehabilitation areas and existing locations of Augusta Kennedia</li> <li>• Rehabilitation</li> </ul>	Pre-construction	Compliant	DoT in consultation with OEC developed the SREMP to address the criteria specified within the approval conditions. The original SREMP was submitted to DoE and approved on 20 September 2011, the most recent revision (Version 12), was approved by DoE on 17 October 2012.	Letter from DSEWPaC dated 17 October 2012

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
			activities / program, including figures showing rehabilitation sites <ul style="list-style-type: none"> <li>• Maintenance of site including vermin control, fire management, pest management and weed control</li> <li>• Timing and implementation of the above monitoring and reporting.</li> </ul>				
8	EPBC Approval Instrument (EPBC2008/45 06)	Ministerial deliverable	The SREMP must be submitted to and approved by the minister prior to construction commencing.	Pre-construction	Compliant	Both the MNMP and the original SREMP were approved by DoE 20 September 2011. First ground works commenced on 27 September 2011.	Letter from DSEWPaC dated 20 September 2011
9	EPBC Approval Instrument (EPBC2008/45 06)	Conservation of significant vegetation	<b>Only 12 peppermint trees</b> of 1.5 m or greater are to be cleared.	Clearing	Compliant	Clearing of vegetation occurred on 5 October 2011. DEC WRP Clearing procedures were complied with. Letter report from Green Iguana confirms clearing of 12 peppermint trees (Report dated 26 October 2011).	Letter report from Green Iguana dated: 26 October 2011
10	EPBC Approval Instrument (EPBC2008/45 06)	Conservation of marine fauna	Develop a MNMP that includes:- <ul style="list-style-type: none"> <li>• Exclusion Zone and mitigation measures during the months of April - November during</li> </ul>	Pre-construction	Compliant	DoT in consultation with Oceanica developed a MNMP to address the criteria specified within the approval conditions. The MNMP was submitted to DoE and approved on 20 September 2011. The most recent revision was approved by DoE on 7 September 2012.	Letter from DSEWPaC dated 20 September 2012



Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
			blasting activities <ul style="list-style-type: none"> <li>• Blasting time restrictions</li> <li>• Exclusion zones and mitigation measures during drilling, if breakwater has not been constructed prior to drilling commences</li> <li>• Drilling methodology</li> <li>• Post blast/drill fauna inspection</li> <li>• Reporting of dead fauna-</li> <li>• Timing and implementation of above measure.</li> </ul>				
11	EPBC Approval Instrument (EPBC2008/45 06)	Ministerial deliverable	MNMP must be submitted and approved by the Minister prior to construction.	Pre-construction	Compliant	Both the MNMP and the initial SREMP were approved by DoE 20 September 2011. First ground works commenced on 27 September 2011.	Letter from DSEWPaC dated 20 September 2011
12	EPBC Approval Instrument (EPBC2008/45 06)	Publication of Ministerial Deliverables	Publish all management plans on the website within one month of being approved.	Overall	Compliant	Management plans are available on the DoT website (refer to link).  Project Manager confirmed that management plans were available on the website within one month of approval, and that each revision of the management has also been made available, following approval by regulators.	Management plans are available on the DoT website (refer to link):  <a href="http://www.transport.wa.gov.au/inline/augusta-boat-harbour.asp">http://www.transport.wa.gov.au/inline/augusta-boat-harbour.asp</a>

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
						<a href="http://www.transport.wa.gov.au/imate/australia-boat-harbour.asp">http://www.transport.wa.gov.au/imate/australia-boat-harbour.asp</a>	
13	Marine Noise Management Plan	Noise	<b>9 out of 10 consecutive blasts</b> are to be <b>less than 125 dB</b> (linear peak).	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period - not required	Monthly Reports
14	Marine Noise Management Plan	Ground Vibration	<b>Ground vibration</b> not to <b>exceed a maximum of 10 mm/sec</b> for dwellings and <b>20 mm/sec</b> for commercial premises.	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period - not required	Monthly Reports
15	Marine Noise Management Plan	Blasting	<b>Normal [blasting] procedure</b> is to undertake <b>several test blast</b> and <b>monitor blast levels</b> . From the data, adjust drilling and blasting pattern as necessary.	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period - not required	Verbal confirmation
16	Marine Noise Management Plan	Noise	<b>Drilling noise</b> is covered under construction noise in the <b>Environmental Protection (Noise) Regulations 1997</b> . The regulations stipulate that construction noise must be carried out in accordance with noise control practices set out in <b>Australian Standard 2436-1981</b> (Guide to Noise Control on Construction, Maintenance and	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period - not required	Construction Environmental Management Plan

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
			Demolition Sites).				
17	Marine Noise Management Plan	Fauna (marine)	A <b>1000 m exclusion zone</b> will remain in place at <b>all times</b> between <b>May through November</b> should any blasting be required during this period.	Quarry operations	Compliant	Site supervisor confirmed that the exclusion zones were in place during the underwater blasting, however were removed just prior to the site audit on 13/11/2014.	Verbal confirmation
18	Marine Noise Management Plan	Noise	If any <b>quarry blasting</b> is required <b>outside the months of December through April</b> , particular care must be taken to <b>conduct monitoring</b> to ensure no <b>sensitive marine fauna</b> enter the <b>1000 m exclusion zone</b> .	Quarry operations	Not applicable/ Compliant	No land based blasting was undertaken during the reporting period. One detonation of underwater charges was undertaken in July. A MFO was present and a sighting form was completed.	MFO Sighting Form 25/7/2014
19	Marine Noise Management Plan	Noise	<b>Blasting and quarrying</b> will be carried out in accordance with the relevant sections of the <b>Mining Act 1978</b> , The <b>Dangerous Goods Handling and Storage Regulations 1992</b> , and other <b>regulations</b> as required including the requirement for a <b>DEC Works Approval</b> and <b>Licence for Crushing and Screening</b> .	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period - not required	
20	Marine Noise Management Plan	Noise	<b>Management Methods</b> [for <b>excessive blast noise</b> ] could include which face is fired, the design of excavation, the	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period - not required	

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
			amount of rock fired, the depth of drill holes, the spacing of the drill patterns, the number of blasts, time of firing and the time delay patterns.				
21	Marine Noise Management Plan	Noise	<b>A sub-surface logger</b> can provide useful information on received <b>acoustic sound levels</b> in the vicinity of operations, and should be deployed if possible.	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period - not required	
22	Marine Noise Management Plan	Blasting	<b>A detailed (logistical) blasting plan</b> will be <b>prepared prior</b> to undertaking any <b>quarry blasting</b> based on specific site characteristics (e.g. are and depth to be blasted, rock hardness etc.) and environmental guidelines. This document shall detail methods to be used, <b>in accordance with AS2187</b> , the blasting/design locations and noise management and monitoring methods.	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period - not required	
23	Marine Noise Management Plan	Vibration	<b>Blasts are not to exceed permitted overpressure and vibration limits.</b>	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period - not required	

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
24	Marine Noise Management Plan	Noise	<b>All quarry blasting</b> should be carried out as defined within this <b>Marine Noise Management Plan</b> .	Quarry operations	Not applicable/ Compliant	No land based blasting was undertaken during the reporting period. However one round of underwater blasting was undertaken in July 2014. In accordance with the MNMP a MFO was on site.	MFO Sighting Form 25/7/2014
25	Marine Noise Management Plan	Blasting	<b>All blast operators</b> will be <b>briefed</b> , prior to quarry blasting commencing, on environmental issues, blasting management actions and contingencies as document in the <b>Marine Management Plan</b> .	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period. Site supervisor confirmed that the blasting contractor conducting the underwater blasting was briefed on environmental issues.	Verbal confirmation
26	Marine Noise Management Plan	Fauna (marine)	A trained, <b>shore based observer</b> should keep a look out for <b>sensitive marine fauna</b> within <b>1,500 m of the blast site</b> , commencing at least <b>15 minutes prior to</b> , and continuing <b>throughout, quarry blasting</b> .	Prior to blasting/blasting	Not applicable/ Compliant	No land based blasting was undertaken during the reporting period. However one round of underwater blasting was undertaken in July 2014. In accordance with the MNMP a MFO was on site.	MFO Sighting Form 25/7/2014
27	Marine Noise Management Plan	Fauna (marine)	If a <b>marine mammal is spotted</b> within <b>1000 m exclusion zone</b> , blasting must <b>immediately be delayed</b> until the animal has left the area, or has not been seen within the exclusion zone for the <b>preceding 20 minutes</b> .	Quarry operations	Compliant	No marine fauna were observed prior to, or during the one underwater detonation that was undertaken in July 2014.	MFO Sighting Form 25/7/2014
28	Marine Noise	Fauna (marine)	A <b>post blast inspection</b>	Post-blasting	Compliant	No marine fauna were observed following the	MFO Sighting Form

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
	Management Plan		for <b>injured fauna</b> should also be carried out.			one underwater detonation that was undertaken in July 2014.	25/7/2014
29	Marine Noise Management Plan	Fauna (marine)	In the event that the 1000 m exclusion zone <b>cannot be observed fully</b> , due to poor weather or any other reason, if marine fauna were not observed in the exclusion zone during the previous day, then <b>quarry blasting may proceed with caution</b> .	Quarry operations	Compliant	No land based blasting was undertaken during the reporting period. Only one underwater detonation was undertaken and the visibility was adequate.	MFO Sighting Form 25/7/2014
30	Marine Noise Management Plan	Fauna (marine)	All <b>marine fauna sightings</b> , including detection of injured or dead fauna, <b>will be recorded</b> , including the date, time and location of sighting and the name, qualifications and experience of the shore-based observer. Environmental / weather conditions should also be recorded, as well as any reasons that observations may have been hampered, for example poor visibility, inclement weather etc. (and records maintained).	Quarry operations	Compliant	No land based blasting was undertaken during the reporting period. Only one underwater detonation was undertaken and the visibility was adequate. No injured or dead marine fauna have been observed within the reporting period.	MFO Sighting Form 25/7/2014
31	Marine Noise Management Plan	Fauna (marine)	In the event of <b>detection of injured or dead marine fauna</b> , a <b>report</b> should be <b>provided to</b>	Quarry operations	Not applicable	No injured or dead marine fauna have been observed within the reporting period.	

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
			<b>DSEWPC</b> in writing within <b>24 hours</b> , including details of the incident or risk, the measures taken and the success of those measures in addressing the incident or risk, as well as any additional measures proposed to be taken.				
32	Marine Noise Management Plan	Blasting	<b>Blasting</b> to be <b>minimised</b> as far as practicable.	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period - not required	
33	Marine Noise Management Plan	Blasting	<b>Blasting</b> as far as practicable <b>to be carried out</b> during <b>November - April</b> (i.e. not during the whale migration season).	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period. There was one underwater detonation that was undertaken in July 2014.	Letter to DoE dated: 10/12/2013.
34	Marine Noise Management Plan	Blasting	<b>Blasting</b> to be carried out <b>according to the relevant Regulations and Guidance</b> .	Quarry operations	Not applicable	No land based blasting was undertaken during the reporting period - not required. Underwater blasting was carried out in accordance with the MNMP.	Verbal confirmation from Site Supervisor and MFO Sighting Form.
35	Marine Noise Management Plan	Blasting	<b>Blasting</b> to be carried out only in <b>daylight hours</b> .	Quarry operations	Compliant	No land based blasting was undertaken during the reporting period. The one underwater detonation that was carried out was undertaken during daylight hours.	Verbal confirmation from Site Supervisor and MFO Sighting Form on 25/7/2014.
36	Marine Noise Management Plan	Blasting	<b>During blasting</b> , a marine fauna <b>exclusion zone of 1000 m</b> and a <b>monitoring zone of 1500 m</b> are to be maintained around the <b>blast zone</b> .	Quarry operations	check to see whether done during underwater blasting	No land based blasting was undertaken during the reporting period. During the one underwater detonation, the exclusion zone was maintained.	Verbal confirmation from Site Supervisor

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
37	Site Rehabilitation and Environmental Management Plan	Rehabilitation	The rehabilitation program will commence in advance of any clearing or earthworks activities occurring at the proposed Augusta Boat Harbour Project Area.	Pre-clearing	Not applicable	<p>The rehabilitation program commenced in advance of any clearing and earthwork activities, in accordance with the SREMP.</p> <p>However, this commitment relates to the pre-clearing phase of the site and was deemed satisfactorily compliant during the 2012 audit. This activity is therefore not relevant to the 2014 audit.</p>	<p>Letters, reports, interviews, verbal confirmation</p> <p>The Oceanica letter (dated 14 October 2012) confirms that clearing commenced 27 September 2011.</p> <p>The OEC Plant Propagation Program Augusta Boat Harbour letter (dated 6 October 2011), Clearing Permit 39902 Annual Report (dated 29 June 2012), and OEC letter report (dated 23 August 2012) verify that rehabilitation activities began prior to the commencement of clearing activities.</p>
38	Site Rehabilitation and Environmental Management Plan	Re-vegetation - seed collection	<b>Collect native seed</b> required for direct sowing and propagation of native seedlings <b>for utilisation in rehabilitation blocks</b> at the site.	Pre-clearing / Earthworks	Not applicable	<p>The collection of native seed for direct seeding and propagation of seedlings for utilisation within rehabilitation blocks at the site was undertaken in accordance with the SREMP. This activity was sufficiently completed as part of the pre-clearing works and was deemed to be compliant during the 2012 audit.</p> <p>There were adequate quantities of native seed remaining in storage to complete rehabilitation activities at the site in 2014. There was no requirement for additional seed collection to be completed in the 2013/14 season.</p>	<p>Letters and reports.</p> <p>The letter from the Shire of Augusta-Margaret River, dated 5 December 2011 confirms that approval for seed collection was granted within seed collection reserves R25141, R27432, R20761, R39156, R11533, R9658 and R40376.</p> <p>The Clearing Permit 39902 Annual Report (dated 29 June 2012), OEC letter report (dated 23 August 2012) and the OEC Plant Propagation Program letter (dated 6</p>



Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
							October 2011), confirm that native seed collection was undertaken for rehabilitation in accordance with the SREMP.
39	Site Rehabilitation and Environmental Management Plan	Weed treatment / control	<b>Treatment</b> of introduced <b>(weed) species</b> within <b>rehabilitation blocks</b> at the site aimed at reducing the weed loading <b>ahead of ground preparation activities</b> , and preventing longer term invasion of developing rehabilitation from surrounding areas – this will <b>commence immediately on acceptance of the SREMP</b> by DEC.	Pre-clearing / Earthworks	Compliant	<p>Following the approval of the SREMP by the DEC, treatment of weed species within rehabilitation blocks was undertaken ahead of ground preparation activities, and in accordance with the SREMP. This activity was sufficiently completed during the pre-clearing /earthworks stage, ahead of ground preparation activities and was found to be compliant during the 2012 audit.</p> <p>Weed treatment occurred over the 2014 reporting period that included the two areas that were rehabilitated (Block 1 and 2), this was confirmed in an email from OEC.</p>	<p>Reports, letters, site inspection and site records and spray logs.</p> <p>Email from OEC dated: 18/11/2014.</p> <p>The SREMP (Version 12) was approved by DSEWPaC on 17 October 2012.</p> <p>The Clearing Permit 39902 Annual Report (dated 29 June 2012), OEP letter report (dated 23 August 2012) and verbal confirmation from the site audit (12 December 2012) verifies that weed treatment was undertaken prior to ground preparation activities and in accordance with the SREMP.</p> <p>The figures Spraying AU1588-02-01_C-A3 and Spraying AU1588-02-02_B-A3 provide evidence that weed species were treated ahead of ground preparation activities accordingly.</p>

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
40	Site Rehabilitation and Environmental Management Plan	Re-vegetation - seedling propagation	Commencing <b>nursery propagation</b> of seedlings from a combination of seed, cuttings and root divisions (aimed at being ready for a <b>mid-June 2012 planting on site</b> ).	Pre-construction	Not applicable	Nursery propagation of seedlings from seeds, cuttings and root divisions was undertaken for the project by Carramar Nursery and in accordance with the SREMP. Propagation of seedlings was undertaken during the preconstruction phase for planting in mid June 2012. This activity was found to be compliant during the 2012 audit and is not applicable for the 2014 audit.	Reports, interviews, verbal confirmation, order forms. The Clearing Permit 39902 Annual Report (dated 29 June 2012) confirms that Carramar Nursery was procured to commence plant propagation on 24 October 2011.
41	Site Rehabilitation and Environmental Management Plan	Priority flora, flora and vegetation	Field demarcation of <i>Kennedia lateritia</i> plants in the field by construction of non-permanent perimeter fencing using white sighter wire.	Pre-construction	Compliant/ Not applicable	Demarcation of <i>Kennedia lateritia</i> through the construction of non-permanent perimeter fencing using sighter wire was completed during pre-construction phase. This activity was found to be compliant during the 2012 audit. There was appropriate demarcation of existing populations of <i>Kennedia lateritia</i> on site ahead of rehabilitation activities being implemented. The 2012 annual rehabilitation assessments confirmed that in situ populations remained intact and there was no direct or indirect impacts recorded. There has since been prolific establishment of <i>Kennedia lateritia</i> throughout the rehabilitated area, consolidating the original populations and reducing edge effects. Fencing had been removed prior to the 2014 site audit as it was no longer needed. The fencing had been replaced by a stone wall to limit access to the rehabilitation areas; this was observed during the audit in 2014.	Photographs, verbal and visual confirmation, site inspection, observation.
42	Site Rehabilitation and	Weed treatment / control	<b>Weed species - Arum lily</b> - Blanket wipe with a mixture of Glean (20g	Pre-construction	Compliant	Management and control of key weed species in appropriate areas was undertaken in accordance with the SREMP.	Verbal confirmation, figures and maps.

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
	Environmental Management Plan		ha-1). Gramoxene W (2 L ha-1), and wetting agent (250 ml 100l-1) in late winter.			This activity was completed during the pre-construction phase and was reported as compliant during the 2012 audit. There was minor mechanical treatment of Arum Lily undertaken in early November 2012 by Onshore Environmental (OEC Nov 2012). No chemical treatment was undertaken in 2013 owing to the young stage and susceptibility of developing revegetation. Spraying was undertaken during the rehabilitation works that were completed in 2014. Spraying occurred in June and October 2014. The figures Spraying AU1588-02-01_C-A3 and Spraying AU1588- 02-02_B-A3 detail the spraying requirements within appropriate boundaries and confirm that spraying has been undertaken.	Email from OEC dated: 18/11/2014 confirming that weed treatment was undertaken by a local contractor Trevor Clarke.  For 2012 work: The figures Spraying AU1588-02-01_C-A3 and Spraying AU1588- 02-02_B-A3 detail the spraying requirements within appropriate boundaries.
43	Site Rehabilitation and Environmental Management Plan	Weed treatment / control	<b>Weed species - Grasses</b> - Use Fusilade 212 or Verdict 520 at 2 L ha-1 for blanket and spot spraying <b>during winter or spring</b> . Fusilade and Verdict are suitable for spraying over native vegetation, and should be used in combination to prevent plants becoming resistant.	Pre-construction	Compliant	Management and control of key weed species in appropriate areas was undertaken in accordance with the SREMP. This activity was completed during the pre-construction phase and was reported as compliant during the 2012 audit. No chemical treatment was undertaken in 2013 owing to the young stage and susceptibility of developing revegetation. Spraying was undertaken during the rehabilitation works that were completed in 2014. Spraying occurred in June and October 2014.	Verbal confirmation, figures and maps.  Email from OEC dated: 18/11/2014 confirming that weed treatment was undertaken by a local contractor Trevor Clarke.  For 2012 work: The figures Spraying AU1588-02-01_C-A3 and Spraying AU1588- 02-02_B-A3 detail the spraying requirements within appropriate boundaries.

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
44	Site Rehabilitation and Environmental Management Plan	Weed treatment / control	<b>Weed species - Dune Onion Weed</b> - Manually remove isolated patches by hand before flowering. Wick application using 5 g of metsulfuron or 500 mL of glyphosate plus 2.5 mL wetting agent per litre of water. Apply before flowering in <b>late winter and spring</b> .	Pre-construction	Compliant	Management and control of key weed species in appropriate areas was undertaken in accordance with the SREMP. This activity was completed during the pre-construction phase and was reported as compliant during the 2012 audit. No chemical treatment was undertaken in 2013 owing to the young stage and susceptibility of developing revegetation. Spraying was undertaken during the rehabilitation works that were completed in 2014. Spraying occurred in June and October 2014.	Verbal confirmation, figures and maps.  Email from OEC dated: 18/11/2014 confirming that weed treatment was undertaken by a local contractor Trevor Clarke.  For 2012 work: The figures Spraying AU1588-02-01_C-A3 and Spraying AU1588- 02-02_B-A3 detail the spraying requirements within appropriate boundaries.
45	Site Rehabilitation and Environmental Management Plan	Weed treatment / control	Mix 500 mL glyphosate (360 g L-1) WITHOUT wetting agent with 100 L of water. Fill backpack from tank and <b>spray infested areas early in the growing season (early winter)</b> . May require re-treatment in early spring. Has minimal impact on native species. However, should <b>not be used on <i>Kennedia lateritia</i></b> .	Pre-construction	Compliant	Management and control of key weed species in appropriate areas was undertaken in accordance with the SREMP. This activity was completed during the pre-construction phase and was reported as compliant during the 2012 audit. There was minor mechanical treatment of Arum Lily undertaken in early November 2012 by Onshore Environmental (OEC Nov 2012). No chemical treatment was undertaken in 2013 owing to the young stage and susceptibility of developing revegetation. Spraying was undertaken during the rehabilitation works that were completed in 2014. Spraying occurred in June and October 2014.	Email from OEC dated: 18/11/2014 confirming that weed treatment was undertaken by a local contractor Trevor Clarke
46	Site Rehabilitation	Weed treatment / control	<b>Weed species - Onion grass</b> - Blanket wipe	Pre-	Compliant	Management and control of key weed species in appropriate areas was undertaken in	Email from OEC dated: 18/11/2014 confirming that

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
	and Environmental Management Plan	control	using 1-2 L ha <sup>-1</sup> of glyphosate (450 g L <sup>-1</sup> ) to 2 parts water for larger infestations in early winter prior to flowering.	construction		accordance with the SREMP. This activity was completed during the pre-construction phase and was reported as compliant during the 2012 audit. There was minor mechanical treatment of Arum Lily undertaken in early November 2012 by Onshore Environmental (OEC Nov 2012). No chemical treatment was undertaken in 2013 owing to the young stage and susceptibility of developing revegetation. Spraying was undertaken during the rehabilitation works that were completed in 2014. Spraying occurred in June and October 2014.	weed treatment was undertaken by a local contractor Trevor Clarke
47	Site Rehabilitation and Environmental Management Plan	Weed treatment / control	The established ground cover of <b><i>Pennisetum clandestinum</i></b> ( <b>Kikuyu Grass</b> ) present within Rehabilitation Blocks 2a – 2c will be <b>cleared and removed from site</b> , the remaining surface soils lightly scarified, and <b>follow-up herbicide control</b> of re-establishing grass undertaken using a grass selective herbicide.	Pre-construction	Not required/ Compliant	Management and control of key weed species in appropriate areas was undertaken in accordance with the SREMP for Block 2a and 2c. This activity was completed during the pre-construction phase and was reported as compliant during the 2012 audit. No chemical treatment was undertaken in 2013 owing to the young stage and susceptibility of developing revegetation. Spraying was undertaken during the rehabilitation works that were completed in 2014. Spraying occurred in June and October 2014. Scarification of rehabilitation blocks planted in 2014 was not possible due to the wet soil conditions	Verbal confirmation, interviews, reports, figures and maps, observations.  Email from OEC dated: 18/11/2014 confirming that weed treatment was undertaken by a local contractor Trevor Clarke. OEC letter report dated: 8/10/2014  The Clearing Permit 39902 Annual Report (dated 29 June 2012) and figure AU1554-12- 01_B-A3_Kikuyu Stripping confirms that Kikuyu Grass was removed from the appropriate areas.

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
48	Site Rehabilitation and Environmental Management Plan	Re-vegetation / weed control	These preparation steps <b>[ID No. 11] will occur ahead of replacing a topsoil / subsoil</b> resource to 0.3 m depth and undertaking <b>direct sowing and planting of nursery</b> raised seedlings.	Prior to Topsoil / Subsoil Replacement	Compliant	Weed control and treatment preparation steps were undertaken prior to the replacing of topsoil and subsoil, and undertaking direct sowing and planting of nursery raised seedlings for the new rehabilitation blocks completed in 2014. This activity was completed prior to topsoil and subsoil replacement and was found to be compliant in the 2014 audit.	OEC letter report dated 8/10/2014.
49	Site Rehabilitation and Environmental Management Plan	Weed treatment / control	<b>Selective removal of Kikuyu</b> will occur <b>around existing scattered plants of <i>Kennedia lateritia</i></b> within Rehabilitation Block 3, with remaining grass to be eradicated using a grass <b>selective herbicide</b> .	Pre-construction	Compliant	Management and control of key weed species in appropriate areas was undertaken in accordance with the SREMP. Selective removal of Kikuyu Grass using a grass selective herbicide was undertaken in accordance with the SREMP for Block 3. This activity was completed during the pre-construction phase and was reported as compliant during the 2012 audit. There was minor mechanical treatment of Arum Lily undertaken in early November 2012 by Onshore Environmental (OEC Nov 2012). No chemical treatment was undertaken in 2013 owing to the young stage and susceptibility of developing revegetation. Spraying was undertaken during the rehabilitation works that were completed in 2014. Spraying occurred in June and October 2014.	Email from OEC dated: 18/11/2014 confirming that weed treatment was undertaken by a local contractor Trevor Clarke.  The Clearing Permit 39902 Annual Report (dated 29 June 2012) confirms that a selective weed removal and spray program was implemented in the rehabilitation areas. Figures Spraying AU1588-02-01_C-A3, Spraying AU1588-02-02_B-A3 and AU1554-12-01_B-A3_Kikuyu Stripping details the removal and spraying specifications in the required areas.
50	Site Rehabilitation and Environmental	Soils and rehabilitation	There will be <b>careful replacement of imported topsoil to 0.3 m</b> depth within this block	Rehabilitation	Not applicable	Imported topsoil was carefully placed to a depth of approximately 0.3 m in rehabilitation areas, in accordance with the SREMP. This activity was undertaken in 2012 and	Interviews, verbal confirmation. The Clearing Permit 39902 Annual Report (dated 29

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
	Management Plan		[Block 3, ID No. 13].			reported as compliant during the 2012 audit.  There was imported topsoil placement completed during the 2014 reporting period.	June 2012) provides a photographic record of the topsoil and subsoil rehabilitation methods implemented on site in the rehabilitation areas. The OEC letter report Update of Site Rehabilitation Activities (dated 30 May 2012) and figure AU1588-03-01_B-A3_Site Rehabilitation Topsoil Harvesting and Rehabilitation provide details on the topsoil and subsoil rehabilitation activities.
51	Site Rehabilitation and Environmental Management Plan	Soils and weed control	<b>Skeletal soils</b> within Rehabilitation Blocks 4a and 4b that support weeds such as * <i>Cynodon dactylon</i> (Couch Grass) will be <b>scalped and the weed load immediately removed from site.</b>	Pre-construction	Not applicable	Skeletal soil scalping and weed load removal on Rehabilitation Blocks 4a and 4b was undertaken in accordance with the SREMP. There was no requirement for scalping during the current reporting period. This was undertaken during the previous reporting period and was found to be compliant during the 2012 audit.	Interviews and verbal confirmation
52	Site Rehabilitation and Environmental Management Plan	Weed treatment / control	A <b>treatment program</b> will be instigated at the site [ID No. 15] <b>using herbicides listed in Table 3</b> [see SREMP], in preparation for topsoil and subsoil placement.	Prior to Topsoil / Subsoil Replacement	Compliant	Management and control of key weed species in appropriate areas was undertaken in accordance with the SREMP.  During the site audit (12 December 2012) verbal confirmation was received that the management of key weed species has been undertaken prior to construction and in accordance with the SREMP.	Interviews and verbal confirmation. Email from OEC dated: 18/11/2014 confirming that weed treatment was undertaken by a local contractor Trevor Clarke.  OEC letter report dated 8/10/2014.

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
						The areas rehabilitated (Block 1 and 2) in the current reporting period of 2013/2014 were prepared in accordance with the SREMP, including weed management (confirmed by email from OEC).	2012 work: Figures Spraying AU1588-02-01_C-A3 and Spraying AU1588-02-02_B-A3. The Clearing Permit 39902 Annual Report (dated 29 June 2012), OEC letter report (dated 23 August 2012).
53	Site Rehabilitation and Environmental Management Plan	Weed treatment / control	<b>Clearing of weeds</b> will occur <b>by hand</b> within Rehabilitation Blocks 5a and 5b, in combination with a <b>selective herbicide program</b> that accounts for the presence of <i>Kennedia lateritia</i> .	Pre-construction	Not applicable	There was minor mechanical treatment of Arum Lily undertaken in early November 2012 by OEC. No additional hand clearing of weeds was undertaken in Blocks 5a and 5b within the 2014 reporting period.	Reports, figures and maps, verbal confirmation and interviews.
54	Site Rehabilitation and Environmental Management Plan	Weed treatment / control	Vegetation occurring at Blocks 1b, 1c and 7 will have <b>targeted weed control</b> undertaken as required. There will be no additional preparation work required as no remedial earthworks will be completed within these blocks.	Pre-construction	Compliant	Management and control of key weed species in appropriate areas was undertaken in accordance with the SREMP. In addition to the spraying that occurred in 2012, weed control and spraying was also undertaken within the 2014 reporting period.	Reports, figures and maps, verbal confirmation and interviews.  Email from OEC dated: 18/11/2014 confirming that weed treatment was undertaken by a local contractor Trevor Clarke.
55	Site Rehabilitation and Environmental Management Plan	Clearing	Prior to any clearing activities commencing at site, <b>disturbance boundaries will be surveyed and clearly delineated</b> by white sighter wire fencing to ensure that clearing of	Pre-construction	Compliant	Disturbance boundaries were surveyed and clearly delineated by sighter wire fencing to protect native vegetation during clearing. The sighter wire fencing was upgraded in 2012 for further site definition and protection. The Clearing Permit 39902 Annual Report	Photographs, report, figures and maps, verbal and visual confirmation, site inspection, observations.



Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
			<p>native vegetation does not exceed those areas approved. <b>After initial clearing activities the white sighter wire may be upgraded to include ring lock fencing fixed under the sighter wire</b> for further site definition and protection.</p> <p>The sighter wire fence may be replaced during construction with a chain wire fence with hessian screening if localised dust management measures need to be implemented. <b>After construction the temporary fences will be removed and replaced with the specified perimeter fencing.</b></p>			<p>(dated 28 June 2013) and figure AU1554-14-01_1-A3_Access Road Temporary Vegetation Protection Fence confirms that fencing was implemented in appropriate areas.</p> <p>Sighter wire fencing was no longer in place during the 2014 audit as it had been replaced with stones for visual amenity purposes. However access to the area was still restricted.</p>	
56	Site Rehabilitation and Environmental Management Plan	Clearing and Soils	<p><b>Pre-clearance checks</b> will be undertaken by the Site Supervisor to ensure that <b>necessary surface preparation</b> has occurred at rehabilitation areas to allow for <b>direct return of topsoil and subsoil (where possible)</b>, stockpile areas for topsoil, subsoil and vegetation debris and brushing resources have been prepared where</p>	Prior to Topsoil / Subsoil Replacement	Not applicable	<p>Pre-clearance checks were undertaken by the Site Supervisor to ensure that all necessary surface preparations were undertaken prior to the direct return of topsoil and subsoil, in accordance with the SREMP.</p> <p>Verbal confirmation that pre-clearance checks were undertaken prior to topsoil and subsoil return was provided by the Site Supervisor during the site audit (12 December 2012). The Clearing Permit 39902 Annual Report (dated 29 June 2012) provides a photographic record of rehabilitation activities and procedures</p>	Reports, photographs, verbal confirmation

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
			direct return of this resource is not possible, and machinery operators have been familiarised with the objectives of the clearing program in respect to required rehabilitation outcomes.			implemented, and an overview of SREMP rehabilitation activities undertaken. This activity was found to be sufficiently completed during the 2012 audit and deemed to be compliant.	
57	Site Rehabilitation and Environmental Management Plan	Clearing and rehabilitation	The <b>above ground vegetation mass</b> from the quarry site will be <b>cleared and direct returned</b> to prepared <b>rehabilitation surfaces</b> as brushing in higher wind areas to minimise erosion.	Pre-construction	Not applicable	Above ground vegetation was cleared and direct returned to prepared rehabilitation surfaces, in accordance with the SREMP. This activity was undertaken during the 2012 reporting period, there have been no further ground preparation activities at the quarry site for this reporting period.	Site inspection, observations, verbal confirmation and interviews, photographs
58	Site Rehabilitation and Environmental Management Plan	Clearing and rehabilitation	<b>Surplus vegetation debris</b> cleared and not required for rehabilitation activities will be <b>removed from site</b> .	Pre-construction	Not applicable	There was no additional clearing of vegetation during the current reporting period. This activity was deemed to be compliant during the 2012 audit as all vegetation was used for rehabilitation purposes and there was no surplus on site. During the 2012 reporting period the Project Manager advised that vegetation debris was cleared. There was surplus vegetation in excess of the brushing requirements for rehabilitation areas, which was removed to the Shire Sand Pit. The peppermint trees requiring clearing on site were removed immediately. This activity was undertaken in previous years and is not considered applicable to this reporting period.	Verbal confirmation, site inspection, observation.
59	Site Rehabilitation and	Soils and rehabilitation	<b>Topsoil will be stripped in stages</b> during development of the	During Construction	Not applicable	Topsoil stripping was completed during a previous reporting period. There was no additional topsoil stripping completed during	Reports, photographs, figures and plans, verbal confirmation

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
	Environmental Management Plan		quarry in line with clearing of the native vegetation cover.			<p>the current reporting period. Therefore this activity is not applicable for the 2014 audit.</p> <p>During the 2012 reporting period topsoil was stripped in stages during the development of the quarry, in accordance with the SREMP. The Clearing Permit 39902 Annual Report (dated 29 June 2012) provides a clearing log which confirms that staged topsoil stripping was undertaken, as well as a photographic record of topsoil and subsoil stripping activities. The figures AU1588-03-01_B-A3_Site Rehabilitation Topsoil Harvesting and Rehabilitation and AU1588-01-01_FA3_Progressive Vegetation Clearing Plan provide evidence that topsoil was stripped in stages and the area was progressively cleared.</p>	
60	Site Rehabilitation and Environmental Management Plan	Soils and rehabilitation	<b>Native topsoil</b> within the footprint of the quarry <b>will be recovered</b> to a depth of 50 mm to <b>preserve the in situ native seed resource</b> and nutrient content, noting this may not be possible in areas where outcropping granulite occurs.	Pre-construction	Not applicable	<p>Topsoil was recovered to the required depth of approximately 50 mm in accordance with the SREMP during the 2012 reporting period, and deemed to be compliant. There was no additional topsoil recovered within the current reporting period and hence is not applicable. Additionally, OEC confirmed that additional topsoil recovered from the quarry expansion area, in accordance with the SREMP procedures, was utilised to create a bund wall around the perimeter of the laydown area to protect adjacent rehabilitation from prevailing south-east winds during summer months. There were no stockpiles of topsoil observed during the 2014 audit as all rehabilitation had been completed.</p>	Verbal confirmation and visual confirmation

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
61	Site Rehabilitation and Environmental Management Plan	Soils and rehabilitation	<p><b>Topsoil will be stockpiled</b> to a maximum <b>height of 1 m</b> at the northern end of the quarry site (the final stage) surrounded by intact vegetation to minimise potential for weed infestation. Stockpile <b>locations and volumes</b> will be <b>recorded and mapped</b>, and stockpiles in the field will be <b>signposted</b> to allow easy differentiation of stripping dates.</p>	Pre-construction	Not applicable	<p>All topsoil and subsoil had been used in rehabilitation areas and was not visible during the 2014 audit.</p> <p>This activity was deemed partially non-compliant during the 2012 audit as topsoil was stockpiled to a maximum height of 2m rather than 1m. The wording of the original requirement is now considered not to be appropriate as the increase in stockpile height was deemed to have a greater net benefit to the rehabilitation areas than if stockpiles were kept to the prescribed height. OEC confirmed that the topsoil was stockpiled to a maximum height less than 2 m and configured to maximise protection of developing rehabilitation areas from the prevailing summer winds. Given the storage period (in excess of 18 months) the increase in stockpile height from 1m to 2m will not be detrimental, particularly given that surfaces were direct sown to promote native plant establishment in an attempt to retain biological activity within the stockpiles. The height and location of the stockpiles were confirmed during the 2013 site audit. OEC confirmed that additional topsoil recovered from the quarry expansion area was in accordance with the SREMP procedures. This was utilised to create a bund wall around the perimeter of the laydown area to protect adjacent rehabilitation from prevailing south-east winds during summer months.</p>	Verbal confirmation, photographs, aerial photographs

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
						Volumes of topsoil were recorded and locations were captured in aerial photography.	
62	Site Rehabilitation and Environmental Management Plan	Soils and rehabilitation	<b>Topsoil</b> will be <b>replaced at a minimum depth of 50 mm</b> onto prepared subsoil medium, however, a deeper profile may be reconstructed using topsoil where surplus volumes are realised (in preference to using subsoil).	Rehabilitation	Compliant	Topsoil was replaced during the 2012 reporting period in accordance with the SREMP to a depth of 50mm, and was found to be compliant. Topsoil was spread for the areas rehabilitated during the 2014 reporting period in accordance with the SREMP. However the soil profile near the entry gate was shallower on the south east side due to the requirement to re-contour the landform.	Letter report and verbal confirmation. The OEC letter report, dated: 8/10/2014.
63	Site Rehabilitation and Environmental Management Plan	Soils and rehabilitation	The <b>subsoil resource</b> will be recovered to a <b>maximum depth of 0.3 m below natural surface</b> following topsoil stripping to ensure the minimum volume of topsoil and subsoil available for rehabilitation activities is realised.	Pre-construction	Not applicable	The subsoil was recovered to a maximum depth of 0.3m in accordance with the SREMP and was reported in the 2012 audit as compliant. There has been no additional subsoil recovery during the current reporting period (2014).	Letter report and verbal confirmation. The OEC letter report, dated 30 May 2012 (Augusta Boat Harbour - Update of Site Rehabilitation Activities) confirms that subsoil was recovered to a maximum depth of 0.3 m below the natural surface.
64	Site Rehabilitation and Environmental Management Plan	Soils and rehabilitation	<b>Subsoil</b> will be <b>direct returned</b> to prepared rehabilitation surfaces where ever possible, <b>or stockpiled to less than 2 m</b> in height at the northern end of the quarry site (within the	Rehabilitation	Not applicable	There was no additional subsoil stockpiling within this 2014 reporting period. The subsoil that was previously stockpiled at the entry gate was used for the rehabilitation sites that were completed in 2014.  Subsoil was direct returned to rehabilitation surfaces in 2012, and stockpiled to a height of	OEC letter report dated 30 May 2012, audit interview and site inspection

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
			final clearing stage).			4m at the entry gate. OEC confirmed that the additional stockpile height was not determined to have a significant impact on material quality and reduced the requirement for additional clearing. This activity was deemed partially noncompliant during the 2012 audit. The wording of the original requirement is now considered not to be appropriate as the increase in stockpile height was deemed to have a greater net benefit to the rehabilitation areas than if stockpiles were kept to the prescribed height.	
65	Site Rehabilitation and Environmental Management Plan	Soils and rehabilitation	<b>Stockpile locations and volumes will be recorded and mapped,</b> and stockpiles in the field will be <b>signposted</b> to allow easy differentiation of stripping dates.	Construction	Not applicable	<p>There were no stockpiles observed in the 2014 audit as they had been used for the two rehabilitation blocks completed in 2014.</p> <p>This activity was deemed partially non-compliant during the 2012 audit as stockpile locations and volumes were not signposted in the field to allow easy differentiating of stripping dates. The original wording of this commitment is considered no longer appropriate as stockpile locations and volumes have been managed by Onshore Environmental Consultants (OEC) and are recorded in the figure AU1588-03-01_B-A3_Site Rehabilitation Topsoil Harvesting and Rehabilitation.</p>	Verbal confirmation, site inspection, figures
66	Site Rehabilitation and Environmental	Soils and rehabilitation	<b>Subsoil</b> be replaced within Rehabilitation Blocks 2a-2c, 4a-4b and 6 to a <b>maximum depth</b>	Rehabilitation	Compliant	Subsoil placement was undertaken during the 2012 reporting period to a maximum height of 0.25m depth, this commitment was deemed to be compliant.	Letter report, verbal confirmation, figures and maps. OEC letter report dated:

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
	Management Plan		<b>of 0.25 m</b> , where adequate topsoil volumes are not available to achieve this profile depth.			There was also subsoil placement for the two remainder rehab blocks (Block 1 and 2) the soil profile was shallower in the north side of Block 1 resulting from the requirement to re-contour the landform.	8/10/2014  The OEC Letter Report, dated 30 May 2012 (Augusta Boat Harbour - Update of Site Rehabilitation Activities), the Clearing Permit 39902 Annual Report (dated 29 June 2012) and figure AU1588-03-01_B-A3_Site
67	Site Rehabilitation and Environmental Management Plan	Soils and rehabilitation	Replaced <b>subsoil will be re-contoured to blend</b> with the surrounding vegetation / landform units in readiness for application of topsoil and then mulched vegetation.	Rehabilitation	Compliant	Re-contouring of subsoil was undertaken in accordance with the SREMP during the 2012 reporting period and was deemed to be compliant. Further re-contouring of the landform within Block 1 was undertaken during the current reporting period 2014.	Interview and verbal confirmation, site inspection. OEC letter report dated: 8/10/2014
68	Site Rehabilitation and Environmental Management Plan	Re-vegetation / rehabilitation	<b>Native vegetation</b> removed during clearing of the quarry site will be <b>spread onto prepared surfaces</b> within Rehabilitation Blocks 2a-2c, 4a, 4b and 6 to 10 mm depth using a Posi Track to minimise compaction, prior to surface scarification.	Pre-construction	Not applicable	There was no spreading of native vegetation over rehabilitation blocks during the current reporting period and therefore this activity is not applicable.  This activity was considered partially non-compliant during the 2012 audit as the vegetation was spread to a higher standard (greater depth of 100mm) than that required in the SREMP (10mm). The original wording of this commitment is considered no longer appropriate as the increase in depth of vegetation is considered to have a greater net benefit to the rehabilitation areas.	Verbal confirmation, photograph logs and site records.

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
69	Site Rehabilitation and Environmental Management Plan	Rehabilitation / weed control	For Rehabilitation Blocks 3, 5a and 5b <b>vegetation debris and brushing will be spread to 50 mm depth</b> aimed at suppressing weed establishment in the ground cover. The material will be <b>spread by machine</b> across open areas within these blocks; however <b>application by hand</b> will be required in localised areas supporting <i>Kennedia lateritia</i> plants.	Rehabilitation	Not applicable	Vegetation debris was spread to 50 mm depth over rehabilitation blocks during the 2012 reporting period. There was no further spreading of vegetation debris within the current reporting period.	Letter report, photographic evidence and verbal confirmation. The OEC letter report, dated 30 May 2012 (Augusta Boat Harbour - Update of Site Rehabilitation Activities)
70	Site Rehabilitation and Environmental Management Plan	Rehabilitation	There will be <b>shallow contour scarification</b> of rehabilitation surfaces within Rehabilitation Blocks 2a-2c, 4a, 4b and 6 to <b>reduce the potential for surface erosion and promote a seed bed</b> for establishing plants. Contour scarification will be completed with the front forks of a Posi Track to a <b>maximum depth of 0.2 m</b> prior to direct seeding and planting of nursery raised seedlings.	Rehabilitation	Not applicable	Appropriate scarification was undertaken within relevant rehabilitation areas and in accordance with the SREMP in 2012 and was deemed to be compliant. There was no further scarification of rehabilitation surfaces in 2014 due to the wet soil conditions experienced during rehabilitation of the final two blocks.	Letter report, verbal confirmation, site inspection, observations.  OEC letter report dated: 8/10/2014.  The OEC letter report, dated 30 May 2012 (Augusta Boat Harbour - Update of Site Rehabilitation Activities)
71	Site Rehabilitation and	Re-vegetation / rehabilitation	<b>Direct seeding</b> will be used to provide a fast establishing vegetation	Rehabilitation	Compliant	Direct seeding for fast establishing vegetation was undertaken in appropriate rehabilitation	Letter report, reports, verbal confirmation.



Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
	Environmental Management Plan		cover within Rehabilitation blocks 2-6, while enhancing native species richness. <b>Hand sowing</b> will be completed in during <b>early winter</b> at a rate of approximating <b>5-7 kg ha-1</b> .			blocks during the 2012 reporting period and deemed to be compliant. Direct seeding was also undertaken in 2014 at the final two rehabilitation blocks (Block 2 and 1).	The OEC letter report dated: 8/10/2014. OEC letter report (Augusta Boat Harbour - update of Site Rehabilitation Activities), dated 23 August 2012, The Clearing Permit 39902 Annual Report, dated 29 June 2012.
72	Site Rehabilitation and Environmental Management Plan	Re-vegetation / rehabilitation	For seed species where seed collection or <b>germination of seed is not possible</b> , plants will be <b>produced by vegetative propagation</b> using cuttings or rootstock material.	Rehabilitation	Compliant/ Not applicable	Cuttings and rootstock were used for rehabilitation during the 2012 reporting period.  Nursery stock was purchased from Carramar Coastal Nursery for planting of the 2014 rehabilitation blocks.	Reports and verbal confirmation. Email from OEC dated: 18/11/2014.
73	Site Rehabilitation and Environmental Management Plan	Re-vegetation / rehabilitation	<b>Native seed and cuttings</b> for tube stock understorey species will be collected <b>during the year prior to planting</b> to ensure a sufficient period for propagation. For certain target species such as <b>Lepidosperma gladiatum</b> , this may involve disturbing areas of vegetation within the proposed clearing footprint at site in order to promote regrowth (daughter rhizomes) essential for plant propagation in the nursery.	Pre-construction	Not applicable	This activity was undertaken in previous reporting years and found to be compliant. Cuttings and rootstock were used for rehabilitation during the 2012 reporting period.	Reports and verbal confirmation

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
74	Site Rehabilitation and Environmental Management Plan	Re-vegetation / rehabilitation	<b>Seedlings</b> for understorey species will be <b>planted evenly</b> across Rehabilitation Blocks 2-6 at a rate approximating <b>12,000 plants ha-1</b> .	Rehabilitation	Not applicable	Seedlings were planted at a rate of approximately 12,000 plants per hectare during the 2012 reporting period.	Verbal confirmation, letter report
75	Site Rehabilitation and Environmental Management Plan	Re-vegetation / rehabilitation	<b>Plantings of the DRF [<i>Kennedia lateritia</i>]</b> will occur throughout all rehabilitation blocks at the site in an attempt to <b>increase the size of the current population</b> and consolidate the area of the population.	Rehabilitation	Not applicable	Planting of <i>Kennedia lateritia</i> throughout rehabilitation blocks was undertaken during the 2012 reporting period. The OEC letter reports for this reporting period and annual monitoring report show that the DRF is prominent throughout the rehabilitation areas, this was confirmed during the 2014 site audit.	Audit, photographs, letter reports.  The OEC letter report dated: 7/2/2014.
76	Site Rehabilitation and Environmental Management Plan	Clearing	<b>Clearing</b> of this vegetation [ <b>Peppermint (<i>Agonis flexuosa</i>) trees</b> ] shall be carried out <b>in accordance</b> with the Western Australian Department of Environment and Conservation's Guideline Procedures to Minimise Risk to Western Ringtail Possums During Vegetation Clearing and Building Demolition ( <b>DEC 2010</b> ).	During Clearing	Not applicable	Clearing of peppermint trees was undertaken in accordance with the guideline procedures during pre-construction and was reported in the 2012 audit as compliant. There was no additional clearing of peppermint trees during the current reporting period (2014).	Letter  A letter from Sue Elscot (from Green Iguana, Dunsborough), dated 26 October 2011
77	Site Rehabilitation and Environmental Management	Re-vegetation / rehabilitation	<b>Peppermint trees</b> will be specifically established <b>around the perimeter</b> of the existing <b>southern population</b> of taller trees as part of the	Rehabilitation	Not applicable	Peppermint trees were established around the southern population of taller trees in accordance with the SREMP and reported as compliant during the 2012 audit. No further establishment of peppermint trees was	Invoice, report, verbal confirmation.  The 2012 invoice from Carramar Nursery confirms

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
	Plan		rehabilitation program to consolidate the existing stand.			undertaken as part of the current reporting period (2014).	the purchase of these plants.
78	Site Rehabilitation and Environmental Management Plan	Exclusion zones	In consultation with the Department of Environmental and Conservation (DEC) a suitable alignment for a <b>perimeter fence</b> will be determined and a fence <b>constructed</b> around the <b>perimeter, or portions of the perimeter, following completion of construction.</b> The alignment shall be chosen to minimise impacts to native vegetation. The type of fence or barrier may vary depending on the interface requirements of the rehabilitation areas to infrastructure but shall <b>generally be 1 m high.</b>	Post-Construction	Not applicable	Due to the prolific growth and establishment of the DRF along the Leeuwin road perimeter, the fence was not able to be constructed without removing the DRF. A rock barrier was placed along the boundary to prevent access instead. The DPaW was consulted about the suitable fence alignment and the perimeter fence was constructed to the required height >1m during the 2012 reporting period, this activity was considered compliant. There were no changes made to perimeter fencing during the current reporting period.	Site inspection, photographs, verbal confirmation
79	Site Rehabilitation and Environmental Management Plan	Exclusion zones	The same style of <b>fencing</b> will be erected to <b>separate infrastructure areas from existing native vegetation</b> in areas at high risk of uncontrolled pedestrian traffic, e.g. coastal side of car parks. Fencing will also be appropriate to act as a dust screen to further minimise the risk of the impacts of dust	Post-Construction	Compliant	Fence to separate infrastructure areas from native vegetation was constructed to the required height >1m during the 2012 reporting period, this activity was considered compliant. The perimeter fencing has been replaced with a stone wall to restrict access. This was sighted during the 2014 site audit and still remains compliant.	Site inspection, photographs, verbal confirmation, site inspection.

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
			emissions.				
80	Site Rehabilitation and Environmental Management Plan	Exclusion zones	<b>Dust control</b> during <b>construction</b> and <b>quarrying work</b> will also focus on limiting the amount of dust generation through the use of plant and equipment such as water carts as practicable.	Construction	Compliant	Dust generation has been managed on site in accordance with the SREMP. During the site audit (12 December 2012), a water cart (20,000L) was observed. The Site Supervisor confirmed that the water was used as required to control dust generated through construction. The Site Supervisor verified that the water cart is used on an as needs basis, and visual assessments are undertaken by the contractor and Site Supervisor regularly. As there was no contractor on site during the 2014 audit, visual confirmation could not be made.	Site inspection, verbal confirmation.
81	Site Rehabilitation and Environmental Management Plan	Fauna (terrestrial)	<b>Control options</b> [for <b>introduced fauna</b> ] should be considered carefully in liaison with surrounding land managers, primarily DEC in this case, prior to being implemented. Potential management options for the Augusta Boat Harbour site are: <b>Construction of perimeter fencing</b> around rehabilitation areas; • <b>Annual baiting for rabbits</b> in and around rehabilitation areas; • <b>Baiting for snails</b> ; and • <b>Fox and feral cat control</b> .	Pre-construction	Compliant	Introduced fauna on site is managed in accordance with the SREMP. Perimeter fencing was constructed during the 2012 reporting period. ALPHA Pest Animal Solutions was commissioned to undertake targeted rabbit control. OEC provided confirmation that the Rabbit Meamorhagic Disease Virus (RHDV) was released in November 2013, and was successful in reducing the local rabbit numbers. Pindone baiting and warren fumigation was also completed in December 2013.	Letter report, report, verbal confirmation and site inspection.  Email from OEC dated 18/11/2014. OEC Report February 2013 and Alpha Pest Animal Solutions: Rabbit Control Progressive Report at Augusta Marina November 2012.
82	Site Rehabilitation	Fire	The DoT will <b>liaise with DEC</b> to ensure that <b>fuel</b>	Planning	Compliant	For the current reporting period, OEC gave confirmation that informal discussions with	Email from OEC dated 18/11/2014.

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
	and Environmental Management Plan		<b>loads</b> within the adjacent National Park areas remain at <b>acceptable levels</b> during the early stages of <b>rehabilitation development</b> , and that any <b>controlled burns</b> undertaken account for the location and age of the rehabilitation at the Augusta Boat Harbour.			DPaW regarding likelihood of controlled burns within the Leeuwin-Naturaliste National Park were undertaken. DPaW stated that it would appear extremely unlikely for controlled burns to be carried out in areas adjacent to the boat harbour. DoT confirmed that attempts to ensure risk from fire would be minimised at site. This activity is considered compliant for the current reporting period as liaison with DPaW was carried out.	
83	Site Rehabilitation and Environmental Management Plan	Dieback	<b>Management of dieback</b> during <b>construction</b> operations will be facilitated by: <ul style="list-style-type: none"> <li>• <b>Adopting a formal approach</b> to managing the dieback threat;</li> <li>• Ensuring that the in <b>situ status does not increase</b> as a result of project development.</li> </ul>	Construction	Compliant	<p>Management of dieback during construction operations has been undertaken on site in accordance with the SREMP. A formal dieback assessment was undertaken for the project in the DoT Augusta Boat Harbour <i>Phytophthora cinnamomi</i> Occurrence Assessment - Draft (Report compiled by Simon Robinson of (Glevan Consulting), dated 14 September 2010 was prepared for the site and provides an overview and requirements for dieback.</p> <p>During the audit process the Project Manager also advised that the topography of the site provides drainage relief to the ocean. Therefore there is no downstream vegetation that could be affected by dieback pathogens.</p> <p>All nursery stock used in the two rehabilitation blocks completed in 2014 were sourced from Carramar Coastal Nursery, a member of the Nursery and Garden Industry of Australia and adheres to the NGIA policies with respect to purchase and use of soil media.</p>	<p>Reports, verbal confirmation.</p> <p>Email from OEC dated 18/11/2014.</p>

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
84	Site Rehabilitation and Environmental Management Plan	Dieback	All <b>contractors</b> will follow <b>strict hygiene protocols</b> when entering the Project area from a ' <b>Clean on Entry Point</b> ' located at the junction of Leeuwin Road and the site access road. The Clean on Entry Point will be the sole entry point onto the site and represent the point at which all personnel will take personal responsibility to <b>ensure the vehicles and machinery</b> they are operating have been <b>appropriately cleaned</b> to ensure no <b>dieback, weeds or other foreign diseases / pests</b> are unknowingly introduced. The Clean on Entry Point will be clearly <b>signposted</b> in red and a copy of the relevant Work Instruction outlining vehicle and machinery hygiene responsibilities and procedures will be maintained at the same point.	Construction	Compliant	All contractors on site follow hygiene protocols and the Clean on Entry Point has been implemented at the junction of Leeuwin Road and the site access road. During the 2014 site audit the Clean on Entry Point sign was clearly observed at the site access gate. During the site audit Site Supervisor confirmed that all works were undertaken in accordance with SREMP and CEMP. The Site Supervisor verified that plant and machinery was cleaned by the contractor before entry to site. The Site Supervisor also advised that haul trucks only travel bitumen and limestone roads, to eliminate the spread of dieback.	Reports, verbal confirmation
85	Site Rehabilitation and Environmental Management	Dieback	All <b>vehicles and machinery</b> must be <b>clean prior to entering site</b> . The process will require either a <b>wash-</b>	Construction	Compliant	All vehicles and machinery are cleaned prior to entering the site. During the audit process it was confirmed that no shire wash-down bay was constructed. However, the Project Manager advised all heavy plant that was	Reports, verbal confirmation

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
	Plan		<b>down or brush down procedure</b> which is outlined in Work Instruction 1. The wash-down / brush down bay will be located at an appropriate Shire facility in Augusta; cleaning of vehicles and machinery should not be completed at the Clean on Entry Point or on site under any circumstance.			transported to site was washed down at the contractor's depot from which it was transported prior to it leaving, and that each piece of heavy plant was inspected at the point of entry to the site by the Site Supervisor. A formal dieback site assessment was undertaken and is detailed in <i>Phytophthora cinnamomi</i> Occurrence Assessment (Report compiled by Simon Robinson of Glevan Consulting), dated 14 September 2010. The report determined that Site conditions were observed to be unfavourable for <i>P. Cinnamomi</i> due to soil type and a lack of susceptible plants. The Project Manager advised during the audit process that further dieback assessment and analysis of the topography of the land determined that a wash down of trucks entering and leaving the site did not require construction of a wash down facility.	
86	Site Rehabilitation and Environmental Management Plan	Dieback	Plant stock used for on-site rehabilitation works will be certified dieback-free prior to being delivered to site.	Rehabilitation	Compliant	It was confirmed by OEC that all nursery stock used in the two rehabilitation blocks completed in 2014 were sourced from Carramar Coastal Nursery, a member of the Nursery and Garden Industry of Australia and adheres to the NGIA policies with respect to purchase and use of soil media.	Email confirmation from OEC dated: 18/11/2014.
87	Site Rehabilitation and Environmental Management Plan	Dieback	<b>Access into areas of native vegetation</b> that are not to be cleared or disturbed will be <b>strictly controlled</b> by a combination of <b>non-permanent fencing and locked gates</b> . There will	Construction	Compliant	Access into areas of native vegetation that were not to be cleared or disturbed on site was strictly controlled. During the 2014 site audit it was visually confirmed that a locked gate is present at the front of the site and that rehabilitation areas have been fenced off accordingly, thereby restricting access.	Verbal confirmation, site audit.

Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
			be clear <b>signposting</b> informing of restricted access at these points. These areas will be <b>clearly demarcated</b> on a <b>site map</b> and included into the formal site induction process. Entry into these areas will be restricted to environmental and/or rehabilitation activities, such as weed control and monitoring; appropriate hygiene measures will apply prior to entry (as described below).			During the site audit the Site Supervisor confirmed that the site induction includes the identification and importance of these areas. Maps are also provided in the site office also as a reference.	
88	Site Rehabilitation and Environmental Management Plan	Dieback	<b>Surface run-off</b> from roads, stockpiles and other soil disturbances/trafficked areas should be <b>contained within the disturbed areas</b> as far as is practicable. Management strategies will include staged clearing of vegetation, retention of vegetation as perimeter buffers, retention of vegetated strips within the clearing zone, and perimeter bunding of topsoil and subsoil stockpiles	Construction	Compliant	Surface run-off from roads, stockpiles and other soil disturbances / trafficked areas were contained within the disturbed areas as required and in accordance with the SREMP. During the 2014 site audit vegetation buffers were observed and storm water drainage was in place. Stormwater management was undertaken in accordance with figure AU1554-18-01_A-A3_Temporary Stormwater Drainage Management and the Augusta BH Stormwater Drainage Management Plan.	Verbal confirmation, reports and management plans, photographs.
89	Site Rehabilitation and	Surface water and dieback	During initial construction of the site access road within Vegetation type 2	Construction	Not applicable	The temporary bunds were not in place at the time of the 2014 audit as they were no longer	Verbal confirmation, reports and management



Ref	Compliance Reference	Subject	Requirement	Phase	Status	Comments	Evidence
	Environmental Management Plan		<p>'Humic Granitic/ Sandy Swale' , <b>surface drainage</b> within disturbed areas of this low lying area will be managed by <b>constructing temporary limestone bunds</b> immediately after installation of the fences and prior to any kikuyu stripping commencing.</p>			<p>necessary.</p> <p>Temporary limestone bunds were constructed within the low lying Vegetation Type 2 area, in accordance with the SREMP during the 2012 reporting period.</p> <p>This bunding was observed during the 2013 site audit and verbal confirmation was provided from the Site Supervisor that surface water management and bunding was undertaken in accordance with the SREMP. Evidence of this is also provided in figure AU1554-18-01_AA3_Temporary Stormwater Drainage Management and the Augusta BH Stormwater Drainage Management Plan and other photographic records available.</p>	plans, photographs



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