

COBURN MINERAL SAND PROJECT
ENVIRONMENTAL MANAGEMENT
PLAN

Priority Flora, Flora and Vegetation
Management Plan

Prepared for

Gunson Resources Limited

Level 2, 33 Richardson Street
WEST PERTH

6 February 2007

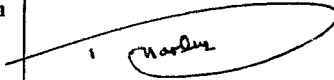
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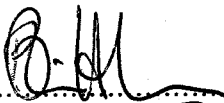


Environmental Management Plan Checklist: EAS Form 1b

General Information

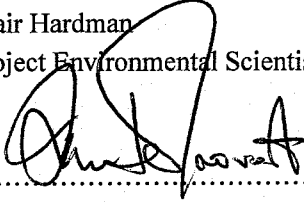
Ministerial Statement No	723	Project Title	Coburn Mineral Sand Project
		Proponent	Gunson Resources Limited
EMP Title (including date and version number)	Priority Flora, Flora and Vegetation Management Plan		
	Date: 6 FEBRUARY 2007		
	Revision: 1		


EMP Content	Yes	No	Comments
Is the document structured according to the EMP guideline?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Element - Is the aspect appropriately described?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 1
Current Status – Are the project description and receiving environment details adequate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 2
Potential Impacts – Are the potential impacts described adequately?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 3
Environmental Objectives – Are the objectives consistent with the Ministerial Statement and the EPA bulletin?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 4
Performance Indicators/Criteria – Are the indicators and criteria used meaningful, sufficient and appropriate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 5
Are the criteria verifiable and reproducible?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Implementation strategy – Are the strategies, tasks and the action program adequate for the environmental objectives?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 6
Have roles and responsibilities been identified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Have adequate timeframes and priorities been identified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Monitoring – Is the program to monitor performance against objectives and criteria adequate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 7
Are details provided on how/when monitoring will be undertaken and reported?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Contingencies – Are the mechanisms to identify actual and apparent non-conformance adequate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 8
Are the actions to address non-conformances adequate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Stakeholder consultation – Is a list of major stakeholders and details of how and when they were and will be consulted, provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 9
Auditing – Are details of an audit process to demonstrate implementation and compliance provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 10
Review and Revision – Is a suitable process to assess the adequacy of the plan detailed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 11
Reporting – are the reporting details provided adequate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 12
Key Management Actions Table - Has adequate information been provided in the Table?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SECTION 13
Does the table list the key actions, how implementation will be reported and the evidence that will be provided to DoE?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Figures and Tables – Have relevant figures and tables been provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Advisory bodies – Has advice been sought from all relevant advisory bodies and incorporated into the EMP?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ADVICE HAS BEEN SOUGHT FROM DEC (MIDWEST REGION & ENV. MGMT. BRANCH). SEE COVER LETTER
Has evidence of this advice been provided with the document?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Additional Comments	-		
The EMP has been developed in accord with the DEC EMP guideline.	 Environmental Manager		Date 6.2.07

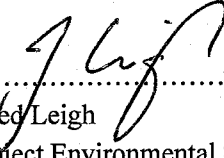
Project Manager: 

Blair Hardman
Project Environmental Scientist

URS Australia Pty Ltd
Level 3,
20 Terrace Road
East Perth, WA 6004 Australia
Tel: 61 8 9326 0100
Fax: 61 8 9326 0296

Project Director: 

 Sonia Finucane
Principal Environmental Scientist

Author: 

Jared Leigh
Project Environmental Scientist

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1	Element-----	1-1
1.1	Background	1-1
1.2	Aspect	1-1
1.3	Relevant Legislation and Policies	1-2
1.4	State Ministerial Conditions	1-4
1.5	Department of Environment and Heritage Conditions	1-6
2	Current Status-----	2-1
2.1	Project Overview	2-1
2.2	Existing Environment	2-2
2.2.1	Regional	2-2
2.2.2	Survey Area	2-2
3	Potential Impacts -----	3-1
4	Environmental Objectives -----	4-1
5	Performance Indicators-----	5-1
5.1	Overview	5-1
5.2	S5 and S10 Plant Communities	5-1
5.3	Priority Flora	5-2
6	Implementation Strategy -----	6-1
7	Monitoring-----	7-1
7.1	Overview	7-1
7.2	Monitoring Programmes	7-1
7.2.1	S5 and S10 Plant Communities	7-1
7.2.2	Effects of Groundwater Mounding on Vegetation	7-2
7.2.3	Effects of Dust and Saline Water Used for Dust Suppression on Vegetation	7-2
7.2.4	Revegetation Success	7-2
7.2.5	Weed Species Diversity and Abundance	7-3
7.2.6	Priority Flora	7-3
7.2.7	Priority Flora Not Directly Disturbed Within the Project Area	7-3
7.2.8	Priority Flora Within the Survey Area but Outside the Project Area	7-3
8	Contingencies-----	8-1
8.1	Overview	8-1
8.2	Priority Flora	8-1
8.2.1	Research Programme	8-1
8.2.2	Monitoring	8-2
8.3	Declared Rare Flora	8-2
8.4	S5 and S10 Vegetation Communities	8-4

Contents

9	Stakeholder Consultation -----	9-1
9.1	Consultation during the EIA Process	9-1
9.2	Consultation during Preparation of this MP	9-1
9.3	Consultation during Construction and Operation	9-2
10	Auditing -----	10-1
11	Review and Revision -----	11-1
12	Reporting -----	12-1
12.1	Internal Reporting	12-1
12.2	External Reporting under the State Ministerial Approval	12-1
12.2.1	Compliance Reports	12-1
12.2.2	Performance Review Reports	12-2
12.2.3	Independent Audit Report	12-2
12.2.4	Annual Environmental Report	12-2
12.3	External Reporting under the Commonwealth Ministerial Approval	12-3
12.4	External Reporting under Mining Lease Conditions	12-3
12.5	External Reporting under the Pollution Prevention Licence	12-3
13	Key Management Actions Table -----	13-1
14	References -----	14-1
15	Limitations -----	15-1

List of Tables & Figures

Tables

Table 1.1	Definition of Rare and Priority Flora Species	1-3
Table 1.2	Management Plan Requirements	1-6
Table 2.1	Key Characteristics of the Coburn Mineral Sand Project.....	2-1
Table 2.2	Significance of Plant Communities in the Project Area	2-3
Table 2.3	Known Populations of Priority Species within the Survey Area.....	2-4
Table 2.4	Distribution of Priority Flora within the Survey Area.....	2-6
Table 2.5	Rare and Priority Flora Recorded in Surveys of the Irwin and Carnarvon Botanical Districts that were not found in the Coburn Project Surveys	2-14
Table 3.1	Predicted Vegetation Disturbance Areas	3-1
Table 5.1	Performance Indicators and Targets for Priority Flora.....	5-2
Table 6.1	Management Actions, Timing and Responsibility for Compliance with Objectives .	6-2
Table 13.1	Key Management Actions Table	13-1

Figures

Figure 2.1	Priority Flora Species Locations within the Survey Area	2-5
Figure 6.1	Schematic Organisational Chart	6-1

1.1 Background

Gunson Resources Limited (Gunson) is developing the Coburn Mineral Sand Project (the Project) in the Shark Bay district of Western Australia (WA), approximately 250 km north of Geraldton and 84 km southeast of Denham. The Project Area is located immediately east of the Shark Bay World Heritage Property (SBWHP). The Project will comprise the mining and processing of a major low grade heavy mineral sand deposit approximately 18 km long, up to 3 km wide and between 10 m and 40 m thick.

The Project was assessed as a Public Environmental Review (PER) under Part IV of the Western Australian *Environmental Protection Act 1986*. In addition, the Project is considered to be a "controlled action" under the Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*. The environmental assessment was conducted in accordance with the bilateral agreement between the Commonwealth of Australia and WA, meaning that the Commonwealth accredited the WA environmental impact assessment process.

The PER (URS, 2005) was issued in July 2005 for an eight-week public review period and the Report and Recommendations of the WA Environmental Protection Authority (EPA) was published as EPA Bulletin 1211 in December 2005. Environmental approval for the Project was granted by the State Minister for the Environment in May 2006 (Ministerial Statement No. 723) and the Commonwealth Environment Minister in July 2006.

1.2 Aspect

This Priority Flora, Flora and Vegetation Management Plan is part of a series of management plans (MPs) for the Project, that are known collectively as the Environmental Management Plan (EMP). The purpose of the EMP is to provide measures to prevent or mitigate potential impacts to the environment and heritage values during construction and operation of the Project. The MPs were developed based upon the impacts identified during the environmental risk assessment process undertaken during preparation of the PER, with consideration given to stakeholder comment and issues addressed during the EPA's and Department of Environment and Heritage's (DEH) assessment of the Project.

This Priority Flora, Flora and Vegetation Management Plan has been prepared in accordance with Condition 8 of Ministerial Statement No. 723 (see Section 1.4), Commitment 1 of Schedule 2 of Ministerial Statement No. 723 and Condition 4 of the DEH Approval Decision – Coburn Mineral Sand Project (EPBC 2003/1221).

Flora species are defined as Declared Rare Flora (DRF) or Priority Flora (PF) where their populations are restricted geographically or threatened by local processes. The Department of Conservation and Land Management (CALM), hereafter referred to as the Department of Environment and Conservation (DEC), recognises these threats of extinction and consequently applies regulations towards population and species protection.

The aspects relevant to the factor “flora and vegetation” are identified in the EPA Bulletin 1211 as:

- Approximately 3,695 ha of vegetation will be cleared;
- Groundwater mounding from tailings seepage could potentially affect vegetation to the north, west and east of the Project Area; and
- Flora and vegetation may also be impacted by dust deposition, generated from mining.

1.3 Relevant Legislation and Policies

Legislation and policies applicable to this management plan include:

- *Wildlife Conservation Act 1950*;
- *Environmental Protection Act 1986*;
- *Environment Protection and Biodiversity Conservation Act 1999*;
- EPA Position Statement No. 2 (Environmental Protection of Native Vegetation in Western Australia, 2000);
- EPA Position Statement No. 3 (Terrestrial Biological Surveys as an Element of Biodiversity Protection in Western Australia, 2002); and
- EPA Guidance Statement No. 51 (Terrestrial Flora Surveys for Environmental Impact Assessment in Western Australia, 2004).

DRF species are gazetted under Subsection 2 of Section 23F of the *Wildlife Conservation Act 1950* and therefore it is an offence to “take” or damage rare flora without Ministerial approval. Section 23F of the *Wildlife Conservation Act 1950* defines “to take” as “... to gather, pick, cut, pull up, destroy, dig up, remove or injure the flora or to cause or permit the same to be done by any means” (Mattiske Consulting Pty Ltd, 2005).

PF are under consideration for declaration as ‘declared rare flora’, but are in need of further survey (Priority One to Three) or require monitoring every 5-10 years (Priority Four). Table 1.1 presents the definitions of Declared Rare and the four Priority ratings under the *Wildlife Conservation Act 1950* as extracted from the West Australian Herbarium (2005a, 2005b).

Under the EPBC Act, an action requires the approval of the Minister if the action has, will have, or is likely to have a significant impact on any of the matters of National Environmental Significance (MNES). The aspect of MNES relevant to flora and vegetation is listed threatened species or communities.

Table 1.1
Definition of Rare and Priority Flora Species

Conservation Code	Category
R	<p>Declared Rare Flora – Extant Taxa</p> <p>“Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection and have been gazetted as such.”</p>
P1	<p>Priority One – Poorly Known Taxa</p> <p>“Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat. Such taxa are under consideration for declaration as ‘rare flora’, but are in urgent need of further survey.”</p>
P2	<p>Priority Two – Poorly Known Taxa</p> <p>“Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (not currently endangered). Such taxa are under consideration for declaration as ‘rare flora’, but urgently need further survey.”</p>
P3	<p>Priority Three – Poorly Known Taxa</p> <p>“Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (ie. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as ‘rare flora’ but need further survey.”</p>
P4	<p>Priority Four – Rare Taxa</p> <p>“Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.”</p>

Source: CALM, 2005

1.4 State Ministerial Conditions

The conditions relevant to flora and vegetation management for the Project from State Ministerial Statement No. 723 are provided below:

2 Proponent Commitments

- 2-1 The proponent shall implement the environmental management commitments documented in Schedule 2 of this statement.

Proponent Commitment No. 1 is included in Schedule 2 and comprises:

1. Finalise the draft Priority Flora Management Plan with consideration of comments received during the public review period of the PER and in consultation with relevant stakeholders.
2. Implement the Priority Flora Management Plan.

8 Flora and Vegetation

- 8-1 Prior to commencement of ground-disturbing activities, the proponent shall prepare a Flora and Vegetation Management Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.

The objective of this Plan is to ensure the conservation of significant flora species and vegetation communities which occur in the vicinity of and within the proposal area as shown in Figure 2 of Schedule 1.

- 8-2 The Flora and Vegetation Management Plan required by condition 8-1 shall include:

1. appropriately timed searches for Declared Rare Flora and Priority Flora in the area to be disturbed prior to the development of each pit and associated infrastructure, including haul roads;
2. the management, monitoring and reporting of impacts on Declared Rare Flora and Priority Flora species within the proposal area;
3. any targeted surveys which are required prior to ground-disturbing activities to provide further information on the conservation status of each of the Declared Rare Flora species found; and
4. reporting procedures and schedule.

- 8-3 The proponent shall implement the Flora and Vegetation Management Plan required by condition 8-1.

-
- 8-4 The proponent shall make the Flora and Vegetation Management Plan required by condition 8-1 publicly available.
- 8-5 In the event that Declared Rare Flora and/or species listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*, are identified in the project area, the proponent shall prepare a Declared Rare Flora Management Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.
- 8-6 The Declared Rare Flora Management Plan required by condition 8-5 shall include:
1. the recorded location of Declared Rare Flora species;
 2. a description of the habitat in which the Declared Rare Flora was found, and the extent of the contiguous area of the same habitat in the local area;
 3. offsite surveys to determine the extent of rare flora species;
 4. the degree of impact of the proposed works on the Declared Rare Flora or its identified contiguous habitat;
 5. a management strategy for the protection of Declared Rare Flora species, in the event that approval to impact the declared rare or priority flora has not been provided pursuant to the *Wildlife Conservation Act 1950* , including:
 - a) identification of a protected buffer area around the Declared Rare Flora;
 - b) delineation of the location of the Declared Rare Flora buffer area to prevent accidental damage to the protected area;
 - c) consideration of relocating Declared Rare Flora species;
 - d) education of workers as to the protection of the Declared Rare Flora location;
 - e) specific management measures for topsoil stripping within areas of the contiguous Declared Rare Flora habitat; and
 - f) specific management measures for site rehabilitation and topsoil replacement within areas previously included as contiguous Declared Rare Flora habitat.
 6. post-activity monitoring plan for Declared Rare Flora and regeneration of vegetation within areas previously included as contiguous Declared Rare Flora habitat, including monitoring for Declared Rare Flora plants.
- 8-7 The proponent shall implement the Declared Rare Flora Management Plan required by condition 8-5.

- 8-8 The proponent shall make the Declared Rare Flora Management Plan required by condition 8-5 publicly available.
- 8-9 The proponent shall not disturb vegetation communities S5 and S10 identified within Figure 3 of Schedule 1, and shall leave an undisturbed buffer of at least 50 metres in width around the vegetation communities.
- 8-10 The proponent shall report within the Annual Environmental Reports required by condition 5-4 the outcomes of any monitoring programs and performance reviews associated with the implementation of the Flora and Vegetation Management Plan required by condition 8-1 and the Declared Rare Flora Management Plan required by condition 8-5.

The requirements of the Flora and Vegetation Management Plan are outlined in Condition 8-2. Table 1.2 identifies where in this document these requirements have been addressed.

Table 1.2
Management Plan Requirements

Proponent Commitment	Requirement	Where Addressed in this EMP
2-1 (1)	Finalise the draft Priority Flora Management Plan with consideration of comments received during the public review period of the PER and in consultation with relevant stakeholders.	Whole EMP
2-1 (2)	Implement the Priority Flora Management Plan.	Not required yet.
Ministerial Condition		
8-2 (1)	Appropriately timed searches for Declared Rare Flora and Priority Flora in the area to be disturbed prior to the development of each pit and associated infrastructure, including haul roads.	Section 6
8-2 (2)	The management, monitoring and reporting of impacts on Declared Rare Flora and Priority Flora species within the proposal area.	Sections 6, 7 and 13
8-2 (3)	Any targeted surveys which are required prior to ground-disturbing activities to provide further information on the conservation status of each of the Declared Rare Flora species found.	Section 6
8-2 (4)	Reporting procedures and schedule.	Section 12

1.5 Department of Environment and Heritage Conditions

The Conditions relevant to flora, vegetation and PF management for the Project from the DEH Approvals Decision – Coburn Mineral Sands Project (EPBC 2003/1221) are provided below:

- Prior to the commencement of mining operations, the person taking the action must prepare a Flora and Vegetation Management Plan as detailed in Condition 4 of the *Statement that a proposal may be implemented (Pursuant to the provisions of the*

Environmental Protection Act 1986) Statement No. 723, published on 22 May 2006. The plan must be implemented.

This Priority Flora, Flora and Vegetation Management Plan has been prepared to comply with Condition 4 and, following DEC approval, will be implemented.

2.1 Project Overview

The Project proposed in the PER included mining and processing of ore from ten open cut pits. However, during the environmental assessment process, Gunson decided to seek approval to develop only nine pits until operational data became available to validate and refine the prediction of environmental impacts associated with Pit 10. Consequently, the main components of the Project comprise:

- Nine open-cut mine pits;
- Up to two processing plants that will be relocated as mining progresses;
- A borefield;
- Haul roads and access corridors;
- Offices, workshops and other supporting infrastructure; and
- An accommodation camp.

The key characteristics of the approved Project are summarised in Table 2.1.

Table 2.1
Key Characteristics of the Coburn Mineral Sand Project

Element	Description
Project Life	Approximately 12 Years.
Number of Pits	Nine pits.
Rate of Mining	Approximately 2,300 tonnes per hour (tph) for the first two years, increasing to 4,600 tph in Year 3 (~15 million tonnes per annum [tpa] for Years 1 and 2, and 30 million tpa for Years 3 to 12).
Mining Method	Dozers and in-pit screening modules.
Estimated Footprint of Disturbance	Approximately 3,695 hectares.
Rate of Processing	Approximately 2,200 tph for the first two years increasing to 4,400 tph in Year 3 (~140,000 tpa of Heavy Mineral Concentrate from Year 1 increasing to 280,000 tpa from Year 3).
Estimated Volume of Tailings	2,180 tph for each 2,200 tph concentrator.
Volume of Process Water	Up to 18 GL/annum at full production.
Estimated Total Volume of Refined Product	Ilmenite – 1,400 kilotonnes (kt) HiTi – 380 kt Zircon – 660 kt

Source: Schedule 1 of Ministerial Statement No. 723

2.2 Existing Environment

2.2.1 Regional

The Project Area is located within the transition zone between the South-West Botanical Province and the Eremaean Botanical Province (Beard, 1990). The northern extent of the Irwin Botanical District (a part of the Southwest Botanical Province) is described by Beard (1990) as ‘tree heath’ comprising herbs and grasses, small and large shrubs, and small trees up to 6 m. The southern portion of the Amy Zone is a part of the Carnarvon Botanical District (a part of the Eremaean Botanical Province) and is characterised by *Acacia* shrublands and low woodlands. This boundary represents the transition from the complex and species-rich heathlands and woodlands of south-western Australia to the less diverse *Acacia* shrublands of the Carnarvon Basin and is thought to relate to the increasing quantity and reliability of rainfall to the south-west (Beard, 1976).

The region is thought to be a major transition zone for the vascular flora of Western Australia, with 229 taxa ending their northern-most range within the SBWHP (Trudgen and Keighery, 1995).

2.2.2 Survey Area

Introduction

Mattiske Consulting Pty Ltd was commissioned by Gunson to undertake flora and vegetation surveys. The area surveyed extends beyond the immediate Project Area. The surveys extended beyond the specific project area to enable the results of botanical studies to be placed in a local and regional context. Therefore reference to the survey area in the following text includes both the Project Area and the adjacent survey areas; whilst the Project Area refers specifically to the proposed mining and infrastructure areas. Based on the current mine plan, the Project Area has an estimated footprint of approximately 2,124 ha, whereas the survey areas cover a total area of 25,985 ha. Surveys were conducted in August 2003, April 2004, September 2004, November 2004, August 2005, August 2006, October 2006 and November 2006. The below information has been largely sourced from these reports.

Vegetation

The vegetation system of the survey area is referred to as the Tamala System. The typical vegetation of this system comprises of “tree heath”, or heath with scattered trees (Mattiske Consulting Pty Ltd, 2005). The vegetation communities within the survey area mainly consist of Low Open Woodlands dominated by *Eucalyptus* sp., and Tall Open Shrublands dominated by *Acacia* sp.

Communities are described as Threatened Ecological Communities (TECs) if they have been defined by the Western Australian Threatened Ecological Communities Scientific Advisory Committee (English and Blyth, 1997) or the EPBC Act. None of the plant communities within the Project Area are considered to be TECs.

Twenty plant communities were defined and mapped during the surveys, comprising seven *Eucalyptus* Woodlands, 12 Shrublands and one Mosaic Community. Of these 20 communities, 12 (E2, E3, E5, E6, E7, S1, S2, S3, S7, S8, S10 and S12) occur within the Project Area (including pits, Project infrastructure, supporting facilities and roads), as listed in Table 2.2.

Table 2.2
Significance of Plant Communities in the Project Area

Community	Contain Declared Rare Flora	Contain Priority Flora	Priority Flora Dominant	Restricted to Calcareous Soils	Locally Significant	Regionally Significant
E2	-	-	-	-	-	X
E3	-	X	-	-	X	X
E5	-	-	-	-	-	-
E6	-	X	-	-	X	X
E7	-	X	-	-	X	X
S1	-	X	-	-	X	X
S2	-	X	-	-	X	X
S3	-	X	-	-	X	X
S7	-	X	-	X	X	-
S8	-	X	X	X	X	-
S10	-	X	X	-	X	X
S12	X	X	X	-	X	-
Total	1	8	2	3	8	8

Vegetation types are considered “regionally significant” when they are limited to specific landform types, are uncommon or restricted plant community types within the regional context, or support populations of DRF (Mattiske Consulting Pty Ltd, 2005). Eight of the 12 Project Area plant communities (E2, E3, E6, E7, S1, S2, S3 and S10) may be considered regionally significant. It should be noted that limited systematic flora and vegetation survey work has been completed in the region and the occurrence of these communities within the wider regional area is largely unmapped. Hence, they are classified as regionally significant on the basis of the limited survey work undertaken to date. However, as shown by the results of the August 2005 survey, many of the plant communities found in the vicinity of the Project Area also occur in the SBWHP to the west, and on the Coburn and Hamelin pastoral leases to the east.

Plant communities are referred to as “locally significant” where the presence of PF species has been recorded, where they provide a range extension of particular taxa from previously recorded locations, or where they are very restricted to one or two locations or occur as small isolated communities. Several plant communities within the survey area are considered locally significant where PF species have been recorded, including communities E3, E6, E7, S1, S2, S3, S7, S8, S10 and S12. Within the S8, S10 and S12 plant communities, PF species constitute a dominant element of the species composition. Plant communities S7 and S8 are relatively restricted to calcareous soils in the eastern part of the survey area and are unlikely to be markedly influenced by the Project.

Flora

To date, a total of approximately 324 taxa (including subspecies and varieties) has been recorded within the Project Area, including nine introduced species (weeds). None of these introduced species recorded are listed as Declared Plants, as defined by the Department of Agriculture (2004). Refer to the Weed Management Plan (in the Progressive Rehabilitation Management Plan) for further details.

One species, *Eucalyptus beardiana*, gazetted as DRF pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act 1950*, and as Endangered under the EPBC Act, has been recorded within the survey area. A DRF Management Plan for *E. beardiana* has been prepared.

Eighteen PF species have been recorded within the survey area, which is significantly larger than the Project Area. Table 2.3 lists the number of populations of each PF species within the area to be disturbed against the total number of populations recorded in the survey area. Table 2.3 also illustrates which of the PF populations within the Project footprint are considered by Matiske Consulting Pty Ltd to be dominant populations within the plant communities.

Table 2.3
Known Populations of Priority Species within the Survey Area

Species	Priority Listing	No. of Populations Within the Project Footprint	No. of Populations Outside of the Project Footprint	Total No. of Populations within the Survey Area
<i>Abutilon</i> sp. Hamelin	P2	0	3	3
<i>Acacia drepanophylla</i>	P3	2	11	13
<i>Acacia subrigida</i>	P2	0	13	13
<i>Chthonocephalus tomentellus</i>	P2	0	8	8
<i>Dicrastylis linearifolia</i>	P3	0	2	2
<i>Eremophila occidens</i> (ms)	P2	2	6	8
<i>Grevillea rogersoniana</i>	P3	3	12	15
<i>Grevillea stenostachya</i>	P3	1	9	10
<i>Jacksonia dendrospinosa</i>	P4	0	6	6
<i>Macarthuria intricata</i>	P3	1	7	8
<i>Malleostemon</i> sp. Cooloomia	P2	0	2	2
<i>Millotia depauperata</i>	P1	0	1	1
<i>Physopsis chrysophylla</i>	P3	1	9	10
<i>Pityrodia glutinosa</i>	P3	0	2	2
<i>Scaevola chrysopogon</i>	P2	0	1	1
<i>Scholtzia</i> ?sp. Eurady (J.S. Beard 6886)	P2	2	7	9
<i>Scholtzia</i> sp. Folly Hill	P2	0	9	9
<i>Triodia bromoides</i>	P4	0	22	22

The distribution and habitat of these species within the survey area and the broader geographic district are discussed below. The precise locations of these species in the survey area are listed in Table 2.4 and are illustrated in Figure 2.1. The following summary reflects records collected during the recent surveys by Matiske Consulting Pty Ltd.

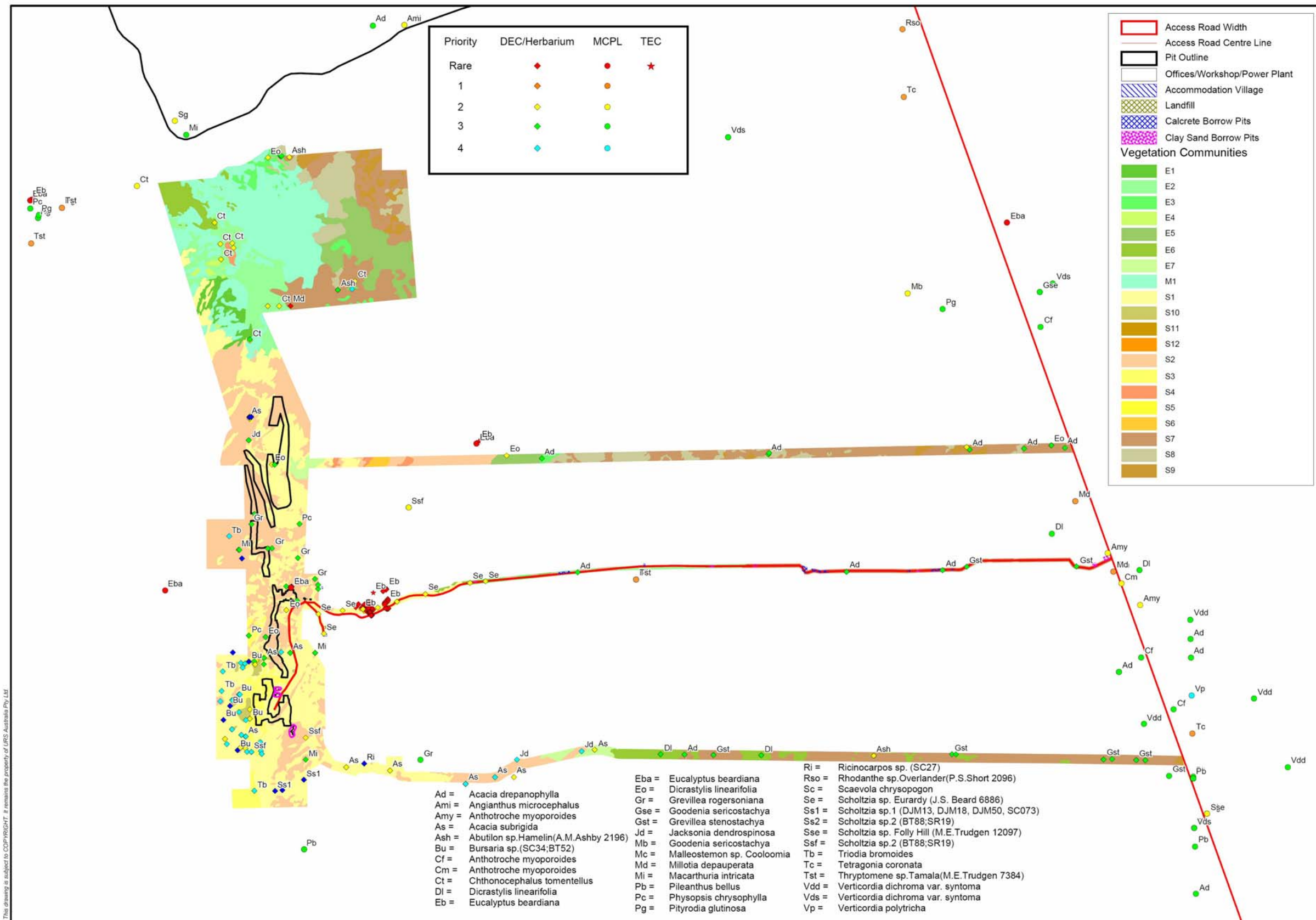


Figure 2.1: Priority Flora Species Locations within the Survey Area

Table 2.4
Distribution of Priority Flora within the Survey Area

Taxon	Population Location	
	Easting	Northing
<i>Abutilon</i> sp. Hamelin (P2)	217240	7059301
<i>Abutilon</i> sp. Hamelin (P2)	214680	7066311
<i>Abutilon</i> sp. Hamelin (P2)	245528	7034711
<i>Acacia drepanophylla</i> (P3)	235536	7034768
<i>Acacia drepanophylla</i> (P3)	228008	7050402
<i>Acacia drepanophylla</i> (P3)	240005	7050694
<i>Acacia drepanophylla</i> (P3)	250577	7050869
<i>Acacia drepanophylla</i> (P3)	253459	7050927
<i>Acacia drepanophylla</i> (P3)	255618	7050963
<i>Acacia drepanophylla</i> (P3)	217240	7059301
<i>Acacia drepanophylla</i> (P3)	214229	7066342
<i>Acacia drepanophylla</i> (P3)	214269	7066378
<i>Acacia drepanophylla</i> (P3)	214197	7066401
<i>Acacia drepanophylla</i> (P3)	249155	7044499
<i>Acacia drepanophylla</i> (P3)	244094	7044416
<i>Acacia drepanophylla</i> (P3)	229895	7044390
<i>Acacia subrigida</i> (P2)	223990	7033220
<i>Acacia subrigida</i> (P2)	226532	7033576
<i>Acacia subrigida</i> (P2)	219993	7033920
<i>Acacia subrigida</i> (P2)	217684	7034104
<i>Acacia subrigida</i> (P2)	230797	7035030
<i>Acacia subrigida</i> (P2)	212367	7035722
<i>Acacia subrigida</i> (P2)	213345	7039873
<i>Acacia subrigida</i> (P2)	214728	7040140
<i>Acacia subrigida</i> (P2)	214790	7043636
<i>Acacia subrigida</i> (P2)	212583	7052500
<i>Acacia subrigida</i> (P2)	212591	7052618
<i>Acacia subrigida</i> (P2)	212572	7052578
<i>Acacia subrigida</i> (P2)	212669	7052601
<i>Chthonocephalus tomentellus</i> (P2)	212595	7056628
<i>Chthonocephalus tomentellus</i> (P2)	214140	7058452
<i>Chthonocephalus tomentellus</i> (P2)	218140	7059751
<i>Chthonocephalus tomentellus</i> (P2)	211073	7060914
<i>Chthonocephalus tomentellus</i> (P2)	211731	7061527

Table 2.4 (cont.'d)

Taxon	Population Location	
	Easting	Northing
<i>Chthonocephalus tomentellus</i> (P2)	211037	7061727
<i>Chthonocephalus tomentellus</i> (P2)	211668	7061768
<i>Chthonocephalus tomentellus</i> (P2)	210736	7062847
<i>Dicrastylis linearifolia</i> (P3)	239586	7034728
<i>Dicrastylis linearifolia</i> (P3)	234275	7034790
<i>Eremophila occidens</i> (ms) (P2)	214728	7040140
<i>Eremophila occidens</i> (ms) (P2)	214522	7042396
<i>Eremophila occidens</i> (ms) (P2)	215109	7042650
<i>Eremophila occidens</i> (ms) (P2)	213764	7050076
<i>Eremophila occidens</i> (ms) (P2)	226151	7050552
<i>Eremophila occidens</i> (ms) (P2)	250432	7051003
<i>Eremophila occidens</i> (ms) (P2)	254901	7051096
<i>Eremophila occidens</i> (ms) (P2)	213552	7066288
<i>Grevillea rogersoniana</i> (P3)	213345	7039873
<i>Grevillea rogersoniana</i> (P3)	214728	7040140
<i>Grevillea rogersoniana</i> (P3)	213755	7040155
<i>Grevillea rogersoniana</i> (P3)	213425	7040973
<i>Grevillea rogersoniana</i> (P3)	215109	7042650
<i>Grevillea rogersoniana</i> (P3)	215084	7042904
<i>Grevillea rogersoniana</i> (P3)	216203	7043518
<i>Grevillea rogersoniana</i> (P3)	216190	7043731
<i>Grevillea rogersoniana</i> (P3)	214790	7043636
<i>Grevillea rogersoniana</i> (P3)	216034	7044042
<i>Grevillea rogersoniana</i> (P3)	215126	7045154
<i>Grevillea rogersoniana</i> (P3)	213765	7045654
<i>Grevillea rogersoniana</i> (P3)	212684	7046931
<i>Grevillea rogersoniana</i> (P3)	212848	7047466
<i>Grevillea rogersoniana</i> (P3)	212594	7056696
<i>Grevillea stenostachya</i> (P3)	259861	7034464
<i>Grevillea stenostachya</i> (P3)	259382	7034480
<i>Grevillea stenostachya</i> (P3)	257658	7034510
<i>Grevillea stenostachya</i> (P3)	249862	7034782
<i>Grevillea stenostachya</i> (P3)	249658	7034787
<i>Grevillea stenostachya</i> (P3)	237070	7034744
<i>Grevillea stenostachya</i> (P3)	234275	7034790

Table 2.4 (cont.'d)

Taxon	Population Location	
	Eastings	Northing
<i>Grevillea stenostachya</i> (P3)	254901	7051096
<i>Grevillea stenostachya</i> (P3)	256225	7044700
<i>Grevillea stenostachya</i> (P3)	250430	7044687
<i>Jacksonia dendrospinosa</i> (P4)	223990	7033220
<i>Jacksonia dendrospinosa</i> (P4)	230105	7034947
<i>Jacksonia dendrospinosa</i> (P4)	212149	7035803
<i>Jacksonia dendrospinosa</i> (P4)	212026	7037015
<i>Jacksonia dendrospinosa</i> (P4)	214247	7040179
<i>Jacksonia dendrospinosa</i> (P4)	212535	7051369
<i>Macarthuria intricata</i> (P3)	215540	7034501
<i>Macarthuria intricata</i> (P3)	213333	7039539
<i>Macarthuria intricata</i> (P3)	212340	7039577
<i>Macarthuria intricata</i> (P3)	216038	7040137
<i>Macarthuria intricata</i> (P3)	216190	7043731
<i>Macarthuria intricata</i> (P3)	212036	7045579
<i>Macarthuria intricata</i> (P3)	212007	7045586
<i>Macarthuria intricata</i> (P3)	213542	7045652
<i>Malleostemon</i> sp. Cooloomia (P2)	212095	7035135
<i>Malleostemon</i> sp. Cooloomia (P2)	211279	7035587
<i>Millotia depauperata</i> (P1)	214740	7058451
<i>Physopsis chrysophylla</i> (P3)	212821	7039685
<i>Physopsis chrysophylla</i> (P3)	213345	7039873
<i>Physopsis chrysophylla</i> (P3)	214728	7040140
<i>Physopsis chrysophylla</i> (P3)	212542	7041047
<i>Physopsis chrysophylla</i> (P3)	214511	7043653
<i>Physopsis chrysophylla</i> (P3)	215215	7046947
<i>Physopsis chrysophylla</i> (P3)	213907	7050072
<i>Physopsis chrysophylla</i> (P3)	212535	7051369
<i>Physopsis chrysophylla</i> (P3)	218562	7042451
<i>Physopsis chrysophylla</i> (P3)	220361	7042844
<i>Pityrodia glutinosa</i> (P3)	216038	7040137
<i>Pityrodia glutinosa</i> (P3)	215084	7042904

Table 2.4 (cont.'d)

Taxon	Population Location	
	Easting	Northing
<i>Scaevola chrysopogon</i> (P2)	213540	7058451
<i>Scholtzia</i> ?sp. Eurardy (J.S. Beard 6886) (P2)	225037	7043923
<i>Scholtzia</i> ?sp. Eurardy (J.S. Beard 6886) (P2)	224213	7043838
<i>Scholtzia</i> ?sp. Eurardy (J.S. Beard 6886) (P2)	216214	7042192
<i>Scholtzia</i> ?sp. Eurardy (J.S. Beard 6886) (P2)	216506	7041153
<i>Scholtzia</i> ?sp. Eurardy (J.S. Beard 6886) (P2)	218562	7042451
<i>Scholtzia</i> ?sp. Eurardy (J.S. Beard 6886) (P2)	217489	7042378
<i>Scholtzia</i> ?sp. Eurardy (J.S. Beard 6886) (P2)	219348	7042530
<i>Scholtzia</i> ?sp. Eurardy (J.S. Beard 6886) (P2)	220361	7042844
<i>Scholtzia</i> ?sp. Eurardy (J.S. Beard 6886) (P2)	221864	7043239
<i>Scholtzia</i> sp. Folly Hill (P2)	212678	7034908
<i>Scholtzia</i> sp. Folly Hill (P2)	212362	7035090
<i>Scholtzia</i> sp. Folly Hill (P2)	213249	7035174
<i>Scholtzia</i> sp. Folly Hill (P2)	215541	7035657
<i>Scholtzia</i> sp. Folly Hill (P2)	211279	7035587
<i>Scholtzia</i> sp. Folly Hill (P2)	212594	7036664
<i>Scholtzia</i> sp. Folly Hill (P2)	212594	7037156
<i>Scholtzia</i> sp. Folly Hill (P2)	212873	7039526
<i>Scholtzia</i> sp. Folly Hill (P2)	212951	7039741
<i>Triodia bromoides</i> (P4)	212828	7032855
<i>Triodia bromoides</i> (P4)	213225	7034804
<i>Triodia bromoides</i> (P4)	212678	7034908
<i>Triodia bromoides</i> (P4)	212444	7034915
<i>Triodia bromoides</i> (P4)	213180	7034962
<i>Triodia bromoides</i> (P4)	211376	7035322
<i>Triodia bromoides</i> (P4)	213141	7035424
<i>Triodia bromoides</i> (P4)	212376	7035722
<i>Triodia bromoides</i> (P4)	211654	7036103
<i>Triodia bromoides</i> (P4)	212386	7036590
<i>Triodia bromoides</i> (P4)	211041	7037583
<i>Triodia bromoides</i> (P4)	211684	7037624
<i>Triodia bromoides</i> (P4)	211667	7037651
<i>Triodia bromoides</i> (P4)	212066	7037940
<i>Triodia bromoides</i> (P4)	212031	7037944
<i>Triodia bromoides</i> (P4)	211102	7038125
<i>Triodia bromoides</i> (P4)	211166	7039158

Table 2.4 (cont.'d)

Taxon	Population Location	
	Easting	Northing
<i>Triodia bromoides</i> (P4)	212212	7039364
<i>Triodia bromoides</i> (P4)	212340	7039577
<i>Triodia bromoides</i> (P4)	212116	7039605
<i>Triodia bromoides</i> (P4)	211502	7046300
<i>Triodia bromoides</i> (P4)	217996	7059349

Source: Mattiske Consulting Pty Ltd, 2006b.

Notes: GPS Datum GDA94

Abutilon sp. Hamelin (P2)

This low shrub has been recorded from 13 locations at Shark Bay and from two disjunct locations in the Carnarvon and Murchison regions. It was recorded at three locations in the survey area to the east of the specific Project Area, in Communities S7 and S8. No populations have been recorded in the Project footprint.

Acacia drepanophylla (P3)

This species typically occurs as a small tree and has a restricted distribution between Hamelin Pool and just south of the Billabong Roadhouse on the North West Coastal Highway (total of 28 collections) (Mattiske Consulting Pty Ltd, 2006c). Within the Coburn survey area it was recorded from 13 locations across four plant communities. It was most abundant in Communities S8 and S9, where it was a co-dominant with *Acacia xiphophylla*, and *Acacia ramulosa* var. *ramulosa* occurring on loam soils over limestone. It was also occasionally recorded as a shrub in Communities S7 and E3 (Mattiske Consulting Pty Ltd, 2006c). Two populations are present in the Project footprint.

Acacia subrigida (P2)

This erect shrub is recorded from several locations in the Murchison, Coolgardie, Avon Wheatbelt and the Geraldton Sandplains. In the Coburn survey area, it has been recorded at 13 locations in Communities S1, S2, S3 and S5, and is a dominant element of Community S5. No populations have been recorded in the Project footprint. The populations of *Acacia subrigida* occurring in the survey area may have particular conservation significance as they may have affinities with a wide phyllode variant that has been previously recorded nearby, 6 km west of Overlander-Denham road towards Tamala Station (Maslin, 2001). This northern population of *Acacia subrigida* may represent a distinct taxon. However, further taxonomic investigation is required.

Chthonocephalus tomentellus (P2)

This prostrate annual herb has been recorded from 28 locations in the Geraldton Sandplains and the Carnarvon region. In the survey area it was recorded from eight locations in plant Communities E2, E6, M1, S4, and S7. This species was not recorded in the Project Area.

Dicrastylis linearifolia (P3)

This shrub species was recorded in two locations during surveying of the now abandoned southern access route, in communities S2 and E2. It has not been recorded in the current Project footprint. The species has been recorded on sandplains from the Yalgoo and northern Geraldton Sandplains regions as well as the western areas of the Carnarvon and Murchison Botanical Districts.

Eremophila occidens (ms) (P2)

This shrub to 1.5 m has only been recorded from two isolated areas at Shark Bay and North West Cape (total of four collections). In the Coburn survey area, it is a relatively common shrub found at eight locations across three widespread communities (S1, S2 and S3). As the known distribution of this species is highly restricted, the number of individuals within the survey area represents a significant proportion of the known species population. However, only two populations have been recorded within the Project footprint.

Grevillea rogersoniana (P3)

This conspicuous shrub or small tree is endemic to Shark Bay and Peron Peninsula (total of 30 collections). In the Coburn survey area it was recorded at 15 locations across Communities S1, S2 and S3, but was most commonly found when shrublands were tall and open. Three populations are known to occur in the current Project footprint.

Grevillea stenostachya (P3)

This dense, pungent shrub has been recorded from the Murchison, Carnarvon and Yalgoo regions (total of 25 collections). The presence of this species in the survey area is particularly significant as it represents a 70 km extension to the west of its known range (Mattiske Consulting Pty Ltd, 2006c). It was locally abundant in the 10 locations in which it was recorded, in the Communities E6 and S7. One of these populations is present in the Project footprint.

Jacksonia dendrospinosa (P4)

This small tree has been recorded from nine locations in the northern section of the Geraldton Sandplains. In the Coburn survey area it was restricted to mature, open shrublands (Community S2), suggesting it is a late successional species. Six populations were recorded within the survey area, but none of these occur in the Project footprint.

Macarthuria intricata (P3)

This small intricately branched shrub has been recorded at nine locations and is endemic to the Shark Bay district. In the Coburn survey area, it was common in Communities S2 and S10. Eight populations were recorded within the survey area. One of these populations occurs within the Project footprint.

Malleostemon sp. Cooloomia (P2)

This shrub occurs up to 1.2 m in height, has pink and white flowers and is generally located on yellow/brown or red sand on the slopes of dunes. In the Coburn survey area, two populations were recorded, but neither of these occur within the Project footprint.

Millotia depauperata (P1)

This prostrate annual herb has been recorded from ten locations near Shark Bay and in the Murchison region. One population of this species was recorded in the survey area within Community S7 to the east of the Project Area. However, this species was not found in the Project footprint during the surveys. It is presumed that conditions prior to the surveys were not suitable for germination of this species, and it is likely the low rainfall may have contributed to its absence (Mattiske Consulting Pty Ltd, 2005).

Physopsis chrysophylla (P3)

This erect shrub has been recorded from 20 locations in the northern section of the Geraldton Sandplains. In the Coburn survey area, 10 populations were recorded and the species was relatively common in Communities S1, S2, and S3. It was a dominant species in Community S10. Only one population was recorded in the Project footprint.

Pityrodia glutinosa (P3)

This medium shrub has been recorded from 25 locations in the northern section of the Geraldton Sandplains. In the survey area, it was recorded from two locations in Communities S1 and S2. Neither population occurs within the Project footprint.

Scaevola chrysopogon (P2)

This perennial herb has been recorded from nine locations near Shark Bay and one disjunct location near Wiluna. It was recorded from one location in Community E2 in the survey area to the east of the Project footprint.

Scholtzia ?sp. Eurardy (P2)

This shrub has been recorded from nine locations in the northern section of the Geraldton Sandplains. In the Coburn survey area it was recorded mainly in the shrublands and the woodlands east of the main dune systems (Communities S1, S2, S12, E3 and E6) (Mattiske Consulting Pty Ltd, 2006c). Of the nine populations present within the Coburn survey area, two occur within the Project footprint.

Scholtzia sp. Folly Hill (P2)

This species has been recorded from six locations within the northern section of the Geraldton Sandplains and Shark Bay. In the Coburn survey area it was found at nine locations in mature and open shrublands (Community S2), which suggests it is a late successional species. None of the known populations occur in the Project footprint.

Triodia bromoides (P4)

This species has been recorded from 30 locations in the Geraldton Sandplains between Geraldton and Shark Bay. In the Coburn survey area it was recorded at 22 locations to the east, west and south of the Project footprint in Communities E5, S2 and S3.

Other Rare and PF have been recorded in the Shark Bay district by Trudgen and Keighery (1995) and Gibson et al. (2000), but were not recorded in the survey area. These are listed in Table 2.5.

Table 2.5
Rare and Priority Flora Recorded in Surveys of the Irwin and Carnarvon Botanical Districts that were not found in the Coburn Project Surveys

Species	Trudgen and Keighery (1995) ^	Gibson et al. (2000)
<i>Acacia isoneura</i> subsp. <i>nimia</i> (P3)	*	
<i>Acacia leptospermoides</i> subsp. <i>obovata</i> (P2)	*	
<i>Acacia plautella</i> (P3)	*	
<i>Acanthocarpus parviflorus</i> (P3)	*	
<i>Anthocercis intricata</i> (P3)	*	
<i>Anthrotroche myoporoides</i> (P2)	*	
<i>Arnocrinum drummondii</i> (P3)	*	
<i>Chamelaucium conostigmum</i> (P3) (ms)	*	
<i>Chamelaucium oenanthum</i> (P1) (ms)	*	
<i>Chthonocephalus muellerianus</i> (P2)		*
<i>Chthonocephalus spathulatus</i> (P1)		*
<i>Dicrastylis micrantha</i> (P3)	*	
<i>Eremophila physocalyx</i> (P3) (ms)	*	*
<i>Eucalyptus beardiana</i> (R)	*	
<i>Goodenia sericostachya</i> (P3)	*	
<i>Grevillea annulifera</i> (P3)	*	
<i>Grevillea stenomera</i> (P2)	*	
<i>Jacksonia velutina</i> (P4)	*	
<i>Lasiopetalum oppositifolium</i> (P3)	*	
<i>Lepidium biplicatum</i> (P2)	*	
<i>Lepidobolus densus</i> (P3) (ms)	*	
<i>Malleostemon</i> sp. Nerren Nerren (A. Payne 360)(P1)(pn)	*	
<i>Melaleuca huegelii</i> subsp. <i>pristicensis</i> (P2)	*	
<i>Ptilotus stirlingii</i> var. <i>pumilus</i> (P1)	*	
<i>Rhodanthe oppositifolia</i> subsp. <i>ornata</i> (P2)	*	
<i>Rhodanthe</i> sp. Overlander (P.S. Short 2096) (P1) (pn)	*	
<i>Sclerolaena stylosa</i> (P1).	*	
<i>Sondottia glabrata</i> (P2)	*	
<i>Tetragonia coronata</i> (P1)	*	
<i>Thryptomene</i> sp. Carrarang (M.E. Trudgen 7420)(P1)(pn)	*	
<i>Verticordia cooloomia</i> (P3)	*	
<i>Verticordia dichroma</i> var. <i>dichroma</i> (P3)	*	
<i>Verticordia dichroma</i> var. <i>syntoma</i> (P3)	*	
<i>Vittadinia cervicalis</i> var. <i>oldfieldii</i> (P1).	*	

Source: Updated from Mattiske Consulting Pty Ltd, 2005.

^ Data extracted from Trudgen and Keighery (1995) includes community groups 1, 5 and 6 only.

Potential impacts of the Project on the flora and vegetation of the Project Area may include:

- Direct loss of vegetation due to clearing operations;
- Introduction and spread of weed species to the local environment;
- Loss of vegetation due to dust deposition;
- Loss of vegetation due to saline water used for dust suppression;
- Loss of vegetation due to change in groundwater levels through dewatering;
- Loss of vegetation due to groundwater mounding;
- Changes to the fire regime caused by human activities; and
- Impacts due to potential leakage or spillage of environmentally hazardous materials or hydrocarbons.

Based on the current mine plan, approximately 2,124 ha of vegetation will be cleared over a 12 year period to accommodate the Project (Table 3.1).

**Table 3.1
Predicted Vegetation Disturbance Areas**

Community	Significance	Area of Community Within Areas Surveyed (ha)	Indicative Area of Disturbance (ha)
E2	Regional	1,841	27
E3	Regional / Local	434	5
E5	-	1,329	2
E6	Regional / Local	487	3
E7	Regional / Local	81	1
S1	Regional / Local	6,777	1,065
S2	Regional / Local	4,969	773
S3	Regional / Local	659	156
S7	Local	4,244	71
S8	Local	1,450	19
S10	Regional / Local	125	1
S12	Local	102	1
Total		22,498	2,124

Note: the Indicative Areas of Disturbance are as estimated on 5 February 2007, based on mine plan information provided to URS at that time. These figures may change if the mine plan is amended.

Of the 18 species of PF recorded within the survey area, only seven species have populations within the Project footprint and no species is found only within the footprint. As such, none of these species will be lost from the survey area as a result of mining. Gunson is committed to minimising the impacts of the Project on the local PF populations. This is an ongoing commitment and has already been realised through modification to the layout of pits and associated infrastructure to reduce disturbance to several PF populations.

Vegetation and topsoil (upper 100 mm) will be collected ahead of mining and dispersed onto areas prepared for rehabilitation. This is discussed further in the Progressive Rehabilitation Management Plan.

Condition 8-1 of Ministerial Statement No. 723 states that the objective of the Flora and Vegetation Management Plan is to ensure the conservation of significant flora species and vegetation communities which occur in the vicinity of and within the proposal (Project) area.

The Proponent's Environmental Commitment in Schedule 2 of Ministerial Statement No. 723 states that the objective for PF is to maintain the abundance, diversity and productivity of PF at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.

5.1 Overview

The effectiveness of managing the flora and vegetation in the Project and surrounding area will be determined through a range of performance indicators associated with regular monitoring programmes. These monitoring programmes and performance indicators have been discussed in the relevant management plans, e.g. the performance indicators and associated monitoring of the effects of groundwater mounding on vegetation will be discussed in the Groundwater Mounding Management Plan, the performance indicators and monitoring programme associated with the effects of dust and saline water used for dust suppression have been discussed in the Dust Management Plan.

Section 7 discusses these monitoring programmes and refers to the appropriate management plan for further information and the associated performance indicators.

5.2 S5 and S10 Plant Communities

Ministerial Condition 8-9 states that the proponent shall not disturb vegetation communities S5 and S10 identified within Figure 3 of Schedule 1 (of Ministerial Statement No. 723), and shall leave an undisturbed buffer of at least 50 metres in width around the vegetation communities. A programme has been developed to monitor the condition of these communities (see Section 7.2.1). The associated performance indicators are:

- No significant decrease in the area of S5 or the condition of the vegetation within S5 (as identified within Figure 3 of the Ministerial Statement) as a result of mining activities over the life of the mine, taking into account natural fluctuations; and
- No significant decrease in the area of S10 or the condition of the vegetation within S10 (as identified within Figure 3 of the Ministerial Statement) as a result of mining activities over the life of the mine, taking account natural fluctuations.

Note: The condition of vegetation will be taken as percentage foliage cover.

The November survey conducted by Mattiske Consulting Pty Ltd identified additional areas of the S10 community. The total area of S10 as presented on Figure 3 of the Ministerial Statement is 3.9 ha. However, the November 2006 survey identified that the S10 community is now known to cover approximately 125 ha. The current mine plan suggests that the mining of Pit 2 will result in the clearing of approximately 1.25 ha (1%) of the known area of the S10 vegetation type. This area to be disturbed was not identified within Figure 3 of the Ministerial Statement, and as such, the Project remains in compliance with Ministerial Condition 8-9. Consultation with the DEC (Statement Management Section and Conservation Branch) has determined that the removal of this amount of the S10 community will not result in a significant impact.

In addition, clearing related to the mining of Pit 1 was predicted to come to within 26 m of a newly identified location of the S10 community. Discussions between the DEC and Gunson resulted in Gunson

agreeing to maintain a minimum 40 m buffer between the S10 community in this area and mining disturbance. Where possible, Gunson will increase this buffer to 50 m in width.

Should further surveys identify additional populations of S5 and S10 communities within the Project Area, the Proponent will seek advice from the DEC prior to any disturbance of these communities.

5.3 Priority Flora

Table 5.1 presents the performance indicators and targets for years 5, 10, 15 and 30 years where relevant, or for over the life of the mine where appropriate.

Research and development programmes implemented by Gunson will advance techniques that should facilitate an improvement in the rehabilitation rate and outcome. Subsequently, performance indicators will be reviewed as the knowledge base improves, in consultation with the DEC. Performance indicators will also be reviewed every five years or as monitoring requires, in consultation with the DEC, as advised by the DEC.

**Table 5.1
Performance Indicators and Targets for Priority Flora**

Performance Indicator	Target (based on pre-mining area surveys)			
Diversity of PF present in the revegetation plots within Project Area - post mining revegetated areas	Year			
	5	10	15	30
	> 10% of original PF species present	> 20% of original PF species present	> 40% of original PF species present	> 80% of original PF species present
Abundance of PF species present in the revegetation plots within Project Area - post mining revegetated areas	Year			
	5	10	15	30
	> 10% abundance of original PF species present	> 20% abundance of original PF species present	> 40% abundance of original PF species present	> 80% abundance of original PF species present
Abundance of PF populations present in directly undisturbed areas in the Project Area	> 80% abundance of original PF populations present over the life of the mine			
Abundance of individual PF populations present outside of the Project Area but within the survey area	No significant decrease in PF population abundance over the life of the mine due to mining operations			

Gunson has outlined a range of measures designed to minimise the impact of mining operations on flora and vegetation and increase rehabilitation success (Table 6.1). Specific systems-focussed management measures that will be conducted on site by Gunson employees will be contained in an Environmental Management System.

Gunson has developed a preliminary site organisational structure (Figure 6.1), with both a Mine Manager and an Environmental, Health and Safety (EH&S) Officer directly employed by Gunson and based on-site. Responsibility for management actions has therefore largely been allocated to one of these two roles. However, it is expected that Gunson’s contractors will implement these actions with supervision, review and audit conducted by Gunson’s EH&S Officer and Mine Manager.

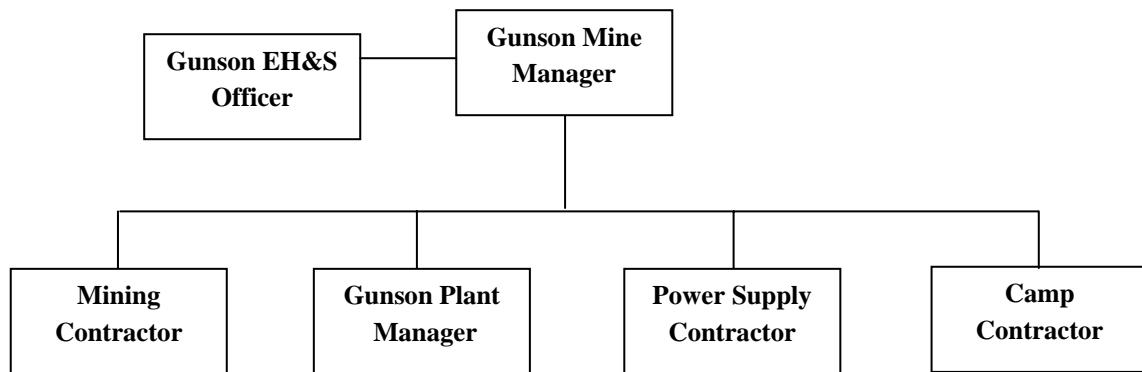


Figure 6.1: Schematic Organisational Chart

**Table 6.1
Management Actions, Timing and Responsibility for Compliance with Objectives**

Objectives	Management Action	Responsible Personnel	Timing
Ensure the conservation of significant flora species and vegetation communities which occur in the vicinity of and within the proposal area.	DRF and PF surveys will be conducted for the initial process plant, borrow pit, access and initial haul road, bores sites, accommodation and associated infrastructure locations.	EH&S Officer	Prior to ground disturbing activities at optimum times for floral identification
	DRF and PF surveys will be conducted within pit boundaries, associated infrastructure and haul road locations.	EH&S Officer	Prior to ground disturbing activities at optimum times for floral identification
	PF plants will be identified and marked using flagging tape.	EH&S Officer	Prior to ground disturbing activities
	A comprehensive up-to-date map will be produced to show locations of all PF populations within the survey area. This map will include any populations cleared or disturbed due to clearing activities and any populations re-established through revegetation.	EH&S Officer	Prior to ground disturbing activities/ construction/operation/ rehabilitation
	No clearing will be undertaken unless specifically required and authorised by the EH&S Officer. Flagged and mapped PF populations will be avoided during clearing activities where possible.	EH&S Officer	Construction/operation/ rehabilitation
	Equipment will be placed on flattened vegetation rather than clearing if practical.	Mining Contractor	Construction/operation/ rehabilitation

Table 6.1 (cont.'d)

Objectives	Management Action	Responsible Personnel	Timing
	The extent of the proposed clearing will be clearly marked by flagging tape.	EH&S Officer	Prior to ground disturbing activities
	Maps will be produced that detail areas to be cleared, including the timing of the clearing operations and areas rehabilitated. These maps will be updated on a regular basis.	EH&S Officer	Prior to ground disturbing activities
	Cleared areas and associated maps will be regularly audited to ensure adherence to the plan.	EH&S Officer	Construction/operation/rehabilitation
	Topsoil will, where possible, be directly returned to rehabilitation areas to ensure viability. Where topsoil is stored for future rehabilitation, the top 100 mm of soil will be stored in stockpiles, less than 2 m in height. The stockpiles will be located a minimum of 5 m from any existing trees and shrubs if possible, may be covered with an emulsion or cover crop to help stabilise the soil and to combat wind erosion, and where possible will not be stored for longer than 12 months.	All site personnel	Construction/operation/rehabilitation
	Cleared vegetation, where practical, will be directly returned to rehabilitation areas. This helps to protect seeds, seedlings and soil against wind erosion. Where cleared vegetation is to be stored for future rehabilitation, the dozer blade/fork/rake will be raised slightly above the soil surface in order to preserve rootstock. Cleared vegetation will not be burnt but stored in separate piles to topsoil, subsoil or overburden.		Construction/operation/rehabilitation

Table 6.1 (cont.'d)

Objectives	Management Action	Responsible Personnel	Timing
	Clearing will be undertaken with a focus on maintaining corridors to link vegetation patches where practicable. Clearing will be conducted in stages and on one front where possible, to allow for local migration of fauna into adjacent areas.	EH&S Officer	Construction/operation/rehabilitation
	No clearing will be undertaken during wet conditions or during periods of high wind.	Mining Contractor	Construction/operation
	Progressive rehabilitation will occur as defined in the Progressive Rehabilitation Management Plan.	EH&S Officer	Construction/operation/rehabilitation
	<p>A research programme will be initiated into the protection, conservation and rehabilitation of PF species impacted by mining operations, including but not limited to:</p> <ul style="list-style-type: none"> • Seed bank methodology; • Germination ecology; • Restoration technology for taxa where seeding or propagation of cuttings fails; • Restoration ecology for reinstatement of the species; and • Propagation of <i>Eremophila occidens</i>. 	EH&S Officer	Construction/operation/rehabilitation

Table 6.1 (cont.'d)

Objectives	Management Action	Responsible Personnel	Timing
	<p>PF seed collection and storage will be undertaken for research, preservation and rehabilitation purposes prior to clearing activities. The collection methods implemented will be species specific, but generally the following will be applied:</p> <ul style="list-style-type: none"> • Capsules or pods that are collected will be dried before storage; • Clean seed will be stored in dry, insect and pest proof containers; • Containers will be clearly labelled with the species, date of collection, approximate numbers and area of collection; • Containers may be treated with an insecticide or/and fungicide; and • The seed storage area will be in a low humidity low temperature environment, and regularly fumigated. 	EH&S Officer	Construction/operation/rehabilitation
	<p>Seed will be collected from dominant PF species in plant communities prior to clearing where practical. This would include:</p> <ul style="list-style-type: none"> • <i>Acacia subrigida</i> (P2) from plant community S5; • <i>Acacia drepanophylla</i> (P3) from plant community S8; • <i>Acacia drepanophylla</i> (P3) from plant community S9; • <i>Physopsis chrysophylla</i> (P3) from plant community S10; and • <i>Physopsis chrysophylla</i> (P3) from plant community S12. 	EH&S Officer	Prior to clearing activities

Table 6.1 (cont.'d)

Objectives	Management Action	Responsible Personnel	Timing
	<p>Seed collection and storage will be undertaken for rehabilitation purposes prior to clearing activities. The collection methods implemented will be species specific, but generally the following will be applied:</p> <ul style="list-style-type: none"> • Capsules or pods that are collected will be dried before storage; • Clean seed will be stored in dry, insect and pest proof containers; • Containers will be clearly labelled with the species, date of collection, approximate numbers and area of collection; • Containers may be treated with an insecticide or/and fungicide; and • The seed storage area will be in a low humidity low temperature environment, and regularly fumigated. 	EH&S Officer	Prior to clearing activities

Table 6.1 (cont.'d)

Objectives	Management Action	Responsible Personnel	Timing
	<p>A seed inventory will be maintained, with information collected including, but not limited to:</p> <ul style="list-style-type: none"> • What seed species are in storage; • When seed was collected; • Where seed was collected; • Expected seed viability rates; • Applicable germination/propagation techniques; • Expected use of seed (e.g. area); and • When seed should be used by. 	EH&S Officer	Prior to clearing activities
	Weeds will be monitored and eradicated as per the Weed Management Plan (which is included in the Progressive Rehabilitation Programme).	EH&S Officer	Construction/operation/ rehabilitation
	After receiving approval from the Pastoral Board of WA, the Coburn pastoral lease will be de-stocked for no less than five years (in accordance with Proponent Commitment 16). An initial de-stocking of sheep and goats on the Coburn pastoral lease will be undertaken.	Mine Manager	Construction/operation
	Feral animal control will be conducted as outlined in the Vertebrate Fauna Management Plan.	Mine Manager	Construction/operation/ rehabilitation

Table 6.1 (cont.'d)

Objectives	Management Action	Responsible Personnel	Timing
	The stock proof fencing between the Project and the SBWHP will be improved based on an assessment by the Coburn station manager prior to the re-stocking of the pastoral lease.	Mine Manager	Prior to re-stocking of the Coburn pastoral lease
	All employees and contractors shall undergo site specific environmental awareness training during inductions. This will include information pertinent to the management of flora and vegetation in the surrounding area, and PF and their legal obligations under the <i>Wildlife Conservation Act 1950</i> . This training will be attended by all employees on an annual basis.	EH&S Officer	Construction/operation/rehabilitation
	A specific survey of vegetation communities S5 and S10 will be conducted to further describe their floristics. These reports will be submitted to the DEC.	EH&S Officer	Survey prior to ground disturbing activities
	Signage will be erected on roads heading north from Pit 3 towards S5 and S10 communities to inform drivers about the vegetation communities and the importance of staying to the roads.	EH&S Officer	Prior to ground disturbing activities
	A semi permanent visual “barrier” will be constructed around the extreme edge of the S10 community adjacent to Pit 1. It will be a minimum of 40 m wide, with markers every 10 -15 m.	EH&S Officer	Prior to ground disturbing activities
	A semi permanent visual “barrier” will be constructed around the extreme edge of the S10 community adjacent to Pit 3. It will be a minimum of 50 m wide, with markers every 10 -15 m. Signage will be erected to illustrate why the barriers are in place and the importance of the community.		

Table 6.1 (cont.'d)

Objectives	Management Action	Responsible Personnel	Timing
	A semi permanent visual “barrier” will be constructed around the extreme edge of S5. It will be 50 m wide, with markers every 10 - 15 m. Signage will be erected to illustrate why the barrier is in place and the importance of the community.	EH&S Officer	Prior to development of Pit 7
	Off-road recreational activities, including off-road use of vehicles, will be strictly prohibited.	Mine Manager	Construction/operation/ rehabilitation
	Tracks will be closed off or access restricted by signage where tracks are not currently needed.	EH&S Officer	Construction/operation/ rehabilitation
	Existing tracks will be utilised where possible.	EH&S Officer	Construction
	Studies will be commissioned in order to ascertain vegetation root depths and the effect of a rising water table on vegetation health.	EH&S Officer	Construction/operation
	Fires affecting flora and vegetation will be managed as per the Bush Fire Management Plan.	EH&S Officer	Construction/operation/ rehabilitation
	Hydrocarbon and hazardous material spills will be managed as per the Spills Response Protocols within the Hydrocarbon Management Plan and Solids and Liquids Waste Management Plan.	EH&S Officer	Construction/operation/ rehabilitation
	Hygiene measures may be implemented to prevent the introduction of soil-borne plant diseases, such as dieback (<i>Phytophthora cinnamomi</i>). Refer to the Soil Management Plan, which is part of the Progressive Rehabilitation Plan. ¹	EH&S Officer	Construction/operation/ rehabilitation

Notes: ¹ Recent communications suggest that *Phytophthora cinnamomi* would not be able to survive under rainfall conditions present at the Project Area (K. Vear, DEC, 2006)

7.1 Overview

Gunson will implement several monitoring programmes to assess the management of flora and vegetation within the Project and surrounding area. Monitoring programmes will be conducted to assess:

- The condition of the S5 and S10 plant communities;
- The effects of groundwater mounding on vegetation;
- The effects of dust and saline water used for dust suppression on vegetation;
- The success of re-establishing vegetation in rehabilitated areas; and
- Weed diversity and abundance.

The effective management of PF in the Project and surrounding area is important due to the identification of at least 18 PF species within the survey area. The success of PF management will be determined through performance indicators associated with the PF monitoring programme.

Monitoring of PF populations will be conducted:

- Within the Project Area for PF populations that are to be cleared (refer to Section 7.2.6);
- Within the Project Area for PF populations that are not directly disturbed by clearing activities (refer to Section 7.2.7); and
- Within the survey area but outside the Project Area (refer to Section 7.2.8).

Additional PF survey work will be commissioned as required.

7.2 Monitoring Programmes

7.2.1 S5 and S10 Plant Communities

To comply with Condition 8-9 of Ministerial Statement No. 723, plant communities S5 and S10 identified within Figure 3 of Schedule 1 will be monitored on a regular basis to confirm the communities have not been adversely disturbed. Baseline surveys to be conducted prior to any ground disturbing activities will further determine the community floristics and delineate the boundaries of these communities. Following this, the communities' area, species occurrence and vegetation condition will be monitored on a two yearly basis, including photographic monitoring.

7.2.2 Effects of Groundwater Mounding on Vegetation

This monitoring programme requires the establishment of permanent monitoring plots in areas determined to be most likely to be affected by a rising water table. In order to ascertain the most suitable position for these plots, a number of studies are initially required. These include:

- Identification of plant communities outside of the Project Area that are most likely to be affected by water table mounding;
- Identification of indicator plant species likely to show an early change in health status due to water table mounding; and
- Studies to determine the depth of indicator species' roots (Mattiske Consulting Pty Ltd, 2006a).

A monitoring programme will then be implemented that monitors both the health of vegetation and identified indicator species within these permanent vegetation plots. Central to the success of this programme is establishing the baseline health condition of vegetation prior to any mining or associated activities having been undertaken.

For further information on this monitoring programme, refer to the Groundwater Mounding Management Plan.

7.2.3 Effects of Dust and Saline Water Used for Dust Suppression on Vegetation

Photographic monitoring stations will be established to monitor the effects of dust and saline water used for dust suppression on vegetation. Monitoring stations will be set up as required to target specific areas where visible dust has been observed or saline water is being used on access roads to suppress dust. As an approximate guide, monitoring stations should be located every 1-2 km along actively used access roads, and set 10 - 15 m back from the road. Monitoring stations may simply be a peg with a referenced GPS coordinate.

Photographic monitoring will include photographic comparisons of vegetation health to determine if mining activities are having a significant effect on vegetation health. Photographs will be taken at the monitoring station towards the access road every year.

Refer also to the Dust Management Plan.

7.2.4 Revegetation Success

The monitoring programme for determining the success of re-establishing native vegetation in rehabilitated areas will include the establishment of permanent monitoring plots in rehabilitated areas, and monitoring the diversity and abundance of species present.

For further information on this monitoring programme, refer to the Revegetation Management Plan which forms part of the Progressive Rehabilitation Programme.

7.2.5 Weed Species Diversity and Abundance

The diversity and abundance of weed species will be monitored in conjunction with the established flora and vegetation permanent monitoring sites within rehabilitated areas, within directly undisturbed areas inside the Project Area, and within the SBWHP.

For further information on this monitoring programme, refer to the Weed Management Plan which forms part of the Progressive Rehabilitation Programme.

7.2.6 Priority Flora

Baseline surveys will be conducted to further determine the diversity and abundance of PF species present prior to ground disturbing activities at each pit area. This will provide Gunson with comparative levels of the diversity and abundance of PF species with which to use in rehabilitated areas. Monitoring of PF will then occur in these rehabilitated areas to determine the success of the re-establishment of PF to the area. This monitoring programme is discussed in the Revegetation Management Plan which forms part of the Progressive Rehabilitation Programme.

7.2.7 Priority Flora Not Directly Disturbed Within the Project Area

Regular monitoring of recorded PF populations within the Project Area that are not to be directly disturbed by clearing activities will be conducted. Advice from the DEC suggests that PF population abundance in these circumstances should be monitored approximately every three years.

7.2.8 Priority Flora Within the Survey Area but Outside the Project Area

Monitoring of recorded PF populations within the survey area but outside the Project Area will be conducted. Advice from the DEC suggests that PF population abundance in these circumstances should be monitored approximately every five years.

8.1 Overview

Gunson will initiate contingency plans if significant adverse impacts are identified during the monitoring process, or as a factor that is exacerbated by the mining process becomes apparent. A range of contingency actions are available to Gunson. Several are listed below with the indicator for initiating these contingency actions.

8.2 Priority Flora

8.2.1 Research Programme

A research programme is to be initiated into the protection, conservation and rehabilitation of PF species impacted by mining operations (see Table 6.1), which includes but is not limited to:

- Seed bank methodology;
- Germination ecology;
- Restoration technology for taxa where seedling or propagation of cuttings fails;
- Restoration ecology for reinstatement of the species; and
- Propagation of *Eremophila occidentalis*.

Should this research programme prove unsuccessful in determining effective germination and propagation techniques for PF rehabilitation, the following contingency actions may be implemented :

- Initiate discussions with DEC's Threatened Flora Seed Centre (08 9334 0500) to determine the possibility of the Centre conducting the relevant PF species rehabilitation research; and
- Directly transplant PF populations from areas to be cleared into areas to be rehabilitated.

PF surveys will be conducted in accordance with Condition 8-2 (Section 1.4). Should PF be located during these surveys, the following contingency actions may be viable:

- Process plant, borrow pit, access and initial haul road, bores sites, accommodation and associated infrastructure locations or design may be able to be modified or changed so as not to disturb PF. Should this occur, the population will be added to the triennial monitoring programme;
- PF maps will be amended to show the location of the population;
- Seed, if available, will be collected from PF prior to the clearing;
- PF may be able to be directly transplanted for use in rehabilitation; and

-
- If the PF species has not been previously located, surveys will be conducted in adjacent areas in an effort to locate the PF species in areas that are not to be disturbed.

8.2.2 Monitoring

Monitoring of PF within rehabilitated areas will occur as per the Revegetation Management Plan. Should the performance indicators in Section 5 not be achieved, contingency actions (based upon the outcomes of the research programme into the protection, conservation and rehabilitation of PF species) may need to be implemented. These may include:

- Direct transplant of PF. Research may indicate that certain PF may re-establish successfully with direct transplantation. This would occur when PF has been located in areas to be cleared, and transplanted directly to areas to be rehabilitated.
- Seeding of rehabilitated areas with PF seed. Research may indicate that additional seeding of certain PF is necessary.
- Seed treatment. Research may indicate that certain PF seed germination rates dramatically improve if the seeds are treated prior to planting.
- Propagation and direct planting of PF seedlings. Research may indicate that certain PF require propagation and direct planting into rehabilitated areas.
- Weed monitoring and eradication. Weed presence may be suppressing PF re-establishment and current weed monitoring and eradication practices may need to be altered.
- Dominant species control. Remedial works may be required to manage over representation of particular native species.
- Herbivore proof fencing. The growth of young, nutrient rich vegetation may entice herbivores into the rehabilitation areas, and herbivore proof fencing may therefore be required around rehabilitation zones.

Monitoring of PF within undisturbed areas, both within the Project Area and within the survey area, will be conducted. Should the performance indicators in Section 5 not be achieved, contingency actions may need to be implemented. These actions will be dependent on the monitoring programs identified within the Weed Management Plan, Groundwater Mounding Management Plan and Dust Management Plan, and the follow-on contingency actions within these plans.

8.3 Declared Rare Flora

Ministerial Statement No. 723 Condition 8-5 states that:

- 8-5 In the event that Declared Rare Flora and/or species listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*, are identified in the project

area, the proponent shall prepare a Declared Rare Flora Management Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.

Should Gunson locate DRF and/or species listed as threatened under the EBPC Act within the Project Area, it will comply with the following Conditions:

- 8-6 The Declared Rare Flora Management Plan required by condition 8-5 shall include:
1. the recorded location of Declared Rare Flora species;
 2. a description of the habitat in which the Declared Rare Flora was found, and the extent of the contiguous area of the same habitat in the local area;
 3. offsite surveys to determine the extent of rare flora species;
 4. the degree of impact of the proposed works on the Declared Rare Flora or its identified contiguous habitat;
 5. a management strategy for the protection of Declared Rare Flora species, in the event that approval to impact the declared rare or priority flora has not been provided pursuant to the *Wildlife Conservation Act 1950*, including:
 - a) identification of a protected buffer area around the Declared Rare Flora;
 - b) delineation of the location of the Declared Rare Flora buffer area to prevent accidental damage to the protected area;
 - c) consideration of relocating Declared Rare Flora species;
 - d) education of workers as to the protection of the Declared Rare Flora location;
 - e) specific management measures for topsoil stripping within areas of the contiguous Declared Rare Flora habitat; and
 - f) specific management measures for site rehabilitation and topsoil replacement within areas previously included as contiguous Declared Rare Flora habitat.
 6. post-activity monitoring plan for Declared Rare Flora and regeneration of vegetation within areas previously included as contiguous Declared Rare Flora habitat, including monitoring for Declared Rare Flora plants.
- 8-7 The proponent shall implement the Declared Rare Flora Management Plan required by condition 8-5.
- 8-8 The proponent shall make the Declared Rare Flora Management Plan required by condition 8-5 publicly available.

8.4 S5 and S10 Vegetation Communities

Should the two yearly monitoring programme of the S5 and S10 communities (as identified within Figure 3 of Schedule 1 in the Ministerial Statement) indicate that the performance indicators are not being met, a range of contingency actions are available to Gunson. These include:

- Weed control. It may be necessary to implement weed control within these communities should it be determined that weed species are affecting the communities;
- Review signage and means by which the communities have been delineated. Further signs and/or a more protective fence around the communities may be required;
- Employee Awareness. It may be necessary to further raise employee awareness of the significance of these communities; and
- The Coburn pastoral lease destocking programme may need to be reviewed if it is determined that the communities are in decline due to grazing by introduced species.

Should it be determined that dust may be the cause of the performance indicators not being met, the following contingency actions are available to Gunson:

- Work to cease in the near vicinity until acceptable conditions or remedial actions have been implemented;
- The wetting of exposed areas;
- The covering of stockpiles;
- Dust minimisation training or review of training for site personnel; and/or
- Increased dust deposition or photographic monitoring;
- The introduction of alternative dust monitoring methods, including high volume samplers or real time monitoring equipment, to assist in determining the nature of dust and/or complaint exceedances.

Selection of the appropriate contingency measure will depend on the factor responsible for, or influencing the achievement of the performance indicators, and will be made after advice is sought from the DEC.

9.1 Consultation during the EIA Process

Gunson undertook stakeholder consultation with CALM, Department of Environment (DoE), Department of Agriculture and surrounding pastoralists prior to submission of the PER in relation to the management of Priority Flora, flora and vegetation. Issues raised during this consultation and Gunson's responses are documented in Section 5 of the PER (URS, 2005). Public comment was also received during the eight-week public review period for the PER, with issues raised and Gunson's responses documented in the Proponent's Response to Submissions (URS, 2006a).

The key stakeholder issues included:

- Seed bank methodology;
- Germination ecology;
- Restoration technology for taxa where seedling or propagation of cuttings fails;
- Restoration ecology for reinstatement of the species;
- Comprehensive survey work was required; and
- Determining the potential for impact on native flora.

9.2 Consultation during Preparation of this MP

Ministerial Condition 8-1 requires that this Flora and Vegetation MP be prepared to meet the requirements of the Minister for the Environment on advice of the EPA and CALM. In addition, the DEC's guidelines on the preparation of EMPs state that it is the relevant advisory agencies and other stakeholders have been provided with an opportunity to provide input to the draft MP. The relevant stakeholders for this MP are:

- EPA; and
- DEC Conservation Branch.

To obtain advice from the DEC Conservation Branch, a draft MP was submitted to the DEC (Midwest Region and Environmental Management Branch) for review. A draft was also submitted to the SBWHP Community Consultative Committee (CCC) and Scientific Advisory Committee (SAC) to obtain their comments. Feedback from the DEC Conservation Branch, SBWHP CCC and SBWHP SAC was addressed during the preparation of this version of the MP, prior to submission to the DEC Statement Management Section.

Documentation on the comments received from the DEC Conservation Branch, and the way in which these comments have been addressed in the MP, has been submitted to the DEC Statement Management Section under separate cover. It is understood that the DEC Statement Management Section consulted with the EPA to obtain its input on the MP.

This version of the MP has been prepared following receipt of comments from the EPA and has been submitted to the EPA through the DEC Statement Management Section and the DEC Audit Branch for sign-off.

9.3 Consultation during Construction and Operation

Stakeholder consultation will continue throughout the life of the Project and will address any issues raised by these parties.

Gunson will establish and maintain a programme and procedures for periodic audits of the EMP, including this MP. The current audit programme is outlined in URS (2006b). Maintenance and implementation of the audit programme will be the responsibility of Gunson's EH&S Officer.

Environmental audits can occur in many forms, but have a common objective: to assess the environmental performance of a facility in order to identify risks and potential liabilities. For this Project, the audits will also be required to provide information and evidence for the reports required under the Ministerial Statement, which are listed in Section 12 of this MP.

The format of the audit will depend on the issue or area being reviewed but could include the following phases:

- Development of the audit protocol.
- Completion of a questionnaire by site personnel prior to a site visit by the auditor.
- Site visit, comprising interviews, site inspections and/or direct measurement.
- Review of relevant documentation and records.
- Preparation and submission of the audit report.

This MP will be audited on an annual basis and the outcomes included in the relevant reports required under Ministerial Condition 5 (see Section 12). Information on the results of the audits will also be provided to Gunson management for review.

In addition to formal audits by internal or external auditors to meet the reporting requirements for Ministerial Condition 5, internal area or facility inspections will be conducted to assess the effectiveness of day-to-day environmental management. This will allow opportunities for improvements in environmental performance to be identified and acted upon as soon as possible. The inspections will occur on a weekly, monthly or less frequent basis, depending on the area or facility being reviewed.

This MP will be reviewed on an annual basis or more frequently if required, to address the following:

- Any changes in Project design or operation that require modifications to the environmental management procedures outlined in this MP;
- Update the proposed performance indicators and targets for Priority Flora if required, in consultation with the DEC;
- Any issues identified as a result of internal and external audits, and Gunson management review of the audit outcomes, in relation to the suitability, adequacy and effectiveness of this MP in meeting the agreed objectives; and
- Corrective or preventative actions developed in response to environmental incidents and nonconformances.

Revision of this MP may also be triggered by Conditions 10 and 11 of the Commonwealth environmental approval. These conditions are as follows:

10. If the person taking the action wishes to carry out any activity otherwise than in accordance with the plans, programs or measures referred to in paragraphs 1 to 8, the person taking the action may submit for the Minister's approval a revised version of any such plan, program or measure. If the Minister approves a revised plan, program or measure so submitted, the person taking the action must implement that plan, program or measure instead of the plan, program or measure as originally approved.
11. If the Minister believes it is necessary or desirable for the better protection of the environment relevant to the species or World Heritage values mentioned in this Approval to do so, the Minister may request the person taking the action to make specified revisions to a plan, program or measure approved pursuant to paragraphs 1 to 8, and to submit the revised plan, program or measure for the Minister's approval. The person taking the action must comply with any such request. If the Minister approves a revised plan, program or measure pursuant to this condition, the person taking the action must implement that plan, program or measure instead of the plan, program or measure as originally approved.

The revised MP will be submitted to the relevant stakeholders (see Section 9) for review and approval.

The revision number for the MP will be recorded on the document's signature page.

12.1 Internal Reporting

Environmental records are evidence of the ongoing environmental performance of the Project and demonstrate conformance with legal and other requirements. Environmental records to be maintained by Gunson and/or its contractors will include:

- A register of legal and other regulatory requirements including licences and permits;
- A register of environmental aspects and impacts
- Incident reports;
- Training records;
- Inspection, calibration and maintenance records;
- Monitoring data;
- A register of non-conformances;
- Public complaints and responses to these; and
- Internal and external audits and reviews.

12.2 External Reporting under the State Ministerial Approval

The reporting requirements defined under Ministerial Statement No. 723 are as described below. There is a degree of overlap for these reports, and it is expected that some of these reports will be combined to simplify the review process.

12.2.1 Compliance Reports

Compliance reports are required under Ministerial Condition 5-1 to address:

- The status of implementation of the proposal, as defined in Schedule 1 of the Ministerial Statement;
- Evidence of compliance with the conditions and commitments; and
- The performance of the environmental management plans and programs.

These reports are to be submitted to on an annual basis, or more frequently if sign-off of a condition or commitment is required more rapidly than annually.

12.2.2 Performance Review Reports

Performance review reports are required every five years after the start of operations. These are required to address:

1. The major environmental issues associated with implementing the project; the environmental objectives for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those objectives;
2. The level of progress in the achievement of sound environmental performance, including Australian industry benchmarking, and the use of best available technology where practicable;
3. Significant improvements gained in environmental management, including the use of external peer reviews;
4. Stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any ongoing concerns being expressed; and
5. The proposed environmental objectives over the next five years, including improvements in technology and management processes.

12.2.3 Independent Audit Report

Ministerial Condition 5-3 requires that an independent auditor prepare a report on each condition/commitment included in the Ministerial Statement which requires preparation of a management plan, programme, strategy or system. The objective of the report is to determine whether the requirements of these conditions and commitments have been fulfilled within the stated timeframe.

It is expected that this report could be included in the Compliance Reports submitted in accordance with Ministerial Condition 5-1.

12.2.4 Annual Environmental Report

An Annual Environmental Report (AER) is required under Ministerial Condition 5-4. The purpose of the AER is to report on:

- Implementation of Gunson's environmental commitments (but not the Ministerial Conditions); and
- Outcomes of any monitoring programs and performance reviews associated with the implementation of the MPs.

Unlike the other reports required under Ministerial Condition 5, this report is to be made available to the public.

This report is not to be confused with the AER required by the DoIR as part of mining lease conditions (Section 12.4), or by the DEC in relation to licencing under Part V of the *Environmental Protection Act 1986* (Section 12.5).

12.3 External Reporting under the Commonwealth Ministerial Approval

Condition 9 of the Commonwealth environmental approval issued under the EPBC Act requires that:

On 1 September of each year after the date of commencement of operations, the Project Director for the person taking the action must provide to the (Australian Government) Minister for the Environment and Heritage (the Minister) a certificate stating that the person taking the action has complied with the conditions of this Approval. This certificate must state, to the satisfaction of the Minister, the manner in which the approval conditions have been complied with. Should the Minister so direct, the person taking the action must appoint an independent auditor to audit compliance under this condition and make the results of that audit available to the Minister.

12.4 External Reporting under Mining Lease Conditions

As part of the mining lease conditions set by the DoIR, Gunson will be required to submit an AER. The objectives of the AER are defined by the DoIR (Department of Minerals and Energy, 1996) as to:

- To concisely document the major mining activities for the reporting year and proposed activities for the following year;
- To concisely document environmental management and rehabilitation activities for the reporting year and proposed activities and developments in the following year;
- To assist operators in monitoring their own performance;
- To assist in the preparation of a completion report and audit for the DoIR on cessation of operations; and
- To provide basic information to DoIR about the extent of mining operations in the State and the standard of environmental management being achieved.

12.5 External Reporting under the Pollution Prevention Licence

A pollution prevention licence will be required for the Project under Part V of the *Environmental Protection Act 1986*. This licence is not yet required. Once the licence has been issued, the need for reporting data relevant to this MP will be reviewed, and the MP amended if required.

Table 13.1
Key Management Actions Table

Target/Objective	Ref	Key Management Action	DEC Reporting/Evidence	Status (to be updated in annual compliance reports)
Ensure the conservation of significant flora species and vegetation communities which occur in the vicinity of and within the proposal area.	PFFV1.1	DRF and PF surveys will be conducted for the initial process plant, borrow pit, access and initial haul road, bore sites, accommodation and associated infrastructure locations.	Results of surveys will be summarised within the Annual Environmental Report (AER).	
	PFFV1.2	DRF and PF surveys will be conducted within pit boundaries, associated infrastructure and haul road locations.	Results of surveys will be summarised within the AER and the report appended to the AER.	
	PFFV1.3	A comprehensive up-to-date map will be produced to show locations of all PF populations within the survey area. This map will include any populations cleared or disturbed due to clearing activities and any populations re-established through revegetation.	The map will be submitted within the AER.	

Key Management Actions Table

Table 13.1 (cont.'d)

Target/Objective	Ref	Key Management Action	DEC Reporting/Evidence	Status (to be updated in annual compliance reports)
	PFFV1.4	<p>Authorisation for all clearing must be given through a clearing permit obtained from the EH&S Officer.</p> <p>Penalties for contravention of this will be included in all contractors agreements.</p>	<p>Maps detailing areas that have been cleared and/or rehabilitated in the previous year to be submitted within the AER.</p>	
	PFFV1.5	<p>A research programme will be initiated into the protection, conservation and rehabilitation of PF species impacted by mining operations, including:</p> <ul style="list-style-type: none"> • Seed bank methodology; • Germination ecology; • Restoration technology for taxa where seeding or propagation of cuttings fails; • Restoration ecology for reinstatement of the species; and • Propagation of <i>Eremophila occidens</i>. 	<p>Results of this research programme will be summarised within the AER and the report submitted as an appendix to the AER.</p>	
	PFFV1.6	<p>Monitoring of PF populations (triennially) within the Project Area that are not directly disturbed by clearing activities.</p>	<p>Results of this monitoring programme will be provided to DEC, a summary submitted within the relevant AER and the report provided as an appendix.</p>	

Table 13.1 (cont.'d)

Target/Objective	Ref	Key Management Action	DEC Reporting/Evidence	Status (to be updated in annual compliance reports)
	PFFV1.7	Monitoring of PF populations (every five years) within the survey area but outside the Project Area.	Results of this monitoring programme will be provided to DEC, a summary submitted within the relevant AER and the report provided as an appendix.	
	PFFV1.8	A seed inventory will be maintained, with information collected including, but not limited to: <ul style="list-style-type: none"> • What seed species are in storage; • When seed was collected; • Where seed was collected; • Expected seed viability rates; • Expected use of seed (e.g. area); and • When seed should be used by. 	Seed inventory will be summarised and submitted annually within the AER.	

Key Management Actions Table

Table 13.1 (cont.'d)

Target/Objective	Ref	Key Management Action	DEC Reporting/Evidence	Status (to be updated in annual compliance reports)
	PFFV1.9	All employees and contractors shall undergo site specific environmental awareness training during inductions. This will include management information pertinent to the management of Priority Flora, flora and vegetation in the surrounding area, and their legal obligations under the <i>Wildlife Conservation Act 1950</i> . This training will be attended by all employees on an annual basis.	Up-to-date staff training records will be kept on-site and produced for regulators/auditors if/when required.	
	PFFV1.10	A specific survey of vegetation communities S5 and S10 will be conducted to further describe their floristics.	Results of the survey will be summarised within the AER.	
	PFFV1.11	Studies will be commissioned in order to ascertain vegetation root depths and the effect of a rising water table on vegetation health.	These studies will be submitted as appendices to the Groundwater Management Plan.	
	PFFV1.12	The monitoring programme for vegetation communities S5 and S10 will be implemented.	The results of this two yearly monitoring programme will be summarised and submitted within the AER.	

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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 Gunson Resources Limited and only those third parties who have been authorised in writing by URS to rely on the 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 Proposal dated 1 June 2006.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between July 2006 and February 2007 and is based on the information provided at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

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