ROCLA PTY LTD
(ACN 000 032 191)

MINE CLOSURE PLAN

M70/1088 & M70/1142

"WARTON ROAD"

SOUTH WEST MINERAL FIELD
WESTERN AUSTRALIA

Version 1
December 2014

Prepared and submitted by:
Austwide Mining Title Management Pty Ltd

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Awards for Environmental Excellence
2008 AWARD RECIPIENT

DMP Mine Closure Plan Checklist

Please cross reference page numbers from the Mine Closure Plan where appropriate, and provide comments or reasons for No (N) or Not Applicable (NA) answers.

Q No	Mine Closure Plan (MCP) checklist	Y/N NA	Page No.	Comments
1	Has the Checklist been endorsed by a senior representative within the tenement holder/operating company? (See bottom of Checklist.)	Y		
2	How many copies were submitted to DMP? (See Appendix C for requirements)	Hard copies = 2 Electronic = 1		
	Cover Page, Table of Contents			
3	Does the cover page include; • Project Title • Company Name • Contact Details (including telephone numbers and email addresses) • Document ID and version number • Date of submission (needs to match the date of this checklist)	Y Y Y Y	Cover page	
4	Has a Table of Contents been provided?	Y	5-7	
	Scope and Project Summary			
5	State why is the MCP is being submitted (as part of a Mining Proposal or a reviewed MCP or to fulfil other legal requirements)		8	Part of a Mining proposal
6	Does the project summary include; • Land ownership details; • Location of the project; • Comprehensive site plan(s); • Background information on the history and status of the project.	Y Y Y Y	9 Appendix I 9-12	
	Legal Obligations and Commitments			
7	Has a consolidated summary or register of closure obligations and commitments been included?	Y	31	
	Data Collection and Analysis			
8	Has information relevant to mine closure been collected for each domain or feature (including pre-mining baseline studies, environmental and other data)?	Y	34-38	
9	Has a gap analysis been conducted to determine if further information is required in relation to closure of each domain or feature?	Y		
	Stakeholder Consultation			
10	Have all stakeholders involved in closure been identified?	Y	26	
11	Has a summary or register of stakeholder	N		

Q No	Mine Closure Plan (MCP) checklist	Y/N NA	Page No.	Comments
	consultation been provided, with details as to who has been consulted and the outcomes?			
	Final land use(s) and Closure Objectives			
12	Does the MCP include agreed post-mining land use(s), closure objectives and conceptual landform design diagram?	Y		
13	Does the MCP identify all potential (or pre-existing) environmental legacies, which may restrict the post mining land use (including contaminated sites)?	Y	24	
	Identification and Management of Closure Issues			
14	Does the MCP identify all key issues impacting mine closure objectives and outcomes?	Y	28	
15	Does the MCP include proposed management or mitigation options to deal with these issues?	Y	28	
16	Have the process, methodology, and rationale been provided to justify identification and management of the issues?	Y		
	Closure Criteria			
17	Does the MCP include an appropriate set of specific closure criteria and/ closure performance indicators?	Y	31	
	Closure Financial Provisioning			
18	Does the MCP include costing methodology, assumptions and financial provision to resource closure implementation and monitoring?	Y	24 & 52	
19	Does the MCP include a process for regular review of the financial provision?	Y	52	
	Closure Implementation			
20	Does the reviewed MCP include a summary of closure implementation strategies and activities for the proposed operations or for the whole site?	Y	32	
21	Does the MCP include a closure work program for each domain or feature?	Y	34	
22	Have site layout plans been provided to clearly show each type of disturbance?	N		
23	Does the MCP contain a schedule of research and trial activities?	N		
24	Does the MCP contain a schedule of progressive rehabilitation activities?	NA		
25	Does the MCP include details of how unexpected closure and care and maintenance) will be handled?	Y	40	
26	Does the MCP contain a schedule of decommissioning activities?	NA		

Q No	Mine Closure Plan (MCP) checklist	Y/N NA	Page No.	Comments
27	Does the MCP contain a schedule of closure performance monitoring and maintenance activities?	Y	40	
	Closure Monitoring and Maintenance			
28	Does the MCP contain a framework, including methodology, quality control and remedial strategy for closure performance monitoring including post-closure monitoring and maintenance?	Y	41	
	Closure Information and Data Management			
29	Does the mine closure plan contain a description of management strategies including systems, and processes for the retention of mine records?	Y	41	
30	Does the mine closure plan contain any confidential material? Please indicate which pages are to be treated as confidential and briefly indicate why?	N		

Corporate Endorsement:

"I hereby certify that to the best of my knowledge, the information within this Mine Closure Plan and checklist is true and correct and addresses all the requirements of the Guidelines for the Preparation of a Mine Closure Plan approved by the Director General of Mines."

Name: VERNON NEWTON **Signed:** _____

Position: RESOURCE & DEVELOPMENT MGR **Date:** 15/12/14.

(NB: The corporate endorsement must be given by tenement holder(s) or a senior representative authorised by the tenement holder(s), such as a Registered Manager or Company Director)

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1. Scope and Purpose

This Mine Closure Plan ("MCP") has been prepared by Austwide Mining Title Management Pty Ltd in support of mining proposal for M70/1088 and M70/1142 ("the Leases"). The Leases comprise the Warton Road Project (the "Project").

The Leases are adjacent to Rocla's existing sand extraction operation on M70/357 (Banjup – Armadale Road).

The Leases are located within an identified "Priority Sand Resource Location" under SPP 2.4.

The scope and structure of this MCP is as follows:

Section 1: Outlines the scope and purpose of the Mine Closure Plan.

Section 2: Provides an overview of the project, including ownership, location and access, tenure, land ownership, a summary of current and proposed activity on the Leases, and an outline of mine closure management units.

Section 3: Summarises the legal obligations and specific legally binding closure commitments relating to the project.

Section 4: Provides environmental data relevant to rehabilitation and closure, information on climatic conditions, geology, soils, hydrogeology, flora and fauna, and the social environment.

Section 5: Describes stakeholder consultation relevant to mine closure, lists the stakeholders identified and provides a register of communications

Section 6: Identifies the post-mining land use and closure objectives based on the proposed land use.

Section 7: Outlines the identification and management of closure issues.

Section 8: Describes the development of site specific completion criteria by which the success of closure will be measured.

Section 9: Describes the process used to estimate closure financial costs.

Section 10: Provides details of Closure Implementation Plans for each management unit.

Section 11: Describes the environmental monitoring programme and maintenance response requirements.

Section 12: Describes how relevant data and information will be managed.

2. Project description

2.1 Ownership

The Warton Road Project (the "Project") comprises M70/1088 and M70/1142.

Tenement information is as follows:

Tenement	Holder/Applicant	Status	Area (ha)	Grant date	Expiry date
M70/1088	Evan Kimberley LESTER 25% Belinda Raylene SMITH 75%	Granted	10.12 ha	24/08/2010	23/08/2031
M70/1142	ROCLA PTY LTD	Granted	64.9263 ha	24/08/2010	23/08/2031

Table 1 - Tenure

The holders of M70/1088 have assigned Power of Attorney to Rocla.

The Project is managed by Rocla Pty Ltd ("Rocla").

All correspondence regarding this document should be forwarded to Austwide Mining Title Management Pty Ltd:

Contact details for Austwide Mining Title Management Pty Ltd are:

Name:	Austwide Mining Title Management Pty Ltd
Street address:	Suite 6, 46 Dellamarta St, Wangara, WA 6065
Postal address:	PO Box 1434, Wangara, WA 6947
Telephone:	(08) 9309 0400
Facsimile:	(08) 9309 0499
E-mail:	Steve Milner – steve@austwidemining.com.au
Rocla's details are:	
Name:	Rocla Pty Ltd
Contact:	Vern Newton
Street address:	130 Fauntleroy Avenue, Redcliffe, WA 6104
Postal address:	PO Box 469 Cloverdale WA 6985
Telephone:	08 9475 2500
Facsimile:	08 9477 2633
E-mail:	vern.newton@rocla.com.au

2.2 Proponent information - Rocla

Rocla have mined high grade sand resources from Western Australia since the early 1980s and has built up a significant enterprise providing a range of sand products to the construction industry.

Rocla is an industry leader in basic raw materials extraction and in Western Australia is particularly well known for their sand operations within the Gnangara Pine Plantation at Gaskell Road. In that operation Rocla works closely with the Forests Products Commission and the Department of Parks and Wildlife (DPaW) to ensure that the pine resource is utilised and that the land is returned to local native vegetation in line with Government Policy for the Gnangara Groundwater Mound. An essential part of the soil restoration and rehabilitation to native vegetation is working with Kings Park to achieve best industry outcomes. The establishment of this sand mine site in Banjup will create a southern Perth operation, in particular servicing the urban and industrial areas of the Canning Vale, Kwinana, Armadale and Byford and will facilitate the long-term supply of high quality sand for Perth's continued expansion of its southern and south-eastern corridors and related construction industries.

2.3 Location and access

The Leases are located approximately 14 km to the south-east of the Perth Central Business District in the suburb of Banjup which is located within the City of Cockburn. Jandakot Airport is situated approximately 1.5 km to the north of the Leases, with larger rural style lifestyle blocks, situated to the north-west and north-east, in between the Leases and the Airport. The areas to the south consist of mixed rural pursuits with forested tracts of bushland remaining on private lands.

The Leases are adjacent to Rocla's existing sand extraction operation on M70/357 (Banjup – Armadale Road) and access is via an internal road from M70/357.

The Leases encompasses in whole or part the following Crown Reserves:

Crown Reserve	**Purpose**	**Extent in M70/1088**	**Extent in M70/1142**	**Manager**
33500 = Lot 467	Police	100%	79.8%	Minister for Police and Emergency Services
33589	Government Requirements	Nil	6.5%	Department of Regional Development & Lands
33590	Government Requirements State Energy Commission	Nil	13.7%	Electricity Networks Corporation

Table 2 - Crown Reserves affecting the Project

See figures 1 in Appendix I.

2.4 Overview of previous investigations and activities

The Mining Proposal (RPS, 2014) gives the following overview of previous activities:

Lot 467 was previously mined for sand by another operator in the 1980s. The previous operator did not undertake any rehabilitation of their sand extraction area. This has resulted in a legacy of a two cleared sites (north and south of Lot 467) totalling 8 ha (Figure 2).

A Notice of Intent was prepared for Lot 467 Jandakot Road (M70/1088 and M70/1142) in 2005, and submitted to the then Department of Industry and Resources. The sand extraction proposal was innovative and included the mining of the cleared and approximately 9.8 ha of vegetated areas to the water table and rehabilitating the site as wetlands. The Notice of Intent report was forwarded by the Department of Industry and Resources to the EPA for comment.

The EPA advised based upon its initial review to set a level of assessment, it would recommend the level be set at "Proposal Unlikely to be Environmentally Acceptable". This was primarily due to the Lot 467 inclusion in Bush Forever (Bush Forever site 390). Based on this advice from the EPA, Rocla withdrew the referral at this time and advised they would undertake further vegetation survey work.

The following environmental investigations have been undertaken on Lot 467, which were completed in order to advance the environmental approvals for mining leases M70/1088 and M70/1142:

- Fauna Survey (M.J Bamford 1996)
- Declared Rare Flora Survey (BBG 2002)
- Notice of Intent – Proposed Sand Excavation Mining Tenement M70/1088 and M70/1142 (RPS 2005).

The Environmental Protection Authority (EPA) considered the Notice of Intent Report did not adequately address the EPA's objectives for protection of biodiversity, particularly the protection of remnant vegetation within a Bush Forever site. The proposal was subsequently withdrawn from the EPA assessment at this time; however Rocla advised they would undertake further vegetation survey work.

In advancing the environmental approval Rocla commissioned the following additional studies:

An additional Priority Flora search in spring 2006. No Declared Rare Flora, particularly Caladenia huegelii which are known to occur in the Jandakot region were found on the site.

Level 2 Flora and Vegetation Survey and report (RPS 2010).

Note: Lot 467 does not coincide exactly with M70/1088 and M70/1142.

2.5 Project description

The Mining Proposal (RPS, 2014) gives the following overview of the Project:

The Leases contains deposits of Bassendean Sand which is suitable for use as construction and fill sand. Extraction of sand at this site will facilitate the continued supply of specialised sand for concrete products and engineering fill for projects in the Perth's southern and south-eastern corridors. It is estimated that there is approximately 300,000 tonnes of sand available for excavation within the 9.56 ha excavation area which will support mining for an estimated three years.

The 3.93 ha of native vegetation clearing and topsoil will be removed as the excavation progresses.

All clearing will be conducted using a tracavator. The topsoil removed from cleared areas will be retained for use in the rehabilitation program. The topsoil will be stockpiled in an appropriate area on site or directly transferred to the completed excavation stage for rehabilitation works. The first section of topsoil will be recovered allowing for the best seed retention at a later date. This technique will utilise the best available research into Banksia re-establishment that Rocla has been conducting in partnership with the BGPA since 1994.

Sand will be mined from the excavation area over a single stage. Rehabilitation will commence post-completion of the excavation.

The extraction pit will be designed to maintain a buffer of greater than 2 m between the maximum depth of extraction and the Likely Future Maximum Groundwater Table (LFMGT) height.

The sequence in the extraction of sand from the site is outlined below:

Prior to excavation, vegetation will be cleared, topsoil will be removed using a landplane and stored for use in rehabilitation, or directly transferred to a rehabilitation site.

Overburden will be removed and stored for future land rehabilitation through backfill and placement.

The sand resource is typically screened using a portable screening plant to remove any organic material and stockpiled prior to tipping directly into road trucks for transportation to stockpile areas.

Reforming of the land is normally carried out using a bulldozer.

Topsoil will be replaced between 50 mm and 100 mm using a land plane.

On completion, the land surface will be graded to ensure the final slopes will not exceed 1 in 3 horizontal to vertical.

Rehabilitation will progressively follow excavation wherever possible.

Excavation proposes to lower natural surface topography following the east–west ridgeline by between 20 m to 2 m to a finished floor level of approximately 29.2 m to 29.5 m Australian Height Datum (AHD). The floor level is proposed to be above the 2 m separation required between the

finished levels and the LFMGT. To achieve the proposed excavation levels each stage will require a sufficiently large footprint to enable internal roads at suitable grades to ensure an efficient and safe excavation operation.

In accordance with the Mines Safety and Inspection Act 1994 the final profile of the batters / faces used to integrate mined surfaces with the natural remaining topography of the site, equates to the final batters being 1 in 3 vertical to horizontal or less.

Working batters on the mine face will be left in a slumped condition at the end of each day and over weekends for safety.

Hours of operation will be from 7.00 am to 5.00 pm Monday to Saturday inclusive.

The flexibility of a six day week operation is necessary to maintain efficiency because not all parts of the site can be excavated at all times of the year. Although the sand will be transported throughout the year, excavation will be discontinuous and dependent upon the demand for this particular sand type, and to avoid very wet conditions. It is more efficient to excavate sand material to produce on-site stockpiles from which sand can be transported in the intervening times as this maximises the use of mobile plant equipment.

An internal access road will be created to link Rocla's existing within Lot 140 Armadale Road with the adjacent Lot 467 sand extraction area. The road will be completely with Rocla's mining tenement areas. The access road will not be located within any wetland areas.

The proposed access road between Lots 467 and 140 is 0.16 ha in total with 0.10 ha native vegetation to be cleared.

The internal access road through Lot 140 to Armadale Road is through historically cleared areas.

Sand extracted from Lot 467 mining tenements M70/1088 and M70/1142 will be screened on site prior to sale. No additional processing is undertaken on site.

Site infrastructure will not be located with Lot 467. The extraction operations will make use of the existing adjacent facilities at Rocla's Armadale Road sand operations within the neighbouring Lot 140. The site infrastructure at Rocla's Armadale Road operations include:

- transportable site office
- weighbridge
- vehicle/equipment compound
- toilet
- refuelling facility (5000 litre (maximum) self bunded diesel above ground tank).

2.6 Mine closure management units

To facilitate the implementation of progressive rehabilitation and closure activities, the Lease is divided into discrete operational areas or management units.

This approach is consistent with the domain model proposed by the Council on Mining and Metals (ICMM 2008) as advocated in DMP/EPA's Guidelines for Preparing Mine Closure Plans (DMP/EPA 2011).

Management Unit	Management Unit Feature(s)
Excavation	Sand extraction area - Excavation proposes to lower natural surface topography following the east–west ridgeline by between 20 m to 2 m to a finished floor level of approximately 29.2 m to 29.5 m Australian Height Datum (AHD).
Topsoil and overburden stockpiles	Separate overburden and topsoil stockpiles stored for future backfill and rehabilitation
Access road	Internal road from the excavation to M70/357

Table 3 – Project Management Units

3. Identification of closure obligations and commitments

3.1 Legal Obligations Register

3.2.1 Tenement conditions

Cond No	Conditions pertaining to closure
2	All surface holes drilled for the purpose of exploration are to be capped, filled or otherwise made safe immediately after completion.
3	All disturbances to the surface of the land made as a result of exploration, including costeans, drill pads, grid lines and access tracks, being backfilled and rehabilitated to the satisfaction of the Environmental Officer, Department of Mines and Petroleum (DMP). Backfilling and rehabilitation being required no later than 6 months after excavation unless otherwise approved in writing by the Environmental Officer, DMP.
4	All waste materials, rubbish, plastic sample bags, abandoned equipment and temporary buildings being removed from the mining tenement prior to or at the termination of exploration program.
5	Unless the written approval of the Environmental Officer, DMP is first obtained, the use of drilling rigs, scrapers, graders, bulldozers, backhoes or other mechanised equipment for surface disturbance or the excavation of costeans is prohibited. Following approval, all topsoil being removed ahead of mining operations and separately stockpiled for replacement after backfilling and/or completion of operations.

Cond No	Conditions pertaining to closure
6	The lessee submitting a plan of proposed operations and measures to safeguard the environment to the Director, Environment, DMP for his assessment and written approval prior to commencing any developmental or productive mining or construction activity.
7	Written notification, where practicable, of the time frame, type and extent of proposed ground disturbing activities being forwarded to the Department of Water Perth seven days prior to commencement of those activities.
8	Any significant waterway (flowing or not), wetland or its fringing vegetation that may exist on site not being disturbed or removed without prior written approval from the Department of Water.
10	The storage and disposal of hydrocarbons, chemicals and potentially hazardous substances being in accordance with the Department of Water's Guidelines and Water Quality Protection Notes .
11	All Mining Act tenement activities prohibited within 200 metres of RAMSAR or ANCA listed wetlands unless written permission of Department of Environment and Conservation, in consultation with the Department of Water, is first obtained.
12	All Mining Act tenement activities prohibited within 200 metres of "Conservation" and "Resource Enhancement" Category wetlands unless written permission of the Department of Water is first obtained.
13	All proposed exploration activities within Public Drinking Water Source Areas complying with the Department of Water's Water Quality Protection Note Land Use Compatibility in Public Drinking Water Source Areas.
14	All Mining Act tenement activities within Public Drinking Water Source Areas being prohibited unless the prior written approval has been obtained from the Department of Water.
15	All Mining Act tenement activities are prohibited within 2 kilometres of the maximum storage level of a reservoir including the reservoir itself, unless the prior written approval of the Department of Water is first obtained.
16	Storage and use of hydrocarbons and potentially hazardous substances requiring the prior written approval or appropriate permits from the Department of Water.
17	All hydrocarbon or other pollutant spillage being reported to the Department of Water. Remediation being carried out to the satisfaction of the Department of Water.
18	All Mining Act tenement activities are prohibited within a 300-metre radius of any observation well in a Public Drinking Water Source Priority P1, P2 &

Cond No	Conditions pertaining to closure
	P3 Areas unless the written approval of the Department of Water is first obtained.
19	All Mining Act tenement activities are prohibited within a 500-metre radius in a P1 area or a 300-metre radius in a P2 or P3 area of any Public Drinking Water Source production well or dam, unless the written approval of the Department of Water is first obtained.
	Consent to mine on Police Reserve No. 33500 granted.

Table 4 - M70/1088 conditions pertaining to closure

Cond No	Endorsements
1	The Lessee's attention is drawn to the provisions of the: • Aboriginal Heritage Act 1972 and any Regulations thereunder; • Water and Rivers Commission Act 1995 and any Regulations thereunder; • Identification of environmental sensitive wetlands listed within the RAMSAR Convention 1971, ANCA's Directory of important wetlands, the National Estates Register and the Environmental Protection Policies 1999; • Country Areas Water Supply Act 1947 and any Regulations thereunder; and • Metropolitan Water Supply Sewerage and Drainage Act 1909 and any Regulations thereunder.
2	The Lessee's attention is drawn to the Environmental Protection Act 1986 and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004, which provides for the protection of all native vegetation from damage unless prior permission is obtained.
3	In respect to the area designated as FNA 2874, in TENGRAPH pursuant to Clause 9(20)(c) of the Alumina Refinery Agreement Act 1961, the grant of this Lease does not include the right to mine bauxite.

Table 5 - M70/1088 endorsements

Cond No	Conditions and commitments
2	All surface holes drilled for the purpose of exploration are to be capped, filled or otherwise made safe immediately after completion.
3	All disturbances to the surface of the land made as a result of exploration,

Cond No	Conditions and commitments
	including costeans, drill pads, grid lines and access tracks, being backfilled and rehabilitated to the satisfaction of the Environmental Officer, Department of Mines and Petroleum (DMP). Backfilling and rehabilitation being required no later than 6 months after excavation unless otherwise approved in writing by the Environmental Officer, DMP.
4	All waste materials, rubbish, plastic sample bags, abandoned equipment and temporary buildings being removed from the mining tenement prior to or at the termination of exploration program.
5	Unless the written approval of the Environmental Officer, DMP is first obtained, the use of drilling rigs, scrapers, graders, bulldozers, backhoes or other mechanised equipment for surface disturbance or the excavation of costeans is prohibited. Following approval, all topsoil being removed ahead of mining operations and separately stockpiled for replacement after backfilling and/or completion of operations.
6	The lessee submitting a plan of proposed operations and measures to safeguard the environment to the Director, Environment, DMP for his assessment and written approval prior to commencing any developmental or productive mining or construction activity.
7	The prior written consent of the Minister responsible for the Mining Act 1978 being obtained before commencing any mining activities on Government Requirements Reserve 33589 and Government Requirements State Energy Commission Reserve 33590.
8	No interference with the transmission line or the installations in connection therewith, and the rights of ingress to and egress from the facility being at all times preserved to the owners thereof.
9	Written notification, where practicable, of the time frame, type and extent of proposed ground disturbing activities being forwarded to the Department of Water Perth seven days prior to commencement of those activities.
10	Any significant waterway (flowing or not), wetland or its fringing vegetation that may exist on site not being disturbed or removed without prior written approval from the Department of Water.
12	The storage and disposal of hydrocarbons, chemicals and potentially hazardous substances being in accordance with the Department of Water's Guidelines and Water Quality Protection Notes .
13	All Mining Act tenement activities prohibited within 200 metres of RAMSAR or ANCA listed wetlands unless written permission of Department of Environment and Conservation, in consultation with the Department of Water, is first obtained.
14	All Mining Act tenement activities prohibited within 200 metres of

Cond No	Conditions and commitments
	"Conservation" and "Resource Enhancement" Category wetlands unless written permission of the Department of Water is first obtained.
15	All proposed exploration activities within Public Drinking Water Source Areas complying with the Department of Water's Water Quality Protection Note Land Use Compatibility in Public Drinking Water Source Areas.
16	All Mining Act tenement activities within Public Drinking Water Source Areas being prohibited unless the prior written approval has been obtained from the Department of Water.
17	All Mining Act tenement activities are prohibited within 2 kilometres of the maximum storage level of a reservoir including the reservoir itself, unless the prior written approval of the Department of Water is first obtained.
18	Storage and use of hydrocarbons and potentially hazardous substances requiring the prior written approval or appropriate permits from the Department of Water.
19	All hydrocarbon or other pollutant spillage being reported to the Department of Water. Remediation being carried out to the satisfaction of the Department of Water.
20	All Mining Act tenement activities are prohibited within a 300-metre radius of any observation well in a Public Drinking Water Source Priority P1, P2 & P3 Areas unless the written approval of the Department of Water is first obtained.
21	All Mining Act tenement activities are prohibited within a 500-metre radius in a P1 area or a 300-metre radius in a P2 or P3 area of any Public Drinking Water Source production well or dam, unless the written approval of the Department of Water is first obtained.
	Consent to mine on Police Reserve No. 33500 granted.

Table 6 - M70/1142 conditions pertaining to closure

Cond No	Endorsements
1	The Lessee's attention is drawn to the provisions of the: • Aboriginal Heritage Act 1972 and any Regulations thereunder; • Water and Rivers Commission Act 1995 and any Regulations thereunder; • Identification of environmental sensitive wetlands listed within the RAMSAR Convention 1971, ANCA's Directory of important wetlands, the National Estates Register and the Environmental Protection Policies 1999;

Cond No	Endorsements
	• Country Areas Water Supply Act 1947 and any Regulations thereunder; and • Metropolitan Water Supply Sewerage and Drainage Act 1909 and any Regulations thereunder.
2	The Lessee's attention is drawn to the Environmental Protection Act 1986 and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004, which provides for the protection of all native vegetation from damage unless prior permission is obtained.
3	In respect to the area designated as FNA 2874, in TENGRAPH pursuant to Clause 9(20)(c) of the Alumina Refinery Agreement Act 1961, the grant of this Lease does not include the right to mine bauxite.
4	The grant of this Lease does not include land the subject of Section 19/152 which was declared exempt from occupation as a mining tenement on 25 September 2000 and published in the Government Gazette dated 6 October 2000 and Club and Club Premises (Pistol Club) Reserve 8129.

Table 7 - M70/1142 endorsements

3.2.2 Mining Proposal commitments

The following table shows commitments in the Mining Proposal:

Item	Summary of Commitments in Mining Proposal	Page No.
Clearing and Hydrology	• Clearing will be undertaken in accordance with an approved Mine Plan. • Excavation will not impact any wetland. • The buffer to the wetland boundary will be clearly marked and fenced to prevent access. • A monitoring bore will be installed at the site, adjacent to the CCW to monitor groundwater levels throughout the duration of the proposed sand extraction. • Groundwater abstraction will not be undertaken at the project site. • The finished batters will be used to integrate the mined surface with the surrounding natural topography of the site.	ix
Restoration	• Progressive restoration will be undertaken by BGPA following sand extraction. • Rehabilitation of 7.38 ha of historically cleared areas, resulting in an approximately additional 200% of area being restored. • Weed management will be undertaken in the restoration areas. • Completion criteria for the Banksia woodland restoration will be to the satisfaction of the Bush	ix

	Forever office and the Department of Parks and Wildlife (DPaW).	
General	• Fuels and chemicals will not be stored on site. • Management measures will be undertaken to prevent and / or minimise dust and noise. This will be detailed in the Mine Plan.	x
Groundwater	Condition 1 from the Ministerial Statement indicates that the proposal must fulfil the commitment given for environmental management. The environmental management commitments relating to the management of groundwater were as follows: • Detailed "Working Arrangements" will be prepared in conjunction with CALM ('now DPaW') which will define management techniques to be adhered to during the mining operation. These will include rehabilitation of excavated pits. • In general terms the objectives of the rehabilitation program will be: – stabilisation of the surface sand against erosion – minimisation of disturbance to the hydrological balance within area Lot 467 and adjacent land – establishment of a diverse, effective and permanent vegetation cover capable of plant succession and regeneration to suit the present priority land use of water production. • Conduct routine monitoring of groundwater levels and report results to the Water Authority of Western Australia on a regular basis Rocla are committed to the following: • survey control of quarry floor to ensure accurate recording of separation distance • monthly monitoring of the groundwater via piezometer • staged rehabilitation program. These key commitments are characteristic of the DPaW's reporting requirements for Rocla's sand extraction operations within Priority Water Source Protection Areas. Additionally it is important to note that any refuelling will occur off site, at the existing facility, on the adjacent Rocla mining tenement M70/357.	17 & 18
Native vegetation and flora	• Staged clearing of the site, through the stage mining process to allow for fauna movement away from proposed mining operations and clearing • 28.29 ha of native vegetation remain outside of the sand extraction area. The excavation area will be clearly defined through a site survey and marked out on the ground at each stage • Provision of a buffer from the sand extraction area to the RE and CC wetlands which maximise	

	the value of the sand resource but also maintains the environmental values of the wetlands. • Rehabilitation in collaboration with BGPA to utilise over eighteen years of research into Banksia Woodland restoration. Rocla proposes the staged rehabilitation of the 9.56 ha sand extraction area (which includes the 5.63 ha of historically cleared area). Rocla also proposes to restore an additional 1.75 ha of historically cleared area outside of the proposed sand extraction area. The total native vegetation rehabilitation area is 11.31 ha. This represents an approximate 200% net increase in black cockatoo foraging habitat • Stockpiling or direct transfer of topsoil for use in regeneration of Banksia woodlands • Provision of the site to be used in future Banksia Woodlands rehabilitation research trials by BGPA	

Table 8 – Mining Proposal commitments

4. Rehabilitation and closure data

4.1 Summary of environmental characteristics

Table 9 summarises the key aspects of the Lease environment that are relevant to rehabilitation and mine closure planning and implementation.

See also section 4 in the Mining Proposal.

Aspect	Description
Climate	The Jandakot area experiences a Mediterranean climate, which predominates in the south-west of Western Australia, and is characterised by cool wet winters and hot dry summers. Average maximum and minimum temperatures in the summer season (October– March) range from 22 °C to 31 °C and 9 °C to 18 °C respectively. In the winter months, maximum and minimum temperatures range from 18 °C to 25 °C and 7 °C to 12 °C respectively (BOM 2010).
Geology, terrain and soils	The Jandakot area is underlain by Bassendean Sands derived from the Bassendean Dune System. Bassendean dunes are characterised as pale grey, white, medium grained, moderately sorted quartz sand with little or no calcium carbonate content. Bassendean dunes (located in the eastern portion of the project area) tend to be acidic, highly leached and nutrient poor (Bolland 1999). The site has a central ridge line located in the middle of Lot 467 and runs north-east with a maximum elevation of approximately 38 m AHD. The land falls in the west and east direction towards the wetlands (abutting the eastern and western boundary) to a height of approximately 30 m AHD (Figure 3).

Acid Sulphate Soils (ASS)	The sand excavation area is mapped as a "moderate to low" risk classifications for potential ASS occurring (Figure 4). The proposed excavation area is set within soils of predominantly aeolian origins. The presence of ASS materials is expected to be limited to the low-lying alluvial wetland area excluded from the extraction area. As the soil extraction operations are not proposed to breach a 2 m vertical buffer between excavations and the water table, and no dewatering is proposed, the oxidative effects of groundwater level modification can be discounted, and the risk of acid generation would hence be considered low, as all soils above the water table would potentially already have been exposed to oxidative effects. It is important to note that these wetland features will have a buffer from soil extraction operations, wetlands which maximise the value of the sand resource but also maintains their environmental values.
Vegetation and flora	The Leases are within Bush Forever Site No. 390. The vegetation was generally described for Site No. 390 as upland Banksia woodland with significant areas of wetland and associated vegetation, predominantly in the western and eastern boundaries. Much of the vegetation at the site was considered to be in "Good or better" condition, with the remainder of the site (approximately one third) considered as being in "degraded" condition. The proposed sand extraction area occurs within two major vegetation complex units. These are: • Southern River Complex: Open woodland of Corymbia calophylla – Eucalyptus marginata and Banksia spp with fringing woodland of Eucalyptus rudis – Melaleuca rhaphiophylla • Bassendean Complex - Central and South: Woodland of Eucalyptus marginata – Casuarina fraseriana – Banksia Spp. The majority of the vegetation at the site is mapped as part of the Southern River Complex, with the vegetation in the south-western corner mapped as part of the Bassendean Complex – Central and South. A Level 2 Flora and Vegetation Survey was undertaken in spring 2010 to identify the type and condition of the vegetation present in the project area. The specific objectives of the 2010 spring flora and vegetation survey were to: • Identify all vascular plant species present within the survey area. • Review the conservation status of the vascular plant species by reference to current literature and current listings by the DPaW (2006a and 2006b) and the Department of the Environment and Heritage website

	under the EPBC Act 1999. • Compare the plant communities at each site with those defined by Gibson et al. (1994) to aid in assessing their local and regional significance. • Produce a report summarising the findings. No Threatened or Priority Flora species were identified as occurring within the sand extraction or surrounding area. No Threatened or Priority Ecological Communities were identified as occurring within the survey area by the Level 2 Flora and Vegetation Survey undertaken in spring 2010. One identified vegetation unit, Banksia ilicifolia woodlands, was shown to have some affinity with Floristic Community Type No. 22, which is a Priority 2 Ecological Community. The proposed sand extraction area is within Bush Forever Site No. 390 See Figure 5, 6 and 7.
Fauna	See section 4.2
Hydrology	Based on regional groundwater data and mapping, the estimated average annual maximum groundwater level beneath the site is around 28 m ADH. The regional groundwater contour data, the groundwater flow is south-east from the site. The 2007 Perth Groundwater Atlas indicates that groundwater beneath the site migrates in a south to south-east direction (DoW 2009). Historical groundwater monitoring of Rocla's adjacent sand mine was undertaken by Rockwater in 1998. Rockwater using local and regional monitoring bores (and data from 1980 to 1998) estimated the Average Annual Maximum Groundwater Level to range from 27.7 m AHD near Armadale Road to 27.2 m AHD along Jandakot and Warton Road. Subsequently in adjacent sand mining areas a base level of the quarry was set at around 27.5 m AHD. The Leases is located within the Priority 1 Jandakot Underground Water Pollution Control Area (UWPCA). Sand extraction within the UWPCA must be in accordance with Statewide Policy No 1 – Policy and Guidelines and Silica Mining in Public Water Source Areas (WRC 1999). The maximum depth of soil extraction activities will not exceed a minimum 2 m vertical buffer distance from the water table, which is consistent with Rocla's adjacent mining tenement M70/357 within Lot 140 Armadale Road. The basis of the 2 m separation distance is premised upon the separation distance that was applied to Rocla's Gaskell Avenue Operations in Lexia. Drainage on the site is towards the wetlands in the east and west of the site. Water run-off from incident rainfall percolates through the highly permeable sandy soils within the site. No direct drainage to the southern wetlands will occur by way of a defined channel.

	A search of the Geomorphic Wetlands Database (Landgate 2009) indicates there are two mapped wetlands within the Leases (Figure 8). The wetland on the eastern edge of tenement M70/1088 is listed as a Resource Enhancement (RE) management category. The wetland on the eastern side of M70/1142 is classified as a Conservation Category Wetland (CCW).
Aboriginal and European Heritage	No records of Registered Aboriginal Sites were recorded in either Lease. One record of an "Other Heritage Place" was recorded as occurring within the boundaries of the Leases: • Site – 3301 Banjup: Calsil. A database search was made of the Heritage Council of Western Australia's Places database. No places were recorded as occurring on the Leases.
Native Title	Native Title Claim: WC2011/009 – Whadjuk People
Environmental legacies	The area was previously mined for sand by another operator in the 1980s. The previous operator did not undertake any rehabilitation of their sand extraction area. This has resulted in a legacy of a two cleared sites totalling ~8 ha.

Table 9 - Summary of pertinent environmental characteristics

4.2 Potentially occurring fauna

Species of conservation importance that potentially occur in the Project area are:

4.2.1 Mammals

1. **Chuditch (Western Quoll) (Dasyurus geoffroii)** is listed as Vulnerable under the EPBC Act and as a Schedule 1 species under the WC Act. This species once occurred over 70% of Australia, but it has been reduced to a patchy distribution throughout the Jarrah and mixed forests of the south-west of Western Australia (DEC 2008a). The Chuditch is found in a wide range of habitats, including woodlands, dry sclerophyll forests and riparian vegetation that contain hollow bearing trees and logs. Numbers have decreased because of habitat alteration, removal of suitable den logs and dens, and competition for food and predation by foxes and cats (DEC 2008a). Considering the current distribution of the species, the urban nature of the site, and the presence of foxes and cats on the site, it is unlikely this species occurs within Lot 467.
2. **Wambenger (Southern Brush-tailed Phascogale) (Phascogale tapoatafa)** is listed as Schedule 1 under the WC Act. The distribution of this species is believed to have been reduced to approximately 50% of its former range (DEC 2008a).This subspecies has been observed in dry sclerophyll forests and open woodlands containing hollow-bearing trees but a sparse ground cover. Habitat destruction, the loss of hollow-

bearing trees and predation by feral animals are thought to be the major threats to surviving populations (DEC 2008a). None have previously been found in the area, and none are known from within approximately 10 km of the site from WA Museum records. Therefore it is unlikely that the Wambenger occurs at the site.

3. **Quokka (Setonix brachyurus)** is listed as Vulnerable on the EPBC Act and as Schedule 1 by the DEC. It is found in the south-west regions of WA, mostly in densely vegetated swamps, tea tree thickets on sandy soils along creek lines and dense heath on slopes. Quokka numbers have declined because of predation by foxes and the clearing and burning of swamp habitats. This species is very rare on the mainland. It was not observed during the nocturnal or diurnal surveys or trapped during the survey, and has not been previously recorded on the Jandakot region. It is therefore highly unlikely to occur at Lot 467.
4. **Greater Long-eared Bat (Nyctophilus timoriensis)** is listed as a Priority 4 species by the DEC. This species is considered widespread across southern Australia, but it is uncommon and localised. The Greater Long-eared Bat inhabits areas of tall forest in the south-west, roosting in tree hollows and under loose bark (Strahan 1995).

4.2.2 Birds

1. **Carnaby's Black-Cockatoo (Calyptorhynchus latirostris)**, preferred habitat is woodlands and scrubs of semiarid interior of Western Australia, in non-breeding season wandering in flocks to coastal areas, especially pine plantations (Johnstone & Storr 1998). Food includes seeds of Banksia species, Dryandra species, Hakea species, Eucalyptus species, Grevillea species and Pinus species; also fruiting almonds (Johnstone & Storr 1998).Occurs in south-west north to lower Murchison and east to Nabawa, Wilroy, Waddi Forest, Manmanning, Durokoppin, Lake Cronin and just east of Condingup. Endemic to Western Australia (Johnstone & Storr 1998). Considering the habitat present on the site, this species potentially occurs there.
2. **Baudin's Cockatoo (Calyptorhynchus baudinii)**, is listed as Vulnerable by the EPBC Act, as Schedule 1 by the WC Act, and is also considered locally significant. This species is distributed through the south-western humid and subhumid zones, from the northern Darling Range and adjacent far east of the Swan Coastal Plain (south of the Swan River), south to Bunbury and across to Albany (Johnstone & Storr 1998). Baudin's Cockatoo rarely occurs in Perth, or anywhere along the coast south to approximately Mandurah. It usually occurs in small flocks of up to 30, occasionally up to 50, or rarely in aggregations of up to 1200 (Johnstone & Kirkby 2008). This species forages primarily in eucalypt forest, where it feeds primarily on Marri (Corymbia calophylla) seeds, flowers, nectar and buds (Johnstone & Kirkby 2008). It also feeds on a wide range of seeds of Eucalyptus, Banksia, Hakea and Dryandra, as well as fruiting apples and pears and persimmons, as well as Pines, and beetle larvae from under the bark of trees (Johnstone & Kirkby 2008, Johnstone & Storr 1998). Considering the habitat present on the site, this species potentially occurs there.

3. **Rainbow Bee-eater (Merops ornatus)** is a migratory species listed under the EPBC Act, which migrates to south-western Australia to breed in spring and summer. The Rainbow Bee-eater is a common and widespread species in Western Australia. It occurs throughout Western Australia except the drier interior of the State and the far south-west (Johnstone & Storr 1998). It occurs in lightly-wooded often sandy country, preferring areas near water. The Rainbow Bee-eater feeds on airborne insects, and nests throughout its range in Western Australia in burrows excavated in sandy ground or banks, often at the margins of roads and tracks (Johnstone & Storr 1998). The Rainbow Bee-eater is common in Perth in summer. It is likely this species forages at the site, and possibly breeds there.

5. Stakeholder consultation

The aim of stakeholder consultation is to ensure that appropriate groups and individuals are identified in order to address concerns and issues relating to closure so that potential impacts are minimised.

5.1 Stakeholder identification

Category	**Stakeholders**	
State Government	Department of Mines and Petroleum	Mining Proposal Mine Closure Plan Environment approvals
	Department of Parks and Wildlife	Environment approvals
	Department of Water	GWA/25 Jandakot GPC/5 – Underground Pollution Control Area
	Environment Protection Authority	DMP MoU – significant impacts BPS/390
	Department of Lands	FNA/11861
	Western Australia Police Department	(CR33500)
Local Government	Cockburn City	CR1820 - Rose Shanks Reserve Post-mining land use
Indigenous People	Whadjuk People	Heritage issues

Other	Kings Park Botanical Gardens and Park Authority (BGPA)	Rehabilitation

Table 10 - Stakeholder identification register

5.2 Consultation process

The Project has been discussed with stakeholders since 2005 and on advice has undertaken several new flora/vegetation surveys. The Mining Proposal has been submitted after further consultation with DMP on the most appropriate way of advancing the Project and further consultation will occur after the submittal of the mining proposal and the closure plan.

6. Post-mining land use and closure objectives

6.1 Post-mining land use

The post mining land use is intended to return the land to Banksia Woodland.

Rocla have committed to the staged rehabilitation (to Banksia spp – Eucalyptus marginata woodland) in collaboration with the BPGA of the site post-extraction works.

Based on the proposal, Rocla will implement the following general measures to avoid or reduce impacts to the black cockatoos:

- the sand extraction proposal is a temporary land use. Rocla proposes to restore Banksia woodland across the sand extraction area of 9.56 ha, noting 5.63 ha of this was historically cleared. Rocla will also restore an additional 1.75 ha of historically cleared areas outside of the sand extraction area. The total native vegetation rehabilitation area is 11.31 ha. This represents an approximate 200% net increase in black cockatoo foraging habitat
- maintaining 28.29 ha vegetated buffer outside of the sand extraction area. The excavation area will be clearly defined through a site survey and marked out on the ground at each stage
- provision of the site to be used in future Banksia Woodland rehabilitation research trials by BGPA
- avoid damage to any habitat outside of the prescribed clearing area
- staged clearing of the site, through the stage mining process to allow for fauna movement away from proposed mining operations and clearing
- provision of a 50 m and a 40 m buffer from the sand extraction area to the RE and CC wetlands which maximise the value of the sand resource and maintains the environmental values of the wetlands.

6.2 Closure objectives

The overall closure objective for this project is to return the land to self-sustaining Banksia Woodland.

Aspect	Closure Objectives
Landform	The post mining land use is intended to return the land to self-sustaining Banksia Woodland.
Public safety	Appropriate measures are implemented to prevent risk to human health and safety.
Soils	Ensure that reconstructed soil profiles are stable and capable of supporting resilient and self-sustaining Banksia Woodland.
Vegetation	Re-establishment of Banksia Woodland. Ensure that weeds are effectively controlled.
Sustainability	Establish resilient and self-sustaining Banksia Woodland. Establish rehabilitated landforms that are capable of providing habitat for a variety of vertebrate and invertebrate species. Ensure that rehabilitated landforms are safe, stable, non-polluting and compatible with Banksia Woodland and stakeholder expectations.

Table 11 – Closure objectives

7. Identification and management of closure issues

The following closure issues have been identified:

Closure issue	Management strategy and commitments
Vegetation and flora	• staged clearing of the site, through the stage mining process to allow for fauna movement away from proposed mining operations and clearing • 28.29 ha of native vegetation remain outside of the sand extraction area. The excavation area will be clearly defined through a site survey and marked out on the ground at each stage • provision of a buffer from the sand extraction area to the RE and CC wetlands which maximise the value of the sand resource but also maintains the environmental values of the wetlands. • rehabilitation in collaboration with BGPA to utilise over eighteen years of research into Banksia Woodland restoration. Rocla proposes the staged rehabilitation of the 9.56 ha sand extraction area (which includes

	the 5.63 ha of historically cleared area). Rocla also proposes to restore an additional 1.75 ha of historically cleared area outside of the proposed sand extraction area. The total native vegetation rehabilitation area is 11.31 ha. This represents an approximate 200% net increase in black cockatoo foraging habitat • stockpiling or direct transfer of topsoil for use in regeneration of Banksia woodlands • provision of the site to be used in future Banksia Woodlands rehabilitation research trials by BGPA
Dieback and weed management	**Prevention** – Undertake a baseline weed status survey prior to excavation works. – Implement a weed control program which includes spraying during the spring flowering season and ongoing monitoring. – If required, intra-project hygiene boundaries will be established to prevent the spread of weeds and dieback within the project area. These boundaries will be clearly demarcated on site and equipped with clean down facilities. – Sand excavation equipment will be cleaned to remove soil, vegetation, rock and debris prior to arrival at site. **Mobilisation Hygiene Certificate** – Internal approval for earth moving equipment to mobilise to site will be dependent on completion of hygiene requirements, i.e. dieback-free. – Any equipment or vehicle considered to have been working in a weed or dieback risk area will be cleaned down before remobilising. – Key Rocla and site personnel (e.g. site manager) will be made aware of dieback issues, identification of weed species / reporting of infestations and hygiene procedures. These key personnel will be responsible for the implementation of the weed control program and dieback management. **Weed Control** – A weed control program will be implemented for project areas where introduced species are present. Where required, infestations will be controlled by spot spraying or manual removal. **Monitoring** – Weed infestation status inspections will be conducted by the Site Manager as part of regular site inspections. – A targeted weed survey will be conducted at the completion of each sand extraction stage area (prior to rehabilitation works commencing) and

	repeated again within twelve months. **Contingencies** – Any new weed populations that arise in the project area as a result of the construction works will be removed. – Incidents relating to a failure in hygiene processes will be reported investigated and rectified to prevent recurrence.
Fauna (Black Cockatoos)	• the sand extraction proposal is a temporary land use. Rocla proposes to restore Banksia woodland across the sand extraction area of 9.56 ha, noting 5.63 ha of this was historically cleared. Rocla will also restore an additional 1.75 ha of historically cleared areas outside of the sand extraction area. The total native vegetation rehabilitation area is 11.31 ha. This represents an approximate 200% net increase in black cockatoo foraging habitat • maintaining 28.29 ha vegetated buffer outside of the sand extraction area. The excavation area will be clearly defined through a site survey and marked out on the ground at each stage • provision of the site to be used in future Banksia Woodland rehabilitation research trials by BGPA • avoid damage to any habitat outside of the prescribed clearing area • staged clearing of the site, through the stage mining process to allow for fauna movement away from proposed mining operations and clearing • provision of a 50 m and a 40 m buffer from the sand extraction area to the RE and CC wetlands which maximise the value of the sand resource and maintains the environmental values of the wetlands.
Surface and Groundwater protection	• survey control of quarry floor to ensure accurate recording of separation distance • monthly monitoring of the groundwater via piezometer • Provision of a 50 m and a 40 m buffer from the sand extraction area to the RE and CC wetlands which maximises the value of the sand resource and maintains the environmental values of the wetlands. • Maintain the final land surface with a separation distance of 2 m to the LFMGT. • Stage clearing of the site in accordance therefore minimising the exposed areas at any one time. • Commence rehabilitation works at the completion of each mining stage in collaboration with BGPA. • Maintain all plant equipment in good condition. • Maintain all haul road and hardstand surfaces in good condition and with suitable grades.

Table 12 - Closure issues and commitments

The following are NOT considered to be closure issues due to the nature of the raw product and subsequent processing:

- Acid and metalliferous drainage
- Pit lakes
- Dispersive minerals
- Radioactive materials
- Fibrous minerals

8. Completion criteria

8.1 Development of completion criteria

The purpose of completion criteria is to establish a set of rehabilitation standards or end-points that, when achieved, will enable Rocla to relinquish the mine site and be released from further liability.

Completion criteria have been developed by RPS Environmental Planning Pty Ltd and are included in the Mining Proposal.

8.2 Completion criteria

The following completion criteria have been developed for the Lease:

Mining area		
Closure objectives	**Completion criteria**	**Measurement Tools**
Restore native Banksia woodland to the site	• landform compatible with the surrounding contours • a self-sustaining cover of native vegetation • weed species at levels not likely to threaten the native species.	Qualitative assessment by BGPA. Auditing by stakeholders to the satisfaction of the Bush Forever office and DPaW (Mining Proposal page ix)
Appropriate measures are implemented to prevent risk to human health and safety.	Appropriate signage is in place	Audit by stakeholders
Ensure that reconstructed soil profiles are stable and capable of supporting resilient and self-sustaining Banksia Woodland.	A self-sustaining cover of native vegetation	Qualitative assessment by BGPA. Auditing by stakeholders to the satisfaction of the Bush Forever office and DPaW (Mining Proposal page ix)
Ensure that weeds are effectively controlled.	Weed species at levels not likely to threaten the native species.	Qualitative assessment by BGPA. Auditing by stakeholders to the satisfaction of the Bush

		Forever office and DPaW (Mining Proposal page ix)

Table 13 - Completion criteria

These interim completion criteria will continue to be reviewed throughout the life of the Lease.

In the event of project closure prior to the rehabilitation of all disturbed areas, Rocla would maintain its rehabilitation strategy. The extent of the rehabilitation would depend upon the period of closure and would be made in consultation with the relevant stakeholders.

9. Financial provision for closure

9.1 Cost estimation methodology

Financial provisions are estimated based on current areas of land disturbance and unit rates for rehabilitation activities e.g. earth moving, topsoil spreading, ripping and seeding. Financial provisions are estimated separately for each management unit and mine feature. Thus, the costs for rehabilitation and closure of each management unit or individual feature can be tracked and updated during biannual reviews. The financial provisions for any given area of disturbed land remain as a liability on the company accounts until such time as the rehabilitation is signed off by the relevant regulatory authorities.

Closure cost estimates will be regularly reviewed to reflect changing circumstances and to ensure that the accuracy of closure costs can be refined and improved with time. Provision will also be made for unexpected closure or temporary closure (on care and maintenance).

Current estimate of costs is $30,000 per hectare.

10. Closure implementation

10.1 Rehabilitation

Rocla have committed to the staged rehabilitation (Banksia spp and Eucalyptus marginata woodland) in collaboration with the BGPA to maximise the regeneration of natural bushland.

The Mining Proposal describes Rocla's rehabilitation plan as follows:

> Rehabilitation will commence with the establishment of topographic contours. The final contours are anticipated to be visually compatible with other parts of the local landscape. A commitment will be made to ensure that the final slopes are similar to those in the local area on the slopes and that the excavation will be left in a safe manner in conformity with the Mines Safety and Inspection Act 1994.
>
> The proposed excavation has been designed to comply with the objectives of the zoning and to return the landform to its current existing pre-

excavation form and rehabilitate the disturb land with native vegetation.

The main objective for the rehabilitation of the site is to restore native Banksia woodland to the site. The methodology adopted for the rehabilitation is based on fifteen years of experience at other Rocla sand extraction sites and rehabilitation as well as research conducted into the ecology of native Banksia woodland areas. The rehabilitation completion criteria are as follows:

- a landform compatible with the surrounding contours
- a self-sustaining cover of native vegetation
- weed species at levels not likely to threaten the native species.

In 1995, Rocla approached the BGPA with the aim of returning post-sand extraction mine sites back into former Banksia woodland. Rocla sought the assistance of the Science Directorate at BGPA to undertake research into the ecology and restoration of Banksia woodland and have now subsequently built a long-term scientific relationship. This research resulted in Rocla and BGPA being awarded the Golden Gecko environmental award by the Department of Mines and Petroleum in 2008, the most prestigious environmental award in the state.

As a result of this partnership Rocla have successfully restored over eight former sand extraction sites back to Banksia woodland on the Swan Coastal Plain.

The objective of the Lots 467 site rehabilitation program is:

- Undertake progressive rehabilitation to minimise the open excavation area at any one time.
- Stabilise the surface sands against erosion.
- Establish a southern and north-west ecological corridor.

The proposed rehabilitation program will consist of application of topsoil and overburden to a depth of up to 10 cm to the rehabilitation areas and seeding with native species. Topsoil is proposed to be directly transferred from the cleared areas to the rehabilitation sites with clearing and rehabilitation preparation occurring simultaneously on an annual basis, after the first year. Topsoil will also be managed and protected to maximise regeneration.

Clearing and commencement of rehabilitation is proposed to occur in autumn each year. Rehabilitation is proposed to commence in Year Two and continue at a rate of approximately 3 ha per year until excavation is complete and the quarry fully rehabilitated.

Brushing with larger logs (remaining following regrowth clearing) will occur on the perimeter of rehabilitation sites to decrease the potential for erosion and vehicle movement.

Rehabilitation Stages

The stages involved in the site rehabilitation program are summarised as follows:

- Rocla will initially will harvest native Banksia spp and Mari seeds (and use topsoil if available) and focus the first phase of rehabilitation on the

1.75 ha previously mined areas located outside of the proposed sand excavation area. Rocla proposes to commence the rehabilitation of this area in advance of the proposed clearing and sand extraction. This outcome will assist both in restoring native vegetation to a cleared area but also with dust control.

- Rocla will undertake the Banksia spp and Eucalyptus marginata woodland rehabilitation for the sand extraction area concurrently with clearing works which are proposed to occur in autumn each year.
- The proposed rehabilitation program will consist of application of topsoil to a depth of up to ten centimetres to the rehabilitation areas and seeding. Where possible topsoil and overburden will be directly transferred from an area being cleared to an area to be rehabilitated. Where this is not possible, the topsoil and overburden will be stored in low piles for future use in rehabilitation.
- The levelled topsoil will be ripped to a depth of 50 to 80 cm with wing shaped tynes. This is intended to eliminate the compaction created in the soil profile during the excavation process.
- A supplementary seed mix containing species which do not regenerate readily from the replaced topsoil will be distributed over the rehabilitation area by hand.
- Slopes are shaped and battered with retained topsoil. These will then be spread with vegetative debris, which acts as a barrier to wind erosion and maximises microhabitats.
- Assessment of the success of the rehabilitation works will be undertaken annually with additional supplementary seeding, planting or re-broadcasting of seed applied in the subsequent winter if considered necessary by the BGPA and Rocla.
- Brushing with larger logs (remaining following regrowth clearing) will occur on the perimeter of rehabilitation sites to decrease the potential for erosion and vehicle movement.

Rocla will undertake, manage and fund the rehabilitation program until the completion criteria outlined below are met. Table 17 presents a provisional schedule of all programmed monitoring activities.

10.2 Closure Implementation Plans

The Closure Implementation Program is underpinned by Closure Implementation Plans that have been prepared for each management unit to address their specific rehabilitation and closure issues and requirements.

10.2 Management Units

10.2.1 Sand excavation area – Closure Implementation Plan

Sand excavation area – Closure Implementation Plan
1. Scope

• Sand excavation	
2. Description and setting	
Location	M70/1088 and M70/1142
Area of disturbances	Historically cleared area within proposed sand extraction area - 5.63 ha Proposed sand extraction rea – 9.56 ha Remnant vegetation to be cleared – 3.93 ha Potential rehabilitation area – 1.75 ha Internal road (existing and proposed) – 0.17 ha
Current status	Inactive
Closure date	To be advised
3. Management history	
Lot 467 was previously mined for sand by another operator in the 1980s. The previous operator did not undertake any rehabilitation of their sand extraction area. This has resulted in a legacy of a two cleared sites (north and south of Lot 467) totalling 8 ha (Figure 2)	
4. Risk assessment	
The potential risks associated with closure are: • Rehabilitation success • Public safety	
5. Closure assumptions	
• Restore native Banksia woodland to the site	
6. Knowledge gaps	
• None known	
7. Rehabilitation and Closure Activities	
Proposed rehabilitation stages • The proposed rehabilitation program will consist of application of topsoil to a depth of up to ten centimetres to the rehabilitation areas and seeding. Where possible topsoil and overburden will be directly transferred from an area being cleared to an area to be rehabilitated. Where this is not possible, the topsoil and overburden will be stored in low piles for future use in rehabilitation. • The levelled topsoil will be ripped to a depth of 50 to 80 cm with wing shaped tynes. This is intended to eliminate the compaction created in the soil profile during the excavation process. • A supplementary seed mix containing species which do not regenerate readily from the replaced topsoil will be distributed over the rehabilitation area by hand.	

- Slopes are shaped and battered with retained topsoil. These will then be spread with vegetative debris, which acts as a barrier to wind erosion and maximises microhabitats.
- Assessment of the success of the rehabilitation works will be undertaken annually with additional supplementary seeding, planting or re-broadcasting of seed applied in the subsequent winter if considered necessary by the BGPA and Rocla.
- Brushing with larger logs (remaining following regrowth clearing) will occur on the perimeter of rehabilitation sites to decrease the potential for erosion and vehicle movement.

8. Task Register

No.	Description (to be expanded)	Timing	Comments / Status
1	Reference site		Adjacent undisturbed parts of the Leases
2	Interim completion criteria	2014	This document
3	Stakeholder consultation	2014 & on-going	On-going
4	Decommissioning plan		Not yet required
6	Decommission/dismantle		Not yet required
7	Earthworks		Not yet required
8	Monitor rehabilitation		Not yet required
9	Relinquishment		Not yet required

Table 14 – Sand excavation area - Closure Implementation Plan

10.2.2 Topsoil and overburden stockpiles closure implementation plan

Topsoil and overburden stockpiles - Closure Implementation Plan

1. Scope

- Topsoil and overburden stockpiles

2. Description and setting

Location	M70/1088 and M70/1142
Area of disturbance	3.93 ha
Current status	Active

Closure date	To be advised

3. Management history

None

4. Risk assessment

The potential risks associated with the Mining Area closure are:

- Level of revegetation success
- Weeds

5. Closure assumptions

- All topsoil will be respread on the excavated areas as part of the rehabilitation programme.

6. Knowledge gaps

- None known

7. Rehabilitation and Closure Activities

During operations

- Progressive clearing will allow for the orderly and manageable salvage of topsoil, mulch, plant material and seed collection to align with the regeneration project.
- The topsoil removed from cleared areas will be retained for use in the rehabilitation program. The topsoil will be stockpiled in an appropriate area on site or directly transferred to the completed excavation stage for rehabilitation works. The first section of topsoil will be recovered allowing for the best seed retention at a later date. This technique will utilise the best available research into Banksia re-establishment that Rocla has been conducting in partnership with the BGPA since 1994.
- Rocla will initially will harvest native Banksia spp and Mari seeds (and use topsoil if available) and focus the first phase of rehabilitation on the 1.75 ha previously mined areas located outside of the proposed sand excavation area. Rocla proposes to commence the rehabilitation of this area in advance of the proposed clearing and sand extraction. This outcome will assist both in restoring native vegetation to a cleared area but also with dust control.

Proposed rehabilitation stages

- The proposed rehabilitation program will consist of application of topsoil to a depth of up to ten centimetres to the rehabilitation areas and seeding. Where possible topsoil and overburden will be directly transferred from an area being cleared to an area to be rehabilitated. Where this is not possible, the topsoil and overburden will be stored in low piles for future use in rehabilitation.
- The levelled topsoil will be ripped to a depth of 50 to 80 cm with wing shaped tynes. This is intended to eliminate the compaction created in the soil profile during the excavation process.
- A supplementary seed mix containing species which do not regenerate readily from the replaced topsoil will be distributed over the rehabilitation area by hand.

• Slopes are shaped and battered with retained topsoil. These will then be spread with vegetative debris, which acts as a barrier to wind erosion and maximises microhabitats. • Assessment of the success of the rehabilitation works will be undertaken annually with additional supplementary seeding, planting or re-broadcasting of seed applied in the subsequent winter if considered necessary by the BGPA and Rocla. • Brushing with larger logs (remaining following regrowth clearing) will occur on the perimeter of rehabilitation sites to decrease the potential for erosion and vehicle movement.

8. Task Register

No.	Description (to be expanded)	Timing	Status
1	Reference site	2014	
2	Interim completion criteria	2014	This document
3	Stakeholder consultation	2014 & on-going	In progress and on-going
4	Native vegetation seed		2015
5	Decommissioning plan		Not yet required
6	Decommission/dismantle		Not yet required
7	Earthworks		Not yet required
8	Seeding		Not yet required
9	Monitor rehabilitation		Not yet required
10	Relinquishment		Not yet required

Table 15 - Topsoil and overburden stockpiles - Closure Implementation Plan

10.2.3 Access road closure implementation plan

Access road - Closure Implementation Plan	
1. Scope	
• Access road from M70/357 to sand excavation area	
2. Description and setting	
Location	M70/1142
Area of disturbance	Access road from Lot 467 to Lot 140 - 0.16 ha (0.10 ha will require clearing)

Current status	Inactive
Closure date	To be advised

3. Management history

Will join onto existing road within M70/357

4. Risk assessment

The potential risks associated with the Mining Area closure are:

- Level of revegetation success
- Weeds

5. Closure assumptions

- All access roads will be fully rehabilitated as part of the rehabilitation programme.

6. Knowledge gaps

- None known

7. Rehabilitation and Closure Activities

During operations

- It is proposed to create an internal access road linking mining tenement M70/1142 and M70/1088 within Lot 467 to Rocla's existing site M70/357 within Lot 140 Armadale Road.

Post operations

- Full rehabilitation as per sand excavation area

8. Task Register

No.	Description (to be expanded)	Timing	Status
1	Reference site	2014	Adjacent undisturbed parts of the Leases
2	Interim completion criteria	2014	This document
3	Stakeholder consultation	2014 & on-going	In progress and on-going
4	Native vegetation seed		2015
5	Decommissioning plan		Not yet required
6	Decommission/dismantle		Not yet required
7	Earthworks		Not yet required
8	Seeding		Not yet required

9	Monitor rehabilitation		Not yet required
10	Relinquishment		Not yet required

Table 16 - Access road closure implementation plan

10.3 Unplanned closure

Care and maintenance procedures will be implemented in the event mining operations are suspended. The extent and detail of procedures will be dependent in part on the nature and duration of any suspension of mining operations. An overall objective of measures undertaken in any care and maintenance phase will be to reduce safety and environmental risk.

Rehabilitation activities during unplanned closure would generally include:

- Maintenance of environmental monitoring and reporting programmes;
- Removal of hazardous materials and fuel from site (other than to maintain essential services and subject to the duration of any suspension);
- Installation of additional safety measures (signage, fencing, bunding) as may be necessary to ensure safety in the absence of an active mining operation;
- Retention of a site caretaker to ensure essential maintenance and that safety precautions such as barriers and signage are kept in good order; and
- Removal or storage of equipment/infrastructure to protect from fire.

The full scope of a care and maintenance programme will be agreed with stakeholders in the event of a decision to suspend mining operations.

11. Closure monitoring and maintenance

11.1 Monitoring programme and procedures

The objectives of rehabilitation monitoring are to:

- Carry out general observations of the progress of revegetation, presence of excessive erosion, presence of weeds, and assess landform stability towards achieving the completion criteria for each Management Unit.
- Determine remediation measures if necessary.
- Take photographs of relevant observations, showing success or otherwise of rehabilitation.

The monitoring schedule proposed in the Mining Proposal is:

Issue	Parameter	Frequency	Time Frame	Responsibility
Rehabilitation	Finalise topography levels.	Once	Prior to site works.	Rocla.
	Finalise native species list for re-vegetation.	Once	Prior to the commencement of rehabilitation works.	Rocla (in collaboration with BGPA).
	Undertake topsoil replacement.	Once a year for life of mine	Every year for the duration of mining.	Rocla.
	Undertake supplementary seed planting.	Once a year	Post-application of topsoil	BGPA.
	Undertake planting (if required).	Once a year	Post-application of topsoil	BGPA.
	Weed Control. Weeds sprayed with an appropriate herbicide or weeded by hand in accordance with the DoW's Herbicide use in Wetlands (WRC 2001).	As required	Two years from initial planting.	Rocla and Rocla.
	Establish two quadrats (2 m x 2 m) plots.	Once	When first year of rehabilitation has been completed.	Rocla.
	Survey quadrats.	Annually (spring)	Five years.	Rocla.
	Assess the success of the re-establishment of vegetation planted.	Annually	Five years.	Rocla.

Table 17 - Monitoring schedule

Currently Rocla recognises the difficulties in planning so far into the future and commits to provide funds and resources for any remedial rehabilitation work if required at the time.

12. Management of information and data

All information specifically relating to closure and rehabilitation are, and will continue to be retained electronically and include:

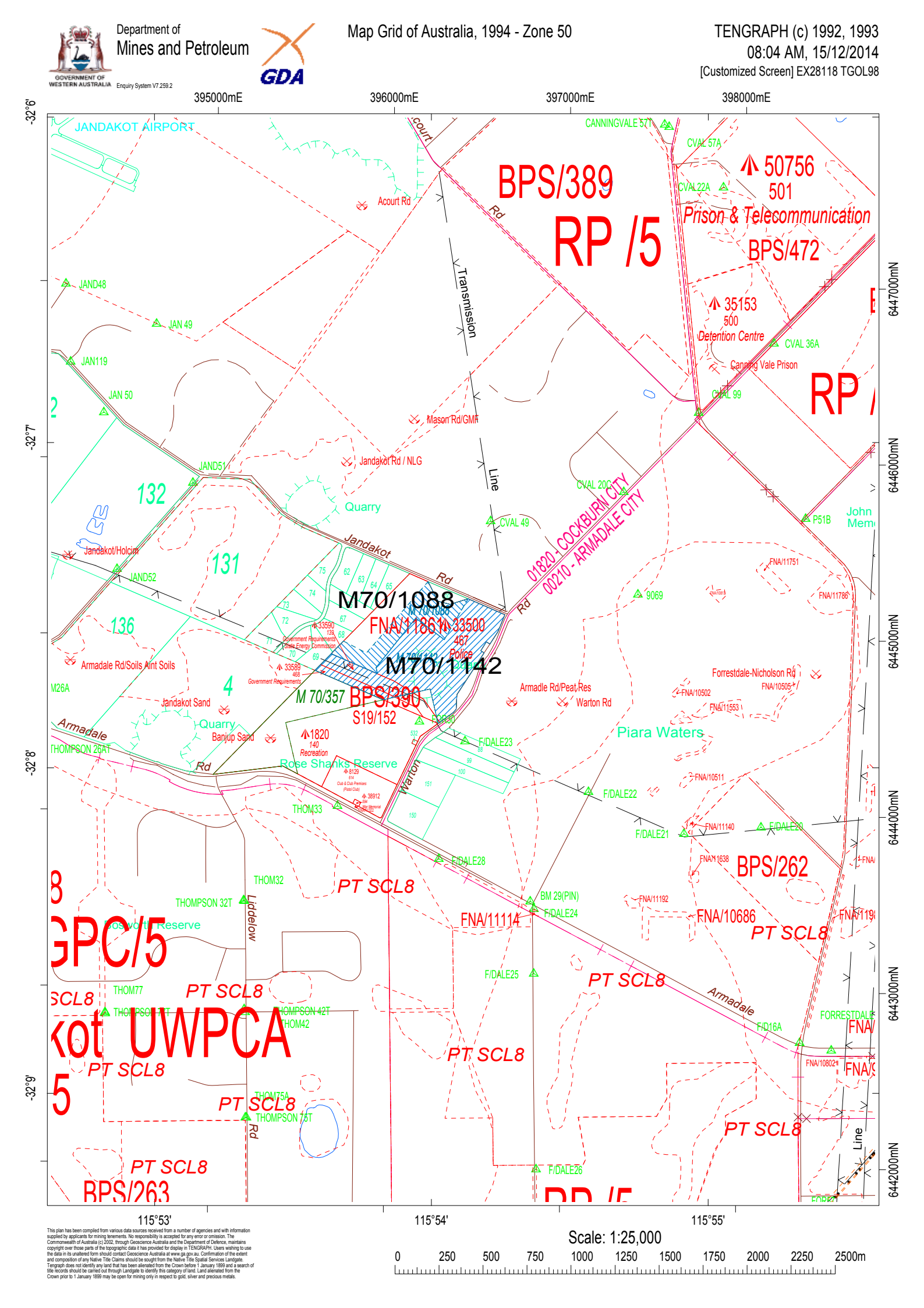
- Annual Environmental Reports
- Mine plans and production information
- Photographic library of the Project
- Stakeholder correspondence
- Mining Proposals and Mine Closure Plans

13. References

RPS, 2014. Warton Road Mining Proposal Mining Tenements M70/1088 and M70/1142, Banjup, RPS Environment and Planning Pty Ltd November 2014

APPENDIX I – Figures

Figure 1 – Project Location plan (Tengraph)



This plan has been compiled from various data sources received from a number of agencies and with information supplied by applicants for mining tenements. No responsibility is accepted for any error or omission. The Commonwealth of Australia (c) 2002, through Geoscience Australia and the Department of Defence, maintains copyright over those parts of the topographic data it has provided for display in TENGRAPH. Users wishing to use the data in its unaltered form should contact Geoscience Australia at www.ga.gov.au. Confirmation of the extent and composition of any Native Title Claims should be sought from the Native Title Spatial Services Landgate. Tengraph does not identify any land that has been alienated from the Crown before 1 January 1899 and a search of title records should be carried out through Landgate to identify this category of land. Land alienated from the Crown prior to 1 January 1899 may be open for mining only in respect to gold, silver and precious metals.

Scale: 1:25,000

0 250 500 750 1000 1250 1500 1750 2000 2250 2500m

Figure 2 - Proposed mining and rehabilitation areas

(after RPS, 2014)

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LEGEND

- Site Boundary
- Mining Tenement
- Proposed Sand Extraction Area and Priority Sand Resource (SPP 2.4)
- Area Historically Cleared within the Proposed Mining Extraction Area
- Remnant Vegetation to be Cleared within the Proposed Sand Extraction Area
- Rehabilitation Area
- Potential Additional Rehabilitation Area
- Future Sand Mining Stage - Subject to Approvals
- Remaining Native Vegetation within Lot 467
- Internal Road (through existing cleared areas)
- Internal Road (through existing cleared areas)
- Proposed Internal Access Road

EXISTING ROCLA MINING AREA

EXISTING SITE INFRASTRUCTURE & REFUELING STATION

PROPOSED MINING AND REHABILITATION AREAS	Area (ha)
Proposed Sand Extraction Area (will be rehabilitated)	9.56 ha
Area Historically Cleared within the Sand Extraction Area	5.63 ha
Remnant Vegetation to be Cleared within the Proposed Sand Extraction Area	3.93 ha
Potential Additional Rehabilitation Area	1.75 ha
Future Sand Mining Stage - Subject to Approvals	10.16 ha
Remaining Native Vegetation within Lot 467	28.29 ha
PROPOSED INTERNAL ACCESS ROAD	
Internal Road (through existing cleared areas)	0.95 ha
Cleared Area Within the Proposed Access Track	0.06 ha
Vegetation to be Cleared Within the Proposed Access Track	0.10 ha
Proposed Access Track Area Total	**1.11 ha**

RPS

Job Number: L10590
Date: 30.10.14
Scale: 1: 5,000 @ A3
Revision: D
Drafted by: MA
Source: Orthophoto (2014), Cadastre (2011) - Landgate Mining Tenement - Landgate, 2010

0 25 50 100 150 200 m

Figure 2

Mining Leases M70/1088 and M70/1142

Figure 3 - Topography

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LEGEND
- Site Boundary
- Proposed Sand Mining Footprint
- Mining Tenement
- Cadastre
- Contour (mAHD)

JANDAKOT RD
MASON RD
SKOTSCH RD
M 70/1088
M 70/1142
WARTON RD
ARMADALE RD
LUDDELOW RD

RPS

Job Number: L10590
Date: 17.10.14
Scale: 1:5000 @ A3
Revision: B
Drafted by: MA
Source: Orthophoto & Cadastre - Landgate, 2011 Mining Tenement - Landgate, 2010 Contours - Landgate & ION Services

0 25 50 100 150 200 m

Figure 4

Topography

Figure 4 – Acid sulphate soils

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LEGEND

- Site Boundary
- Proposed Sand Mining Footprint
- Mining Tenement
- Cadastre

Acid Sulfate Soil Risk Mapping

- High to moderate risk
- Moderate to low risk

JANDAKOT RD
LOUISIANA GLEN
ACKWORTH RD
WARTON RD
SKOTSCH RD
M 70/1088
M 70/1142
SOUTHAMPTON DR
DELFT L
DELFT L
NAPOLI AV
PADUA RD
BRESCIA L
MASON RD
MURDOCH WY
CARLSON PL
LIDDELOW RD
ARMADALE RD
WRIGHT RD

RPS

Job Number: L10590
Date: 17.10.14
Scale: 1:7500 @ A3
Revision: B
Drafted by: MA
Source: Orthophoto, Cadastre - Landgate, 2013 Mining Tenement - Landgate, 2010. Acid Sulphate Soil Mapping - DEC 2010.

0 37.5 75 150 225 300 metres

Figure 5

Acid Sulfate Soil Risk Mapping

Figure 5 – Bush Forever and Geomorphic wetlands

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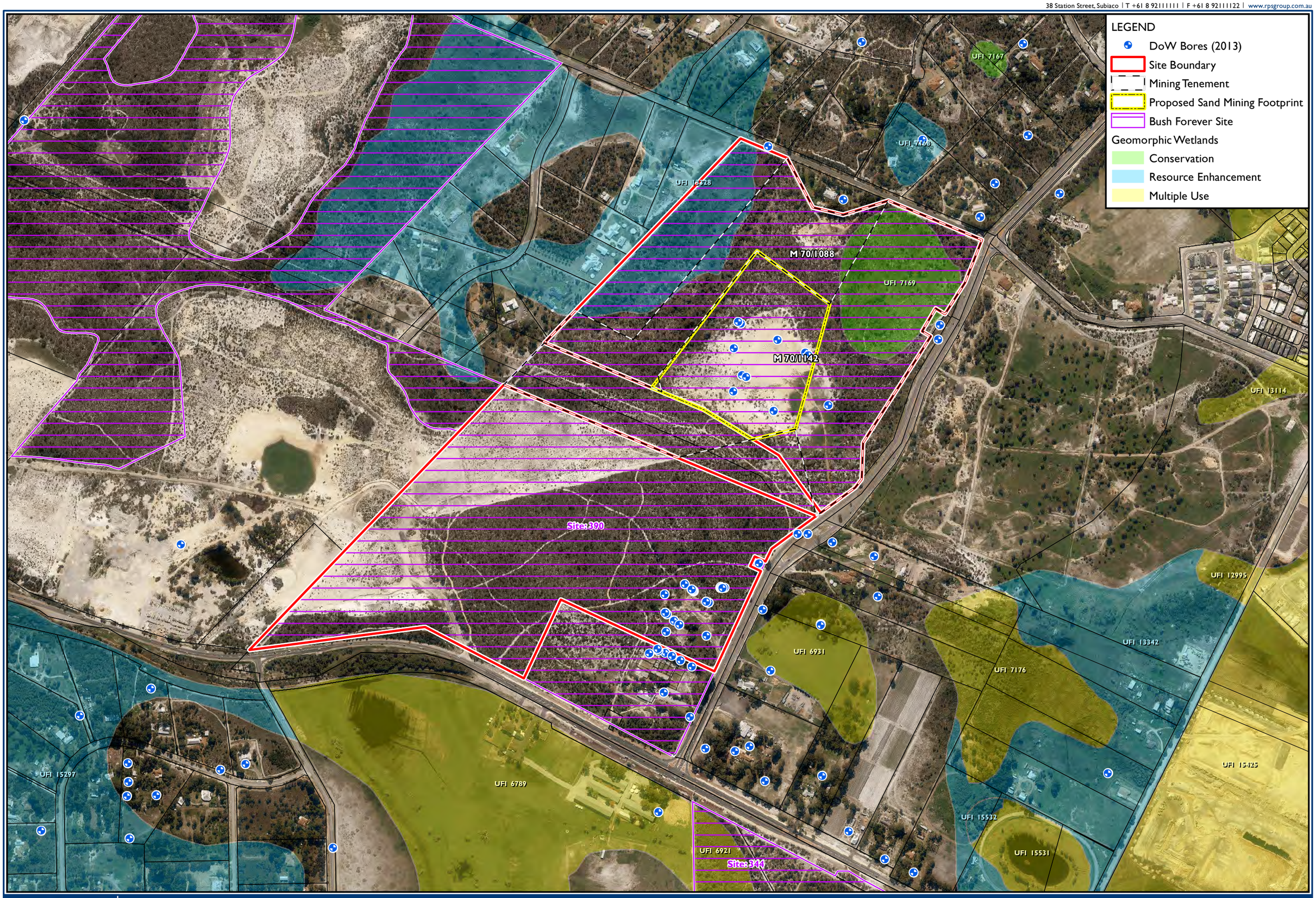

RPS

Job Number: L10590
Date: 23.09.13
Scale: 1:7500 @ A3
Revision: B
Drafted by: MA
Source: Cadastre (2011) & Orthophoto (2014) - Landgate Wetlands - DPaW, 2013 Bush Forever - DPI, 2009

0 37.5 75 150 225 300 metres

Figure 3

Bush Forever and Geomorphic Wetlands Within the Mining Leases

Figure 6 – Vegetation units

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VEGETATION UNITS

(i) *Banksia attenuata-Banksia menziesii* low woodlands on dune slopes

BaBm *Banksia attenuata*, *Banksia menziesii*, (*Allocasuarina fraserina*) low woodland over *Allocasuarina humilis* shrubland over *Hibbertia hypericoides*, *Astroloma xerophyllum* low shrubland over *Desmocladus flexuosus*, *Amphipogon turbinatus* open sedgeland/grassland.

(ii) *Melaleuca preissiana* mixed woodlands on gentle slopes and flats around the base of the dune

MpAa *Melaleuca preissiana*, (*Allocasuarina fraseriana*) low open forest over *Xanthorrhoea preissii*, *Astartea affinis* open shrubland over *Hypocalymma angustifolium* scattered low shrubs over *Dasypogon bromeliifolius* open herbland to herbland.

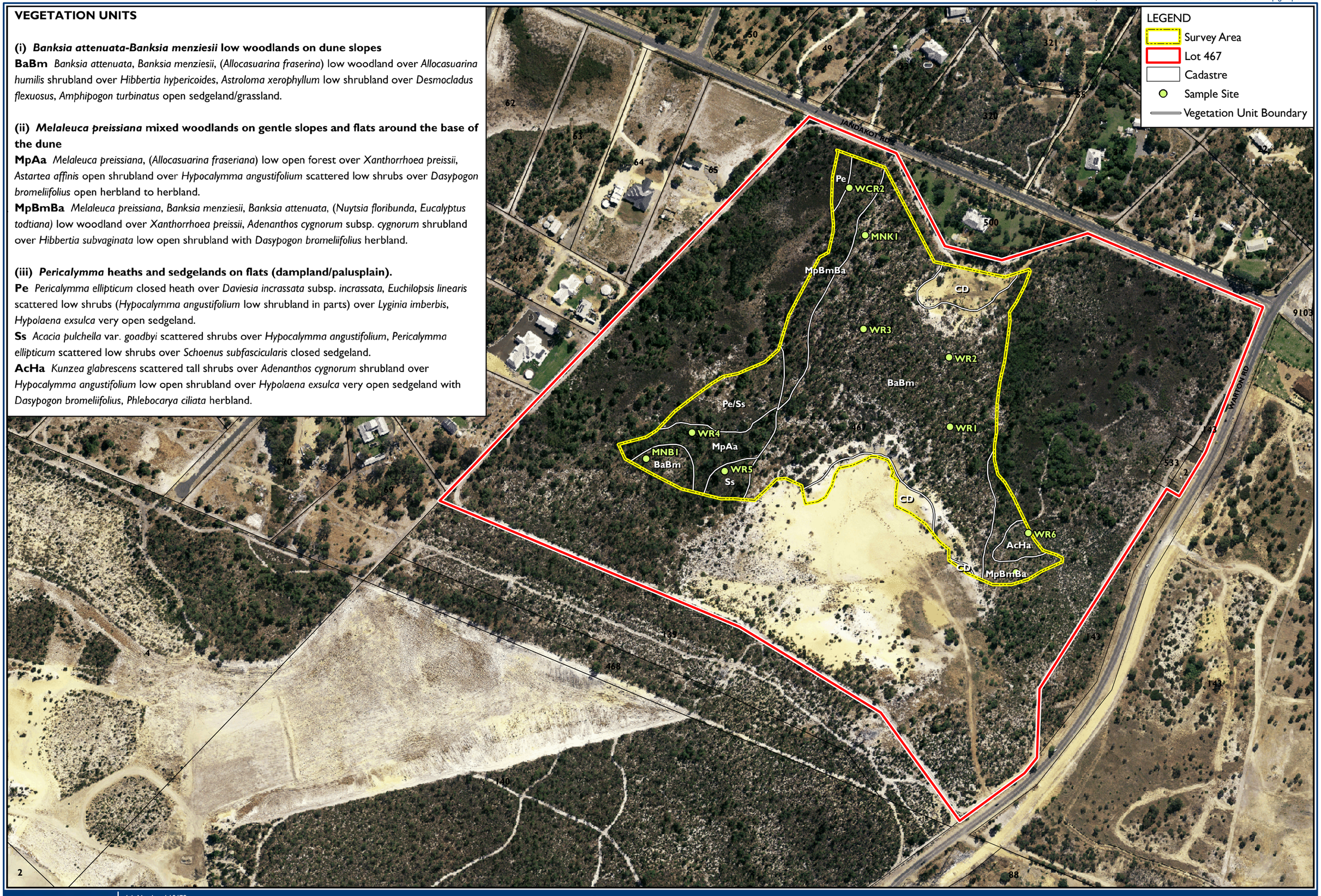
MpBmBa *Melaleuca preissiana*, *Banksia menziesii*, *Banksia attenuata*, (*Nuytsia floribunda*, *Eucalyptus todtiana*) low woodland over *Xanthorrhoea preissii*, *Adenanthos cygnorum* subsp. *cygnorum* shrubland over *Hibbertia subvaginata* low open shrubland with *Dasypogon bromeliifolius* herbland.

(iii) *Pericalymma* heaths and sedgelands on flats (dampland/palusplain).

Pe *Pericalymma ellipticum* closed heath over *Daviesia incrassata* subsp. *incrassata*, *Euchilopsis linearis* scattered low shrubs (*Hypocalymma angustifolium* low shrubland in parts) over *Lyginia imberbis*, *Hypolaena exsulca* very open sedgeland.

Ss *Acacia pulchella* var. *goadbyi* scattered shrubs over *Hypocalymma angustifolium*, *Pericalymma ellipticum* scattered low shrubs over *Schoenus subfasciculatis* closed sedgeland.

AcHa *Kunzea glabrescens* scattered tall shrubs over *Adenanthos cygnorum* shrubland over *Hypocalymma angustifolium* low open shrubland over *Hypolaena exsulca* very open sedgeland with *Dasypogon bromeliifolius*, *Phlebocarya ciliata* herbland.



Job Number: L10478
Date: 20.05.11
Scale: 1:4000 @ A3
Revision: 0
Drafted by: SC
Source: Cadastre & Orthophoto - Landgate 2010

0 25 50 100 150 200 metres

Figure 5

Vegetation Units

Figure 7 - Rare flora , TECs and PECs

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BIBRA LAKE
JANDAKOT AIRPORT
YANGEBUP LAKE
THOMSONS LAKE
FORRESTDALE LAKE

Caladenia huegelii
Tripterococcus paniculatus
Aponogeton hexatepalus
Schoenus capillifolius
Diuris purdiei
Drakaea micrantha
Caladenia huegelii Rchb.f.
Byblis gigantea
Verticordia lindleyi subsp. lindleyi
Schoenus pennisetis
Stylidium longitubum
Jacksonia sericea
Jacksonia gracillima
Drosera occidentalis subsp. occidentalis
Cyathochaeta teretifolia

SCP10a
SCP08
SCP22
SCP21c

LEGEND

- Lot 467
- Survey Area

TEC / PEC Location

- TEC (Endangered)
- TEC (Vulnerable)
- PEC (Priority 2)
- PEC (Priority 3)

Rare Flora Location

- Declared Rare Flora
- Priority 1
- Priority 2
- Priority 3
- Priority 4

RPS

Job Number: L10478
Date: 20.05.11
Scale: 1:35000 @ A3
Revision: 0
Drafted by: SC
Source: Cadastre & Orthophoto - Landgate 2010 DRF TEC/PEC - DEC

0 0.25 0.5 1 1.5 2 km

Figure 3

Location of DEC Records of Rare Flora and TECs/PECs

Figure 8 - Wetland vegetation

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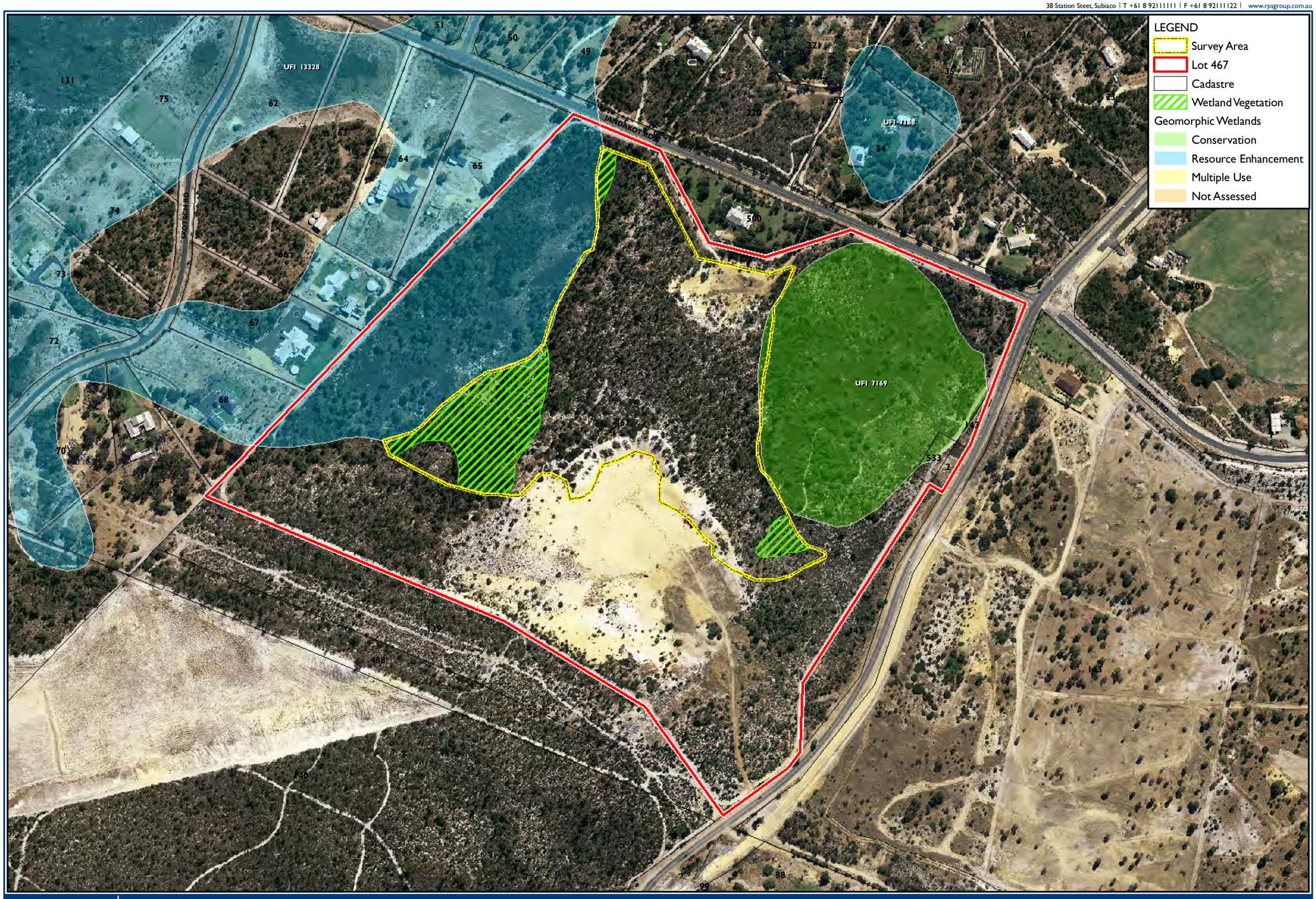

RPS

Job Number: L10478
Date: 20.05.11
Scale: 1:4000 @ A3
Revision: 0
Drafted by: SC
Source: Cadastre & Orthophoto - Landgate 2010

0 25 50 100 150 200 metres

Figure 6

Wetland Vegetation