

Placer Dome Asia Pacific

Flora Study for proposed land clearing Red Hill, Mining Leases M27/184 & M27/127

Introduction

Minesite Rehabilitation Services Pty Ltd carried out a flora study of 2 sites that are proposed to be cleared at the Red Hill operations of Placer Dome Asia Pacific on The 15th December 2004. The Red Hill operations are located in the South-Western Interzone of the Coolgardie botanical district approx 20km northeast of Kalgoorlie.

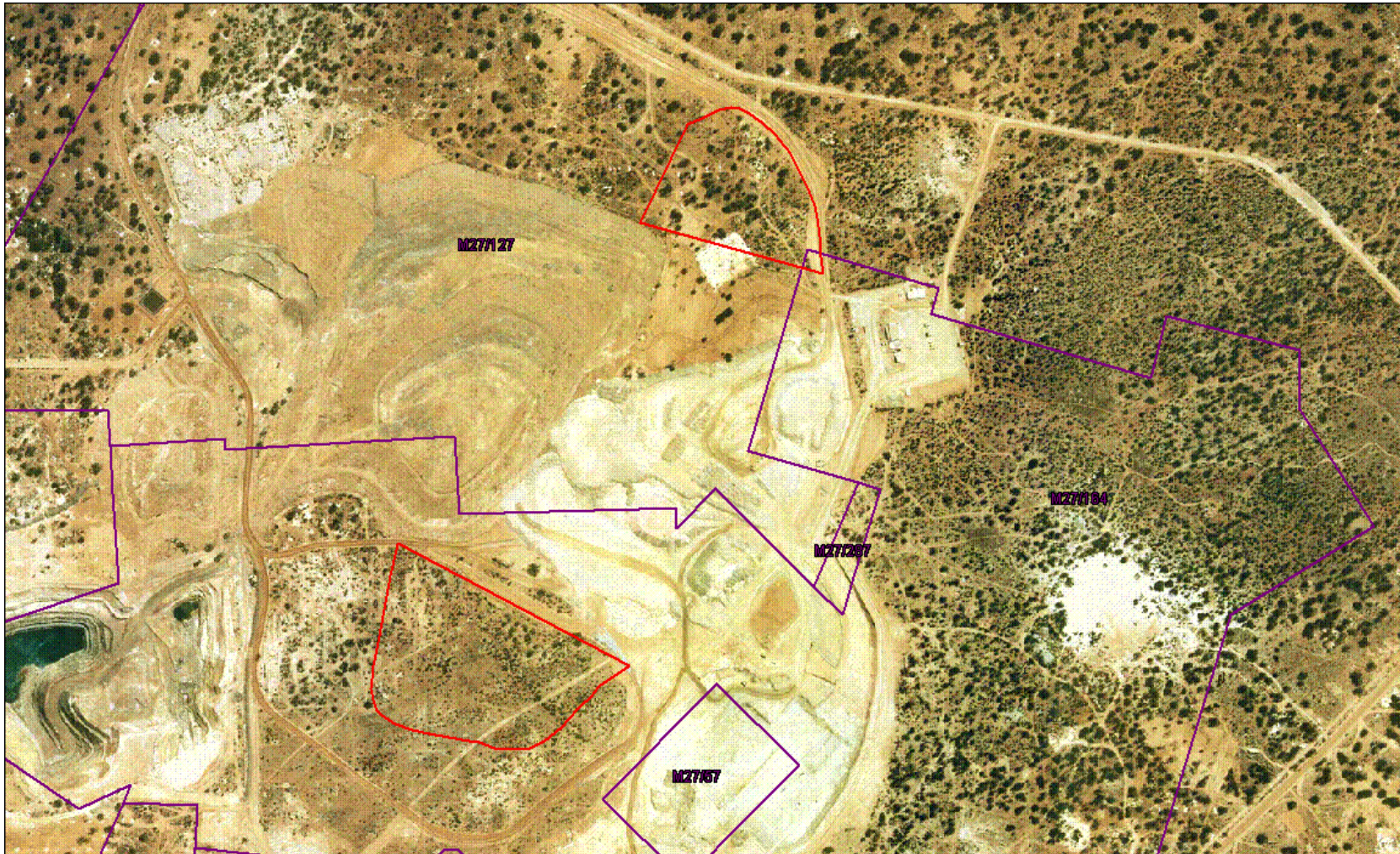
There were 2 areas of study for the purpose of this report they were referred to as **Area 1** and **Area 2**.

The methodology for the study was opportunistic sightings with the areas being traversed at 10-15m intervals with the aid of GPS. This method was chosen for the study given the small size of the areas to be surveyed

Area 1 is approx 2.5ha and is located in the eastern portion of the minesite, its western boundary is the existing waste rock dump. The Paddington haul road defines the southern and eastern boundaries. The area of study is typical of an open Goldfields eucalypt woodlands with an upper storey dominated by eucalypts a middle story of acacia's, eremophila's and a lower story comprising of chenopod's. There is evidence of considerable previous disturbance on the site, there are numerous old mine diggings and tracks. Dung droppings also indicate the site is well grazed by kangaroo's and rabbits. The area is level with its surrounding natural environment with no obvious drainage lines running through it.

Area 2 is approx 7-8ha and is located in the north-western portion of the minesite, the top of a rocky slope defines the southern and western boundaries. This slopes towards the eastern boundary, which is the base of an existing waste rock dump. An area of considerable disturbance defines the northern boundary with a number of old mine shafts present. The vegetation on the site consists of middle story species of acacia's, eremophila's, and dodonea's, with a lower story of chenopods mainly sclerolena's, with atriplex and ptilotus species present. There are indications that a number of annual species are present on the site, however the accurate recording of these species was not able to be undertaken due to the season (dry December) of the study. Dung droppings also indicate the site is well grazed by kangaroo's. A number of old mine workings are also present on the site.

Map showing the two areas that were surveyed. Both areas are defined within the red lines with area 1 in the top right hand corner of the photograph and area 2 at the bottom left hand side.



Vegetation Unit Descriptions

Area 1

Open Eucalypt Woodland



Typical view of “Open Eucalypt Woodland” looking from Paddington haul rd towards waste rock dump.

The open eucalypt woodland is characterised by an upper story of Eucalypts (*E. griffithsii*, *E. lesouefii*, *E. salmonphloia*, *E. celastroides*, *E. salubris* var *glauca* and *E. transcontinentalis*). There was a sporadic middle story of acacia's, eremophila's and dodonea's and a lower story of chenopods. The distribution of the middle and lower

stories was related to the previous disturbance on the site, with the lower story chenopods favoring areas of disturbance with their ability to re-colonise. The soils of this site appear to be of a deep red clay-loam and may well be suited for use as a topsoil cover in future rehabilitation processes. A detailed study of the soil was not undertaken.

Clearing Impacts

The likely clearing impacts on this area (**Area 1**) would be negligible. There may be some salvageable specialty timbers on the site but not in sufficient quantities to be of economic value. Reasons for this include the size of the site. Current degraded condition of the site due to previous disturbance. There are no obvious drainage lines on or through the site. The location of the waste rock dump and haul rd surrounding the site will stop any likely increased runoff from leaving the site.

During the course of the flora study any opportunistic fauna sightings were also recorded. Other than the dung of kangaroos and rabbits no fauna was sighted. No significant fauna habitats or nestings were observed during the study period.

The following is a list of species found in the Area 1 Open Eucalypt Woodland vegetation unit

Family	Genus	Species	Var
Amaranthaceae	Ptilotus	aeroides	
	Ptilotus	obovatus	
Asclepiadaceae	Marsdenia	australis	
Astreaceae	Olearia	mulleri	
	Cratystylis	conocephala	
Caesalpiniaceae	Senna	artemisioides	nemophila
Casuarinaceae	Casuarina	pauper	
Chenopiaceae	Atriplex	bunburyana	
	Atriplex	nummularia	

	Atriplex	vesicaria	
	Dissocarpus	paradoxus	
	Erichiton	scerolaenoides	
	Halosarcia	sp	
	Maireana	georgeii	
	Maireana	glomerifolia	
	Maireana	sedifolia	
	Maireana	tomentosa	
	Maireana	triptera	
	Rhagodia	drummondii	
	Sclerolaena	diacantha	
	Sclerolaena	obliquicupis	
	Sclerolaena	patenticuspis	
Frankeniaceae	Frankenia	sp	
Goodeniaceae	Scaevola	spinescens	
Mimosaceae	Acacia	acuminata	
	Acacia	tetragonophylla	
Myoporaceae	Eremophila	glabra	
	Eremophila	scorparia	
	Eremophila	oldfieldii	
	Eremophila	latrobei	
	Eremophila	parvifolia	
Myrtaceae	Eucalyptus	celastroides	
	Eucalyptus	griffithsii	
	Eucalyptus	lesouefii	
	Eucalyptus	salmonphloia	
	Eucalyptus	salubris	glauca
	Eucalyptus	transcontinentalis	

Sapindaceae	Dodonea	lobulata	
	Dodonea	viscosa	
Santalaceae	Exocarpus	aphyllus	
Solanaceae	Lycium	australe	
	Solanum	orbiculatum	

Area 2

Rocky Slope



A typical view of vegetation on the “Rocky Slope” looking from top towards waste rock dump

The sloping terrain of this site has a surface that is gravel and rocks strewn with some isolated pockets of shallow topsoil. These isolated pockets support a middle story of eremophila's, dodonea's, and acaia's. A lower storey of chenopods (*Atriplex*, *Maireana*, *Sclerolaena*) with *Ptilotus obovatus* inhabiting the remainder of the site where the soil is shallow. There is evidence that a number of small annual's (*Asteraceae*, *Poaceae*) are present on the site but these were unable to be identified due to the dry season. On the

northern boundary there is a small upper story component of Eucalyptus (E.campaspe, E.salubris var glauca) this is restricted to a few individual tree's.

The north-eastern corner of the site includes a small area <0.5ha that contains previous rehabilitation. Species within this area include Eucalyptus, Attriplex, Dodonea, Senna, Ptilotus and Maireana.

Clearing Impacts

The likely clearing impacts on this area would be negligible. Reasons for this include the size of the site. Current degraded condition due to previous disturbance. The slope of the site towards the base of the existing waste rock dump collecting any increased runoff.

During the course of the flora study any opportunistic fauna sightings were also recorded. Other than the dung of kangaroos and the observance of one kangaroo sheltering in low shade no other fauna was recorded. No significant fauna habitats or nestings were observed during the study period.

The following is a list of species found in the Area 2 Rocky Slope vegetation unit

Family	Genus	Species	Var
Amaranthaceae	Ptilotus	obovatus	
Asclepiadaceae	Marsdenia	australis	
Astreaceae	Olearia	muelleri	
Caesalpiniaceae	Senna	artemisioides	nemophila
Chenopiaceae	Atriplex	acutibractea	
	Atriplex	bunburyana	
	Atriplex	nummularia	
	Atriplex	vesicaria	
	Chenopodium	gaudichaudianum	
	Dissocarpus	paradoxus	

	Maireana	georgeii	
	Maireana	sedifolia	
	Maireana	tomentosa	
	Maireana	triptera	
	Rhagodia	drummondii	
	Sclerolaena	diacantha	
	Sclerolaena	obliquicupis	
	Sclerolaena	patenticuspis	
Goodeniaceae	Scaevola	spinescens	
Mimosaceae	Acacia	acuminata	
	Acacia	erinacea	
	Acacia	tetragonophylla	
Myoporaceae	Eremophila	glabra	
	Eremophila	scorparia	
	Eremophila	oldfieldii	
	Eremophila	latrobei	
Myrtaceae	Eucalyptus	campaspe	
	Eucalyptus	salubris	glauca
	Eucalyptus	salmonphloia	
Poaceae	Stipa	scabra	
Sapindaceae	Dodonea	lobulata	
Santalaceae	Exocarpus	aphyllus	
Solanaceae	Lycium	australe	
	Solanum	orbiculatum	
Zygophyllaceae	Zygophyllum	aurantiacum	