

Report on Works undertaken ~
2002 – 2003 Financial Year for the
REHABILITATION OF MINING LANDS TRUST FUND

Project:: rehabilitation of land alluvially mined for tin in the vicinity of
Gladstone and South Mount Cameron, North East Tasmania

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Photograph:
SOUTH MT CAMERON / ENDURANCE AREA, NE TASMANIA, 2002

REHABILITATION OF MINING LANDS TRUST FUND

Report on Works undertaken ~2002 – 2003 Financial Year

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REHABILITATION OF MINING LANDS TRUST FUND

Report on Works undertaken ~2002 – 2003 Financial Year

Introduction

This report details rehabilitation of abandoned alluvial tin mining operations in the Gladstone / South Mt Cameron area undertaken in the past year. These works are a continuation of sites first targeted by the Trust in 1997 for rectification. They are based on appraisals of mine rehabilitation needs on abandoned alluvial tin mines by D Cook, (1997) and also on reports and on ground works undertaken by consultants, SEMF in the period 1997 to 1999.

This report details projects that have expanded, maintained or rectified the three principal SEMF identified localities in need of treatment. These are known locally as: *Endurance*, at South Mt Cameron, *Star Hill*, NE of Gladstone, and *Monarch* at the foot of Mt Cameron on the northern coastal side.

This year saw the completion of the intensive remedial works program. All programmed works were completed. Allocated funds were sufficient to include an extra area of degraded drainage channel spoil at "Cat Gully". Three areas were comprehensively rehabilitated, and previously treated areas were subject to actions designed to maintain fertility, control weeds and address any appreciable instability of earlier erosion reduction measures. Mining rehabilitation techniques utilized here have continued to be medium to low 'tech', with moderately high labour input, low cost local materials and flexible practical, non-prescriptive approaches to implementing the works program. After some delays in commencing his tasks, the local contractor that undertook the major earthworks tasks has again produced a most satisfactory result. The use of the writer's equipment on a needs basis, such as tools, 4 wheel bike, trailers, tractors has also contributed to cost effective rehabilitation. Continuation of the committed performance from a team of three local workers who again partook of this irregular employment must again be acknowledged., On the basis of funds expended 'per hectare of severely eroded gully' efficiencies would be comparable with the good results of the previous year.

The mining rehabilitation procedures and outcomes for eight NE projects undertaken are detailed with the aid of photographs and summary maps. The projects are listed below in decreasing scale of the works undertaken this year. Recommendations for the 2003 – 04 period are included.

Materials used ~ Mine rehabilitation 2000 to 2004


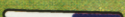



Table 1

Materials	Quantity Used 2000 - 2001	Quantity Used 2001 - 2002	Quantity Used 2002 -2003	Projected Quantity Used 2003 -2004
Rock (silcrete and forkings from Endurance mine)	200 m ³ / 25 loads	Nil ~ all exhausted	Nil ~ all exhausted	
Rock (basalt for drains)	nil	50 plus x 8m3 loads	20 plus x 8m3 loads	[There is some 50 m3 in a stockpile near Little Blue Lake]
Tailings (from Endurance mine)	560 m ³ / 70 loads	nil	nil	
Pyrethrum (spent marc)	360 m ³ / 6 loads	480m3 /8 loads	nil	
Lime (agricultural)	40 m ³ /2 loads	nil	nil	
Gypsum (conditioner)	20 x 50kg bags	Balance of stock 12 x 50kg bags	nil	
Fertiliser (high analysis, maybe with trace elements)	6 t, (of low analysis)	7 t bulk of 3.15.13 2 t in 25 kg bags of 3.15.13	6.5 t bulk of 3.15.13 2 t in 25 kg bags of 3.15.13	1.2 t of bagged 3.15.13 in 25 kg bags.
Jute Matting @ 500m x1.2m + staples	13 bales	30 bales	12 bales	nil
Geotextile	Approx 2 rolls	Approx 1 roll	Approx 0.3 of a roll	
Grass seed –e.g. cheap tamma ryegrass	nil	nil	nil	
Scrub	15 trailer loads	10 trailer loads	~14 x5m3 trailer loads	??
Straw	Nil big square	58 big square	0 big square	
Hay / straw	50 round bales	4 round bales	3 round bales	
Hay / straw	100 bales	700 bales	700 bales	Approx 15 bales needed
Sandbags	nil	8	2	
Native Seed	Balance of stock bar 2kg mixed natives	<i>Balance of stock plus Wildseed order of about 16kg</i>	<i>Balance of stock less 3kg retained</i>	<i>Use balance of stock?</i>
Native Seed Collected (<i>Acacia sophore</i> of local providence)	4 kg	4kg mixed acacia seed	2kg mixed acacia seed	nil
Seedlings	Nil	1000 @ \$0.40 each	nil	nil
Temporary Fencing	Nil	Approx. 500m	nil	
Misc.- Materials	Extra skewers	Extra skewers	300kg sawdust, 400l of thistle spray	Est 500l of thistle and "hock" spray applied

Location Map ~ Clay Pit Area, South Mt Cameron

Mine Rehabilitation Trust Fund. ~ Alluvial Tin Mining Gully Erosion Control Works 1998- 2003

Legend

-  Gabion Baskets
-  Rock Lined Drains
-  Cutoff Drains
-  Area Intensively Rehabilitated
-  Area Scarified, Seeded & Fertilised

N2 Gully [1998-99]
(gabions shown)

Clay Pit Gully [2002]

CLAY PIT
MINE

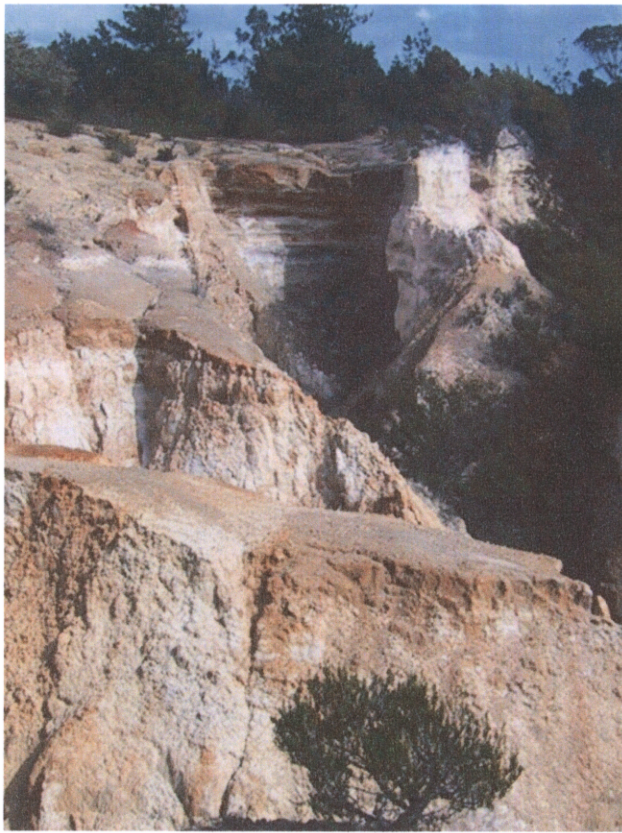
KAOLINITE
MINE

N2 south east gully 2003

Tailrace Gully [2003]

R Munro September 2003

5 cm



Photographs before and after ~ Clay Pit Area~ **N2 South East Gully' 2003.**





'Tail Race Gully' ~ Stages of treatment ~ construction of rock drains (above), finished gully (below)



Location Map ~ Clay Pit Area, South Mt Cameron

Mine Rehabilitation Trust Fund. ~ Alluvial Tin Mining Gully Erosion Control Works 1998- 2003

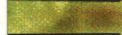
Legend



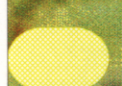
Gabion Baskets



Rock Lined Drains



Cutoff Drains



Area Fertilised
in 2003

Clav Pit Gully [2002]

CLAY PIT
MINE

N2 Gully [1998-99]

KAOLINITE
MINE

N2 south east gully 2003

Tailrace Gully [2003]

R Munro September 2003

5 cm

Fig 1a.

1 'Tail Race Gully' and 'N2 South East Gully' ~ vicinity of the Clay Pit, Endurance Mine, South Mt Cameron.

Background

Rehabilitation of these two gullies was the major works input for this year's program. Works undertaken are detailed below. The location and extent are shown on figure 1.

Rehabilitation Treatment ~ Planned and undertaken

Reshaping of both these gullies resulted in the following areas being rehabilitated:

Tail Race Gully:

Intensive treatment [Reshaping, cereal stubble, jute matting, seed and fertiliser] – 0.87 ha

Remedial treatment [Scarifying, seed and fertiliser] – 0.34 ha

N2 South East Gully:

Intensive treatment [Reshaping, cereal stubble, jute matting, seed and fertiliser] – 0.36 ha

Remedial treatment [Scarifying, seed and fertiliser] – 0.87 ha

Materials & Techniques used ~ Gully rehabilitation 2002 / 2003

The techniques used in 2002-2003 are continued refinements of those utilized in the previous years. They are described in detail in the earlier reports.

- "Fluffed" straw with an overlay of pinned jute matting was used wherever possible.]. A number of sources of straw were used. The small bales of oaten hay have been found to be the most versatile. Some hay on the very windy exposed sites blew away if left uncovered. Increasingly a four wheel bike was used to distribute bales and jute matting 'biscuits' around the sites.
- Where possible, the native seed was hand broadcast as a split application, i.e. before treatment and after the laying of the hay and jute.
- The laying of scrub was limited to steep banks.
- Some 145 m of rock drains have been constructed at these sites. Extra loads of basalt rock have been imported from the Briseis Mine at Derby . All rock drains are proving to be very stable and are superior to gabions.
- A further 100 m of jute lined, cutoff and subsidiary drains have also been constructed.

2 Cat Gully area adjacent to Blue Lake, Endurance Mine, South Mt Cameron.

Background

This area has been the focus for the largest works program in previous years. Continuing works are detailed below. Its location and extent are shown on figure 2.

Rehabilitation Treatment ~ Planned and undertaken

a. Cat Gully 'East'

The area to the east of the Cat Gully drain [excavated by dragline in about 1968] was a bare area containing high kaolinite content, actively eroding spoil, [i.e. now 35 years old].

An area of 0.55ha has been landscaped by the excavator, seeded, 'hayed' and fertilised this year. Only 0.1ha of this amount has been covered with the last of the jute matting stock.

Reshaping of the surface has only been partially undertaken. On the basis of cost and disturbance to adjoining undisturbed lands some steep batters still remain. Cut scrub has been laid over these steep batters. It was necessary to tie branches to the face in many places. Strong winds have since disturbed some of these works.



Photographs of Cat Gully.

Above, Existing treatment on West side showing sporadic revegetation and 2003 treatment area on eastern side.



Left, Truncated spoil heaps with brush placed on steep slopes

LOCATION MAP

Mine Rehabilitation Trust

CAT GULLY & ENDURANCE MINE Alluvial Tin Mining Erosion Control & Revegetation - 2000-2003

Area that received
intensive treatment
during 2000 - 2002

ENDURANCE
Mine Tailings

sluice

Blue Lake

Blue
Lake

All treated
gullies hand
fertilised

2003 intensive
treatment,
Cat Gully
East

Area subject to Broadacre
Fertiliser top Dressing in 2003

CAT
GULLY

Dragline
Channels

mine

tailings
trial

CAT GULLY
'MRT' CROSSING

5 cm

Fig 2.

An access track and the construction of a footbridge over Cat Gully were other associated works at Cat Gully 'East'.

b. Hinterland to the Cat Gully areas

Approximately 2 t of 3.15.13 high analysis fertiliser was spun on by tractor on some 15.3ha as a continued top dressing of the area. No further works were needed apart from this tractor based top dressing this year and a little weed control. A portion of the "weedy" shrub, *Acacia retinoides* was felled with a chainsaw. There is scope for more of such actions to curb the spread of this rehabilitation weed.

The response from the previous application of pyrethrum mulch and fertiliser is still profound. Growth on existing vegetation such as *Banksia marginata*, *poa* sp. and mosses is still most apparent.

c. Cat Gully 'West' series of gullies

- All gullies have been subject to the application of 3.15.13 high analysis fertiliser at a rate of 250 kg/ha by hand application.
- Selected areas have been reseeded with native seed mix [approx 70% by area]
- Scotch thistle and a little slender thistle have spread from introduction with carted rock and imported straw. They have readily germinated in the pyrethrum application areas where vigorous plants are now a problem. Control is current to eradicate seedlings and prevent further germination. There is evidence that the ground is too poor to sustain a thistle problem over the long to medium term.

3. Star Hill [Garfield, Lawrys] Mine, Gladstone.

Rehabilitation Treatment ~ Planned and undertaken

All the splendid revegetation of the first rehabilitation phase at Star Hill has been hand fertilised (2 ton of 3.15.13 high analysis **Impact** product) during the period. The area for hand fertilising is quite irregular and is estimated as 9 ha in area. (Coloured yellow on the attached figure 3) The works took the equivalent of five person days. The use of a four wheel bike aided the distribution of bagged fertiliser.

Continued vigorous growth should thus be retained by this topdressing exercise.

On a 1.5 ha portion of Phase 2 tailings, (adjacent to where the bulldozer was bogged) an exercise in *Pinus radiata* removal was undertaken. ~ In three hours 1100 seedlings up to 1m in high were pulled from this area. A number of "seed" trees were also felled. It is estimated that the scale of the pine problem stemming from 'mine rehabilitation' in 1982 is some 20 times the scale of this exercise.

As reported previously, the results of the last (second) rehabilitation phase (2000 – 2001) to date have been assessed as disappointing. Rilling has been extensive, especially where ripping and direct seeding did not follow contours. In the first phase, rapid plant colonization was able to stem an initial erosion phase. In the case of the second phase, seedling germination and/of survival has been poor. There is evidence of intense native animal browsing pressure. There is scope for further monitoring with a view to either undertaking remedial works, that may include additional fertilizing of the surviving seeding.

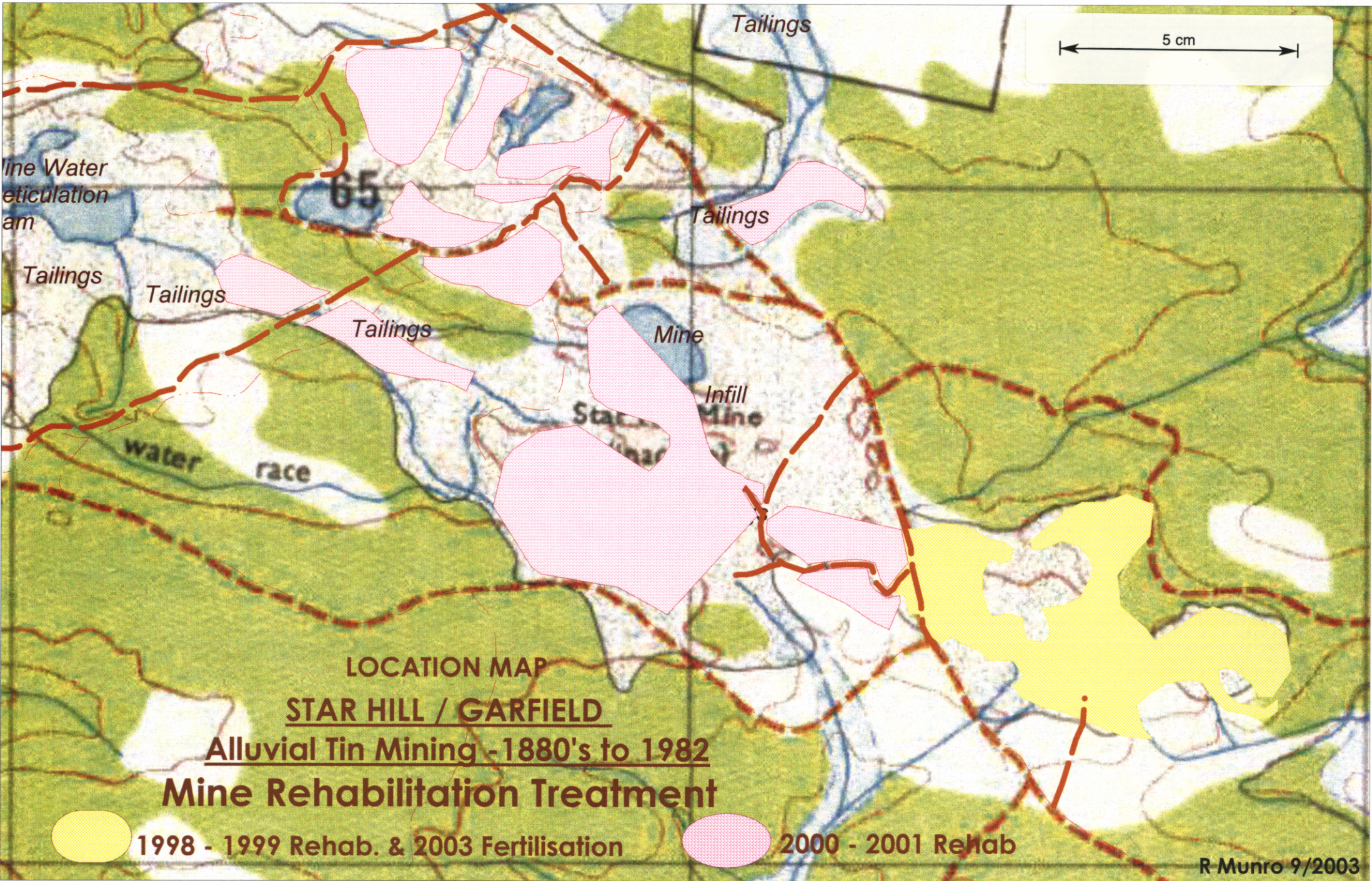


fig 3.

4. Endurance No1 Scraper Workings, South Mt Cameron.

Background

The area immediately to the west of Cat Gully is termed the Endurance No 1 scraper Workings. Much of the area is flat "clay" site with lenses of hard native cement. The road to Western Endurance dissects the area. The southern portion is rilled and sloping towards the southern tailing fans. Situated on the Endurance No 1 Scraper Workings are:

- ❖ The remains of the last Deep Lead Endurance Tin Mining Co. treatment plant (their only jig plant of the late 1960's)
- ❖ Remnants of the scraper fed Endurance No1 stockpile heap with associated ground sluice race..

The company Boral rehabilitated the complete area in the mid 1980's. Vegetation is sparse over most of the areas and minor erosion gullies have formed. Exotic species such as *Acacia pravissima*, *Acacia baileyana*, *Callistomen* species and *Acacia retinoides* have been planted. Most are struggling to survive though again it is evident that *Acacia retinoides* is thriving and is becoming a weed. An accumulation of pyrethrum spent marc remains unspread on this site, a left over remnant not spread by the mediocre efforts of the previous years fertiliser spreading contractor.

Rehabilitation Treatment ~ Planned and undertaken

The program for the current season entailed top dressing fertilizing. The area treated amounted to 13.2 ha. High analysis fertiliser (3.15.13) was applied at 120kg / ha.

5. Endurance Tailings, Ruby Creek Diversion, Riffle, vicinity of the Endurance Mine South Mt Cameron.

Rehabilitation Treatment ~ Planned and undertaken

Rehabilitation strips established last year have been monitored. Visible responses to fertiliser are apparent.

6. Clay Pit Gully, Clay Pit Area, Endurance Mine, South Mt Cameron.

Background

The Clay Pit gully was a elongate (250 metre) gully that lies to the north of the rehabilitated N2 gully. It deepened significantly from its mid point downwards and was probably an old tailrace structure that was only back cutting slowly. The Clay Pit gully was fully rehabilitated last year. Its location and extent are shown on figure 1.

Rehabilitation Treatment ~ Planned and undertaken

This gully has been monitored with hand fertilizing and minor weed control being undertaken. Erosion stabilization works have been very effective, but regrowth germination to date has been poor. The area was reseeded with the native mix in an attempt to redress this matter.

7. N2 Gully, Endurance Mine, South Mt Cameron.

Rehabilitation Treatment ~ Planned and undertaken

The N2 gully continues to show excellent vegetation growth across a range of substrates and environs. A small area with suspected sulphur / pyritic contamination remains bare. The annual application of about 100 kg/ha of high analysis fertiliser over an area of 1.12ha has continued..

8. Shallamar Creek Gully, Old Monarch Mine,

Rehabilitation Treatment ~ Planned and undertaken

The rock channel / chute structures constructed to replace failed gabions have continued to be monitored this year. They are stable and have required no maintenance.

Planned Works 2003 – 2004

Major Works

- Nil

Minor Works

- Continued topdressing with high analysis fertiliser selected works completed to date at Gladstone [most in need], South Mt Cameron or Monarch.{est 12 labour unit hours}
- Stabilising a minor erosion gully forming at N2[south east gully]. .{est 4 labour unit hours}
- Weed control.
 - ❖ Spraying of thistles (scotch, and slender) together with some docks and "hock" species. .{est 20 labour unit hours}
 - ❖ More *Acacia retinoides* weed control.{est 1 labour unit hour}
 - ❖ More *Pinus radiata* weed control.{est 1 labour unit hour}, Note: This is only on areas "rehabilitated" by this project. This weed is widespread.

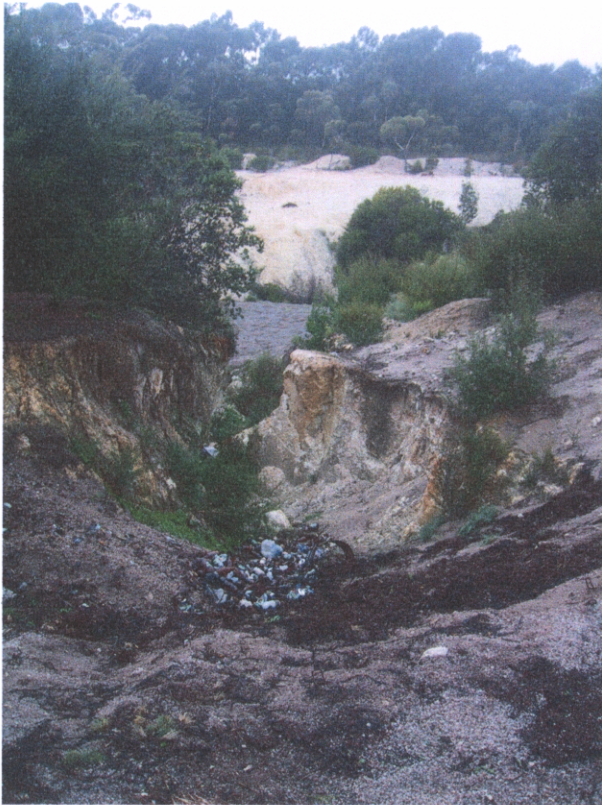


Photo Gallery

Left~ Rubbish dumped in rehabilitation area ~ Action was taken! (Note: about six car bodies on the mine site were also buried).

Below~ 'Pulled' pines at Star Hill Phase 2 site.



Left~ Bales heading to South Mt Cameron

Below ~ Straw being applied at the Tailrace site



