DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

REPT.BK.NO. 82/69

MINTARO GOLDFIELD - GEOLOGICAL INVESTIGATIONS, 1980-82. M.C.1214, M.L.4994, 4893

GEOLOGICAL SURVEY

by

R.S. ROBERTSON

SEPTEMBER, 1982

DME.532/80

CONTENT

	PAGE
ABSTRACT	1
INTRODUCTION	1
HISTORY AND PRODUCTION	2
MINERAL TENURE	4
GEOLOGICAL SETTING	4
SITE GEOLOGY AND MINERALISATION	4
SUMMARY AND CONCLUSIONS	10
REFERENCES	12

FIGURES

No.	TITLE	DRG. NO.
1.	Location	S 16213
2.	Geological Setting & Tenement Location	S 16214
3.	Site Plan M.C. 1214, M.L. 4893 (M.C. 1155)	82-224
4.	Group B underground workings. Plans & cross sections	S 16215

Plates

		Neg. No.
1.	Mintaro Goldfield. New shaft B workings	22981
2.	Mintaro Goldfield. B workings, underground Ferruginous fault zone.	22982
3.	Mintaro Goldfield. Exploration trenches near creek.	22983
4.	Mintaro Goldfield. Exploration trench across creek.	22984

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

Rept.Bk.No. 82/69
DME No. 532.80
Disk No. 99

MINTARO GOLDFIELD - GEOLOGICAL INVESTIGATIONS, 1980-82
M.C. 1214
M.L. 4994, 2893

ABSTRACT

Mintaro Goldfield has produced small quantities of gold from both shallow alluvial and underground workings since discovery in about 1892.

Mineralisation is associated with north west trending faults cutting grey shale, siltstone and dolomite of Auburn Dolomite and feldspathic sandstone of Watervale Sandstone Member both of the Burra Group. Fault zones comprise ironstone, ferruginous clay and quartz veins in highly weathered shale and siltstone. Gold is irregularly distributed along the faults and in wall rocks. 28 samples collected had gold contents varying from 7.6 p.p.m. to below detection limit with most samples less than 1 p.p.m.

Gold in the shallow alluvial workings was derived from mineralisation along the fault system.

INTRODUCTION

The small Mintaro Goldfield, 1 km east of the town of Mintaro, consists of shallow alluvial diggings along a tributary of the Wakefield River with several underground workings uphill to the east. Most workings are now back-filled, with the location of alluvial diggings marked by uneven ground.

Mintaro Goldfield extends over sections 2153 and 2154 hundred of Stanley, county of Stanley in the District Council of Clare, part of the Mid North Planning Area.

Access from the town of Mintaro is by an unsealed track heading east from the Mintaro to Manoora road (Fig. 2).

Workings are located on undulating pasture land cleared except for some clumps of large eucalypts.

Following a request from the claimholder for geological assistance, the site was visited on 27/8/80 by J.G. Olliver (Supervising Geologist, Mineral Resources), D.A. Young (Senior Technical Officer), I.G. Faulks (Senior Geologist, Metallic Minerals) and the author in company with Mr. T.G.P. McDonald (claimholder).

The area was mapped from 22/9/80 to 24/9/80 by the author and P.P. Crettenden and W.P. Fradd (Field Assistants). Crettenden carried out the stadia survey (Fig. 3).

The easterly underground workings near the top of the hill (designated group A on Fig. 3) were inspected and sampled at this time. When the site was visited again on 11/2/81, this group of workings had been backfilled by the landholder and as a consequence have not been mapped.

Development was in progress underground at workings designated Group B on Fig. 3 and a map had been prepared by the claimholder. In June 1981 and July, 1982, the author up-dated the mapping using tape & compass (Fig. 4). A new shaft was sunk vertically to 9 m and on the underlay to 19 m depth as at July 1982. Old workings (drives and a winze) were encountered in the course of this work.

Costeaning had also been carried out near the creek (Fig. 3). Small fragments (up to 0.1 gm) of gold were obtained from these costeans.

HISTORY AND PRODUCTION

Some gold found in area in 1860's ?

Mintaro alluvial diggings are first mentioned in H.Y.L. Brown (1908) in a note dated 1892. In this report and in a report by Inspector of Mines H.S. Cornelius (1931) gold was said

to occur in two levels, thinly distributed in the surface loam and gravel to a depth of approximately 0.5 m and in a 'second wash', 0.15 m to 0.30 m thick, lying on bedrock. The lower level carried heavier gold with nuggets reported up to 6 ozs (187 gms) both as rough fragments suggesting a close source and as waterworn fragments.

Cornelius (1931a) reported revived interest in the field with about 36 men digging in September 1931. About 130 claims of 9.29m^2 area had been pegged along the creek and up the slope of the hill to the east. Two distinct alluvial leads were said to be apparent. Little gold had come from the shallow alluvial workings and most work was underground presumably on lodes in weathered bedrock. Rough gold totalling 3.5 oz. (119 gms) was reported from one drive.

Cornelius (1931b) reported underground work continuing with a small profit to the miners. Cornelius (1932) stated that the gold bearing vein had become too poor to be worked profitably and the workings were about to be abandoned. These are thought to be the group B workings.

Prospecting by trenching and 'loaming' was reported by Cornelius (1934). This work had located 'a series of quartz and ironstone and pug leaders', one of which contained gold. A shaft was sunk to 11.3 m (37 feet) and the lode followed at several levels. Panned samples from the lode at the 5.5 m level were estimated to contain 6 dwts per tonn (9.3 gms/t). Gold occurred over a width of about 2 m as free gold in clay seams associated with quartz and ironstone veins with a few specks in quartz veins. These workings are probably group A.

No further work has been reported on Mintaro Goldfield until the activities of the current tenement holders.

The only recorded production for Mintaro Goldfield other than that mentioned above is 64.5 gms of gold from 'Mintaro Central' purchased by the Mount Torrens Battery in 1922.

MINERAL TENURE

MC 708 was registered for T.G.P. McDonald on 7/10/75 but lapsed on 6/10/76.

MC 1155 was registered for T.G.P. McDonald on 13/7/79 over the same area as MC 708. ML 4893 was granted over MC 1155 for 7 years from 14/1/81. ML 4893 was transferred to Gold Mines of South Australia Pty. Ltd. on 15/4/81.

MC 1214 was registered for T.G.P. McDonald, on 15/1/80, but lapsed on 15/1/81.

MC 1215 was registered for T.G.P. McDonald from 16/1/80. ML 4994 was granted over MC 1215 for 7 years from 11/1/82. The location and size of the tenements are shown on figs 2 and 3.

GEOLOGICAL SETTING

The regional geological setting shown on Fig. 1 has been adapted from BURRA 1:250 000 sheet (Mirams, 1964). The geology shown on Fig. 2 has been adapted from 1:63 360 sheet (Forbes, 1964).

Mintaro Goldfield is located on the eastern limb of a northerly plunging syncline in sedimentary rocks belonging to the Burra Group of Adelaidean age. Diggings occur in Auburn Dolomite in and above the Watervale Sandstone Member which shows minor displacement by north west trending faults.

SITE GEOLOGY AND MINERALISATION

Outcrop of rock is limited with slope colluvium and soil overlying weathered bedrock over most of the goldfield.

Dark grey dolomitic shale and siltstone with lensoidal dolomite interbeds are exposed along the creek and in recent diggings on MC 1214. To the east, weathered shale and siltstone with ferruginous pyrite relicts are scattered as surface float and exposed underground. The fine to medium grained feldspathic sandstone unit which forms the ridge to the east is regarded as Watervale Sandstone Member. Other sandstones bands are interbedded with the shale & siltstone. Bedding throughout dips westward at about 60^0.

Gold mineralisation is associated with a system of parallel faults trending about 310^0 M.N. which displace the Watervale Sandstone Member.

In group A workings, irregular quartz veins and ferruginous clay delineate the fault zone which cuts highly weathered, off white, kaolinitic shale and siltsone. Gold occurs both in quartz veins and as free gold in clay seams (Cornelius, 1934). Analyses of 4 chip samples from quartz veins in these workings are shown in Table 1. All samples contained small quantities of gold. The extent of driving and stoping (from about 5 m to 13 m depth for about 20 m horizontally along the fault zone) suggests that there was some production from these workings.

Other old diggings are located on the same fault trend as the group A workings. Chip sample A835/80 from quartz and ironstone mullock on the surface northwest of A workings contained 4.6 ppm. Au.

TABLE 1

Sample Descriptions - Mintaro Goldfield

Sample No.	Description
A835/80	Chip sample of quartz & ironstone mullock - shallow diggings northwest of group A workings.
A836/80	Ironstone float north of workings.
A837/80	Group B underground workings. Chip sample over 0.2 m lode width, 2 m east of base of shaft.
A838/80	Group B underground workings. Chip sample across lode, 2.4 m west of base of shaft.
A839/80	Group A underground workings. Chip sample-ferruginous quartz vein. 'Winze ladder'.
A840/80	Group A underground workings. Chip sample-fractured quartz vein. 'Top winze'.
A841/80	Group A underground workings. Chip sample-quartz vein. 'Cross vein'.
A842/80	Group A underground workings. Chip sample-ferruginous quartz vein 'Roof, lowel level'.
All samples below are from B workings.	
A850/81	Chip sample across fault zone. Incline shaft. 15.2 m depth (vertical below collar). Channel samples along drive across lode 13.0 m depth.
A551/81	Fault to 0.6 m west.
A552/81	0.6 to 1.5 m west.
A553/81	1.5 to 2.3 m west.
A554/81	2.3 to 3.2 m west.
A555/81	4.1 to 4.7 m west.
A556/81	Grab sample, bottom of winze 18.0 m depth
A557/81	Chip sample, winze 17.0 m depth.

Channel samples across lode 18.0 m depth

A 328/82	Footwall (east of fault) 0.0 - 0.76 m (0.76m)	0.5 ppm Au
A 329/82	'Pug seam, footwall of gouge' 0.76 - 0.84 m (.08m)	0.4
A 330/82	'Fault gouge?' 0.84 - 1.19 m (.35 m)	0.1
A 331/82	'Pug seam hanging wall of gouge' 1.19 - 1.27 (.08m)	4.4
A 332/82	'Ferruginous fault' 1.27 - 1.47 m (0.2m)	2.8
A 333/82	'Mineralisation hanging wall of fault' 1.47 - 2.49 m (1.02 m)	0.3
A 334/82	'Back of pillar, 10 m below surface. Footwall 0.3 m, fault 0.15 m, handing wall 0.3 m (0.75 m total)	0.5

Channel samples along lode 18.0 m depth

South to north on 'fault gouge' approx. 0.30 m wide

A 607/82	0 - 0.45 m north	5.2 ppm Au
A 608/82	0.45 - 0.915 m north	1.0
A 609/82	0.915 - 1.37 m north	1.7
A 610/82	1.37 - 1.83 m north	1.1
A 611/82	'Rock enclosed in fault gouge' 0.6 m	0.1

Samples A551/81-A557/81, A328/82-A334/82, A607/82-A611/82 collected by T.G.P. McDonald

Samples A835/80-A842/80, A 850/81 collected by R.S. Robertson.

TABLE 2

Analyses - Mintaro Goldfield

Sample No. Analyses (ppm.) by AMDEL A.A.S. schemes C3 (Au) & C1 (Cu, Pb, Zn)

	Au	Cu	Pb	Zn
A835/80	4.6	510	20	46
A836/80	<0.05	75	5	26
A837/80	<0.05	150	5	6
A838/80	<0.05	100	5	14
A839/80	0.20	18	<5	6
A840/80	0.25	16	<5	6
A841/80	0.10	18	<5	6
A842/80	0.50	18	5	4
Detection Limits	0.050	2	5	2

Analyses by AMDEL A.A.S. schemes K4/1 (Au-fire assay collection & A.A.S. of prill) & C1 (Cu, Pb, Zn).

A850/81	<0.1	240	15	12
A551/81	0.1	130	10	22
A552/81	0.3	130	10	20
A553/81	0.1	60	20	2
A554/81	<0.1	65	10	2
A555/81	7.6	250	15	55
A556/81	6.1	290	20	32
A557/81	0.3	120	5	<2
A328/82	0.5	220	10	10
A329/82	0.4	80	10	8
A330/82	0.1	75	15	6
A331/82	4.4	85	10	6
A332/82	2.8	390	10	6

A333/82	0.3	130	10	6
A334/82	0.5	95	15	8
A607/82	5.2			
A608/82	1.0			
A609/82	1.7			
A610/82	1.1			
A611/82	0.1			
Detection Limits	0.1	2	5	2

In group B workings (Fig. 4), the fault zone comprises iron oxide and ferruginous clay. Country rock is highly weathered grey shaley siltstone with ferruginous pyrite relicts. Shallow dipping iron oxide and quartz veins, 1-2 cm thick, cut the country rock in the hanging wall of the fault.

Results of sampling of these workings are shown on Table 1 and 2. Samples from the ferruginous fault zone have erratic gold contents from 2.8 ppm to <0.5 ppm. Best value of 7.6 ppm. was 4 m from the fault zone in highly weathered country rock. Anomalous copper values tend to be associated with higher gold values.

Probable source of the gold was hydrothermal fluids moving along fault zones. Penetration of the fluids along joints or bedding planes would explain the occurrence of gold away from faults. Hydrothermal alteration may have assisted in the strong weathering and bleaching evident in the wall rocks.

Gold mineralisation along the fault system is the source of shallow gold found in alluvium and colluvium downhill to the west and along the creek.

SUMMARY AND CONCLUSIONS

At the small Mintaro Goldfield, westerly dipping, dark grey shale, siltstone and dolomite (Auburn Dolomite) and feldspathic sandstone (Watervale Sandstone Member) of the Adelaidean Burra Group host the mineralisation.

Underground workings are located on a system of north west trending faults which displace the Watervale Sandstone Member. The fault zones contain ferruginous clay, ironstone and quartz veins in highly weathered shale and siltstone country rock. Gold is reported to occur in ironstone and quartz veins and as free gold in clay seams.

Both the group A and B underground workings have produced some gold. Sampling shows that gold is irregularly distributed along the faults and in adjacent wall rocks. All mineralisation found so far in the current underground work is uneconomic with gold contents varying from below detection limit to 7.6 ppm, most values being less than 1 ppm.

Gold in shallow alluvial and colluvial workings to the west was derived by erosion of mineralised fault zones.

Further exploration of the fault zones, either along strike or at depth, provides the best chance of locating economic gold mineralisation at Mintaro. Localities where faulting cuts sandstone bands may be more favourable due to the greater likelihood of brittle fracturing.

R. S. Robertson.

RSR/GU

R.S. Robertston
MINERAL RESOURCES SECTION

REFERENCES

Brown, H.Y.L., 1908. Record of the Mines of South Australia, 4th Ed. Gov. Printer, Adelaide.

Cornelius, H.S., 1931a. Notes on gold prospecting operations. Min. Rev., Adelaide, 54: 34.

Cornelius, H.S., 1931b. Notes on gold prospecting operations. Min. Rev., Adelaide, 55: 97.

Cornelius, H.S., 1932. Notes on gold prospecting operations. Min. Rev., Adelaide, 56: 79.

Cornelius, H.S., 1934. Mintaro gold prospecting, Min. Rev., Adelaide, 61: 83.

Forbes, B.G., 1964. Clare map sheet, Geological Atlas of South Australia, 1:63 360 series. Geol. Surv. S. Aust.

Mirams, R.C., 1964. BURRA map sheet, Geological Atlas of South Australia, 1: 250 000 series. Geol. Surv. S. Aust.

PLATE 1. Mintaro Goldfield. August, 1980.
New shaft with windlass, B workings. View east with A workings in background.

PLATE 2. Mintaro Goldfield. June, 1981.
B workings. Underground, 13 m level. Ferruginous fault zone bounded by highly weathered grey silty shale.

PLATE 3. Mintaro Goldfield. August, 1980.
Exploration trenches near creek. View west.

PLATE 4. Mintaro Goldfield. August, 1980.
Exploration trench across creek. View east.

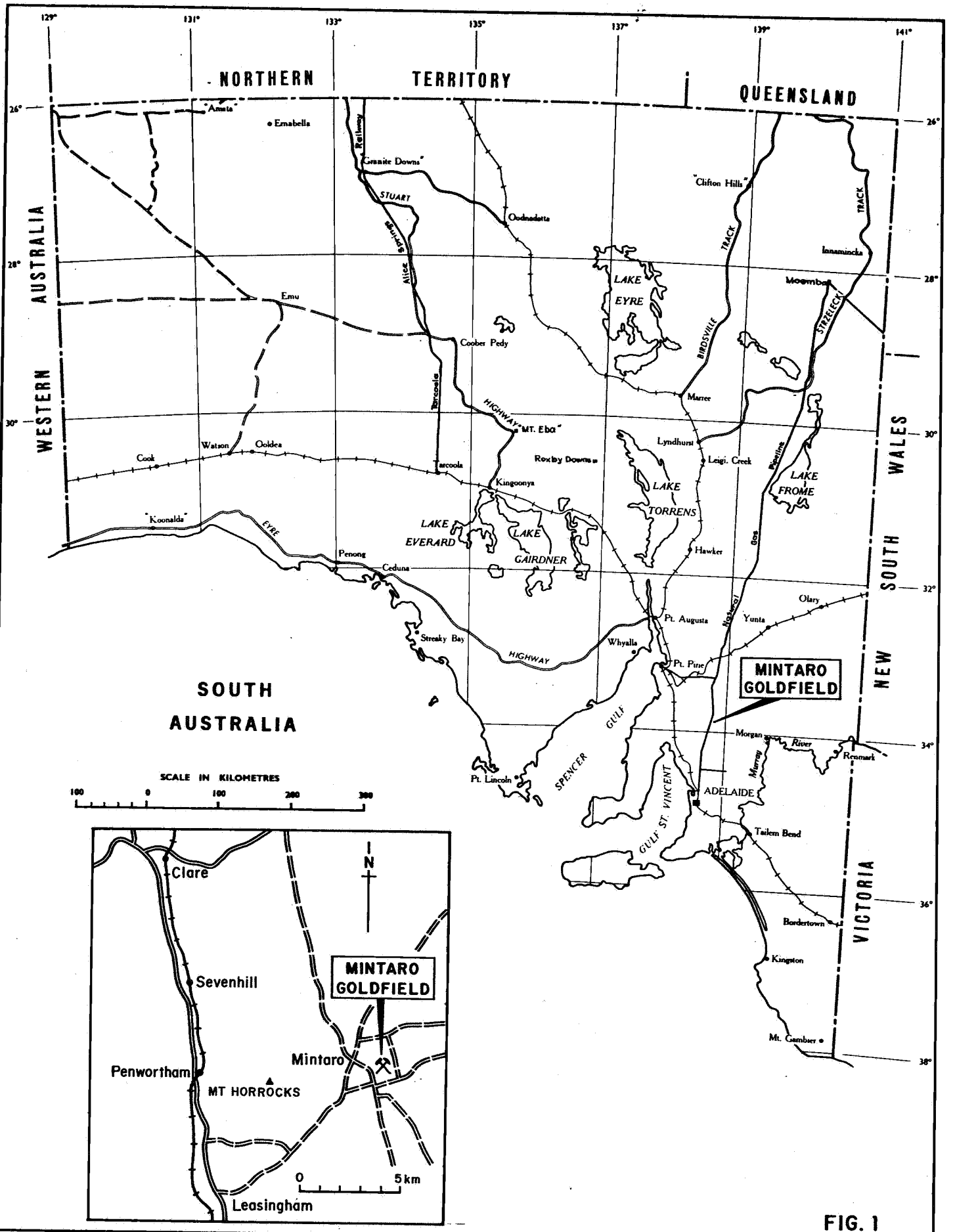
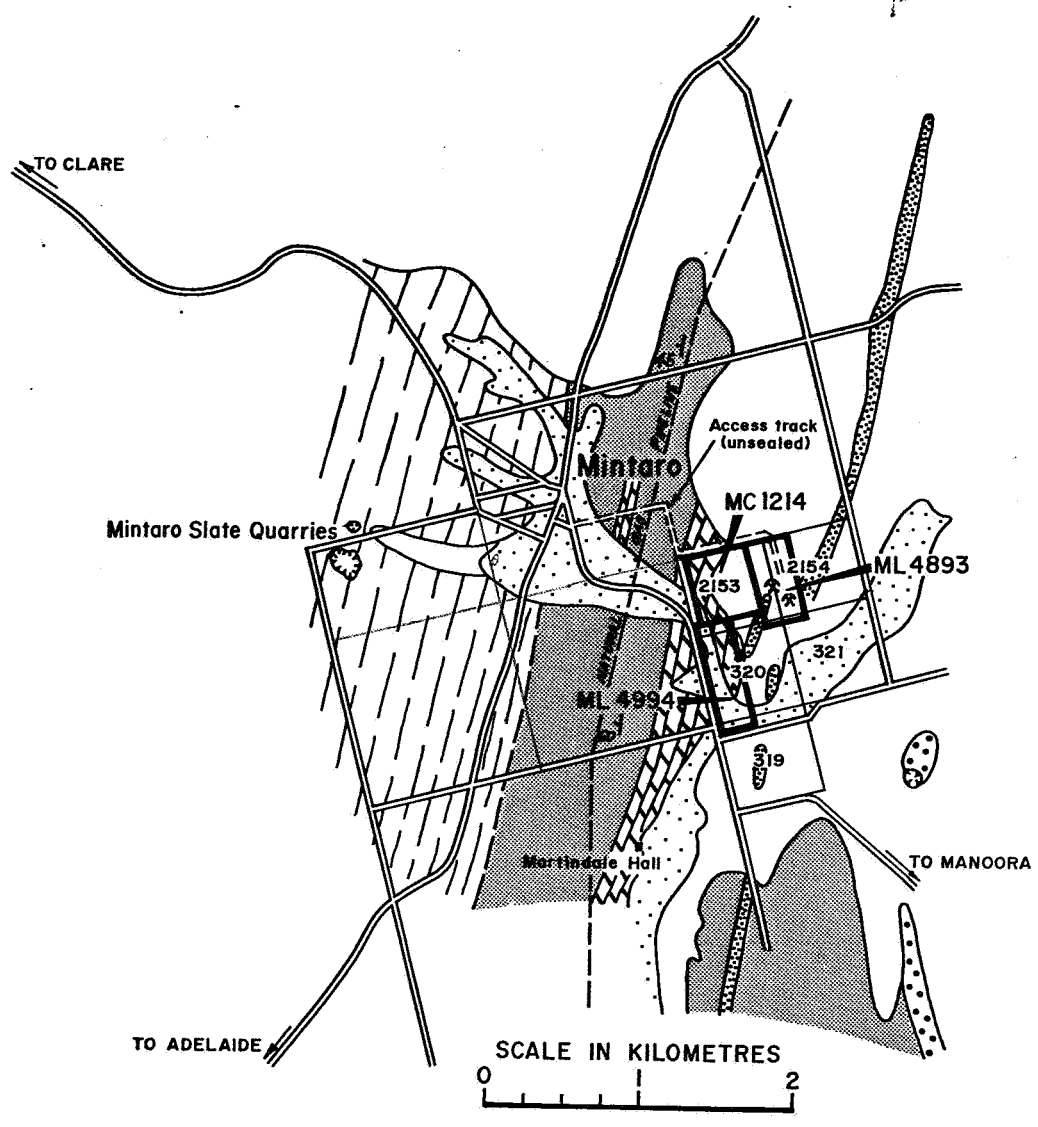


FIG. 1

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

Compiled. R.S.R.	MINTARO GOLDFIELD LOCALITY MAP	Date: 20-5-82
Drn. A.F. Ckd.		Drg. No. S16213

P.F. No. 55850 994.2



LEGEND

PROTEROZOIC — ADELAIDEAN — TORRENSIAN — STURTIAN — QUATERNARY

BURRA GROUP — BELAIR SUB GROUP

Low level alluvium. Sediments and soils of creek beds and flood plains.

Slope alluvium. Outwash and soils.

MINTARO SHALE: Grey laminated siltstone, slate, sandstone and minor dolomite and black shale.

SADDLEWORTH FORMATION: Grey laminated slate, siltstone, silty slate and dolomite.

AUBURN DOLOMITE: Dark dolomite, dark slate and siltstone.
Watervale Sandstone Member: Fine to coarse grained feldspathic quartzite and arkose.

UNDALYA QUARTZITE: Fine to medium grained laminated feldspathic quartzite.

Geological boundary .....

Strike and dip of bedding .. 45

Quarry .....

Section boundary - Hundred of Stanley . 321

Mining tenement boundary ML4994

FIG. 2

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA

MINTARO GOLDFIELD — ML 4893 ML 4994 MC 1214
SECTIONS 2153 2154 319 320 321 HUNDRED OF STANLEY
GEOLOGICAL SETTING AND MINERAL TENURE

COMPILED R.S.R.	C.D.O 27·9·82 DATE
DRAWN A.F.	SCALE 1:50000
DATE 20-5-82	PLAN NUMBER S16214
CHECKED	

MN

Old diggings

Siltstone and sandstone float

Sandstone, slightly ferruginous

Ironstone and fine to medium grained feldspathic sandstone

75 Feldspathic sandstone

Old shallow diggings

Sandstone float

1980 Trenches

Dark grey dolomitic siltstone

Area of uneven ground

(Old shallow diggings)

65 Grey shale

Silty shale with lensoidal interbeds of dolomite

Shallow trenches (1980)

Grey dolomitic siltstone and shale

STN 1 381·8

80 1980 Trench

65

Casing

ML 4893

Weathered shale with ferruginous blebs

Old diggings

+A835/80

Ferruginous quartz in fine grained sandstone

+A836/80

Ironstone and ferruginous siltstone

MC 1214
(LAPSED)

GROUP 'B' WORKINGS
(SEE PLAN S16215)

Underground workings

'New' shaft
EL of shaft collar 393·2m

Fault zone

GROUP 'A' WORKINGS
(ALL WORKINGS BACKFILLED)

Underground: Weathered kaolinitic shale and siltstone. Quartz vein and ferruginous clay along fault zone.
SAMPLES A839/80–A842/80

75/80 Shaft (depth 10·2m)

50 Collapsed shafts

Shaft (depth 14·4m)

White fine to medium grained feldspathic sandstone

STN 2 405·9

Old diggings

65 Black calcareous dolomitic siltstone

Feldspathic sandstone with vein quartz

Scattered shallow diggings

STN 3 394·0

Shale and sandstone boulders

Grey brown silty shale

Weathered grey siltstone with ferruginous blebs

STN 4 391·8

ML 4994

SCALE IN METRES

50 0 50 100 150 200

REFERENCE

- Soil and alluvium
- Feldspathic sandstone
- Fault ; fault zone, inferred
- Approximate geological boundary
- 65 Strike and dip of bedding
- 50 Strike and dip of fault zone
- 75 Strike and dip of jointing

Areas of rock outcrop and float indicated by notes

- Mining tenement boundary and corner post
- Trenches or shallow diggings
- Fence
- Creek
- 380 Topographic contour in metres
- STN 1 381·8 Survey station, elevation in metres (AHD approx.)
- +A836/80 Sample location and number

Stadia survey by P.P. Crettenden September 1980 SFB 635

FIG. 3

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA

MINTARO GOLDFIELD

ML 4893 ML 4994 MC 1214

GEOLOGICAL PLAN

COMPILED	R.S.R.
DRAWN	A.F.
DATE	20-5-82
CHECKED	
	27·9·82 CDO DATE
SCALE	1:2000
PLAN NUMBER	82-224

28/6

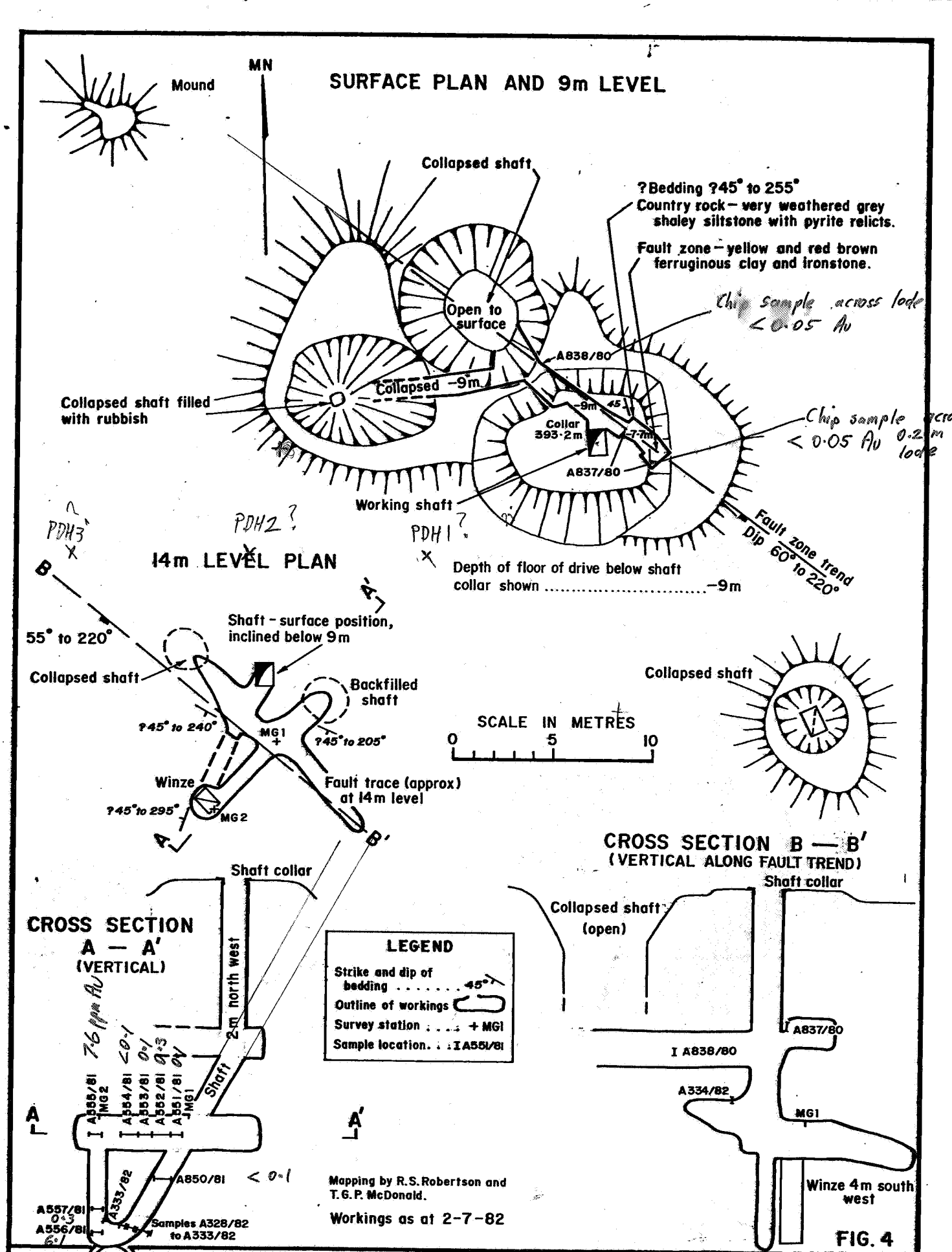


FIG. 4

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

COMPILED R.S.R.	C.D.D	27·9·82 DATE
DRAWN A.F.	SCALE 1:250	
DATE 20–5–82	PLAN NUMBER S16215	
CHECKED		

MINTARO GOLDFIELD – ML 4893
GROUP 'B' UNDERGROUND WORKINGS
PLANS and CROSS SECTIONS

Mintaro Goldfield Drillhole 2

Table 1

Leaseholder Sampling					SADME (RSR) Sampling - Drill cuttings ground on				
Depth	Sample No.	Classic Labs	Analabs		Approximate Depth	Sample No	Classic Labs	Analabs	
-Metres	6630RS	Au (ppm)	Au (ppm)	Cu (ppm)		6630RS	Au (ppm)	Au (ppm)	Cu (ppm)
1-3	452	0·06							
3-6	453	<0·02							
6-9	454	0·08			8-9	484	0·06		
9-12	455	0·22			9-12	485	0·18		
12-15	456	0·1	0·033	45	12-14	486	0·14	0·012	45
15-18	457	0·2	0·54	110	14-18	487	0·10	0·006	105
18-19	458	11·0	8·93	145	18-19	488	0·10	0·01	180
19-20	459	175	137	115	19-22	489	0·72	0·650	240
20-21	460	165	129	120					
21-22	461	350	298	615					
					22-27	490	2·28	44·00	210
23-24	462	500	388	465					
24-25	463	270	335	540					
25-26	464	400	337	165					
26-28	465	50	38·9	55					
28-30	466	4·6	5·48	45	27-31	491	0·04	0·002	45
30-32	467	0·22	0·13	40					
32-34	468	0·28	0·17	35	31-36	492	0·14	0·130	240
34-36	469	0·16	0·15	255					

MN

Shallow Pits (Old)

4
DH 5

5
DH 6

6
DH 7

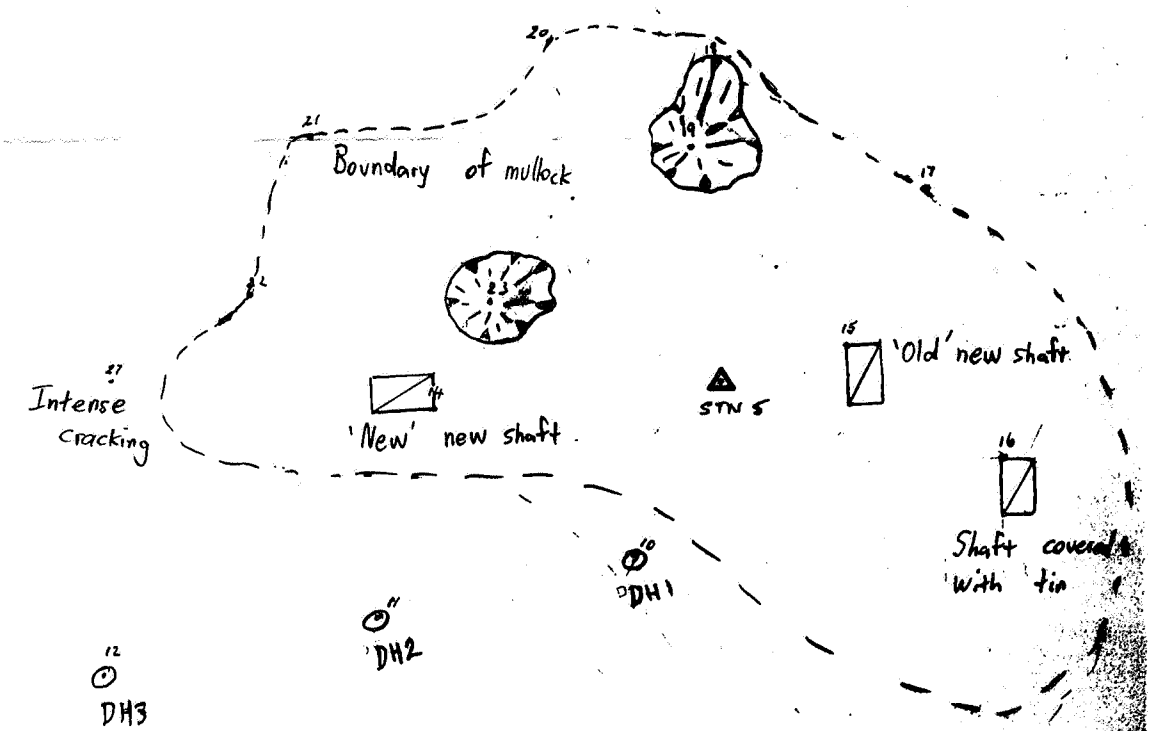
Zone of surface Cracks in clay.

28 Shallow Pit (old)

Quartzite Fragments

Zone of surface cracks in clay.

'Group B' Workings



Scale 1: 250

0 10 20 Metres

Mintaro Goldfield April 1990
ML 4893

⊙ Drillholes 1989 (DH 1)
1990 (DH 2-7)

Bearings (mag.) & horizontal distance to lease corner pegs from Stn 5.

247° 15'	154.1 m
312° 14'	119.0 m
94° 15'	142.4 m
147° 08'	167.4 m

See also RB 82/69
Fig. 3 & 4
(Plans 82-224 & S16215)

PPC, RSR, MWF, SJE