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E.L.42/71 (SOUTH)

GRAND PRIZE AREA

FINAL REPORT 1985/86

OPEN FILE

UNCLASSIFIED

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May, 1986.

Circulation: G.F.E.L. (2)
Mines Department (1)

G.F.E.L. Report No. T/86/3

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SUMMARY

The Grand Prize section of E.L.42/71 is the southern part of the licence area, lying to the south of the Renison Mine Lease. It is prospective for fracture controlled, carbonate replacement tin deposits and has been explored from the 1940's through to 1986. The majority of this work has been completed at the Grand Prize Mine, where narrow structures within Dundas Group sediments are known to host hydrothermal tin mineralisation.

An exploration programme undertaken during 1985/86 concentrated on discovering the source of a strong combined EM37 and ground magnetics response recorded on the Carbine Hill Grid in the Great Northern Mine area. A total of 469.3m was drilled in two holes, G.P.11 and G.P.11A (the latter being a re-drill of the former), with disappointing results. Fractures encountered in the holes were unmineralised and the alteration levels, in general, were very weak. Unfortunately the drill holes missed the target lying at depth, due to excessive flattening. A subsequent down hole EM survey, however, showed that the probable source of the EM anomaly is an ultramafic rather than a pyrrhotite body.

The Great Northern and the Grand Prize mine areas were considered the most prospective at Grand Prize. However due to the sub-economic style of mineralisation discovered in the vicinity of the Grand Prize Mine and the poor results obtained from this season's exploration near the Great Northern Mine, these prospects have been significantly downgraded. Also, exploration for fracture controlled, carbonate replacement tin deposits is now considerably less attractive because of the current and likely future state of world tin markets. For these reasons, no further exploration can be justified at Grand Prize.

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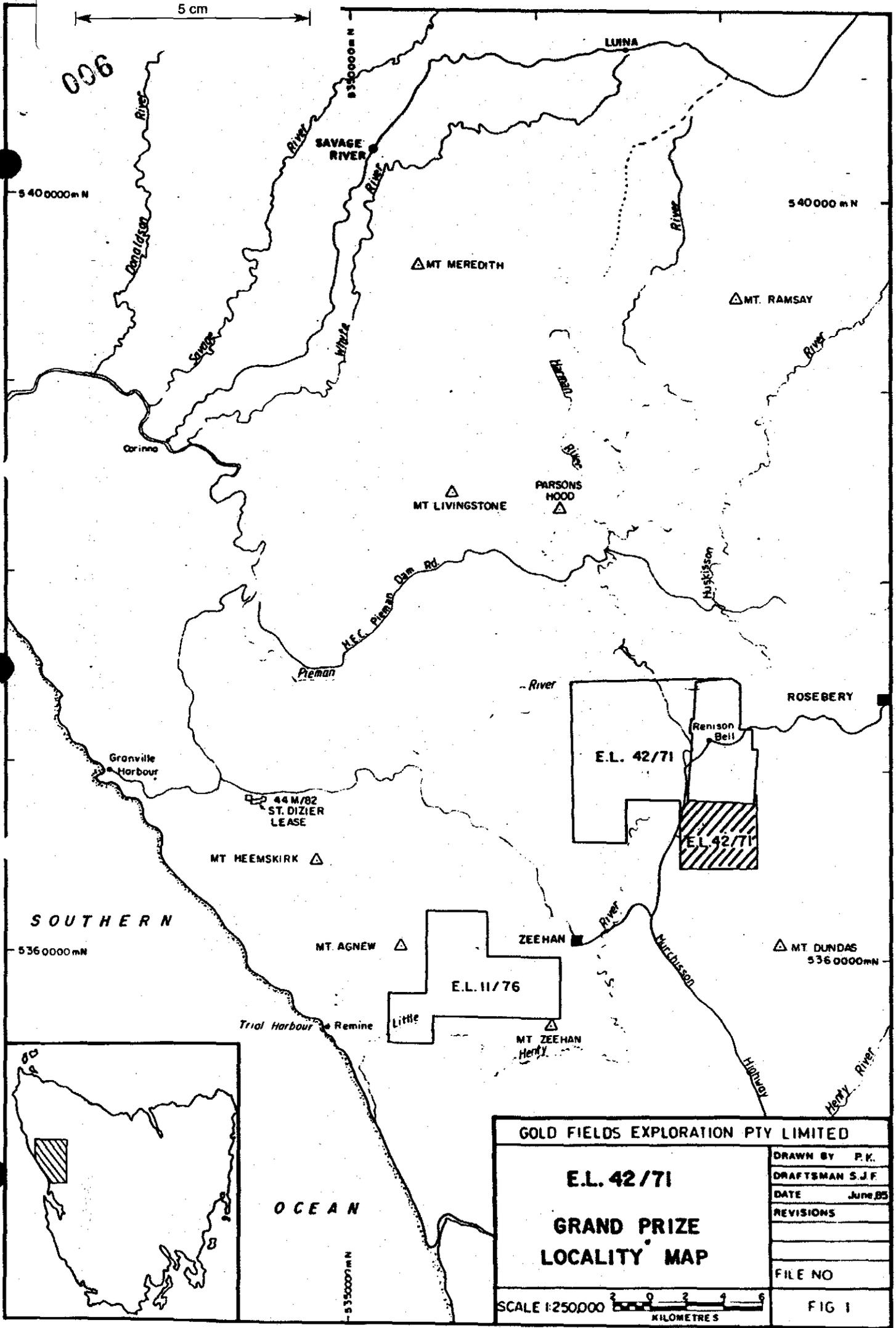
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1. INTRODUCTION

The Grand Prize area is the portion of E.L.42/71 south of the Renison Mine Lease (Figure 1). The western section, known as the Argent area, is operated and reported on by Renison Ltd. E.L.42/71 covers a total of 53 sq. km.

Geologically the Grand Prize area is underlain by strongly faulted and folded sediments of the Cambrian Dundas Group, together with several ultrabasic masses. Known mineralisation within the area includes stanniferous gossan and sulphides at the Grand Prize Mine and minor lead-zinc mineralised veins elsewhere. Exploration targets in the Grand Prize area have been carbonate replacement and fracture controlled tin deposits.

This report summarises all previous exploration at Grand Prize and describes the 1985/86 exploration programme. The work undertaken comprised the drilling of one diamond drill hole (and a re-drill of that hole), G.P.11-G.P.11A, and a subsequent down hole EM survey, in the Great Northern Mine area. A total of 469.3m was drilled.



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5 cm

5 40 0000 m N

5 40 0000 m N

5350000 m N

LUNNA

SAVAGE RIVER

△ MT MEREDITH

△ MT. RAMSAY

Corinna

△ MT LIVINGSTONE

PARSONS HOOD △

M.C. Piddock Dam Rd

Premar

ROSEBERY

E.L. 42/71

E.L. 42/71

Granville Harbour

44 M/82 ST. DIZIER LEASE

△ MT HEEMSKIRK

SOUTHERN

536 0000 m N

△ MT. AGNEW

ZEEHAN

△ MT DUNDAS
536 0000 m N

E.L. 11/76

Trial Harbour Remine

Little

△ MT ZEEHAN
Herby

Murdison River

Highway 1

Henry River

OCEAN

5350000 m N

GOLD FIELDS EXPLORATION PTY LIMITED	
E.L. 42/71	
GRAND PRIZE LOCALITY MAP	
DRAWN BY P.K.	
DRAFTSMAN S.J.F.	
DATE June 83	
REVISIONS	
FILE NO	
SCALE 1:250000	0 1 2 3 4 5 KILOMETRES
	FIG 1

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2. EXPENDITURE

Expenditure on the Grand Prize area in the eleven months to the end of April amounted to \$66,870. A total of \$993,600 has now been spent on exploration at Grand Prize.

Expenditure details are listed in Appendix 1.

3. LAND TENURE

E.L.42/71 is held solely by Renison Ltd. Three vacant mining leases (29M/51, 23M/52 and 102M/66) over the Grand Prize Mine, formerly held by Minops Pty. Ltd., have now been incorporated into the E.L.

4. PREVIOUS WORK

A complete history of exploration at Grand Prize from the 1940's through to 1984 is recorded below. This summary is taken from Komysan (1985).

Prior to 1954, work in the Grand Prize area was limited to individual prospects. These prospects included the Grand Prize Mine (cassiterite), Melba Mine (galena, sphalerite, jamesonite), Kapi Mine (galena, sphalerite), Great Northern Creek or Carbine Mine (galena, sphalerite, tetrahedrite, bismuthinite), alluvial tin workings on detritus derived from Pine Hill and minor alluvial gold and tin workings in the Melba Flats area.

1941- Mining at the Grand Prize Mine. Production was 1,548 tons of 1959 ore with an average grade of 0.8% Sn.

1954 Geological Mapping by J. Elliston.

1956- Airborne E.M. survey (probably a Hunting System) by Rio Tinto.
1957 Survey details are not available but anomalies were located on Pine Hill and just south of E.L.42/71 within the serpentinite.

1958 Two diamond drill holes, K1 and K2, were drilled by the Mines Department beneath the Kapi Mine but no significant sulphide mineralisation was intersected. Another diamond drill hole drilled west beneath the Melba Mine intersected minor galena, pyrite and magnetite (but was not assayed for tin). Exact collar locations for these three drill holes are not known.

1958- Grand Prize, Intermediate and Dundas Grids were cut between the 1960 Razorback Mine and Grand Prize Mines by the B.M.R. These grids were then covered by Turam, self potential and magnetic surveys (Hamilton, 1960). Within E.L.42/71 a linear 5000 gamma magnetic anomaly "associated in part with a distinct Turam indicator" extended south of the Grand Prize Mine and, at the western end of the Intermediate Grid, a Turam anomaly was indicated within Dundas Group sediments. Blissett and Gulline (1961a) mapped the grid and surrounding areas.

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- 1962 Mines Department drilled two holes (MD1 and MD2) on the magnetic anomaly south of the Grand Prize Mine and intersected serpentine in the target area (McLeod and Jack, 1962). A third drill hole (MD3) was drilled into the Grand Prize Fault but only traces of tin were obtained.
- 1964- Placer Prospecting Pty. Ltd. drilled two diamond drill holes
1966 (G1 and G2) on the Grand Prize Fault Structure (Clark, 1965 and Wilson, 1967). Recovery was only 10% and only a trace of tin was recorded in the Grand Prize Fault by G1. No information is available on G2. Craze's and No.4 adits were extended. An overall grade of 0.32% Sn was reported from bulk sampling of cross cuts in No.4 adit. Chip samples and soil samples taken on the Grand Prize Grid, south of the Grand Prize Mine gave assays of up to 1% Sn. However contamination of these and adit samples as well as the use of dubious analytical techniques at the Placer Laboratory in Zeehan is suspected.
- 1967 Rubenach (1967) completed an Honours Thesis on the Serpentine Hill complex and later published a paper summarizing his work (Rubenach, 1974).
- 1967- Renison established the North Dundas Grid and carried out soil
1970 geochemistry, magnetic and mapping surveys. Areas anomalous in tin were delineated to the east of E.L.42/71 (Fergusson, 1970, Forsythe, 1968 and Elders, 1967).
- 1968- Renison Ltd. cut the Commonwealth Hill Grid and the Razorback
1969 Grid. Regional soil geochemistry, magnetic and mapping surveys were carried out. On the Razorback Grid, two zones anomalous in tin (within E.L.42/71) were located. These anomalies occur south of the Grand Prize Mine and immediately south of the Black Hill summit. On the Commonwealth Hill Grid, tin anomalies which are not associated with the Pine Hill Granite are probably due to alluvial tin. Subsequent soil sampling during 1983-84 has suggested that laboratory contamination was a problem in earlier surveys, and anomalies located by them may not be reliable (Komysan and Roberts, 1984).

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- 1969- I.P. surveys were carried out over the serpentinites of the Razor-
1970 back and Commonwealth Hill Grids to test nickel anomalies (Dickoff,
1970).
- 1969- Renison Ltd. cut the Kapi Fault Grid. However, no results from
1970 any subsequent work are available.
- 1971 Gippsland Minerals N.L. carried out detailed mapping and chip
sampling of the Grand Prize Workings. Two diamond drill holes,
GP1 and 2, were drilled on the Grand Prize Fault with collars
located in the vicinity of the MD3 collar. Low tin values and
poor recoveries were recorded in GP1 (6m at 0.07% tin). Only
traces of tin were recorded in GP2 (O'Shea, 1971).
- 1972 P. Brophy (1972) reported on the asbestos potential of the Razorback
and Serpentine Hill Complexes.
- 1976- Renison Ltd. established the Kapi Grid over the interpreted N-S
1977 trending Kapi Fault. Mapping, soil geochemistry, magnetic and
E.I.P. and M.I.P. surveys (Howland-Rose, 1977) were carried out.
Anomalous chargeability and resistivity responses were found
(Kelleher, 1977).
- 1977- Diamond drill hole S453 was drilled (by Renison) west on line 1900N
1978 of the Kapi Grid, beneath the Kapi Mine. No significant mineralisa-
tion was intersected (Newnham, 1978).
- 1978- Diamond drill hole S554 was drilled (by Renison) west on line 2300N
1979 of the Kapi Grid. No significant mineralisation was intersected
(Stephenson, 1979).
- 1979- Renison drilled 4 diamond drill holes (S652, S653, S658, S677)
1980 on the Grand Prize Fault structure (Stephenson and Bond, 1980).
- 1980- Renison drilled 2 diamond drill holes (S764, S862) on the Grand
1981 Prize Fault (Stephenson and Bond, 1981). A mapping programme in
the Grand Prize Area delineated hornfelsing near the summit of
Black Hill.

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A Dighem survey was flown over and just south of the Renison Mining Lease by B.H.P. Anomalies are located within the Serpentine Hill Complex and along the serpentinite/Crimson Creek Formation boundary.

The Mines Department conducted a semi-regional gravity survey over part of the mapped area and a reconnaissance aeromagnetic survey over much of the West Coast including all of E.L.42/71.

1981- Renison drilled 2 diamond drill holes (S947, S969) on the Grand
1982 Prize Fault (Bond, 1982).

A Dighem survey was flown over the eastern portion of E.L.42/71 by E.Z. Two significant anomalies were located on Carbine Hill in the S.E. corner of E.L.42/71 and a grade 5 E.M. anomaly was located south of Pine Hill.

1982- Gold Fields Exploration drilled one diamond drill hole (GP3A)
1983 on the Grand Prize Fault and two diamond drill holes, GP4 and GP5, on the Grand Reward Fault structure (Komyschan and Roberts, 1983).

Two overlapping grids (the Black Hill Grid and the Carbine Hill Grid) were established over virtually the entire outcrop area of Dundas Group sediments within E.L.42/71. Minor mapping and stream sediment sampling were also carried out.

A Dighem survey flown over the Renison Mine Lease and in the vicinity of Pine Hill, by Comstaff, located a number of minor anomalies just south of Pine Hill.

1983- Gold Fields Exploration drilled three diamond drill holes (GP6,
1984 GP7, GP8) on the Grand Prize Fault structure (Komyschan and Roberts, 1984).

Reconnaissance surveys comprising geological mapping, soil geochemistry, ground magnetics, and V.L.F.-E.M. were carried out over the Black Hill and Carbine Hill Grids.

1984- A number of grid lines on the Black Hill and Carbine Hill Grids
1985 were extended and several infill lines were also established.

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These were geologically mapped, rock chip sampled, bedrock sampled and ground magnetically surveyed. In addition, an E.M.37 survey was carried out over sections of the Carbine Hill Grid, and two diamond drill holes (GP9, GP10) were completed near the Grand Prize Mine, on the Grand Prize Fault structure (Komysan, 1985).

5. WORK COMPLETED AND RESULTS, 1985/86

The 1984/85 Annual Report recommended three areas worthy of further exploration. These were:

- (i) the Grand Prize Mine area where a series of drill holes have outlined a zone of tin mineralisation. The Report recommended that drill hole GP7 be re-entered and extended in an attempt to improve the estimated tonnage potential of the outlined tin mineralisation.
- (ii) the Great Northern Mine area where favourable geology and a combined magnetic-E.M. anomaly indicate potential for Renison-style mineralisation. Here the Report recommended a diamond drill hole together with down hole E.M. to test for "near misses".
- (iii) the Western Pine Hill area where tin-arsenic soil geochemical anomalies were thought to represent a number of possible styles of tin mineralisation (skarns as well as Renison-style). A programme of bedrock sampling was recommended to better assess the potential of the area.

Since the completion of the 1984/85 Annual Report, a re-assessment of the tin mineralisation potential within Tasmania has been undertaken. The results of this has been a decision to forgo exploration on numbers (i) and (iii) above, (ii) being the only remaining prospect thought to have significant potential for the target sought, i.e. large tonnage, fracture-controlled carbonate-replacement tin mineralisation. Therefore the work completed during 1985/86 comprised drilling GP11 (re-drilled as GP11A) and a subsequent down-hole E.M. survey at the Great Northern Mine area.

5.1 Drilling

Diamond drill hole GP11 was planned to test a coincident E.M.37-magnetics anomaly on the Carbine Hill Grid, in the Great Northern Mine area. A helicopter-supported programme using a Longyear 38 rig (East Coast Drilling) was commenced in December 1985, after the necessary preparations of track cutting and helipad construction had been completed. The initial drill target choice was the E.M.37

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anomaly situated on Line 900N (at 1550E - see Figure 2). However the interpretative geology of this area (Figure 3) indicated that a hole drilled from Wallace's Tram Line (the only place suitable for helipad location) would be drilled near parallel to bedding for much of its length. Therefore a "geologically more realistic" hole was chosen, further to the north (Figures 2, 3). This hole was drilled as GP11, but after swinging off the target in bearing by 4° to the north, and shallowing by 8° in 88m, it became obvious that the hole would pass the target anomaly at depth. In mid-December 1985, GP11 was abandoned, and re-drilled as GP11A with a steeper collar angle, from the same site.

In all, a total of 469.3m was drilled, and detailed logs and assays are given in Appendix 3. Drill hole summaries are given below:

GP11

Collar Co-ordinates: 5,365,862N, 371,364E (AMG)

Azimuth (AMG): 140°

Dip: 50°

Length: 88.6m.

Duration: 12.12.85 to 17.12.85

Summary Log: 0 - 88.6 Carbine Hill Greywackes? Inter-
bedded fine grained sandstones
and siltstones.

Assays: No assays taken.

GP11A

Collar Co-ordinates: As above (AMG)

Azimuth (AMG): As above

Dip: 62°

Length: 370.7m

Duration: 18.12.85 to 28.1.86

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Summary Log: 0.0- 81.5 Carbine Hill Greywackes? Interbedded
fine grained sandstones and siltstones.

81.5- 86.3 Quartz-siderite vein-filled fault zone.

86.3-223.7 Brewery Junction Formation? Slightly
graphitic black shales and siltstones
with minor cherty conglomerates.

223.7-230.7 Quartz-feldspar brecciated vein-filled
fault zone.

230.7-370.7 Carbine Hill Greywackes? Siltstones and
shales with minor cherty breccias and
conglomerates.

Assays: Assays were taken from a variety of lithologies and
the vein/fracture systems. The results were poor;
maximum values as follows:

Sn	49 ppm	:	311.5 - 312.0m
As	4912 "	:	" "
Cu	930 "	:	" "
Pb	8800 "	:	" "
Zn	3490 "	:	239.0 - 240.2m

Petrographic examinations of a number of sections of core from
GP11A were completed by C.M.S. These were undertaken primarily
to confirm the presence of minor carbonates and identify vein mate-
rials. The C.M.S. reports are detailed within the log of GP11A, in Appendix 3.

Comments:

Although collared at a steeper angle to counter excessive shallowing,
GP11A flattened sharply between 97m and 175m (21°). Consequently,
it appears likely that the hole drilled through or over the top
of the source of the E.M. anomaly, and because of this a down-hole
E.M. survey was completed.

Magnetic susceptibility measurements were taken over the entire
length of GP11A, however the responses recorded were all low, the
maximum obtained being 160×10^{-5} SI units from a thin quartz-siderite
vein.

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Overall the lithologies encountered in GP11-GP11A were carbonate-poor and very weakly altered. The poor assay results confirm the weak alteration/mineralisation. GP11A appears to have intersected two blocks of Carbine Hill Greywacke separated by Brewery Junction Formation (Figures 3, 4). Quartz-filled faults mark the contacts between these lithologies. An aplitic dyke, with Pine Hill Granite affinities, 0.3m wide, was found in GP11A at 286.6m.

5.2 Geophysics

A description of the down-hole E.M. survey and a discussion of the results by Mitre Geophysics is given in a separate report in Appendix 2.

The main conclusions resulting from the survey are that the conducting body lies approximately 70-100m vertically below GP11A and it is probably an ultra-mafic body. Given the relatively "clean" data generated by the down-hole survey (in comparison with the ground E.M.), it can now be said with some confidence that the source of the E.M. anomaly is not a pyrrhotite orebody.

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6. CONCLUSIONS

Exploration for fracture-controlled, carbonate-replacement style tin deposits on the Grand Prize section of E.L.42/71 has now reached a stage where a number of areas with potential for this style of deposit have been tested.

In the vicinity of the Grand Prize Mine, drilling has indicated a sub-economic resource of 0.9 million tonnes with an average grade of 0.8% Sn and 0.7% Cu, in several mineralised structures (Komyshan, 1985). The latter are now known to be consistently both thin and only moderate in grade, and are therefore clearly uneconomic. Consequently, further exploration is not warranted, especially under the current economic conditions of low world tin prices.

The results of the recent exploration programme detailed in this report have significantly reduced the chances of finding Renison-style deposits in the Great Northern area. The rock types encountered in GP11A and their levels of alteration indicate that the target area is unlikely to host hydrothermal, fracture controlled, carbonate replacement tin deposits. The source of the strong E.M.37 anomaly, which was the target of the hole, appears to have been missed, lying 70-100m below the hole. However, the subsequent down-hole E.M. survey has shown the probable source of the anomaly to be an ultramafic rather than a massive pyrrhotite body.

The Great Northern Mine area and the Grand Prize Mine area represented the prospects with the strongest exploration potential at Grand Prize. Both are now much less attractive; the Grand Prize Mine area because of the subeconomic style of mineralisation discovered there, and the Great Northern area because of the poor results obtained from this season's exploration programme. In conclusion therefore, no further exploration can be justified on Grand Prize.

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APPENDIX 1

1985/86 EXPENDITURE DETAILS

(11 months to end of April, 1986)

<u>GEOLOGY</u>	- Salaries and Wages	12,635
	- On-costs	1,011
	- Outside contractors	200
	- Accommodation	91
	- Miscellaneous	204
		<hr/>
		14,141
<u>GEOPHYSICS</u>	- Outside contractors	4,160
		<hr/>
		4,160
<u>TRANSPORT</u>	- Outside contractors	14,144
		<hr/>
		14,144
<u>DRILLING</u>	- Outside contractors	24,351
	- Assays	722
	- Stores	3,146
	- Miscellaneous	149
		<hr/>
		28,368
<u>SURVEYING</u>	- Outside contractors	100
		<hr/>
		100
<u>SITE PREPARATION</u>	- Outside contractors	2,180
		<hr/>
		2,180
<u>INDIRECT MOTOR VEHICLE EXPENSES</u>		2,145
		<hr/>
		2,145
<u>ADMINISTRATION COSTS</u>		1,632
		<hr/>
		1,632
TOTAL		<hr/>
		\$ 66,870
		<hr/>

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APPENDIX 2

REPORT ON DOWN-HOLE E.M. SURVEY BY MITRE GEOPHYSICS



INTERPRETATION OF THE DHEM SURVEY DOWN GP11A (E.L. 42/71).

A down-hole electromagnetic (DHEM) survey was carried out down GP11A in the 1985/86 field season. The survey was done by Solo Geophysics using SIROTEM with the early time-base.

GP11A was targeted on apparently coincident EM and magnetic anomalies and was drilled as part of the exploration program for Renison style tin deposits on E.L. 42/71. The hole, which flattened much more than anticipated (see Figure 4), found no magnetically susceptible rocks, but did intersect some black shales which were found to have negligible conductivity (see attached table).

The hole was surveyed from a single square 100m loop (see Figure 2). The data was recorded on the early time-base to channel 18 (ie to about 2.7ms). The results are shown in Figures 5a & 5b*. The change from positive to negative at ~100m is interpreted as a change in sign of the background response due to the relative position of the loop and the drill-hole. The second change in sign, from positive to negative, in the region 220m to 280m is interpreted as being due to a large conductor beneath the drill-hole.

Although the response is well-defined, only a weak or moderate conductor is indicated. Since the SIROTEM data was only recorded out to 2.7ms, a direct comparison could not be made with the EM37 data, the interpretation of which gave a time constant of 1.8ms‡. The SIROTEM data gives a value of less than 1.5ms; however, it is not certain that late-time conditions have been reached.

The shape of the response is consistent with that from a large, thick conductor and a cylinder should be a reasonable approximation. The distance to the centre of the equivalent cylinder is calculated to be about 70-100m vertically below 255m +/-20m. This interpretation is in agreement with that from the surface data and the drill-hole is assumed to have passed some tens of metres above the target (an approximate radius can be calculated (eg, Buselli et al, 1985) but this has not been done.

This target was originally recommended as a drill-target (Bishop, 1985) despite the poor time-constant calculated. I consider that more confidence can usually be obtained from down-hole data and

* The logarithmic plot is useful for detecting subtle responses. The linear plot is required for interpretation.

‡ The time constant is the inverse of the slope of the late-time decay (which should be a straight line on log-lin paper) multiplied by log(e) (often expressed as 1/2.3). Unfortunately, UTEM uses a different convention; a decay of 1/5 rather 1/e is assumed (Macnee, 1985) and this introduces a factor of 1.43 instead of 2.3. Further, some practitioners merely cite the inverse of the slope.



that the target can therefore be significantly down-graded given the lack of response from the DHEM survey. (Compare, for example, the log obtained from a drill-hole above the massive pyrrhotite body at the nearby Colebrook Hill (Figure 6). This has a similar shape to the GP11A log, but a much more persistent decay.)

I suggest that the source of the conductor is probably an ultra-basic body rather than massive pyrrhotite, nevertheless given sufficient geological and geochemical encouragement from GP11A, redrilling to intersect the target would be warranted.

J.R. Bishop
May, 1986.

REFERENCES

- Bishop, J.R., 1985. Interpretation of the EM37 survey over the Carbine Hill grid (E.L. 42/71). Mitre Geophysics report GF/MG85/11.
- Buselli, G., McCracken, K.G. & Rutter, H., 1985. Manual for SIROTEM field procedures and data interpretation. CSIRO, Div. of Mineral Physics.
- Macnae, J.C., 1985. Manual of large loop EM interpretation. Lamontagne Geophysics.



CARBINE HILL GRID
PETROPHYSICAL MEASUREMENTS

Samples: Core from DDH GP11A

Measured by: Prof. D.W. Emerson, Uni. of Sydney.

Date: June, 1986.

SAMPLE No.	DEPTH (m)	DRY BULK DENSITY t/c.m.	CONDUCTIVITY ^x S/m	RESISTIVITY [‡] ohm-m	IP EFFECT milliradians [@]	IP EFFECT PFE	PETROLOGY
27/1	105.6	2.8 - 2.84	negligible	348	5	0	black shales
27/2	147.	"	"	244	78	15	" "
27/3	172.6	"	0.25	9,531	10	2	" "
27/4	222.5	"	negligible	6,657	17	3	" "

* measured inductively at 2.5 MHz.

‡ measured galvanically at 0.1 Hz.

@ The parameter measured is phase angle. Although 10mr is often considered to be approximately equivalent to 1PFE, 5mr is a much closer approximation here. Multiply by 6.0 (+/-) to convert to chargeability (mv/v).

028

APPENDIX 3

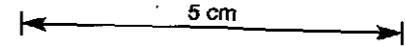
DIAMOND DRILL LOGS 1985/86 (G.P.11, G.P.11A)

PROJECT: TYNDALL

HOLE NO: GP II/GP IIA

GOLD FIELDS EXPLORATION PTY. LIMITED
DIAMOND DRILL HOLE PLOT

SCALE 1:

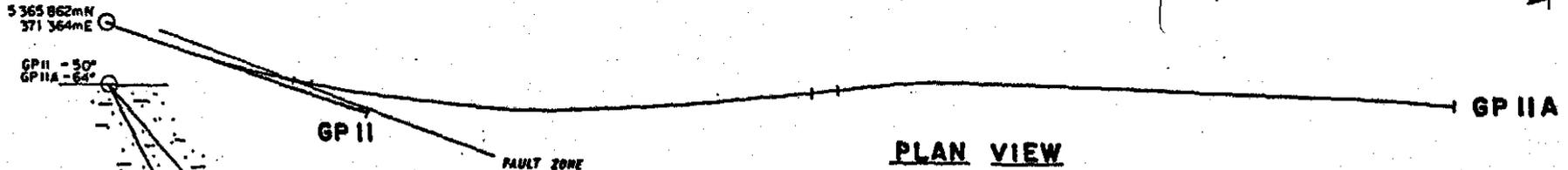


529.4mRL

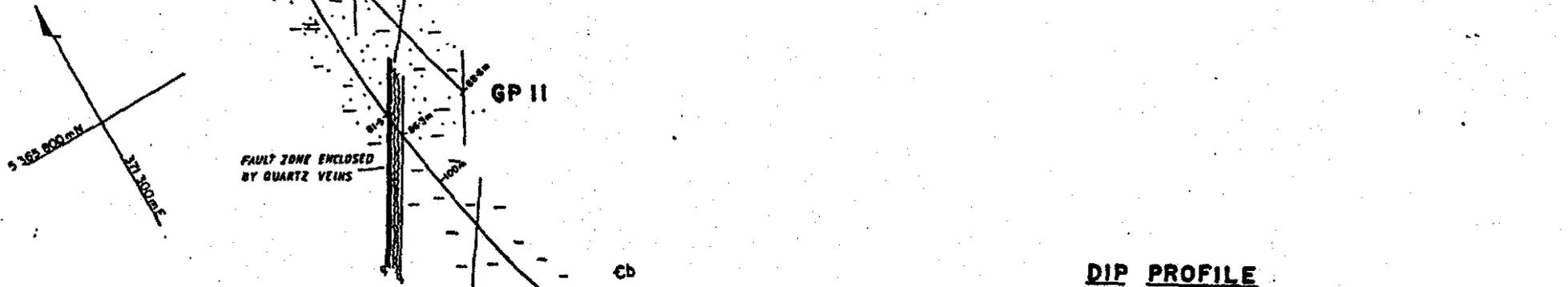
459.5mRL
455.8mRL

374.9mRL
372.0mRL

320.1mRL



PLAN VIEW



DIP PROFILE

LEGEND

- CARBINE HILL GREYWACKE
Siltstone / Sandstone sequence with minor carbonates and gritty conglomerates
- BREWERY JUNCTION FORMATION
Weakly graphitic black shale sequence with minor gritty conglomerates & tuffs
- Contact
- Bedding (approx.)
- Major quartz veins

GOLD FIELDS EXPLORATION PTY. LIMITED
DRILL CORE LOG AND ASSAY DATA

017038

037

PROJECT: GRAND PRIZE

HOLE NUMBER: GP 11A

Page: 4

ULV. PRESS

INTERVAL		RECOVERY		DESCRIPTION	ASSAY DATA (ppm)													
From	To	m	%		Sample No	From	To	Rec. %	Sn	As	Cu	Pb	Zn	Bi				
				The vein trends 28° CA, on both surfaces. (This vein has a relatively high magnetic susceptibility of 160 units). A similar vein occurs at 184.6 (0.4m thick), with irregularly shaped contacts. Like veins occur at 191.8 (0.5m thick), 192.7 (0.3m thick) and 193.2 (0.4m thick).														
193.2-193.7, 0.2m recovered)				An angular veined contact (quartz, 2 cm thick) occurs on the contact with the unit below, at 22° CA.	T 3126	190.0	191.0	100	45	98	35	60	150	410				
					7		191.7	"	7	1336	50	120	310	"				
					8		192.7	"	45	25	45	10	80	"				
					T 3129	192.7	194.4	82	6	44	50	20	70	"				
94.4	219.9	25.5	100	Pale green-grey quartz pyritic tuffaceous pyroclastic unit. Massive with minor interbedded shale, the unit is small crystals of quartz in a pale green sericitic matrix. Irregular quartz veins and minor sulphides occur. Overall weakly altered. Small zones of increasing veining sulphides alteration and brecciation usually occur on the contacts between the volcanics and sediments. These contacts are very irregular. Unfractured. In places, bright green chloritic? alteration is present.														
9.9	223.7	3.8	100	The dark grey-black shale unit returns. Slightly graphitic, weakly fractured, unaltered and cut by many thin quartz veinlets. Slightly to weakly pyritic in places also. Thin interbeds of slightly coarser silts occur, ranging from 25° CA to 50° CA.														
				223.7 - 230.7 MASSIVE QUARTZ-FELDSPAR VEIN WITH BRECCIATED MARGINS. WEAKLY SULPHIDIC.														
223.7	225.0	1.3	100	The rock type described in the unit above is brecciated and cemented with quartz in this zone. Pyrite is commonly developed, as are vuggy quartz-feldspar veins at irregular attitudes.	T 3130	223.7	225.0	100	11	33	15	10	60	410				
				The rock is moderately fractured and the proportion of vein material increases gradually with depth into the unit below.	1		226.0	"	45	7	45	"	50	"				
					2		227.0	"	6	16	30	20	110	"				
					3		228.0	"	45	17	135	410	40	"				
225.0	229.9	4.9	100	Massive, coarse grained (bladed) feldspar-quartz vein. Accessory chlorite occurs as wisps throughout the vein. Coarse crystalline quartz needles occur in the numerous large vugs that characterise this vein. Small fragments of wall rock also occur within the	4		229.0	"	"	45	35	10	50	"				
					T 3135	229.0	230.0	"	"	"	25	"	20	"				

GOLD FIELDS EXPLORATION PTY. LIMITED
DRILL CORE LOG AND ASSAY DATA

017039

038

PROJECT: GRAND PRIZE

HOLE NUMBER: GP 11A

Page: 5

ULV. PRESS

INTERVAL		RECOVERY		DESCRIPTION	ASSAY DATA (ppm)									
From	To	m	%		Sample No.	From	To	Rec. %	Sn	As	Cu	Pb	Zn	Bi
				vein. Sulphides are present; mainly pyrite with some sphalerite and chalcopyrite.										
29.9	230.7	0.8	100	Another brecciated-quartz cemented zone occurs on the lower vein contact - similar to the upper vein contact.	T3136	230.0	231.0	100	<5	67	130	150	130	<10
				230.7 - 370.7 GREY SILTSTONES AND SHALES WITH MINOR CHERTY BRECCIAS AND CONGLOMERATES. QUARTZ VEINED AND SULPHIDIC.										
30.7	240.2	9.5	100	Black, dark grey shales and fine grained siltstones. Moderately pyritic with very fine bedded pyrite often remobilised into quartz veins and veinlets that cut the sequence. Weakly to unaltered and weakly fractured.										
				At 233.8, an irregular 1.3m thick quartz-feldspar vein occurs. Weak sulphides are also developed.										
				At 239.2, 0.5m of a coarse gritty unit occurs. The fragments consist of pale sub-angular chert. The base of the unit is terminated by a quartz vein which trends at 10-15° CA (covers 0.5m of core).	T3137	239.0	240.2	100	<5	17	45	50	3*90	<10
240.2	256.7	15.4	93	A change in rock type from the siltstones above to slightly coarser and paler fine to medium grained pale grey silty sandstones and mudstones. Very weakly fractured and altered, with a bedding/foliation developed at 30-45° CA.	T3138	244.7	245.7	100	6	24	15	40	80	<10
				Below 244.7, zones of chert breccia become abundant. These consist of angular chert fragments in a pale grey fine matrix interbedded with the siltstones.	9		246.7	"	<5	20	5	30	50	"
					10		247.7	"	"	28	20	"	80	"
					1		248.7	"	"	36	30	40	40	"
				At 246.6 at 0.5m quartz-feldspar vein cuts the core at 15° CA.	2		249.7	"	"	31	25	"	70	"
				At 248.5 an unusual polymict breccia occurs, developing downhole into a coarse breccia of coarse angular silica fragments (up to 5 cm across) in a dark shaley matrix. This ends at 251.0,	3		250.7	"	7	30	60	60	90	"
				where a 5 cm quartz vein occurs. Many of the clasts are pyritic.	4		251.7	"	<5	35	30	"	160	"
					5		252.7	"	5	27	25	90	80	"
					6		253.7	"	8	27	20	520	220	"
				(253.7-256.7, 1.9m recovered) Below 251.0, a zone of moderately intense fracturing and quartz veining (almost stockworking in places) occurs, to 256.7.	7		254.7	63	<5	33	35	50	310	"
					8		255.7	"	"	8	10	310	170	"
					T3149	255.7	256.7	"	10	18	40	120	120	"

GOLD FIELDS EXPLORATION PTY. LIMITED
DRILL CORE LOG AND ASSAY DATA

017040

HOLE NUMBER: GP 11A

Page: 6

239

PROJECT: GRAND PRIZE

ULV. PRESS

INTERVAL		RECOVERY		DESCRIPTION	ASSAY DATA (ppm)													
From	To	m	%		Sample No	From	To	Rec. %	Sn	As	Cu	Pb	Zn	Bi				
256.7	370.7	113.7	100	The rock returns to weakly quartz veined and fractured pale-medium grey siltstones as before. Slightly coarser fine sandstone lenses and thin beds are common, as are soft sediment deformation features. Bedding occurs at various angles indicating possible tight folding.														
				At 286.6, a 0.3m pale green weakly sericitic aplite? dyke occurs. This has irregular contacts and is weakly quartz phyrlic and pyritic.														
(289.8-290.4, 0.3m recovered)				At 288.1, a broken zone occurs. The core is shattered and fractured into angular pebble sized fragments. No clay zone occurs. This zone continues to 290.5.	T3150	290.4	291.8	100	25	119	110	400	760	<10				
				Immediately below this zone, small quartz-siderite veins cut the sequence, down to 291.7.														
				At 293.7, a 0.2m zone of thin quartz-sulphide (pyrite and chalcopyrite) stockwork occurs.	T3151	309.5	310.5	100	18	47	20	20	90	10				
				At 299.6, a 2.2m weakly fractured zone occurs.	2		311.5	"	19	78	425	660	-	20				
				At 311.5, a patch of rock with pyritic stringers is present, down to 312.0, where a 0.10m semi-massive pyrite zone occurs.	3		312.0	"	49	492	930	8.800	1120	70				
				This also contains minor base metal sulphides.	T3154	312.0	313.0	"	12	47	40	280	190	<10				
				Below 324.0, patches of very light grey bleached rock (up to 0.5m wide) occur - possible hornfelsed.	T3155	314.0	315.0	"	9	10	110	20	60	-				
				At 332.5, a 1.0m long irregular quartz-feldspar vein occurs.	T3156	316.0	317.0	"	5	17	70	-	70	-				
				At 341.6, a 2.0m zone of quartz veinlets and stockwork-breccias occurs.	T3157	318.0	319.0	"	<5	5	80	-	60	"				
				Bedding varies from 50° to 80° CA at these lower depths in this unit - still siltstones with minor fine sandstones.	T3158	320.0	321.0	"	6	13	65	-	50	"				
				The bleached/tan colour of some of the finer grained units still occurs however. The soft sediment and tectonic deformation is also apparent.	T3159	322.0	323.0	"	5	17	85	10	60	"				
					T3160	341.5	342.5	100	6	37	70	40	90	-				
					1		343.5	"	9	36	60	-	80	-				
				END OF HOLE 370.7m.	T3162	343.5	344.5	"	6	33	85	110	100	"				

GOLD FIELDS EXPLORATION PTY. - LIMITED
DRILL CORE RECORD

017043

042
HOLE No. : GP.11A

STATE : TASMANIA

REPORT CMS 86/3/17
Part 1

A suite of eight drill core samples from GP 11A (Grand Prize) was received for routine petrological examination. Representative thin-sections were prepared and examined together with respective offcuts, with carbonate and feldspar stain tests performed as warranted. Attached tabulated descriptions summarise the microscopic data and include interpretative comments.

Summary

This suite is a composite of variably altered sedimentary and subordinate igneous rocks.

Sediments include pelites and polymict (basic to acid volcanically-derived in part) sedimentary breccias in addition to impure dolomite and dolomite breccia. These rocks are variably carbonaceous and syngenetic-pyritic and are variously sideritic carbonate-altered and/or veined with zones of mild chloritic alteration or, elsewhere, development of a quartz-albite-carbonate-chlorite assemblage. Sample T 2599 represents a siderite-quartz vein with sporadic irregular vugs of clear carbonate, mesoscopically white and contrasting with the otherwise optically similar buff-coloured variety.

Igneous rocks are represented by T 2596, a quartz-carbonate-altered chromiferous amygdaloidal basalt, and T 2600, a moderately greisenized porphyritic micaceous alkali microgranite, typical of the late minor intrusive facies of "Pine Hill-type" intrusives.

D. Cowan, B. Sc.

GOLD FIELDS EXPLORATION PTY. LIMITED
DRILL CORE RECORD

017044

043
HOLE No. : GP.11A
STATE : TASMANIA

Sample No.	Classification - Composition	Fabric	Accessories	CENTRAL MINERALOGICAL SERVICES	
				Comments	PART 1
EP 11A T 2593 100.0m (T.S. 55662)	Dolomitic Carbonaceous Pelite. Fine to semi-sericitic kaolin-illite, pervasive micro-crystalline ankeritic dolomite, minor silt-sized clastic quartz, white mica flakes. Sparse discordant veinlets of ankeritic carbonate	Planar to low-angle transcurrent-bedded silty shale, weakly low-angle discordantly sheared (slaty).	Carbonaceous matter, ultrafine "syngenetic" pyrite. Traces secondary chlorite. Minor traces very fine chalcopyrite in veinlets.	Incipiently sheared pyritic, carbonaceous, dolomitic, quartzose-micaceous silty shale. Includes minor thin impure (silty) dolomite partings. Incipiently carbonate-chlorite-veined, altered.	
T 2594 249.9m	Altered Breccia. Framework of quartz-albite-carbonate-altered rhyolite, similarly altered chloritic basalt, and carbonaceous psammopelitic clasts. Carbonaceous psammopelitic matrix. Sporadic quartz-carbonate-albite veins, late carbonate-chlorite veinlets.	Poorly sorted/sandy pelite-matrixed, "conglomeratic". Mildly sheared. Displacive chlorite veinlets.	Syngenetic pyrite in carbonaceous sediment clasts, matrix. Rare sphalerite in altered volcanic clasts.	Polymict sedimentary breccia altered with carbonaceous matter-impregnated, weakly pyritised, quartz-albite-carbonate-chlorite-altered basic and acid volcanic lithoclasts.	
T 2595 291.4m	Veined Pelite. Semi-sericitic white mica with varying proportions of silt-sized quartz, muscovite flakes, pervasive carbonaceous matter, minor pyrite. Irregular veins, veinlets of siderite with disseminated pyrite, minor quartz.	Laminated/siltstone-parted silty shale. Contorted to brecciated irregularly veined, with late sericitic microfractures.	Minor "sideritised" dolomite, syngenetic pyrite. Sparse altered dolomite intraclasts in siderite veins.	Fractured to locally brecciated/siderite(-pyrite)-healed pyritic carbonaceous pelite with late sericitic carbonaceous microfractures.	
T 2596 194.9m	Altered Basalt. Abundant carbonate-quartz-pseudomorphed pyroxene phenocrysts, subordinate silicified feldspar microphenocrysts, sporadic quartz-carbonate amygdaloids in a kaolin-illite/cloudy carbonate-altered groundmass.	Strongly porphyritic, weakly amygdaloidal, "basaltic".	Relict primary chromite, ultrafine leucogenised opaques. Traces of pyrite.	Pervasively quartz-clay-carbonate-altered, chromiferous, amygdaloidal basalt. In sharp siderite-chalcedony-veined contact with a silicified/carbonated carbonaceous pelite.	
T 2597 43.4m	Impure Dolomite. Ankeritic dolomite with subordinate to minor, silt- to fine sand-sized clastic quartz, semi-pervasive carbonaceous matter. Interbeds of dolomitic silty shale. Sporadic carbonate veins.	Interbedded massive and quartzose silty to sandy dolomite. Concordant and discordant irregular veins.	Syngenetic pyrite, detrital muscovite flakes. Minor carbonaceous stylolites.	Dominantly impure dolomite (dolomitised limestone) with relatively sandy and pelitic interbeds. Concordant vein is "cone-in-cone"-structured.	
T 2598 178.7m	Dolomitic Breccia. Framework of sericitic/silicified acid volcanic, sericitic/carbonate-stained basalt, carbonaceous dolomite, impure dolomite and pelite clasts. Fine to micro-crystalline dolomite cement. Minor siderite veinlets.	Poorly sorted, angular to subangular, weakly bedded gritty conglomeratic. Mildly corrosive cement.	Disseminated pyrite in clasts, cement. Minor siderite-quartz and late chlorite veinlets.	Polymict conglomerate with affinities to T 2594, but (ankeritic) dolomite-cemented rather than sediment-supported.	
T 2599 192.3m	Siderite-Quartz Rock. Sideritic carbonate with disseminated an- to subhedral quartz grains, clusters. Thinly dispersed clasts of carbonaceous pelite. Irregular vugs of lustre-mottled siderite (white).	Uneven (generally coarse) grained, massive (unbanded), mildly stressed.	Traces of pyrite in shale intraclasts and as inclusions in carbonate and quartz.	Weakly intraclastic vein with late vugs of optically clear siderite (white in hand specimen). Exhibits minor quartz-healed fractures.	
T 2600 286.6m (T.S. 55669)	Altered Porphyry. Frequent sanidine-, subordinate sericitic albite-, minor quartz- and pale phlogopite phenocrysts, thinly disseminated grains, clusters of green schorl. Pervasively sericitic microcrystalline quartz-feldspathic groundmass.	Strongly porphyritic, weakly flow-structured, weakly banded on a micro-scale.	Traces of fluorite.	Moderately greisenized tourmaline-mica alkali-microgranitic porphyry with selective alteration of plagioclase. Affinities with the minor differentiated "Pine Hill" porphyries.	

GOLD FIELDS EXPLORATION PTY. LIMITED
DRILL CORE RECORD

017045

044
HOLE No. : GP.11A

STATE : TASMANIA

REPORT CHS 86/3/17
Part IMineragraphic NotesT 2594 (GP 11A/249.9 m) (P.S. 55663)

Mineragraphic examination confirms the bulk of pyrite in this rock as syngenetic in character with partly recrystallized framboidal and semi-nodular concentrations in clasts, and relatively unrecrystallized microscopic framboids concentrated in the carbonaceous matrix.

Altered volcanic clasts include thinly disseminated fine-grained crystalline (euhedral, cubic) pyrite and, in addition to rare sphalerite blebs, thinly disseminated microscopic (< 20 μ) blebs of chalcopyrite.

T 2595 (GP 11A/291.4 m) (P.S. 55664)

This section exhibits fine to ultrafine-grained, partly recrystallized syngenetic pyrite disseminations in the host rock and coarser-grained disseminations with vein and metasomatic carbonate aggregates.

Carbonate-hosted pyrite exhibits a wide variety of grain-shapes and represents a composite of mechanically included, recrystallized syngenetic, and second generation (introduced) components. Accessory traces of pyrite-marcasite-pseudomorphed pyrrhotite appear with the vein as isolated blebs and discontinuous films. No additional sulphide phases were detected.

D. Cowan, B. Sc.



SEDIMENTARY ROCKS		Upper Cambrian		Lower Cambrian		IGNEOUS ROCKS		SYMBOLS	
Quaternary	Talus	Fairfields Formation	Razorback Conglomerate	Ermine Creek Formation	Extrusives	Melba Sillites	Intrusives	Interpreted Geological Boundary	Dip & Strike of Jointing
Alluvium	Carbine Hill Greywacke	Red Lead Conglomerate	Lower Cambrian	Dunah Formation	Ultra-mafic Rock (undifferentiated)	Devonian Granite	Devonian Granite	Fault approximate position	Compositional layering in ultrabasic
	Confidence Saddle Formation	Mafic Clastics			Serpentine	Cambrian Gabbro	Devonian Granite	Vertical Bedding	Line of horizontaling
	Brewery Junction Formation				Tremolite Rock		Devonian Granite	Dip & Strike of Bedding	Mine workings, Adit
								Dip & Strike of Rotation	Shaft
								Artificial Vertical Axis	Pump
									Abandoned workings

ZEEHAN B 2/3	ZEEHAN B 2/4
ZEEHAN B 4/1	ZEEHAN B 4/2
ZEEHAN B 4/3	ZEEHAN B 4/4

RENISON LIMITED
ZEEHAN B4/4
 INTERPRETATIVE GEOLOGY

SCALE 1:5000 METRES

017047
 5 cm

DRAWN	
TRACED	
DATE	
SCALE	1:5000
DRAWING No.	

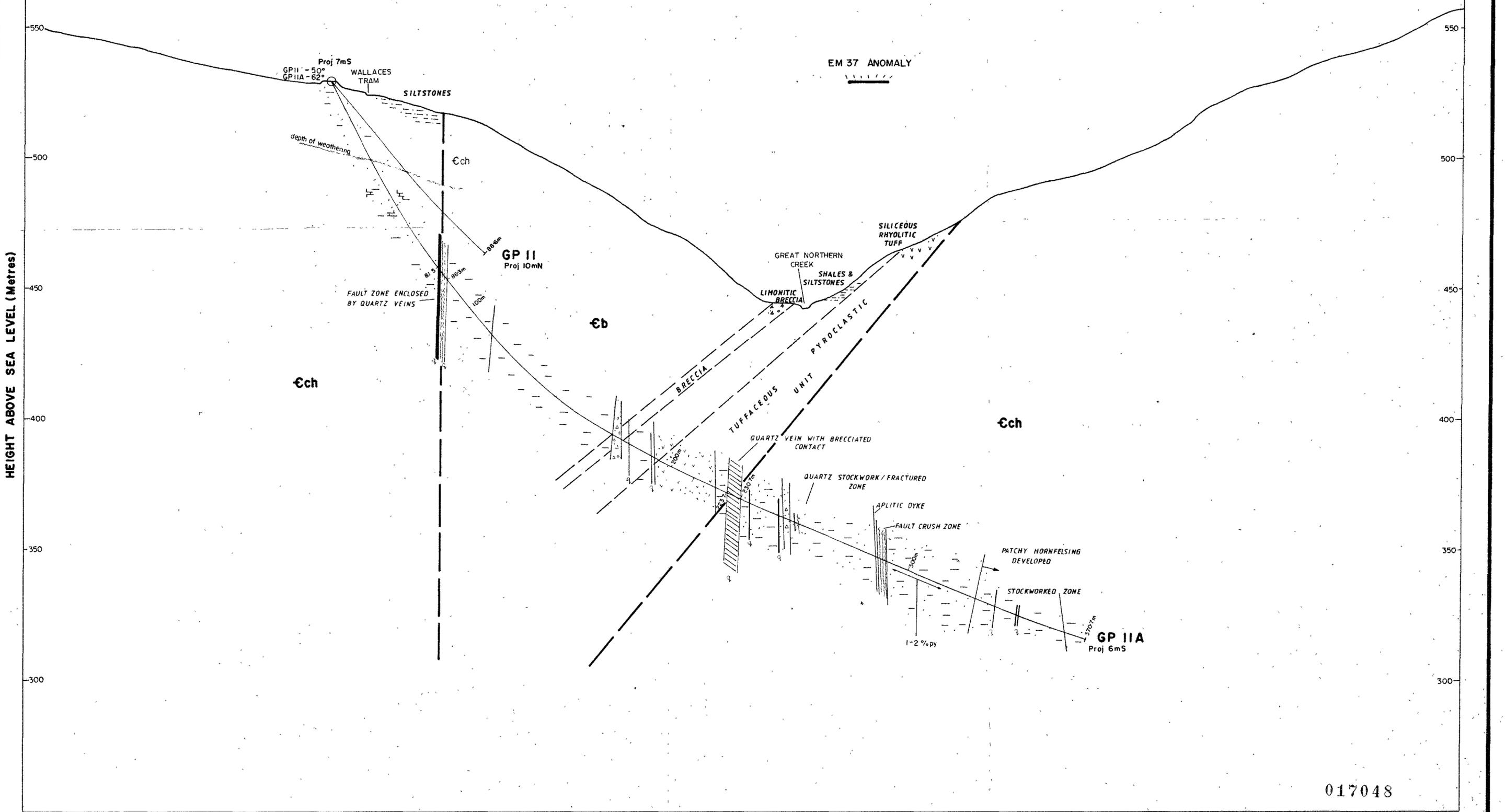
FIG. 3
6583

SECTION BEARING 123° AMG

371 400mE

5 365 800mN

371 600mE



HEIGHT ABOVE SEA LEVEL (Metres)

550
500
450
400
350
300

550
500
450
400
350
300

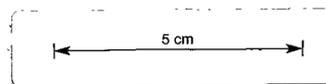
371 400mE

5 365 800mN

371 600mE

LEGEND

- CARBINE HILL GREYWACKE**
Siltstone / Sandstone sequence with minor carbonates and gritty conglomerates
- BREWERY JUNCTION FORMATION**
Weakly graphitic black shale sequence with minor gritty conglomerates & tuffs

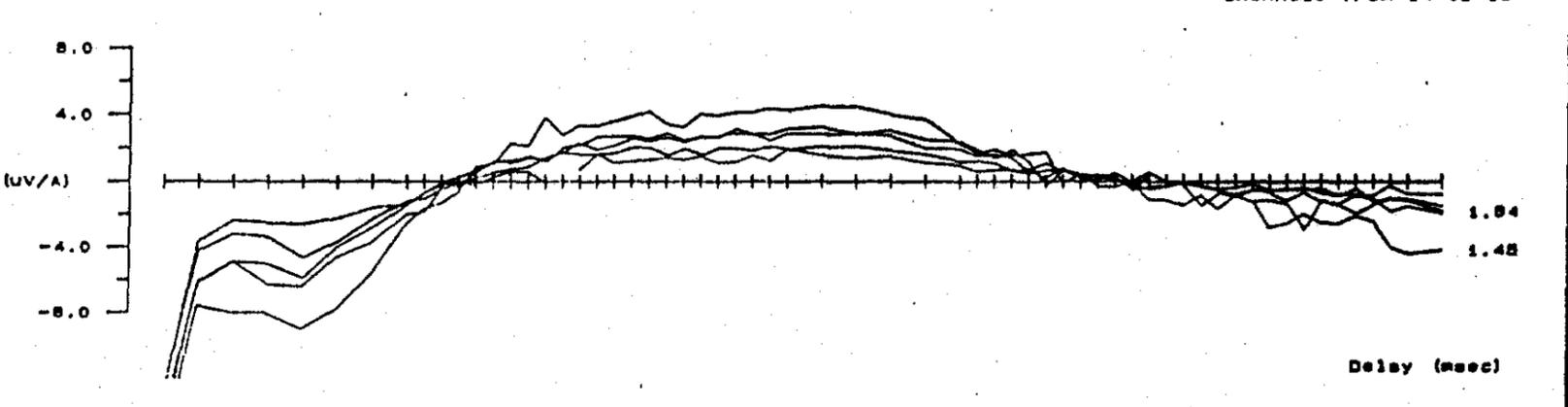
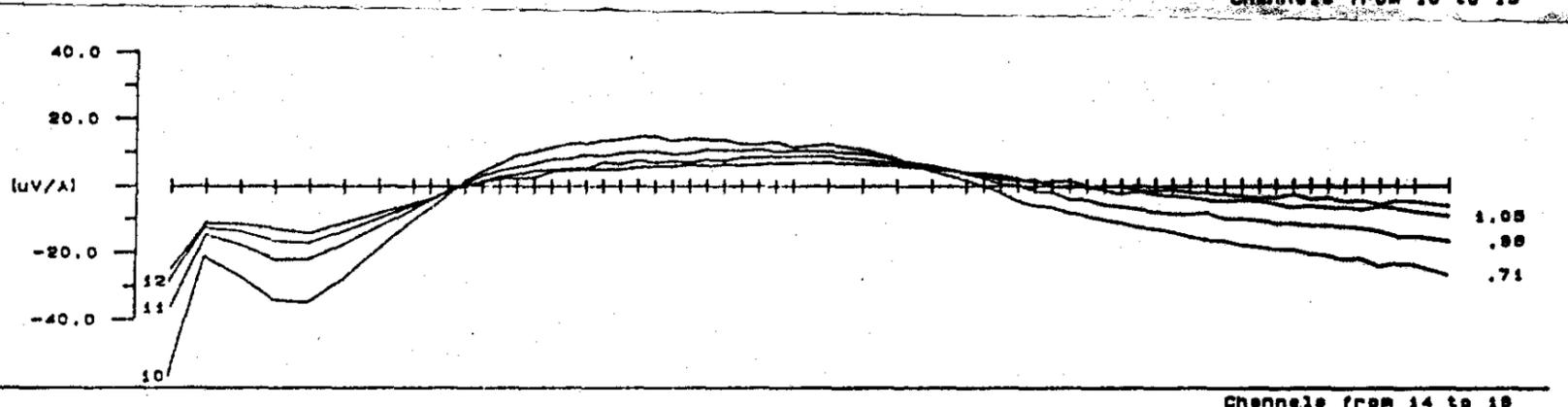
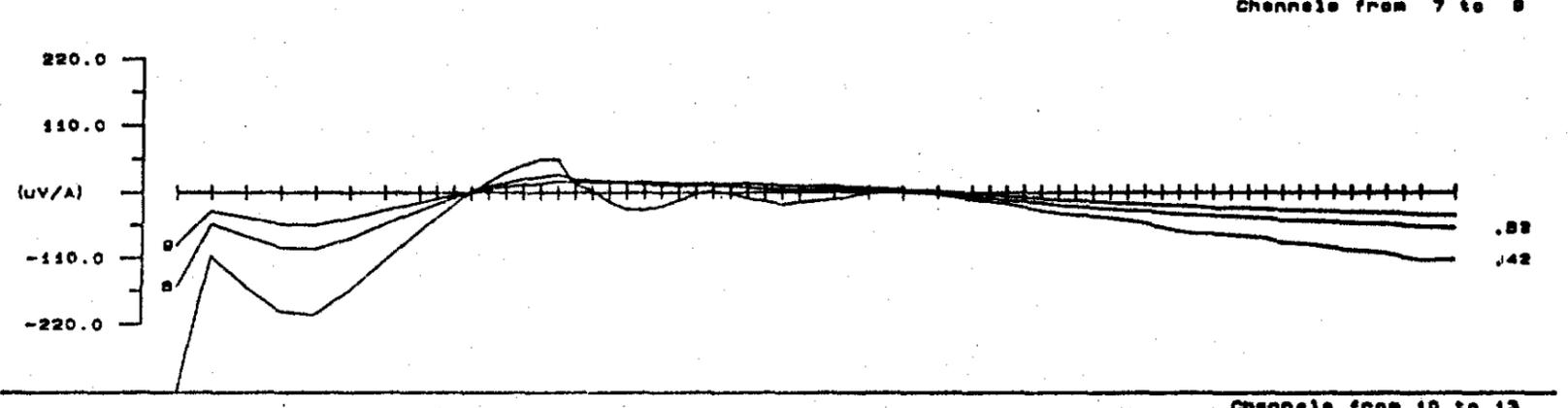
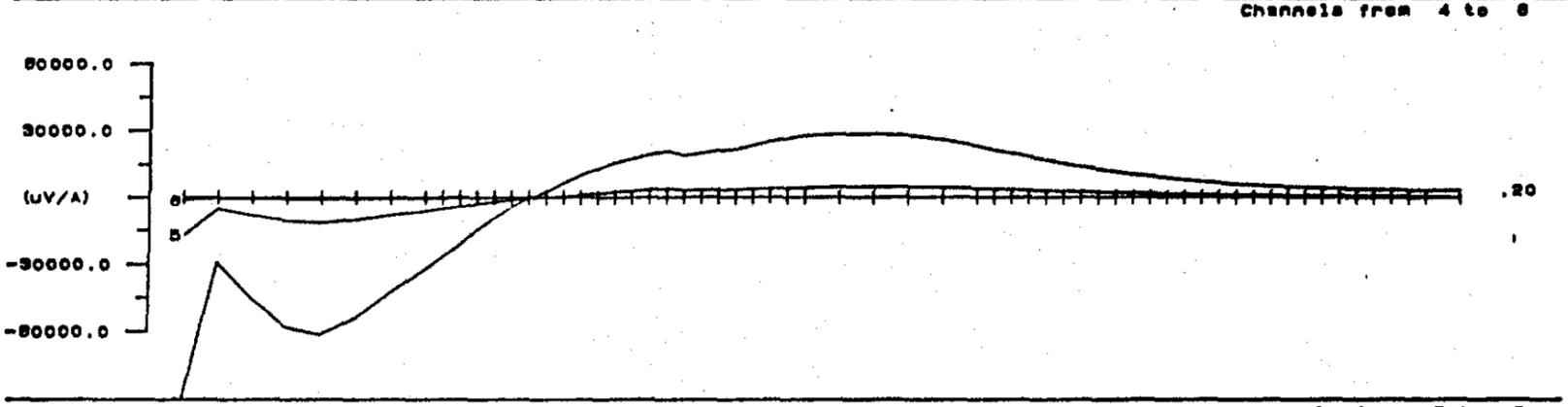
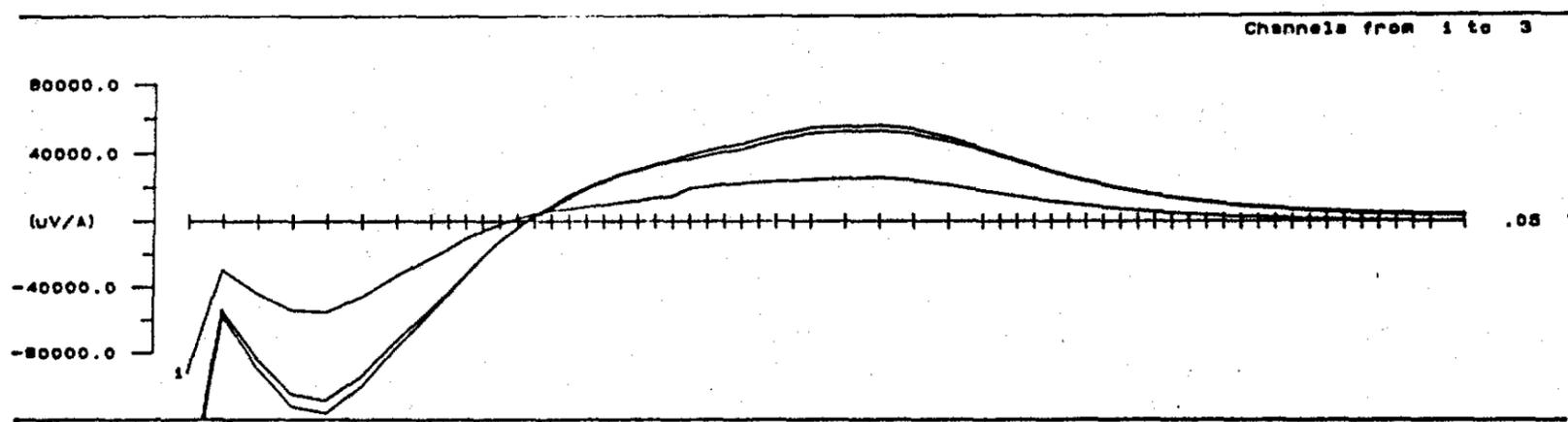


017048

GOLD FIELDS EXPLORATION PTY. LIMITED	
DRILL SECTION	DRAWN BY AC
GP II - GP IIA	DRAFTSMAN
	DATE
	REVISIONS
	FILE NO.
SCALE 1:1,000	FIG 4

6584

86-2563



TRANSIENT E.M. RESPONSE

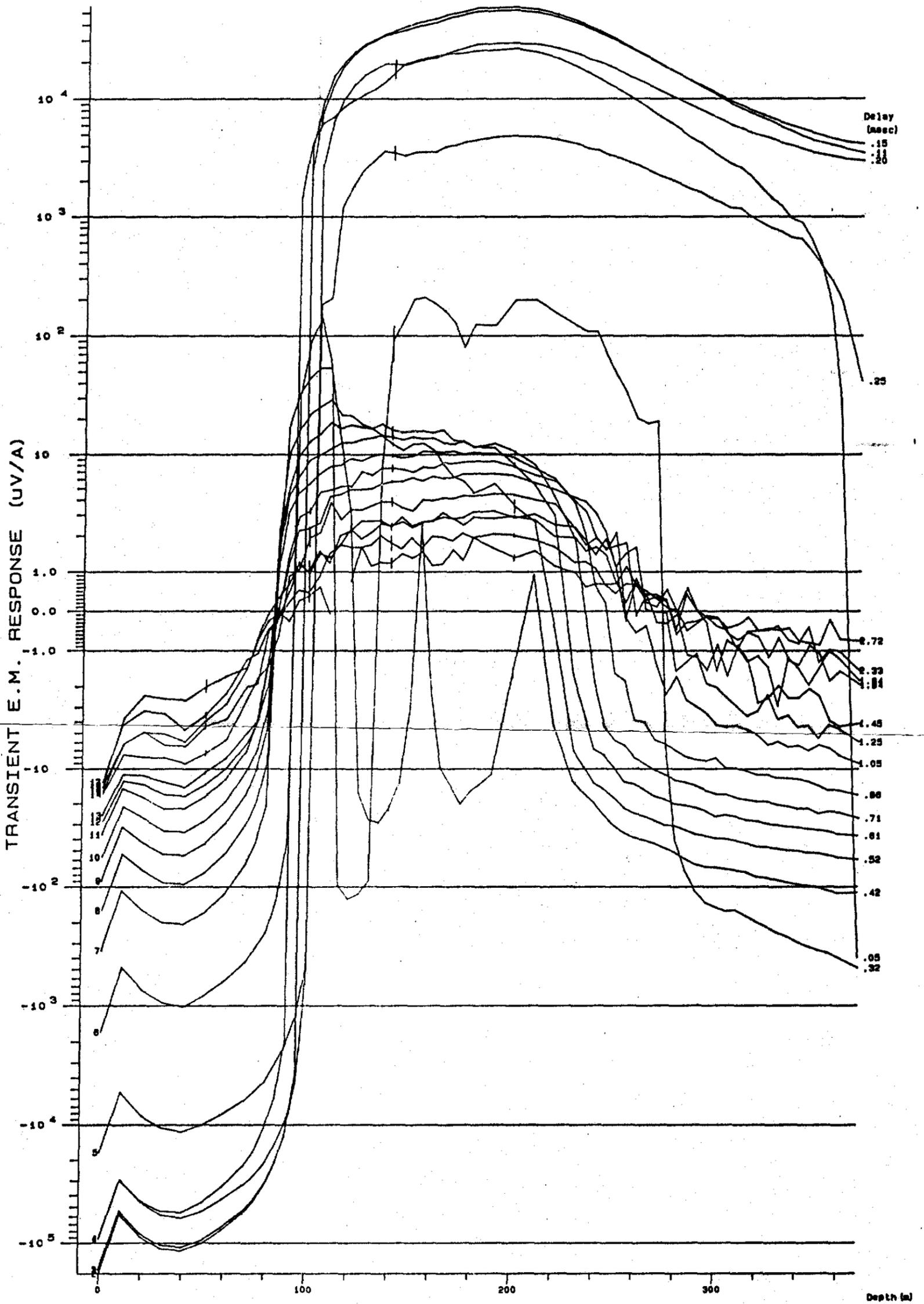
017049

GOLD FIELDS EXPLORATION PTY. LIMITED	
EL 42/71 - GRAND PRIZE AREA	
DHEM SURVEY - GP11A	
<i>linear-linear plot</i>	
DRAWN BY : Ac/low	FILE NO
DRAFTSMAN :	FIG. 5a
DATE : 04/86	
REVISIONS :	

GOLDFIELDS EXPLORATION PTY. LTD.
 GRAND PRIZE, ZEEHAN, TASMANIA
 (JOB NO. 812B)
 DH S1182 LOOP EAST
 SIROTEM Survey by SOLO Geophysics & Co.
 SOLO hole ref. 520 Reading interval 5 m
 SCALE 1 : 2000 Loop size : 100 m
 LOOP configuration : Drill hole
 Plotted : 4:29 PM 27/ 5/86

5 cm





01 01 17

GOLD FIELDS EXPLORATION PTY. LIMITED

EL-42/71 - GRAND PRIZE AREA
 DHEM SURVEY - GP/1/A
log-linear plot

6588

SCALE 1:2,000

FILE NO

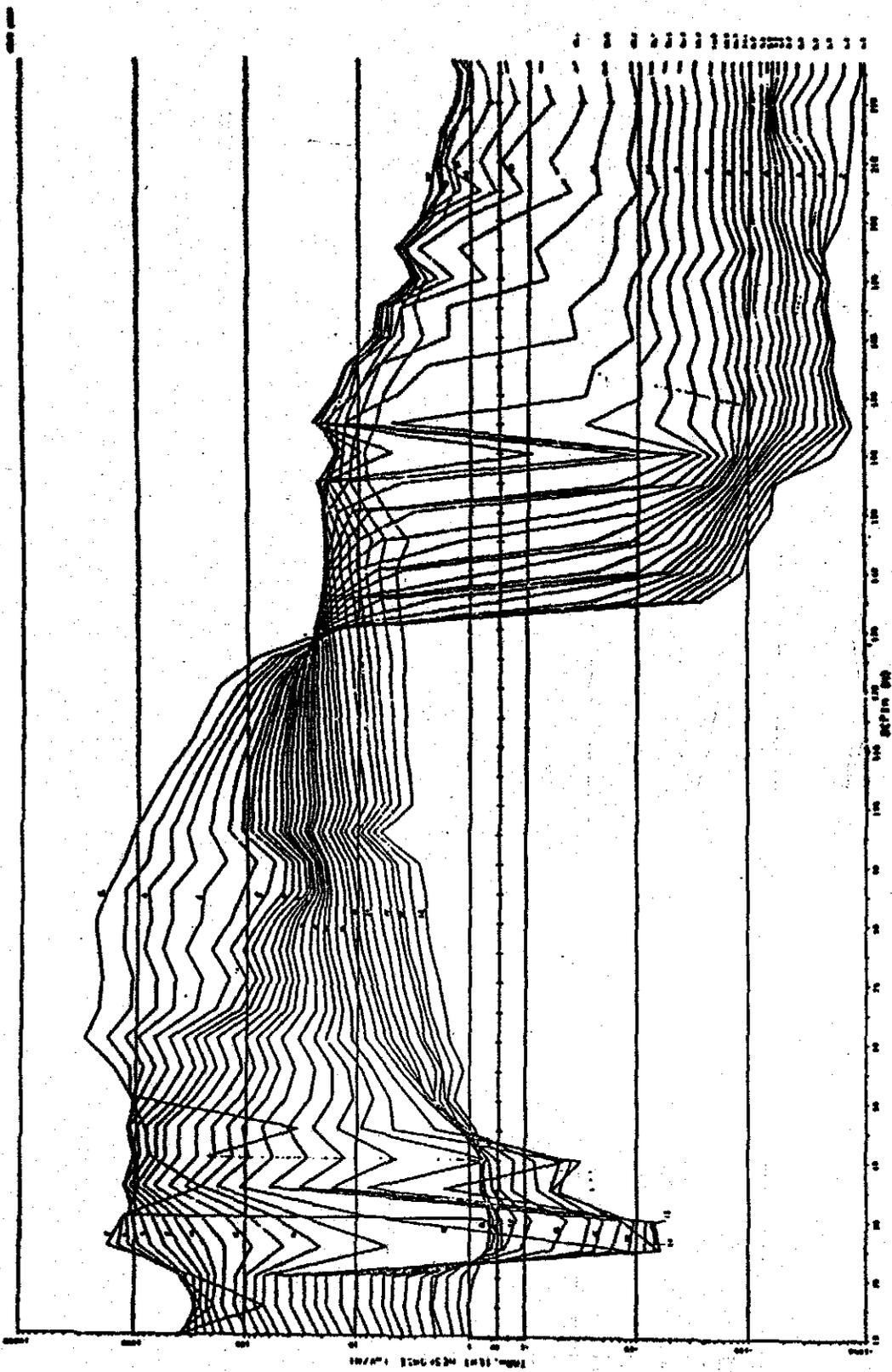
FIG 55

017050

GOLDFIELDS EXPLORATION PTY. LTD.
 GRAND PRIZE, ZEEHAN, TASMANIA
 (JOB NO. 812B)
 DH S1182 LOOP EAST
 SIROTEM Survey by SOLO Geophysics & Co. 26/ 2/86
 SOLO hole ref.520 Reading interval 5.0 m
 SCALE 1 : 2000 Loop size : 100 m
 LOOP configuration : Drill hole
 Plotted : 2:56 PM 27/ 5/86

5 cm



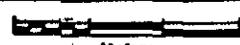


NB. Standard SIRTEM time-base used. Note similarity of shape, but not decay, with Fig 5b.
 (From Buselli et al., 1985).

017051

5 cm

86-2563

GOLD FIELDS EXPLORATION PTY. LIMITED	
EL 42171 - GRAND PRIZE AREA	DRAWN BY : AC/RS
DHEM SURVEY - GP11A	DRAFTSMAN:
	DATE : 04/86
COLEBROOK HILL DHEM	REVISIONS :
log-linear plot.	FILE NO.
SCALE 1	 Metres
FIG. 6	