SOUTH AUSTRALIA

DEPARTMENT OF MINES AND ENERGY

OPEN FILE ENVELOPE NO. 8428

EL 1698, PIONEER DAM

PROGRESS AND FINAL REPORTS FOR THE PERIOD
14/2/91 TO 13/8/92

Submitted by

CRA Exploration Pty Ltd

1992

ENVELOPE 8428

TENEMENT: EL 1698, Pioneer Dam

TENEMENT HOLDER: CRA Exploration Pty Ltd

CONTENTS

				SADME NO.	
REPORT:	**Mackee, G.L., 1992.** Sixth quarterly and final report for Pioneer Dam EL 1698, South Australia, for the period ending 13th August, 1992 (CRAE report no. 18264).			**8428 R 6** Pgs 49-58	
PLANS		**Scale**	**Company Plan no.**		
	Location plan.	1:250 000	SAa 5392	Pg. 56	*A3*
	Base map.	1:100 000	SAa 5488	8428-6	

END OF CONTENTS

SEPARATELY HELD DATA

DRILLHOLE SAMPLES (held by SADME Core Library):

For up to date information on available drillhole samples, contact the Supervisor, SADME Core Library and quote the Exploration Licence and drillhole number/s you wish to query.

CRA EXPLORATION PTY. LIMITED

FIRST QUARTERLY REPORT FOR PIONEER DAM EL 1698, SOUTH AUSTRALIA, FOR THE PERIOD ENDING 13 MAY , 1991

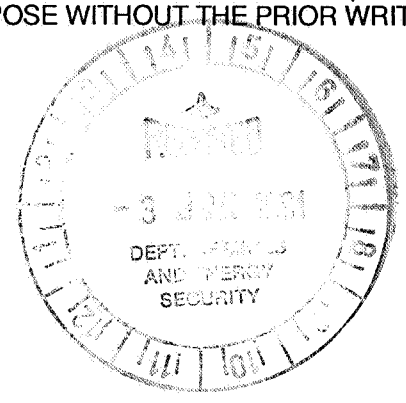
AUTHOR: G.L. MACKEE

COPIES TO: SADME
CIS CANBERRA

DATE: 28TH MAY, 1991

SUBMITTED BY: M. Donnelly
For G.L. MACKEE

ACCEPTED BY:



17300

CONTENTS

LIST OF PLANS

Plan No.	Title	Scale
SAa 5392	Pioneer Dam EL 1698 - S.A., Location Plan	1:250 000
SAa 5488	Pioneer Dam EL 1698 - S.A., Base Map	1:100 000
SAa 5489	Pioneer Dam EL 1698 - S.A., Aeromag Contour Plan	1:100 000
SAa 5538	Pioneer Dam EL 1698 - S.A.,Regional Gravity Contours	1:100 000

1. SUMMARY

Pioneer Dam EL 1698 was granted to CRA Exploration Pty. Limited on 14th February, 1991 for a period of one year. The area is considered to have potential for base-metal mineralisation of both Mississippi Valley and Roxby Downs styles.

During the first quarter, notices of entry were sent to the major lease holders and compilation of geophysical data started. The gravity plan was upgraded using SADME's digital database, and structural re-interpretation commenced. A consequence of this work has highlighted the need to assess available open-file seismic data.

2. CONCLUSIONS AND RECOMMENDATIONS

- Some platformal basement areas adjacent to interpreted faulting may be conducive to MVT base-metal mineralisation.

- Available open-file seismic traverses over these areas should be acquired and inspected to assist structural interpretation.

3. INTRODUCTION

Pioneer Dam EL 1698 was applied for and subsequently granted on 14th February, 1991 for a period of one year. The licence covers an area of approximately 1425 square km and is located 130 km north of Olary on land held under several pastoral leases (plans SAa 5392 and SAa 5488).

The EL area has previously been explored for Tertiary Uranium and Roxby Downs Style targets by Pacminex/Esso (SML's 268/267, 543/544, EL's 45/42, 59, 109) from 1971-74, Mines Administration (EL 171) from 1975-76, C.S.R. Limited (EL's 227, 411, 722, 1065, 1487) from 1976-1990.

CRA Exploration selected the area for investigation of Roxby Downs style targets and possible MVT base-metal mineralisation.

4. WORK COMPLETED

4.1 Landholders

Title searches were completed and Notices of Entry sent to the major pastoral lease holders.

4.2 Geophysics

Plans at 1:100 000 scale of regional aeromagnetics and gravity were compiled (SAa 5489 and SAa 5538). The regional gravity database was improved through the purchase of the S.A.D.M.E. digital gravity data base which incorporates substantial detailed traverses along petroleum exploration seismic lines. Several detailed gravity grids over Roxby-style magnetic anomalies were also acquired from open-file data, but these have not been incorporated into the data set since they are not tied in to the regional data.

Structural interpretation of the geophysical data is not yet complete, but preliminary investigations suggest a series of fault-bounded basement platforms which have been tilted into half-grabens by the north-west trending MacDonald, Strathearn and Benagerie Faults. Open-file seismic sections will be inspected to assist in the structural interpretation.

M. Donnelly
FOR G.L. MACKEE

G.L. MACKEE

GLM/dt

EXPENDITURE

Expenditure on Pioneer Dam EL 1698 for the period ending 30th April, 1991, the nearest accounting period, amounted to $13,380.00, as detailed below.

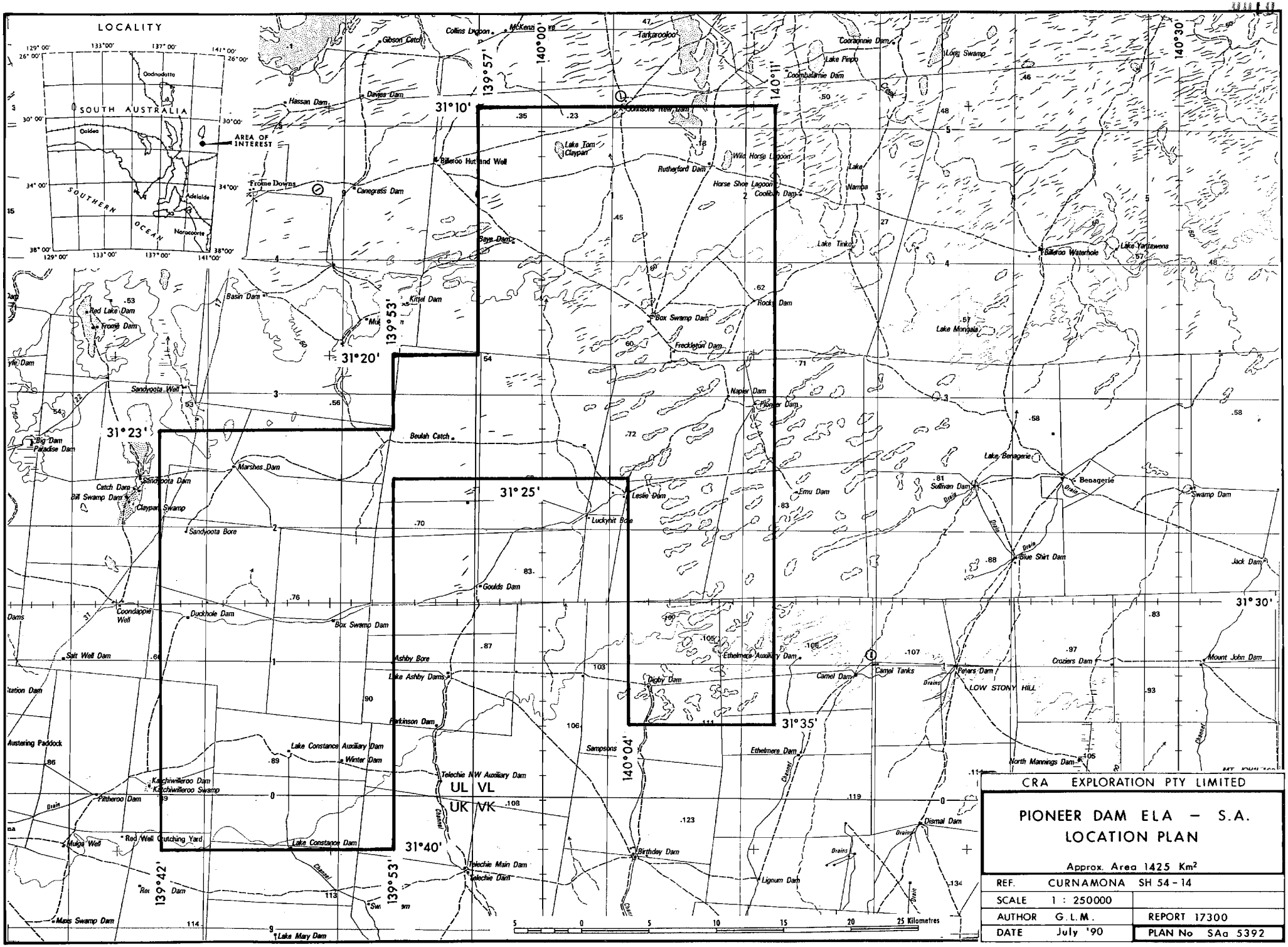
	$
Payroll & Benefits	4 338
Field & Transport	3 742
Contractors	500
General Administration & Office	2 584
Overheads	2 213
Rounding	3
Total	**$13 380**

LOCATION

Curnamona	SH54-14	1:250 000 sheet
Pasmore	6835	1:100 000 sheet
Benagerie	6935	1:100 000 sheet
Curnamona	6834	1:100 000 sheet
Kalabity	6934	1:100 000 sheet

KEYWORDS

Geophys Gravity, Geophys Magnetics, Base Metals



CRA EXPLORATION PTY LIMITED

PIONEER DAM ELA – S.A.
LOCATION PLAN

Approx. Area 1425 Km²

REF.	CURNAMONA SH 54 - 14		
SCALE	1 : 250000		
AUTHOR	G.L.M.	REPORT	17300
DATE	July '90	PLAN No	SAa 5392

8428-1

PIONEER DAM E.L.1698

8428-1

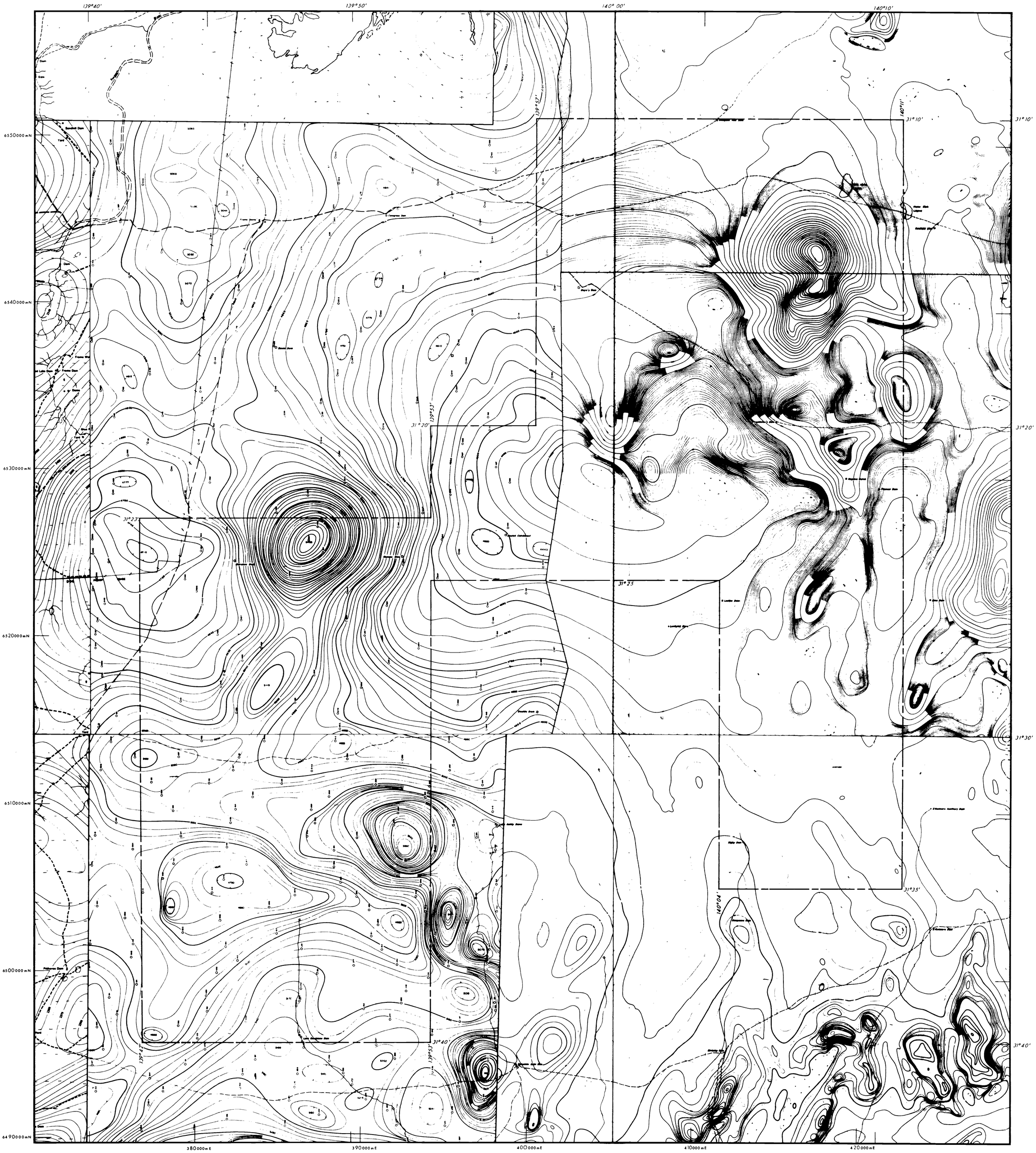
CRA EXPLORATION PTY. LIMITED

PIONEER DAM EL.1698 - S.A.

BASE MAP

REFERENCE · CURNAMONA SH 54-14	
SCALE : 1:100000	DRAWN: F.R
AUTHOR G.L.M	REPORT · 17300
DATE JAN. 1991	PLAN NO. SAa 5488

8428-2



8428-2

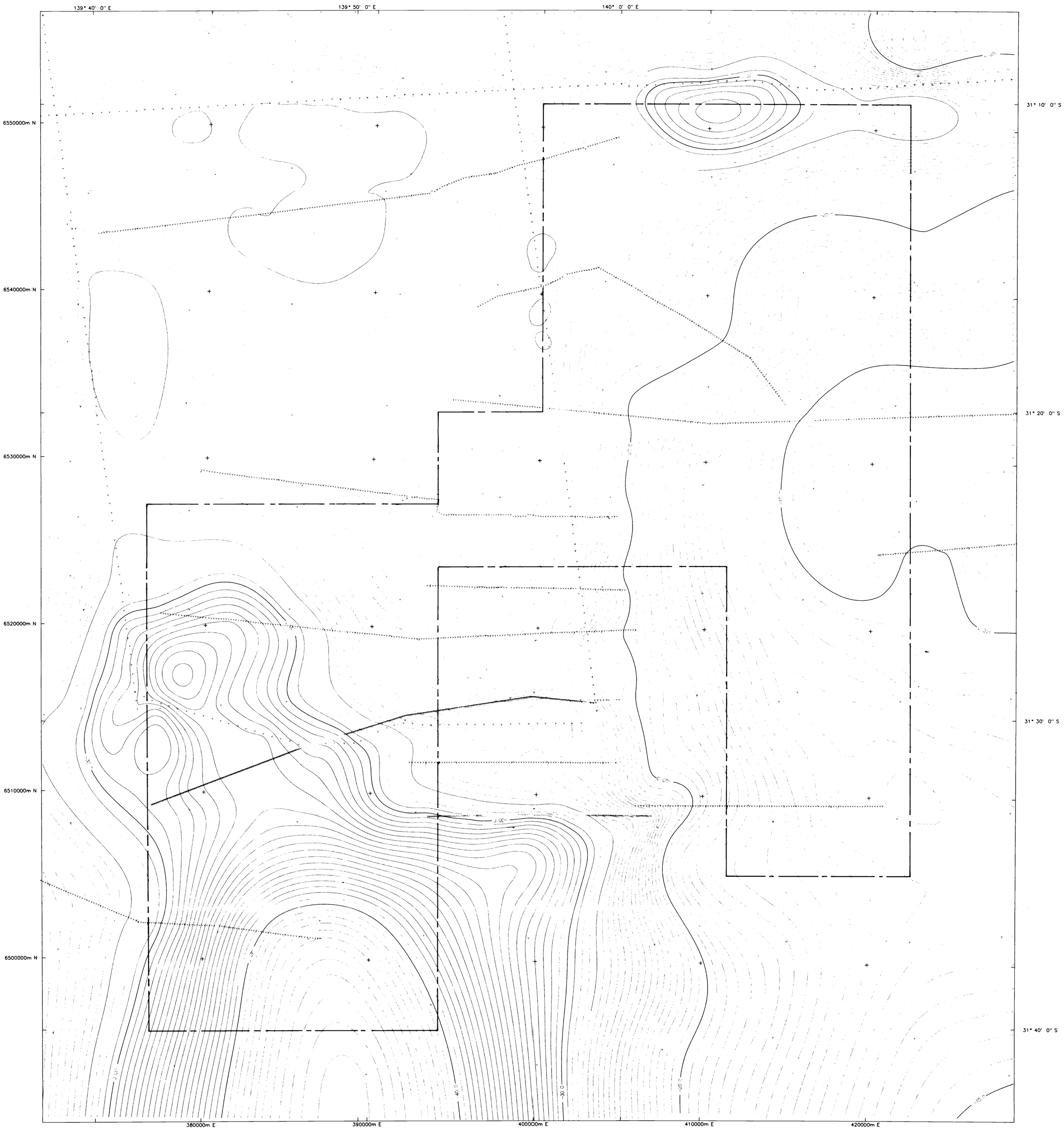
CRA EXPLORATION PTY. LIMITED

PIONEER DAM E.L. - S.A.

AEROMAGNETIC CONTOUR PLAN

REFERENCE: CURNAMONA SH 54 - 14	
SCALE: 1:100 000	DRAWN: F.R.
AUTHOR: G.L.M.	REPORT: 17300
DATE: JAN. 1991	PLAN NO. SAa 5489

8428-3



SCALE 1:100000

0 2 4 6 8
km

8428-3

C.R.A EXPLORATION PTY LIMITED

PIONEER DAM EL 1698 – S.A.

BOUGUER GRAVITY CONTOURS

REF. CURNAMONA SH 54 - 14	
SCALE 1:100000	
AUTHOR : G L M	REPORT : 17300
DATE : 9/ 5/ 91	PLAN NO. : S A o 5538

CRA EXPLORATION PTY LIMITED

SUBJECT: SECOND QUARTERLY REPORT FOR PIONEER DAM EL 1698, SOUTH AUSTRALIA, FOR THE PERIOD ENDING 13TH AUGUST, 1991

AUTHOR: G.L. MACKEE

DATE: 16TH AUGUST, 1991

CRAE REPORT NO: 17478

CRA EXPLORATION PTY. LIMITED

SECOND QUARTERLY REPORT FOR PIONEER DAM EL 1698, SOUTH AUSTRALIA, FOR THE PERIOD ENDING 13TH AUGUST , 1991

AUTHOR: G.L. MACKEE

COPIES TO: SADME
CIS CANBERRA

DATE: 16TH AUGUST, 1991

SUBMITTED BY:

ACCEPTED BY:

CONTENTS

LIST OF PLANS

Plan No.	Title	Scale
SAa 5392	Pioneer Dam EL 1698 - S.A., Location Plan	1:250 000
SAa 5488	Pioneer Dam EL 1698 - S.A., Base Map	1:100 000
SAa 5489	Pioneer Dam EL 1698 - S.A., Aeromag Contour Plan	1:100 000
SAa 5538	Pioneer Dam EL 1698 - S.A.,Regional Gravity Contours with Interpreted Faults	1:100 000

1. SUMMARY

Interpretation of regional geophysical data within the EL suggests a series of fault bounded basement platforms have been tilted into a series of half grabens. One such platformal area has been selected for drill-testing to establish the presence of a sufficient thickness of Cambrian carbonates to host Mississippi Valley type Pb/Zn mineralisation.

Approval for the proposed drill hole of up to 400 metres depth has been granted by the South Australian Department of Mines and Energy. The hole is planned to commence during the next quarter.

2. INTRODUCTION

Pioneer Dam EL 1698 was applied for and subsequently granted on 14th February, 1991 for a period of one year. The licence covers an area of approximately 1425 square km and is located 130 km north of Olary on land held under several pastoral leases (plans SAa 5392 and SAa 5488).

The EL area has previously been explored for Tertiary Uranium and Roxby Downs Style targets by Pacminex/Esso (SML's 268/267, 543/544, EL's 45/42, 59, 109) from 1971-74, Mines Administration (EL 171) from 1975-76, C.S.R. Limited (EL's 227, 411, 722, 1065, 1487) from 1976-1990.

CRA Exploration selected the area for investigation of Roxby Downs style targets and possible MVT base-metal mineralisation. This report details the activities to the end of the Second Quarter, ending 13th August, 1991.

3. WORK COMPLETED

3.1 Geophysical Interpretation

The structural interpretation of the regional gravity and magnetic data has resulted in a series of tilted basement blocks being defined (plans SAa 5489 and 5538). Existing drill holes ETM5 and BWM1 (plan SAa 5488) show Cambrian sediments to be thinning out against a basement dome to the east of the EL. An interpreted down thrown platform west of the Strathearn Fault in the Confidence Bore area retains the potential of a shallow, thick sequence of Cambrian carbonates. The structural setting of these adjacent intersecting major fault systems further enhances the potential for a mineralised system to be present.

To the NW, the Cambrian carbonates become increasingly deep beneath the younger sediments of the Arrowie Basin.

3.2 Drilling

An exploration drill hole is planned within the above area to test for Mississippi Valley Pb/Zn mineralisation. The pastoral lease holder has been served with a Notice of Use of Declared Equipment and approval for the hole has been sought and granted by SADME.

G.L. MACKEE

GLM/dt

EXPENDITURE

Expenditure on Pioneer Dam EL 1698 for the period ending 31st July, 1991, the nearest accounting period, amounted to $8 622.00, as detailed below.

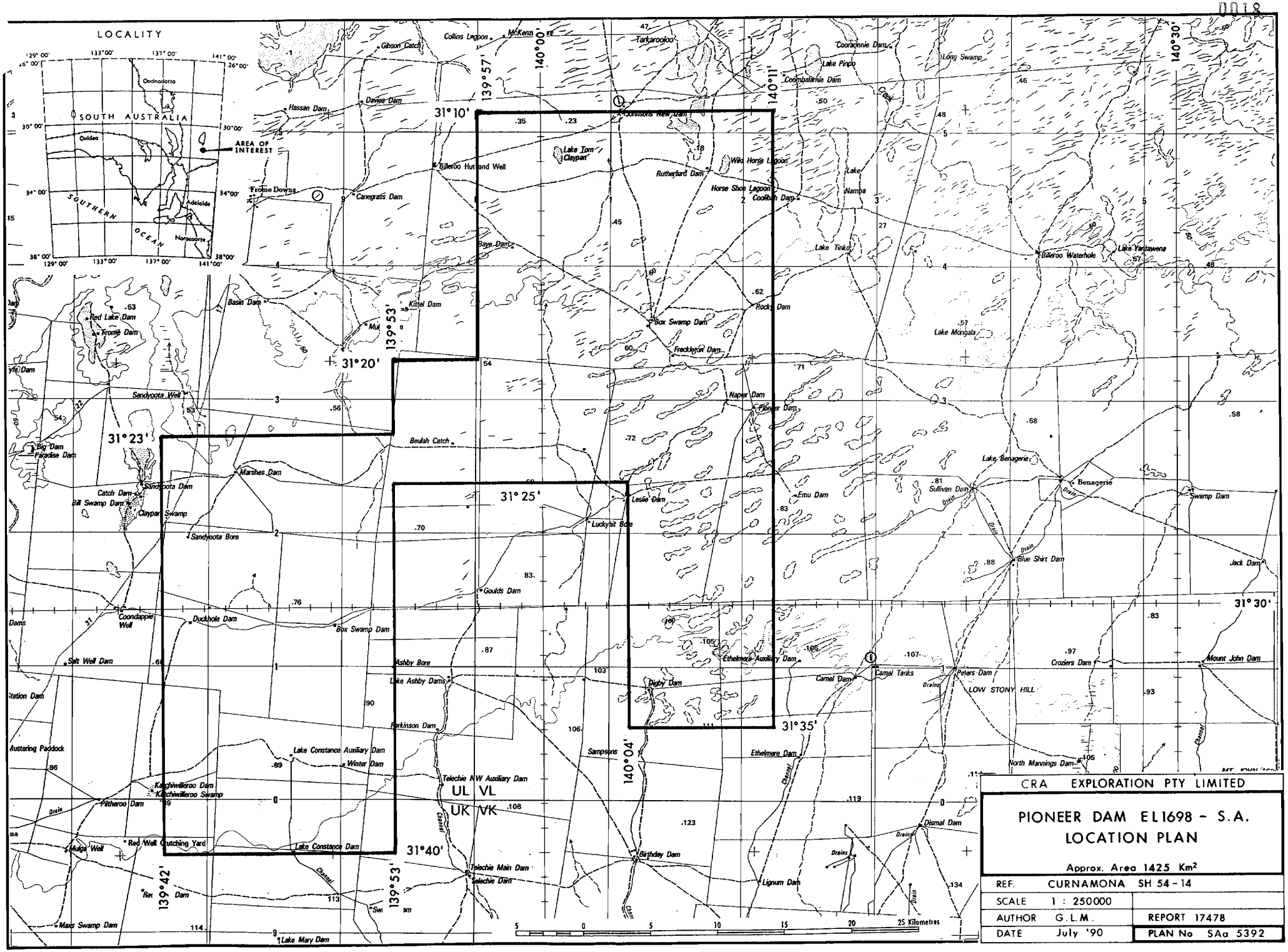
	$
Payroll & Benefits	3 174
Field & Transport	1 066
District Administration	3 044
Regional Overheads	1 338
Total	**$8 622**

LOCATION

Curnamona	SH54-14	1:250 000 sheet
Pasmore	6835	1:100 000 sheet
Benagerie	6935	1:100 000 sheet
Curnamona	6834	1:100 000 sheet
Kalabity	6934	1:100 000 sheet

KEYWORDS

Geophys Gravity, Geophys Magnetics, Base Metals



CRA EXPLORATION PTY LIMITED

PIONEER DAM EL1698 - S.A.
LOCATION PLAN

Approx. Area 1425 Km²

REF.	CURNAMONA SH 54-14	
SCALE	1 : 250000	
AUTHOR	G.L.M.	REPORT 17478
DATE	July '90	PLAN No SAa 5392

8428-1

PIONEER DAM E.L.1698

8428-1

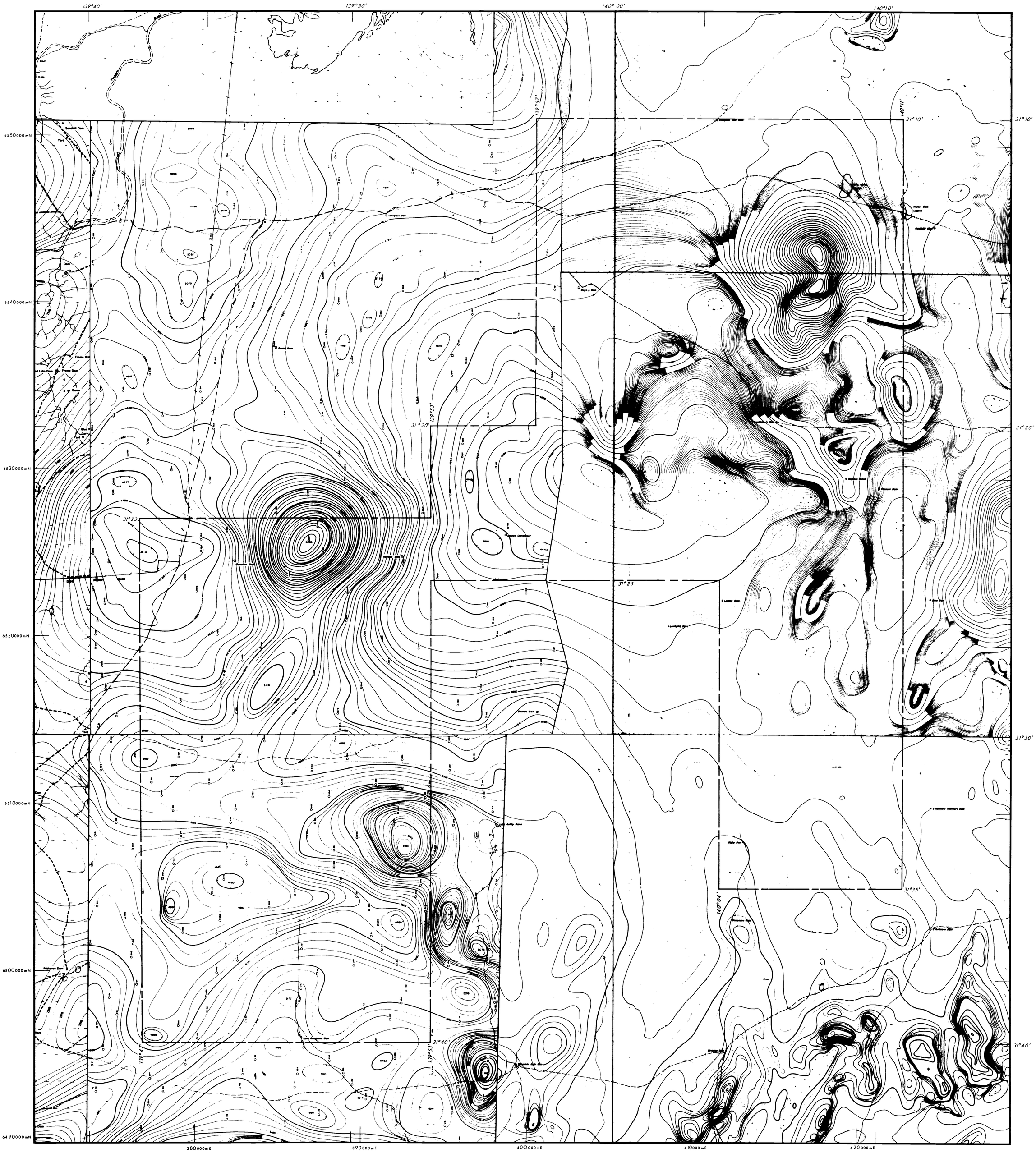
CRA EXPLORATION PTY. LIMITED

PIONEER DAM EL.1698 - S.A.

BASE MAP

REFERENCE · CURNAMONA SH 54-14	
SCALE : 1:100000	DRAWN: F.R
AUTHOR G.L.M	REPORT · 17300
DATE JAN. 1991	PLAN NO. SAa 5488

8428-2



8428-2

CRA EXPLORATION PTY. LIMITED

PIONEER DAM E.L. - S.A.

AEROMAGNETIC CONTOUR PLAN

REFERENCE: CURNAMONA SH 54 - 14	
SCALE: 1:100 000	DRAWN: F.R.
AUTHOR: G.L.M.	REPORT: 17300
DATE: JAN. 1991	PLAN NO. SAa 5489

8428-4

139° 40' 0" E
139° 50' 0" E
140° 0' 0" E
31° 10' 0" S
31° 20' 0" S
31° 30' 0" S
31° 40' 0" S
6550000m N
6540000m N
6530000m N
6520000m N
6510000m N
6500000m N
380000m E
390000m E
400000m E
410000m E
420000m E
OBMW1
PROPOSED DRILL HOLE
ETM5
TWM9
Benagerie Fault
Strathearn Fault
MacDonald Fault
D U
U D
-30
-40
-50

Interpreted Fault

SCALE 1:100000
0 2 4 6 8
km

8428-4

C.R.A EXPLORATION PTY LIMITED

PIONEER DAM EL 1698 – S.A.

BOUGUER GRAVITY CONTOURS
WITH INTERPRETED FAULTS

REF. CURNAMONA SH 54 - 14	
SCALE 1:100000	
AUTHOR : G L M	REPORT : 17478
DATE : 9/ 5/ 91	PLAN NO. : S A a 5538

CRA EXPLORATION PTY. LIMITED

THIRD QUARTERLY REPORT FOR PIONEER DAM EL 1698, SOUTH AUSTRALIA, FOR THE PERIOD ENDING 13TH NOVEMBER , 1991

AUTHOR: G.L. MACKEE

COPIES TO: SADME
CIS CANBERRA

DATE: 28TH NOVEMBER, 1991

SUBMITTED BY:

ACCEPTED BY:

CONTENTS

LIST OF PLANS

Plan No.	Title	Scale
SAa 5392	Pioneer Dam EL 1698 - S.A., Location Plan	1:250 000
SAa 5488	Pioneer Dam EL 1698 - S.A., Base Map	1:100 000
SAa 5642	Pioneer Dam EL 1698 - Confidence Bore Prospect DD91PD1	1:500

1. SUMMARY

Drillhole DD91PD1 was completed to 409 metres depth to test for the presence of Cambrian Carbonate lithologies with Mississippi Valley Base Metal potential. No significant thicknesses of carbonate were encountered.

Further work should await results of geochemical assay of selected intervals from the drillhole.

2. CONCLUSIONS AND RECOMMENDATIONS

- A significant thickness of shallow Cambrian carbonate lithologies is not present in the Confidence Bore area.
- Further work in the area should await results of the geochemical assays from the core, particularly in the interval 150 - 200 metres where a significant SP anomaly was detected during geophysical logging of DD91PD1.

3. INTRODUCTION

Pioneer Dam EL 1698 was applied for and subsequently granted on 14th February, 1991 for a period of one year. The licence covers an area of approximately 1425 square km and is located 130 km north of Olary on land held under several pastoral leases (plans SAa 5392 and SAa 5488).

The EL area has previously been explored for Tertiary Uranium and Roxby Downs Style targets by Pacminex/Esso (SML's 268/267, 543/544, EL's 45/42, 59, 109) from 1971-74, Mines Administration (EL 171) from 1975-76, C.S.R. Limited (EL's 227, 411, 722, 1065, 1487) from 1976-1990.

CRA Exploration selected the area for investigation of Roxby Downs style targets and possible MVT base-metal mineralisation. This report details the activities to the end of the Third Quarter, ending 13th November, 1991.

4. WORK COMPLETED

4.1 Drilling

Hole DD91PD1 was sited at 405050 mE/6531000 mN on the Confidence Bore Prospect as a result of geophysical structural interpretation of available regional magnetic and gravity data (refer Second Quarterly Report). The location is shown on plan SAa 5488.

A 140 metre pre-collar was completed by the S.A. Department of Mines and Energy using rotary-mud techniques. This pre-collar was cased with 100mm steel casing and pressure grouted to confirm with SADME requirements to ensure no interconncetion of Quaternary/Tertiary aquifers with underlying aquifers. Silver City Drilling of Broken Hill, NSW completed the diamond-cored hole to 409 metres total depth.

A summary of the drillhole is as follows:-

Summary Log of DD91PD1 - Pioneer Dam EL 1698

Depth (m)	Description
0 - 6	Sand.
6 - 120	Clays, grey/green to brown with occ. thin bands of sand. Base of Cainozoic?
120 - 214	Red/Brown micaceous, calcareous laminated siltstone with vughs and fractures mostly clay filled, occasionally calcite filled. Rare sulphides.
214 - 309	Red/brown micaceous laminated siltstone/shale with common thin bands of white evaporite. No vughs.
309 - 319	Brown, very micaceous, competent sandstone and dolomite.
319 - EOH	Interbedded shale, dolomite and sandstone, very micaceous, lamellae from ,1mm to 20cm at 90 deg. to LCA.

All magnetic susc. readings in range 0.00005 SI to 0.00030 SI.
All Scintillometer readings in range 50 to 70 cps (Scintrex BGS-4).

Hole surveyed at 409 metres - 4.5 deg. off vertical at 125 degrees.

A fully detailed log of hole DD91PD1 will be presented when assays and petrological results are available.

4.2 Geophysical Logging

DD91PD1 was geophysically logged approximately one month after hole completion, with natural gamma, single point resistance and self-potential parameters recorded - refer plan SAa 5642.

The natural gamma response was uniformly low throughout most of the hole, with minor peaks over the intervals 6 - 21 metres and at 54 metres. A significant S.P. anomaly of -160 mV is present over the interval 150 - 200 metres. The cause of the anomaly is not know, and assays and petrological studies of the core are awaited.

A magnetic susceptibility log of the hole was abandoned due to technical problems, but regular measurements on the chips and core indicate no susceptibilities in excess of 0.00030 SI units.

G.L. MACKEE

GLM/tt

EXPENDITURE

Expenditure on Pioneer Dam EL 1698 for the period 1st August, 1991 to 31st October, 1991 amounted to $74,477 as detailed below.

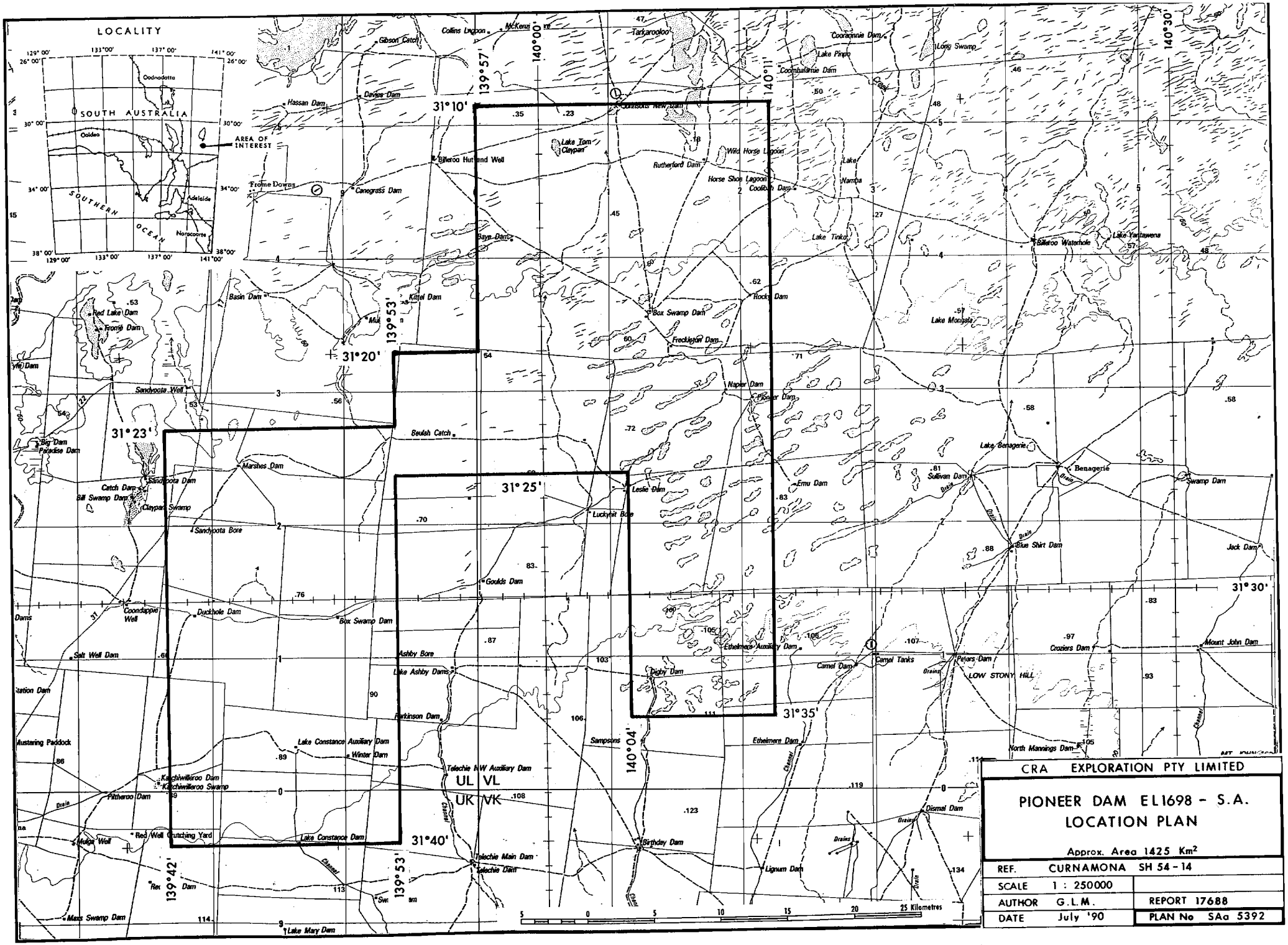
		$
Payroll & Benefits		8,930.00
Drilling		47,067.00
Field & Transport		4,632.00
Computer Services		805.00
Office Supplies		111.00
District Administration		8,760.00
Regional Overheads		4,172.00
	Total	74,477.00

LOCATION

Curnamona	SH54-14	1:250 000 sheet
Pasmore	6835	1:100 000 sheet
Benagerie	6935	1:100 000 sheet
Curnamona	6834	1:100 000 sheet
Kalabity	6934	1:100 000 sheet

KEYWORDS

Geophys Gravity, Geophys Magnetics, Base Metals, Drill Rotary, Drill Diamond, Geophys Borehole, Cambrian.



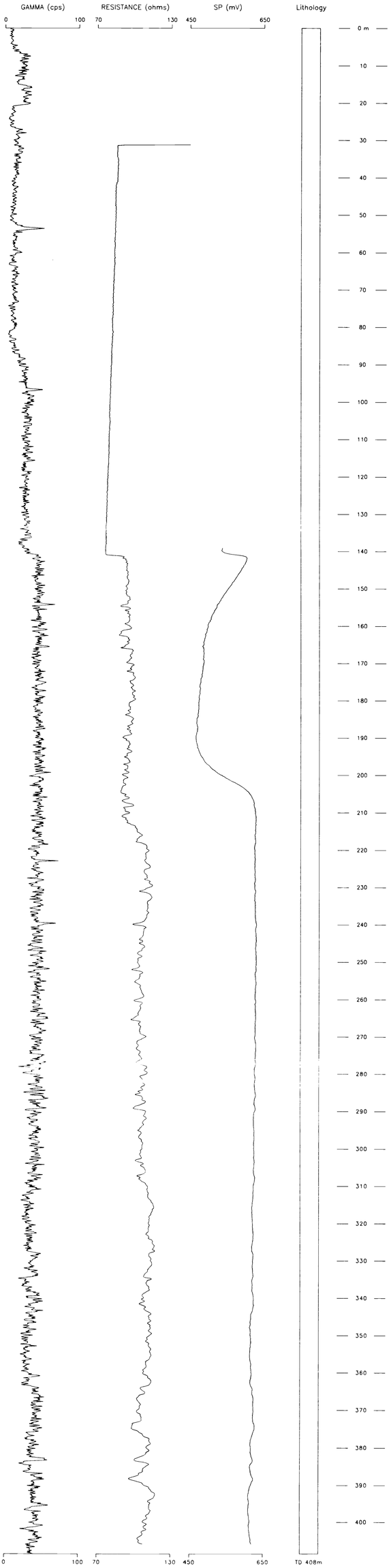
CRA EXPLORATION PTY LIMITED

PIONEER DAM EL1698 - S.A.
LOCATION PLAN

Approx. Area 1425 Km²

REF.	CURNAMONA SH 54 - 14		
SCALE	1 : 250000		
AUTHOR	G.L.M.	REPORT	17688
DATE	July '90	PLAN No	SAa 5392

8428-5



8428-5

CRA EXPLORATION PTY LIMITED

PIONEER DAM EL 1698

CONFIDENCE BORE PROSPECT

DD91PD1

REFERENCE CURNAMONA SH 54-14	
SCALE 1:500	DRAWN DGP
AUTHOR GLM	REPORT 17688
DATE 26 NOV 91	PLAN No SAg 5642

8428-1

PIONEER DAM E.L.1698

8428-1

CRA EXPLORATION PTY. LIMITED

PIONEER DAM EL.1698 - S.A.

BASE MAP

REFERENCE · CURNAMONA SH 54-14	
SCALE : 1:100000	DRAWN: F.R
AUTHOR G.L.M	REPORT · 17300
DATE JAN. 1991	PLAN NO. SAa 5488

CRA EXPLORATION PTY LIMITED

SUBJECT: FOURTH QUARTERLY REPORT FOR PIONEER DAM EL 1698, SOUTH AUSTRALIA FOR THE PERIOD ENDING 13TH FEBRUARY, 1992

AUTHOR: G L MACKEE

DATE: 30TH MARCH, 1992

CRAE REPORT NO: 17957

CRA EXPLORATION PTY. LIMITED

FOURTH QUARTERLY REPORT FOR PIONEER DAM EL 1698, SOUTH AUSTRALIA, FOR THE PERIOD ENDING 13TH FEBRUARY, 1992

AUTHOR:	G.L. MACKEE
COPIES TO:	SADME CIS CANBERRA
DATE:	30TH MARCH, 1992
SUBMITTED BY:	G. L. Mackee
ACCEPTED BY:	

CONTENTS

LIST OF PLANS

Plan No.	Title	Scale
SAa 5392	Pioneer Dam EL 1698 - S.A., Location Plan	1:250 000
SAa 5488	Pioneer Dam EL 1698 - S.A., Base Map	1:100 000
SAA 5702	Pioneer Dam EL 1698 - Billeroo West Prospect Lines 13000N, 14000N, 15000N - T.M.I. Profiles	1: 10 000
SAa 5703	Pioneer Dam EL 1698 - Billeroo West Prospect Line 10,000 mE - Bouguer Gravity and T.M.I. Profiles	1: 25 000

LIST OF APPENDICES

Appendix I Drillhole DD91PD1 - Borehole Logs.

1. SUMMARY

Interpretation of lithologies encountered in drillhole DD91PD1 indicates the hole failed to penetrate the targetted early Cambrian sediments. Geochemical assays of the middle Cambrian lithologies encountered between 140 and 409 metres did not realise any significant values.

A second prospect area, Billeroo West, was selected for further investigations several km to the SE of DD91PD1 where the Strathearn Fault approaches a basement high and shallower lower Cambrian sediments may be expected. Ground magnetic and gravity traversing has been completed in this area to locate the fault and allow depth modelling of a basement-related cross-cutting magnetic anomaly.

The western part of EL 1698 has been relinquished. The remaining area was renewed for a further 12 months.

2. INTRODUCTION

Pioneer Dam EL 1698 was applied for and subsequently granted on 14th February, 1991 for a period of one year. The licence covers an area of approximately 1425 square km and is located 130 km north of Olary on land held under several pastoral leases (plans SAa 5392 and SAa 5488).

The EL area has previously been explored for Tertiary Uranium and Roxby Downs Style targets by Pacminex/Esso (SML's 268/267, 543/544, EL's 45/42, 59, 109) from 1971-74, Mines Administration (EL 171) from 1975-76, C.S.R. Limited (EL's 227, 411, 722, 1065, 1487) from 1976-1990.

CRA Exploration selected the area for investigation of Roxby Downs style targets and possible MVT base-metal mineralisation. This report details the activities to the end of the Fourth Quarter, ending 13th February, 1992.

3 WORK COMPLETED

3.1 Drilling

All geochemical assays for drillhole DD91PD1 have been received. They are fully detailed in Appendix I in the final drillhole logs for DD91PD1. No significant base or precious metal assays were detected. In particular, no elevated geochemical results were detected over the interval 150 to 200 metres, where a strong S.P. anomaly was detected (Third Quarterly Report). The S.P. anomaly is possibly caused by acquifers of differing salinity.

Inspection of the core from DD91PD1 indicates the lithologies intersected are consistent with the middle Cambrian Balcoracana or Billy Creek Formations. The target basal Cambrian carbonates are not present in the hole.

As a result of the above, the potential for shallow lower Cambrian carbonates to the west of DD91PD1 is considered low. Accordingly, the western part of EL 1698 has been relinquished, with the remainder being retained for a further 12 months (refer Plan SAa 5392 for the retained area).

3.2 Geophysical Logging

Billeroo West Prospect was selected several kilometres to the S-E of DD91PD1, where the Strathearn Fault traverses the edge of a basement high lying to the N-E.
In this area, a cross-cutting linear magnetic anomaly may indicate a favourable structure for the formation of Mississippi Valley type mineralisation.

Inspection of the core from DD91PD1 indicates the lithologies intersected are consistent with the middle Cambrian Balcoracana or Billy Creek Formations. The target basal Cambrian carbonates are not present in the hole.

As a result of the above, the potential for shallow lower Cambrian carbonates to the west of DD91PD1 is considered low. Accordingly, the western part of EL 1698 has been relinquished, with the remainder being retained for a further 12 months (refer Plan SAa 5392 for the retained area).

A 12 km traverse of 100 metre spaced gravity stations was emplaced across the Strathearn Fault zone in this area to assist in location and possibly modelling of the fault structure (Plans SAa 5703 and SAa 5488). Additionally, three orthogonal traverses of 10 metre spaced ground magnetics were completed to detail the magnetic anomaly (Plan SAa 5702). Initial modelling of the magnetics suggests a depth to magnetic (?pre-Adelaidean) basement of 450 to 550 metres. Further modelling of the gravity and magnetics data is to be carried out.

J.L. Mackee

G.L. MACKEE

GLM/tt

EXPENDITURE

Expenditure on Pioneer Dam EL 1698 for the period ending January 1992, the nearest accounting period, amounted to $6,943.00, as detailed below.

		$
Payroll & Benefits		2,632.00
Drilling		(5,212.00)
Laboratory		2,000.00
Field and Transport		3,413.00
District Administration		2,917.00
Regional Overheads		1,193.00
	Total	**6,943.00**

LOCATION

Curnamona	SH54-14	1:250 000 sheet
Pasmore	6835	1:100 000 sheet
Benagerie	6935	1:100 000 sheet
Curnamona	6834	1:100 000 sheet
Kalabity	6934	1:100 000 sheet

KEYWORDS

Geophys Gravity, Geophys Magnetics, Base Metals, Drill Rotary, Drill Diamond, Geophys Borehole, Cambrian.

APPENDIX I

Drillhole DD92PD1

Borehole Logs

DIAMOND DRILL LOG
PIONEER DAM EL 1698

CONFIDENCE BORE PROSPECT

HOLE DD91PD1

MAPSHE CURNAMONA SH 54-14, BENAGERIE 6935									DPO P53062		CASING LEFT
AZIMUTH	N/A	EASTING	405050	COMMENCED	10/1/91	OPEN HOLE	0 - 140.0 m		DPO		CASING LEFT
INCLINATION	-90	NORTHING	6531000	COMPLETED	10/10/91	HQ	140.0 - 141.1 m		DPO		WATER TABLE
TOTAL DEPTH	409 m	RL	Approx 60 m	GEOLOGIST	GLM/MJD	NQ	141.1 - 409.0 m		DPO		OXIDISED TO

CORE BLOCKS					GEOLOGICAL DESCRIPTION								
From	To	Rec	%Rec	Log	From	To	Summary	Detail	Sample No	From	To	Int (m)	Rec
					0	1	SAND	Brown surficial sand		0	2		
					1	6		Poorly consolidated, fine sand with ~25% clay. Sample is		2	4		
								orange-brown and calcareous.		4	6		
								4-6 contains 5% gypsum.		6	8		
					6	8	CLAY	Grey/Brown Clay - 10% qtz sand		8	10		
					8	10		Grey Clay - 10% qtz sand		10	12		
					10	12		Grey Clay - 10% qtz sand		12	14		
					12	14		Grey Clay		14	16		
					14	16		14-15 well rounded coarse qtz sand to 1mm grainsize		16	18		
								15-16 stiff grey and brown clay with 10% coarse qtz sand.		18	20		
					16	18		Stiff, interlayed brown and grey clay; approx 5% coarse qtz sand, poss.		20	22		
								contamination from uphole		22	24		
					18	20		Grey and Brown clay as above		24	26		
					20	22		20-20.5 as above; at 20.5m grey/white calcareous band with 1-2% black min.		26	28		
								?MnO		28	30		
								By 22m into stiff white clay		30	32		
					22	24		Stiff white clay with thin layers brown and grey clay. ? some silcrete		32	34		
								contamonation		34	36		
					24	26		Stiff white clay, some hard white and grey/green clay fragments		36	38		
					26	28		As above, occ. black mineral (?MnO) in grey/green clay		38	40		
					28	30		Stiff grey clay. Occasional black mineral- weathered to clay partly		40	42		
					30	32		As above		42	44		
					32	34		As above		44	46		
					34	36		As above		46	48		
					36	38		As above		48	50		
					38	40		As above - occ. fragments hard black mineral to 1cm		50	52		
					40	42		As above - occ. fragments hard black mineral to 1cm		52	54		
								dark grey clay content increasing		54	56		
					42	44		As above - mostly medium grey clay		56	58		
					44	46		As above - mostly medium grey clay					
					46	48		As above - mostly medium grey clay					
					48	50		As above - mostly medium grey clay					
					50	52		As above - mostly medium grey clay					
					52	54		As above - mostly medium grey clay					
					54	56		Green clay similar to above					
					56	58		Grey /green clay as above					

140 m o'Steel	PROSPECT AREA	CONFIDENCE BORE
2 m of 8" Steel	CONTRACTOR	SADME / SILVER CITY
	DRILLER	
	RIG	PORTA DRILL 524 / UNIVERSAL 650

RESULTS										RESULTS						
Au	As	Pb	Ag	Cu	Zn	Fe	Ba	Co	Ni	La	Eu	Er	Yb	Mo	SI	CPS
															40	60
															60	60
															60	60
															60	75
															60	70
															50	80
															20	75
															40	70
															20	85
															20	85
															15	75
															10	50
															5	50
															5	55
															5	65
															5	60
															5	70
															5	70
															5	65
															10	65
															15	60
															10	65
															10	60
															5	60
															5	55
															5	55
															10	70
															10	75
															10	60

HOLE DD91PD1 p.1 of 6

DIAMOND DRILL LOG
PIONEER DAM EL 1698

CONFIDENCE BORE PROSPECT

HOLE DD91PD1

MAPSHE CURNAMONA SH 54-14, BENAGERIE 6935											DPO P53062			CASING LEFT	
AZIMUTH	N/A			EASTING	405050	COMMENCED	10/1/91	OPEN HOLE	0 - 140.0 m		DPO			CASING LEFT	
INCLINATION	-90			NORTHING	6531000	COMPLETED	10/10/91	HQ	140.0 - 141.1 m		DPO			WATER TABLE	
TOTAL DEPTH	409 m			RL	Approx 60 m	GEOLOGIST	GLM/MJD	NQ	141.1 - 409.0 m		DPO			OXIDISED TO	

CORE BLOCKS					GEOLOGICAL DESCRIPTION									
From	To	Rec	%Rec	Log	From	To	Summary	Detail	Sample No	From	To	Int (m)	Rec
					58	60	CLAY	Grey/green clay as above		58	60		
					60	62		As above		60	62		
					62	64		As above plus a sand -band. Poor recovery		62	64		
					64	66		As above		64	66		
					66	68		As above		66	68		
					68	70		As above		68	70		
					70	72		70-71 clay dark grey, 71> as above		70	72		
					72	74		grey/green clay as above		72	74		
					74	76		As above		74	76		
					76	78		As above		76	78		
					78	80		As above		78	80		
					80	82		As above - occ. fragments of harder brown clay		80	82		
					82	84		As above - occ. frags of harder brown clay		82	84		
					84	86		As above - occ. frags of harder brown clay. ?carbonaceous		84	86		
								plus occasional hard white fragments - calcareous layers?;		86	88		
								reacts with HCl. Also 5-10% yellow clay.		88	90		
					86	88		As above, but greatly reduced recovery. Gritty fine white clay		90	92		
								present - probably most of interval.		92	94		
					88	90		80% soft off-white sludgy clay + 20% stiff grey clay.		94	96		
								V. occasional rounded qtz grain to 2mm		96	98		
					90	92		95% soft off-white to lt. brown clay with v. fine grit (carbonaceous)		98	100		
								5% hard grey nodules clay ?carbonaceous		100	102		
					92	94		90% soft lt. brown clay sludge; 10% dk. brown-lt. grey hard clay nodules		102	104		
					94	96		90% soft lt. brown and red/brown clay sludge. Occ. hard fragments		104	106		
								of red/brown clay and carbonaceous clay fragments		106	108		
					96	98		As above		108	110		
					98	100		As above; increasing % of red/brown clay to 80%		110	112		
					100	102		As above, but 90% red/brown soft-stiff clay. 5% lt. brown/white; 5% hard grey		112	114		
								nodules		114	116		
					102	104		Soft red-brown clay with occ. nodules harder grey clay					
					104	106		As above, nodules to 10%					
					106	108		As above					
					108	110		As above					
					110	112		As above					
					112	114		As above					
					114	116		As above - nodules only 1-2%					

140 m o Steel	PROSPECT AREA	CONFIDENCE BORE
2 m of 8" Steel	CONTRACTOR	SADME / SILVER CITY
	DRILLER	
	RIG	PORTA DRILL 524 / UNIVERSAL 650

RESULTS										RESULTS						
Au	As	Pb	Ag	Cu	Zn	Fe	Ba	Co	NI	La	Eu	Er	Yb	Mo	SI	CPS
															10	60
															10	60
															10	65
															10	60
															10	60
															10	60
															5	60
															5	60
															5	55
															5	60
															5	55
															5	55
															5	55
															5	65
															5	65
															5	75
															5	75
															5	75
															5	75
															5	80
															5	80
															5	80
															5	95
															5	110
															5	100
															5	95
															5	100
															5	100
															10	85

HOLE DD91PD1 p. 2 of 6

DIAMOND DRILL LOG

PIONEER DAM EL 1698

CONFIDENCE BORE PROSPECT

HOLE DD91PD1

MAPSHE CURNAMONA SH 54-14, BENAGERIE 6935						DPO P53062	CASING LEFT
AZIMUTH	N/A	EASTING	405050	COMMENCED	10/1/91	OPEN HOLE 0 - 140.0 m	DPO	CASING LEFT
INCLINATION	-90	NORTHING	6531000	COMPLETED	10/10/91	HQ 140.0 - 141.1 m	DPO	WATER TABLE
TOTAL DEPTH	409 m	RL	Approx 60 m	GEOLOGIST	GLM/MJD	NQ 141.1 - 409.0 m	DPO	OXIDISED TO

CORE BLOCKS From	CORE BLOCKS To	Rec	%Rec	Log	GEOLOGICAL DESCRIPTION From	To	Summary	Detail	Sample No	From	To	Int (m)	Rec
					116	118	CLAY	As above		116	118		
					118	120		As above		118	120		
					120	122	SILTSTONE	As above, but with Indurated frags - 5 % laminated flakes of (predominantly)		120	122		
								brown and grey ?mudstone. Slight/rare reaction to HCl - ?calcareous		122	124		
					122	124		Predominantly brown and grey flake of siltstone mudstone - Indurated		124	126		
								v. finely micaceous layers in laminations. Slightly calcareous		126	128		
					124	126		As above		128	130		
					126	128		As above		130	132		
					128	130		As above		132	134		
					130	132		As above		134	136		
					132	134		As above		136	138		
					134	136		As above		138	140		
					136	138		As above					
					138	140		As above End of pre-collar 12.00 noon. 2/10/91					

140 m o Steel	PROSPECT AREA	CONFIDENCE BORE
2 m of 8" Steel	CONTRACTOR	SADME / SILVER CITY
	DRILLER	
	RIG	PORTA DRILL 524 / UNIVERSAL 650

RESULTS										RESULTS						
Au	As	Pb	Ag	Cu	Zn	Fe	Ba	Co	Ni	La	Eu	Er	Yb	Mo	SI	CPS
															10	90
															10	90
															10	95
															15	95
															20	95
															15	85
															15	95
															20	95
															15	95
															20	95
															20	95
															20	90

HOLE DD91PD1 p. 3 of 6

0150

140 m o Steel	PROSPECT AREA	CONFIDENCE BORE	
2 m of 8" Steel	CONTRACTOR	SADME / SILVER CITY	
	DRILLER		
	RIG	PORTA DRILL 524 / UNIVERSAL 650	

RESULTS										RESULTS						
Au	As	Pb	Ag	Cu	Zn	Fe	Ba	Co	Ni	La	Eu	Er	Yb	Mo	Sl	CPS
-0.0010	5	10	-0.5	24	126	46300	431	21	43	47	1	3	2	-10	15	65
-0.001	4	10	0.5	18	101	49100	520	19	44	46	1	2	2	-10	20	65
0.003	5	15	-0.5	12	92	47600	849	20	43	45	1	2	2	-10	15	70
-0.001	7	10	0.5	18	102	45500	682	18	39	44	1	3	3	-10	20	75
0.001	6	25	1	65	119	53300	684	22	63	46	1	3	2	-10	20	70
0.001	7	10	0.5	15	91	45500	1050	18	37	48	1	3	2	-10	20	70
-0.001	6	5	0.5	12	82	47900	1160	18	36	49	1	3	3	-10	20	70
-0.001	11	15	0.5	10	83	50300	1000	19	39	51	1	2	2	-10	20	70
-0.001	7	10	0.5	20	81	46700	1860	20	38	53	1	2	3	-10	20	70
-0.001	7	15	-0.5	10	85	51500	1130	21	45	49	1	3	2	-10	20	70
-0.001	6	10	-0.5	12	90	48600	814	20	43	47	1	3	3	-10	20	70
-0.001	8	10	0.5	11	84	49400	750	19	42	48	2	3	3	-10	20	70
-0.001	7	10	-0.5	38	92	45400	652	20	44	45	1	3	2	-10	20	70
0.003	4	10	0.5	382	97	48900	724	22	46	47	1	3	2	-10	20	70
-0.001	6	10	-0.5	46	90	46700	507	19	39	44	1	3	2	-10	20	70

HOLE DD91PD1 p.4 of 6

DIAMOND DRILL LOG

PIONEER DAM EL 1698

CONFIDENCE BORE PROSPECT

HOLE DD91PD1

MAPSHE CURNAMONA SH 54-14, BENAGERIE 6935									DPO P53062		CASING LEFT
AZIMUTH	N/A		EASTING	405050	COMMENCED	10/1/91	OPENHOLE	0 - 140.0 m	DPO		CASING LEFT
INCLINATION	-90		NORTHING	6531000	COMPLETED	10/10/91	HQ	140.0 - 141.1 m	DPO		WATER TABLE
TOTAL DEPTH	409 m		RL	Approx 60 m	GEOLOGIST	GLM/MJD	NQ	141.1 - 409.0 m	DPO		OXIDISED TO

CORE BLOCKS From	CORE BLOCKS To	Rec	%Rec	Log	GEOLOGICAL DESCRIPTION From	To	Summary	Detail	Sample No	From	To	Int (m)	Rec
					140	214	SILTSTONE	General Description: Red-brown,micaceous,calcareous,laminated siltstone-					
								stone-shale,-very fine laminations, bedding approx horizontal exhibiting	1159912	140	145	5	
								liting local undulations(ripple marks,minor slumping, micro brecciation)					
								tion) & cross-bedding.	1159913	145	150	5	
								Vughs common up to 1cm size, occ. containing					
								calcitic rem ains, but mostly clay filled.	1159914	150	155	5	
								V. fine sulphide common in fractures parallel to bedding,					
								across bedding and in some vughs. ?pyrite.	1159915	155	160	5	
								Fine white calcareous laminae common (acid reaction)					
								parallel to bedding and also in fractures	1159916	160	165	5	
								Clay seams parallel to bedding also common up to 3cm,					
								containing brecciated host rock & occ. sulphides	1159917	165	170	5	
					140.7	140.8		Vertical fracture with v.fine dissem. pyrite coating.					
					142.27			Approx. 1cm Vugh with v.fine silver-grey lining of ?sulphide	1159918	170	175	5	
					145.55	145.57		Green alteration cutting across laminae, with some blebs of					
								calcite in fractures.	1159919	175	180	5	
					151.6	151.62		Calcareous green clay (crumbles on exposure to air), trace py.					
					154.6	155.35		Laminated, micaceous, v.fine green beds grading downwards	1159920	180	185	5	
								to m. grained sandstone, interbedded with red beds;					
								Includes a 5cm clay band with brecciated fragments	1159921	185	190	5	
								host from 155.15 to 155.20m					
					156.1	156.2		As above, but no s/stone & includes clay rich rubble at base	1159922	190	195	5	
					161.7	163.05		Interbedded green and red beds, carbonate rich in upper					
								parts?	1159923	195	200	5	
					166	166.5		As above,limey green claystone interbedded with red beds;					
								trace sulphides on fractures.	1159924	200	205	5	
					170.1	170.25		As above, includes 6cm central coarse sandstone with					
								clay matrix and 1-2% black, shiny mineral grains??	1159925	205	210	5	
					190.5	190.7		Limey green beds, laminated, strong acid reaction on					
								clagey lamination breaks - grades downwards to red beds	1159926	210	215	5	
					190.7	214		Repetite sequences of interbedded red and green beds; red					
								beds becoming more vughy, almost honeycombed in places					
								with remains of calcite material in vughs.					
								Includes at 211.15 - 211.30m a m.g. green layered zone					
								?? possible volcanics. Similar layer at 218.10 - 218.15m.					

DIAMOND DRILL LOG
PIONEER DAM EL 1698

CONFIDENCE BORE PROSPECT

HOLE DD91PD1

MAPSHE CURNAMONA SH 54-14, BENAGERIE 6935														DPO P53062				CASING LEFT	
AZIMUTH		N/A			EASTING		405050	COMMENCED	10/1/91	OPEN HOLE	0 - 140.0 m			DPO				CASING LEFT	
INCLINATION		-90			NORTHING		6531000	COMPLETED	10/10/91	HQ	140.0 - 141.1 m			DPO				WATER TABLE	
TOTAL DEPTH		409 m			RL		Approx 60 m	GEOLOGIST	GLM/MJD	NQ	141.1 - 409.0 m			DPO				OXIDISED TO	
CORE BLOCKS					GEOLOGICAL DESCRIPTION														
From	To	Rec	%Rec	Log	From	To	Summary		Detail					Sample No	From	To	Int (m)	Rec	
					214	309.45	SHALE	GENERAL DESCRIPTION: Core is more competent; still largely laminated											
								red-brown micaceous shale, but with no vughs of clay seams.						1159927	215	220	5		
								Common bands of clear to white evaporitic mineral						1159928	220	225	5		
								(? anhydrite) up to 3cm. These mineral bands						1159929	225	230	5		
								occur both parallel to bedding and cross-cutting, and						1159930	230	235	5		
								include brecciated fragments of host lithology.						1159931	235	240	5		
								Hardness is similar to finger-nail and crumbles into						1159932	240	245	5		
								elongate, needle-shaped crystals.						1159933	245	250	5		
					308.56	308.59	SANDSTONE	Coarse ? sandstone composed of pink/white						1159934	250	255	5		
								rounded grains in green ? calcareous matrix.						1159935	255	260	5		
								Medium grained feldspathic sdstinterbed with minor calcareous matrix.						1159936	260	265	5		
								Feldspar grains subangular. Frags of Gn and Pu-6n shale incorporated in band.						1159937	265	270	5		
								Possible evidence of bioturbation (sub-vert. burrows) @ 307.46, 308.14-309.13m.						1159938	270	275	5		
309.45	319.3	9.85						GENERAL DESCRIPTION: Brown, very micaceous, competent sandstone with						1159939	275	280	5		
								alternating zones of horizontal laminations (bedding) and						1159940	280	285	5		
								cross-bedded with highly disrupted bedding caused						1159941	285	290	5		
								by slumping or high energy depositional environment.						1159942	290	295	5		
319.3	324.64	5.34						Laminated, very micaceous,horizontally bedded ?sandstone. Rare						1159943	295	300	5		
								thin (<<1mm) white evaporitic bands.						1159944	300	305	5		
								Micro-scale disruptions to laminae.						1159945	305	310	5		
324.64	324.69	0.05						band of f.g. grey ?claystone.						1159946	310	315	5		
324.69								As for 319.3-324.64, but colour becoming more grey and						1159947	315	320	5		
								rock quite hard.						1159948	320	325	5		
307	310	3.02			309.45	319.24	S/STONE and	SANDSTONE AND DOLOMITE						1159949	325	330	5		
	313	3					DOLOMITE	Brown, very micaceous, competent, fine grained sandstone. Contains brown						1159950	330	335	5		
	316	2.99						mudstone lamellae,lighter coloured dolomite bands of 0.5 -4.cm thickness. Sdst						1159951	335	340	5		
	319	2.96						contains minor carbonate. Slumping and cross-bedding present. Anhydrite bands						1159952	340	345	5		
	322	3.04						no longer present.						1159953	345	350	5		
	325	2.98												1159954	350	355	5		
	328	3.01			319.24	364.09	SHALE/DOLO	INTERBEDDED SHALE, DOLOMITE AND SANDSTONE						1159955	355	360	5		
	331	2.98					and S/STONE	Both brown and green shale(50%) interbedded with grey-white dolomite						1159956	360	365	5		
	334	2.96						(35%) and brown fine grained non-calcareous sandstone (15%).											
	337	3.03						Dolomite is impure, with shale lamellae, fine sand and muscovite. Brown shal is											
	340	2.93						micaceous. Bedding thicknesses vary from 1mm to 20 cm, typically <1cm.											
	343	3						Slumping common, cross bedding moderately common. Bedding angle is											
	346	3.07						perpendicular to core axis. Trace calcite veinlets.											

140 m o Steel	PROSPECT AREA	CONFIDENCE BORE	
2 m of 8" Steel	CONTRACTOR	SADME / SILVER CITY	
	DRILLER		
	RIG	PORTA DRILL 524 / UNIVERSAL 650	

RESULTS										RESULTS						
Au	As	Pb	Ag	Cu	Zn	Fe	Ba	Co	Ni	La	Eu	Er	Yb	Mo	SI	CPS
-0.001	5	10	-0.5	19	77	44000	447	17	37	45	1	4	3	-10	20	70
0.002	2	10	0.5	9	81	46700	526	18	40	45	1	3	2	-10	20	70
-0.001	5	5	-0.5	9	66	38700	393	16	33	42	1	3	2	-10	20	70
-0.001	8	5	-0.5	11	68	39600	352	15	31	46	1	4	3	-10	20	70
-0.001	10	10	-0.5	9	75	44500	467	18	35	46	1	4	2	-10	20	70
-0.001	12	10	0.5	9	71	43100	415	12	35	48	1	4	3	-10	20	70
-0.001	12	10	0.5	14	80	43500	454	17	37	44	1	4	2	-10	20	70
-0.001	10	10	0.5	18	79	44800	442	18	34	47	1	3	3	-10	20	70
-0.001	10	10	-0.5	12	81	45200	499	17	36	48	1	4	3	-10	20	70
-0.001	11	10	0.5	34	77	42900	483	18	34	43	1	2	2	-10	20	70
-0.001	13	15	-0.5	15	75	40400	476	18	35	42	1	4	2	-10	20	70
-0.001	10	15	0.5	9	79	45600	507	18	37	38	1	3	2	-10	20	70
-0.001	11	10	0.5	7	76	45600	467	18	38	44	1	3	2	-10	20	70
-0.001	12	10	-0.5	8	77	44800	480	18	37	42	1	3	2	-10	20	70
-0.001	15	10	0.5	7	76	44600	432	17	36	45	2	4	3	-10	20	70
-0.001	12	15	0.5	10	83	47400	554	18	38	45	1	3	3	-10	20	70
-0.001	10	15	0.5	8	78	44500	428	19	36	43	1	4	2	-10	20	70
-0.001	15	15	0.5	13	81	48400	791	18	38	41	1	4	3	-10	20	70
-0.001	12	10	0.5	10	80	51700	604	19	39	51	2	4	3	-10	20	70
-0.001	5	5	0.5	14	81	37800	529	18	38	35	1	2	2	-10	20	70
-0.001	6	10	1	12	87	43800	506	21	43	32	1	2	2	-10	20	70
-0.001	8	15	0.5	14	83	48200	500	19	40	49	1	3	2	-10	20	70
-0.001	5	10	0.5	252	144	43200	517	26	58	40	1	2	2	-10	20	70
-0.001	4	10	0.5	289	85	41500	485	21	44	47	1	3	2	-10	20	70
-0.001	7	10	1	39	83	46500	547	20	41	39	1	2	2	-10	20	70
-0.001	6	10	0.5	85	79	43200	539	19	43	47	1	4	2	-10	20	70
-0.001	4	10	0.5	60	112	44600	521	23	47	39	1	2	2	-10	20	70
-0.001	4	10	0.5	49	100	43200	532	22	46	34	1	2	2	-10	20	70
-0.001	6	10	0.5	9	79	51800	553	22	44	33	1	-2	2	-10	20	70
-0.001	11	5	0.5	36	83	48000	569	20	47	36	1	3	2	-10	20	70

HOLE DD91PD1 p.5 of 6

DIAMOND DRILL LOG
PIONEER DAM EL 1698

CONFIDENCE BORE PROSPECT

HOLE DD91PD1

MAPSHE CURNAMONA SH 54-14, BENAGERIE 6935						DPO P53062	CASING LEFT
AZIMUTH N/A	EASTING 405050	COMMENCED	10/1/91	OPEN HOLE	0 - 140.0 m	DPO	CASING LEFT
INCLINATION -90	NORTHING 6531000	COMPLETED	10/10/91	HQ	140.0 - 141.1 m	DPO	WATER TABLE
TOTAL DEPTH 409 m	RL Approx 60 m	GEOLOGIST	GLM/MJD	NQ	141.1 - 409.0 m	DPO	OXIDISED TO

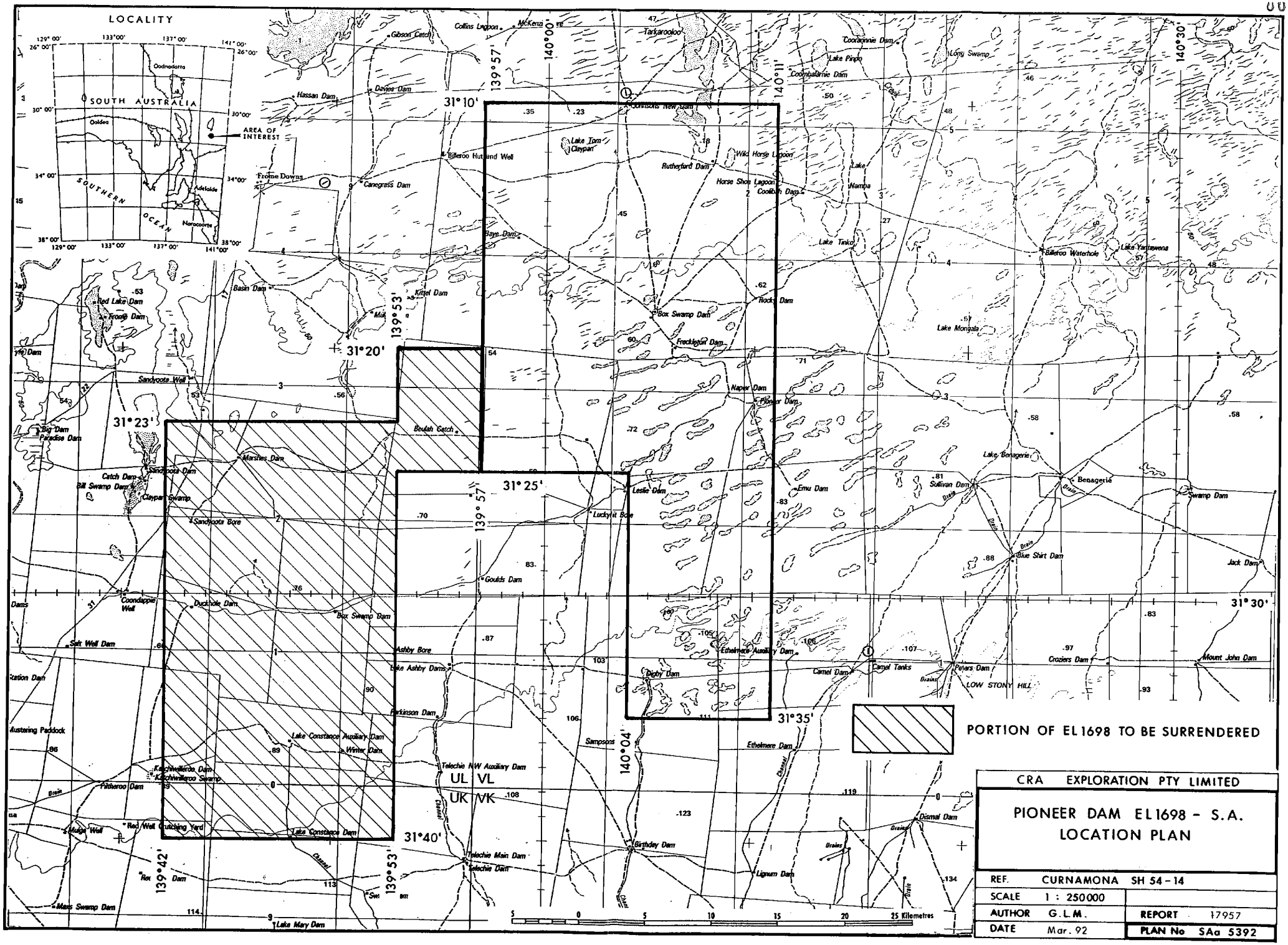
CORE BLOCKS From	To	Rec	%Rec	Log	From	To	Summary	GEOLOGICAL DESCRIPTION Detail	Sample No	From	To	Int (m)	Rec
	349	3.01											
	352	2.95			364.09	373.89		GREEN SHALE Predominantly green non-calcareous shale with minor brown	1159957	365	370	5	
	355	3.06						micaceous shale and white grey dolomite lamellae and bands up to 2cm thick.					
	358	3						Green shale other than lamination does not contain sedi structures. Dolomite	1159958	370	375	5	
	361	2.99						bands exhibit slumping, cross-bedding and lenticular disrupted shapes.					
								Includes: 364.09-368.70: Green shale (95%), brown shale and dolomite (5%)	1159959	375	380	5	
361	362.1	1.21						368.70-372.28: Dolomite bands little more common (5-7%) 372.28-373.89:					
	367	4.87						Brown shale lamellae content increases to approx 10% as grading into underlying	1159960	380	385	5	
	373	5.96						unit.					
373	379	6.04							1159962	385	390	5	
	385	6.03			373.89	376.37		Brown shale and sandstone. Brown, finely laminated, non-calcareous shale (55%)					
	391	5.96						with interbedded grey fine grained sandstone (43%). Dolomite bands only 2%.	1159963	390	395	5	
	397	6.02						Bioturbation(?) structures relatively common. 0.2-1cm thick sub-vertical					
	403	6.01						burrowing through bedding. Shape is dyke-like rather than tubular. Slumping is	1159964	395	400	5	
403	409	5.9						common. Bands and lamellae almost all <1cm thick. Small amount of 2 degree					
								fine carbonate @ 375.24m.	1159965	400	405	5	
								At 406m, thin L/stone band with fossil shell fragments					
					376.37	409		INTERBEDDED SHALE, DOLOMITE AND SANDSTONE Sequence of interbedded brown	1159966	405	409	4	
								and green shale (45%), impure white-grey dolomite(35%) and fine grained					
								sandstone (20%). Shale is non-calcareous and finely laminated. Dolomite is					
								impure with varying amounts of shale lamellae, sand and muscovite. Slumping is					
								most evident in dolomite bands. Dolomite and sandstone are gradational					
								depending on amount of carbonate. Cross-bedding evident in many dolomite					
								bands.					
								Unit overall is laminated to thinly bedded. Bedding angle to core axis is					
								perpendicular. Rare hairline fracture at low angle to core axis. Interval includes:					
								384.02-386.25:- Sandy dolomite bed, only minor lamellae hence tending towards					
								massive.					
								387.89-390.35: Red-brown shale (65%) dominated interval and fine grained					
								sandstone (20%) and dolomite (15%). Dyke-like bioturbation structures are					
								common and confined to this interval. Unit is finely laminated. Lamellae are					
								wavy.					
								394.90-397.43: Dolomitic sandstone bed. Lamellae less common.					
								403.71-405.18: Zone with fractures, subparallel to core axis. Fractures coated					
								with 1mm thick vein calcite and very trace pyrite smear. Lost water circulation.					

0045

140 m o Steel	PROSPECT AREA	CONFIDENCE BORE
2 m of 8" Steel	CONTRACTOR	SADME / SILVER CITY
	DRILLER	
	RIG	PORTA DRILL 524 / UNIVERSAL 650

RESULTS										RESULTS						
Au	As	Pb	Ag	Cu	Zn	Fe	Ba	Co	Ni	La	Eu	Er	Yb	Mo	Sl	CPS
-0.0010	4	10	0.5	95	80	45200	505	20	44	43	1	2	2	-10	20	70
-0.001	9	10	0.5	60	81	48200	516	20	43	48	1	3	2	-10	20	70
-0.001	7	10	-0.5	23	80	446000	605	18	41	41	1	3	2	-10	20	70
-0.001	3	10	0.5	30	71	38100	412	17	36	39	1	3	2	-10	20	70
-0.001	10	10	-0.5	6	69	47900	513	18	38	44	1	3	2	-10	20	70
0.002	91	10	-0.5	64	77	39800	431	19	42	38	1	3	2	-10	20	70
-0.001	5	10	-0.5	25	71	38700	573	18	39	37	1	2	2	-10	20	70
-0.001	42	10	0.5	73	89	44100	502	21	46	37	1	3	2	-10	20	70
-0.001	8	10	-0.5	62	95	43200	469	19	44	33	1	3	2	-10	20	70

HOLE DD91PD1 p. 6 of 6

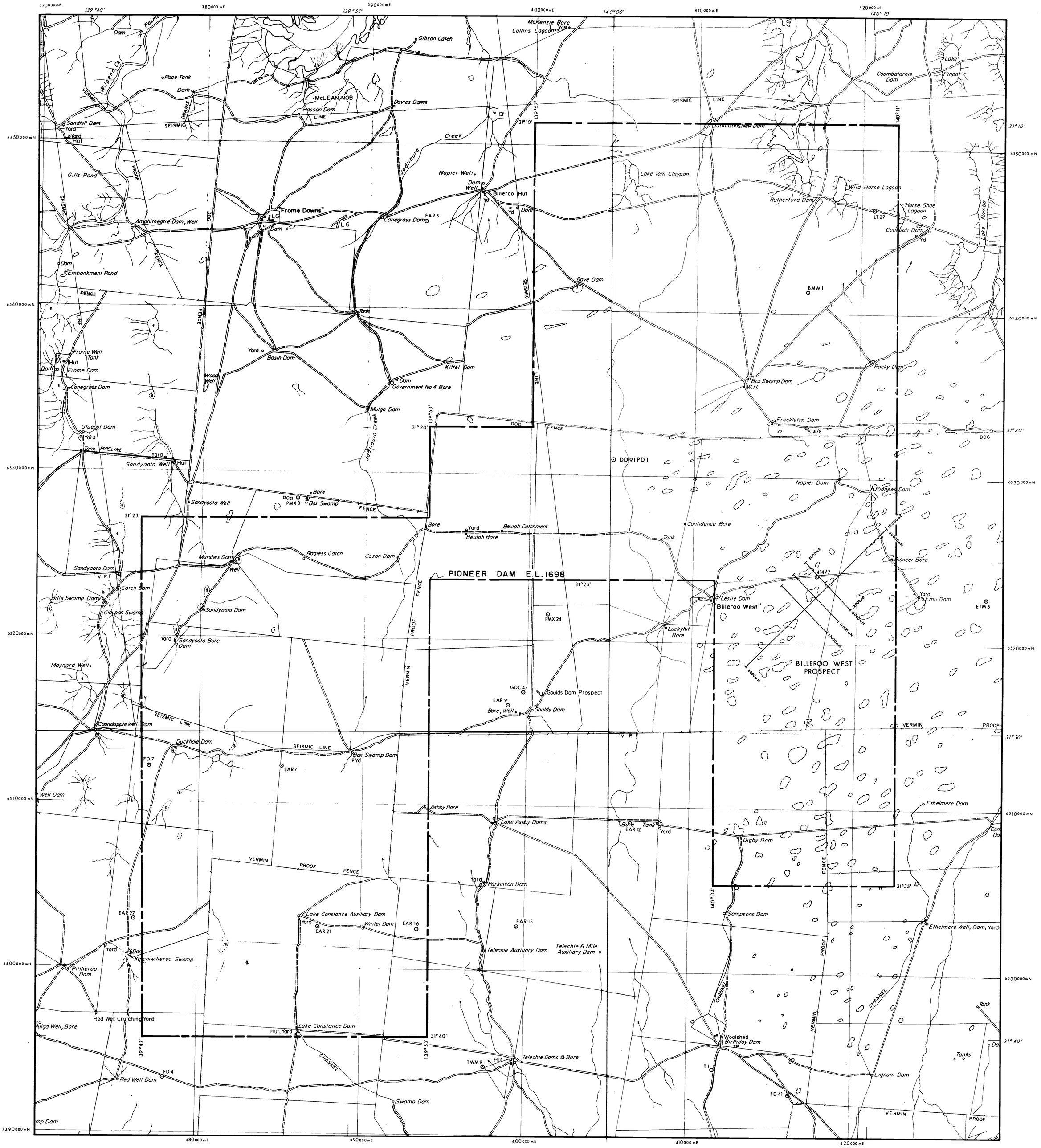


CRA EXPLORATION PTY LIMITED

PIONEER DAM EL1698 - S.A. LOCATION PLAN

REF.	CURNAMONA SH 54-14		
SCALE	1 : 250000		
AUTHOR	G.L.M.	REPORT	17957
DATE	Mar. 92	PLAN No	SAa 5392

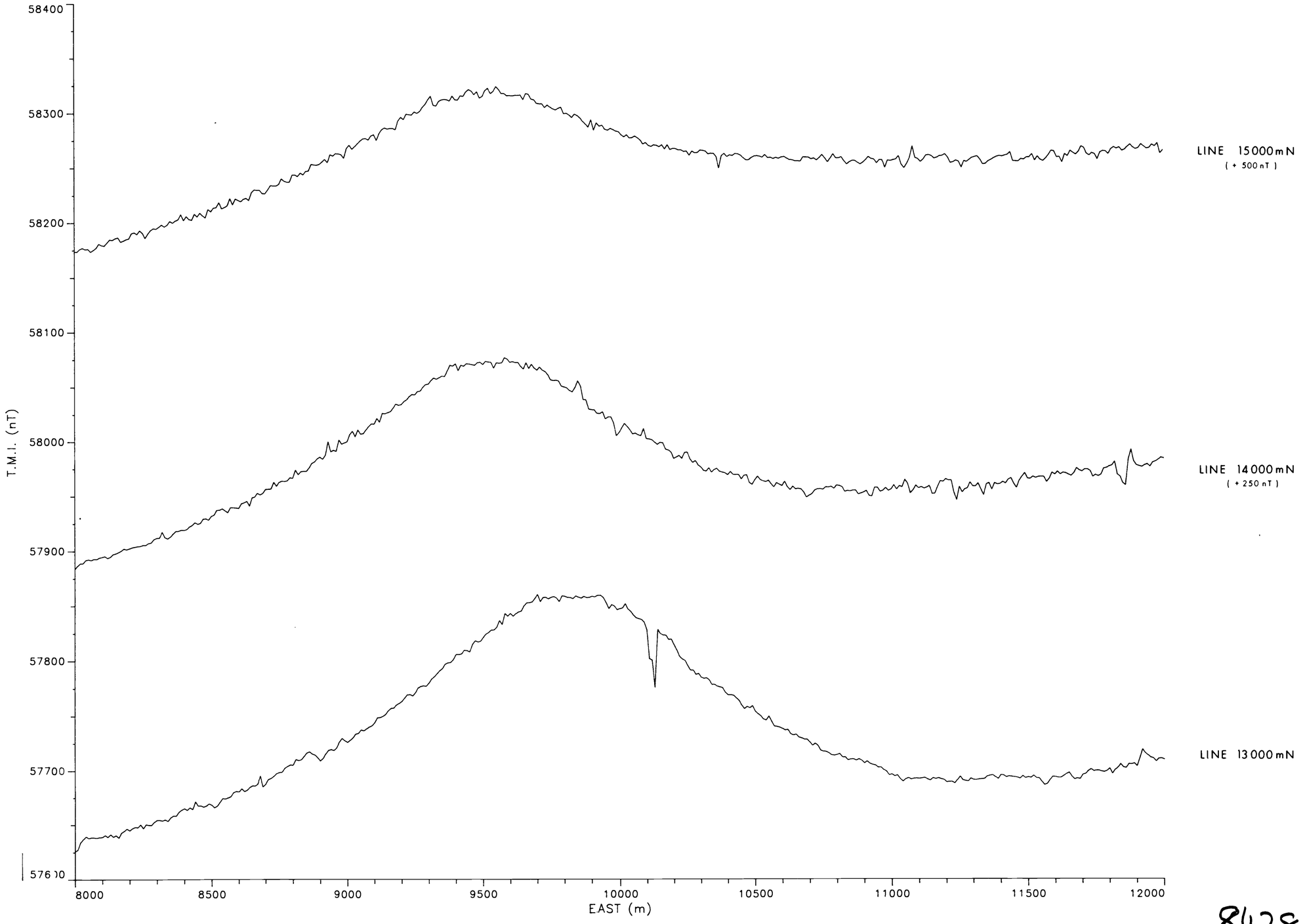
8428-6



8428-6

CRA EXPLORATION PTY. LIMITED	
PIONEER DAM E.L.1698 - S.A.	
BASE MAP	
REFERENCE: CURNAMONA SH 54-14	
SCALE: 1:100 000	DRAWN: F.R.
AUTHOR G.L.M.	REPORT: 17957
DATE: Mar. 1992	PLAN NO. SAa 5488

8428-7



8428-7

CRA EXPLORATION PTY LTD

PIONEER DAM EL 1698

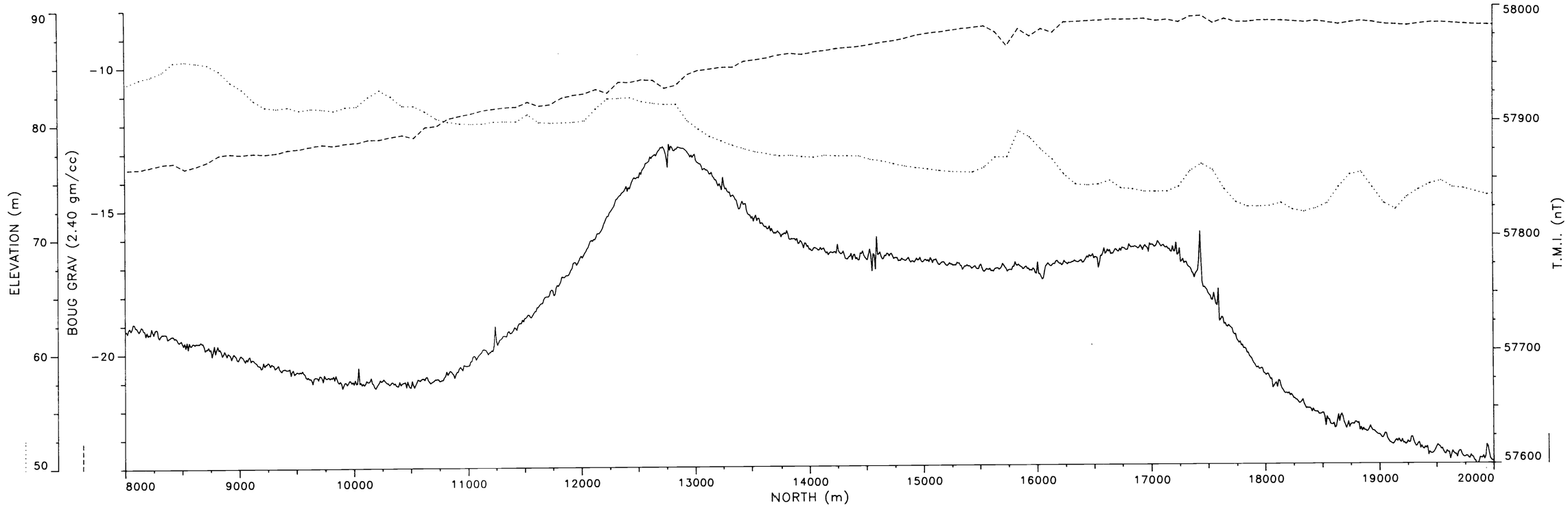
BILLEROO WEST PROSPECT

LINES 13000N, 14000N, 15000N

T.M.I. PROFILES

REFERENCE CURNAMONA SH 54-14	
SCALE 1 : 25000	DRAWN GLM
AUTHOR GLM	REPORT 17957
DATE 10 FEB 92	PLAN No SAa 5702

8428-8



8428-8

CRA EXPLORATION PTY LTD

PIONEER DAM EL 1698
BILLEROO WEST PROSPECT
BOUGUER GRAVITY AND
T.M.I. PROFILE
LINE 10,000 mE

REFERENCE CURNAMONA SH 54-14	
SCALE 1:10,000	DRAWN GLM
AUTHOR GLM	REPORT 17957
DATE 11 FEB 92	PLAN No SAa 5703

CRA EXPLORATION PTY LIMITED
31 Osmond Terrace Norwood 5067 South Australia Australian Company Number 000 057 125

2nd June, 1992

The Director General,
Department of Mines & Energy, South Australia
PO Box 151,
EASTWOOD. S.A. 5063.

Dear Sir,

Re: EL 1698 Pioneer Dam, S.A.
Fifth Quarterly Report For The Period Ended 13th May, 1992

No field work was undertaken during the period.

Interpretation of the geophysical survey data collected in the previous quarter is incomplete. On completion, the results from the geophysical survey will be reported.

Expenditure for the quarter ended 30th April, 1992 amounted to $17 975.

Yours faithfully,

G.L. MACKEE
GEOPHYSICIST

GLM/pq

CRA EXPLORATION PTY LIMITED

SUBJECT: SIXTH QUARTERLY AND FINAL REPORT FOR PIONEER DAM EL 1698, SOUTH AUSTRALIA, FOR THE PERIOD ENDING 13TH AUGUST, 1992

AUTHOR: G L MACKEE

DATE: SEPTEMBER, 1992

CRAE REPORT NO: 18264

CRA EXPLORATION PTY. LIMITED

SIXTH QUARTERLY AND FINAL REPORT FOR PIONEER DAM EL 1698, SOUTH AUSTRALIA, FOR THE PERIOD ENDING 13TH AUGUST, 1992

AUTHOR: G L MACKEE

COPIES TO: SADME
CIS CANBERRA

DATE: 8TH SEPTEMBER, 1992

SUBMITTED BY: J.L. Mackee

ACCEPTED BY:

CONTENTS

LIST OF PLANS

Plan No.	Title	Scale
SAa 5392	Pioneer Dam EL 1698, SA, Location Plan	1:250 000
SAa 5488	Pioneer Dam EL 1698, SA, Base Map	1:100 000
SAa 5899	Pioneer Dam EL 1698, SA, Billeroo West Prospect Bouguer Gravity Model - Line 10 000 mE	1:100 000
SAa 5900	Pioneer Dam EL 1698, SA, Billeroo West Prospect Ground Magnetics Model - Line 14 000 mN	1: 25 000

1. SUMMARY

Final modelling of the gravity and magnetic data from Billeroo West prospect was completed. The model did not definitively locate the Strathearn Fault zone and no drilling target for Mississippi Valley type deposit resulted.

No further priority targets were considered to exist within the licence are and Pioneer Dam EL 1698 was surrendered on 23rd September, 1992.

2. INTRODUCTION

Pioneer Dam EL 1698 was applied for and subsequently granted on 14th February, 1991 for a period of one year. At the completion of the first year of tenure, the tenement reduced from 1425 square kilometres to its present 804 square kilometres (Plan SAa 5392). The licence is located 130 km north of Olary on land held under several pastoral leases.

CRA Exploration selected the area for investigation of Roxby Downs style targets and Mississippi Valley box-metal mineralisation. No work was completed during the Fifth Quarter, and this Sixth and Final Report details the activities for the period ending 13th August, 1992.

3. PREVIOUS WORK

The EL area has previously been explored for Tertiary Uranium and Roxby Downs Style targets by Pacminex/Esso (SML's 268/267, 543/544, EL's 45/42, 59, 109) from 1971-74, Mines Administration (EL 171) from 1975-76 and CSR Limited (EL's 227, 411, 722, 1065, 1487) from 1976-1990.

During the first quarter of CRA Exploration's tenure, compilation of regional and detailed geophysical data was completed and structural interpretation commenced (CRAE Report 17300).

Structural interpretation was completed during the second quarter and a drill site targeted to test an interpreted Rift-graben structure for the presence of lower Cambrian carbonates with MVT mineralisation (CRAE Report 17478).

In the third quarter, drill hole DD91PD1 was completed at 409 metres TD without intersecting the targeted basal Cambrian units (CRAE Report 17688).

During the fourth quarter, ground magnetic and gravity surveying was completed at the Billeroo West prospect to try to locate the Strathearn Fault tract adjacent to an interpreted basement high. Geochemical assays for DD92PD1 gave no elevated base metal values. A partial reduction in tenement was also granted (CRAE Report 17957).

No field work was completed during the fifth quarter.

4. WORK COMPLETED

Final modelling of the gravity and magnetic data collected over the Billeroo West prospect was completed. No definitive fault trace in the general area of the Strathearn Fault was apparent in the model, which tended to show a gradual deepening of basement cover towards the south west, along line 10 000 mE (Plan SAa 5899). The model of the magnetic anomaly on line 14 000 mN, at about the projected location of the Strathearn Fault, shows magnetic basement to be at 500 metres depth (Plan SAa 5900). This agrees fairly well with the gravity model at this location.

Aside from the source of the magnetic anomaly itself, it is not considered that a significant MVT drilling target exists in this area.

G L MACKEE.

GLM/tt

5. EXPENDITURE

Expenditure on EL 1698 for the three month period ending 31st July, 1992 amounted to Nil.

6. REFERENCES

Mackee GL, 1991 First Quarterly Report for Pioneer Dam EL 1698, SA for the Period Ending 13th May, 1991. CRAE Report No 17300.

Mackee GL, 1991 Second Quarterly Report for Pioneer Dam EL 1698, SA for the Period Ending 13th August, 1991. CRAE Report No 17478.

Mackee GL, 1991 Third Quarterly Report for Pioneer Dam EL 1698, SA for the Period Ending 13th November, 1991. CRAE Report No 17688.

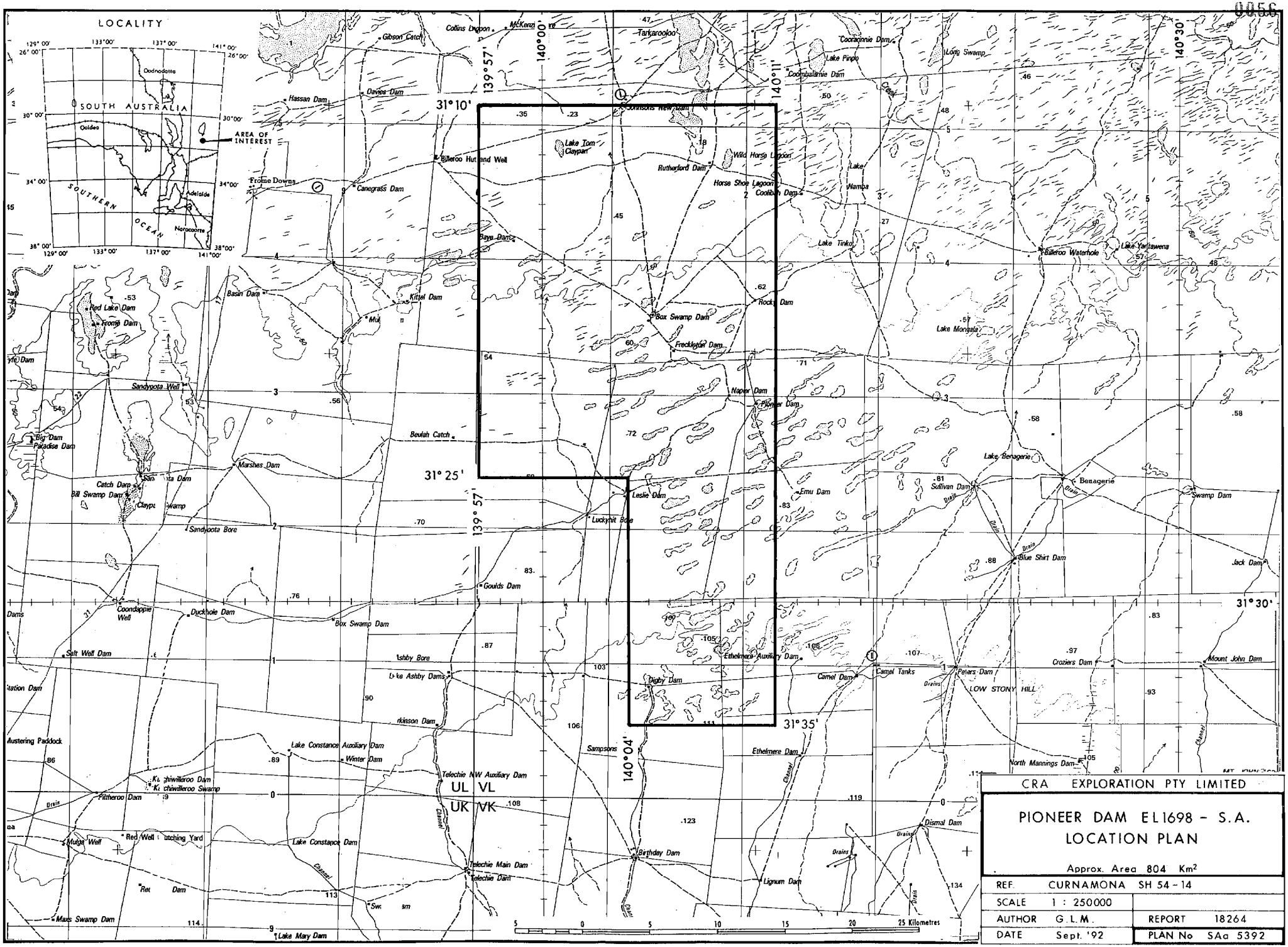
Mackee GL, 1992 Fourth Quarterly Report for Pioneer Dam EL 1698, SA for the Period Ending 13th February, 1992. CRAE Report No 17957.

7. LOCATION

Curnamona	SH 54-14	1:250 000 sheet
Pasmore	6835	1:100 000 sheet
Benagerie	6935	1:100 000 sheet
Curnamona	6834	1:100 000 sheet
Kalabity	6934	1:100 000 sheet

8. KEYWORDS

Geophys Gravity, Geophys Magnetics, Base Metals, Cambrian.



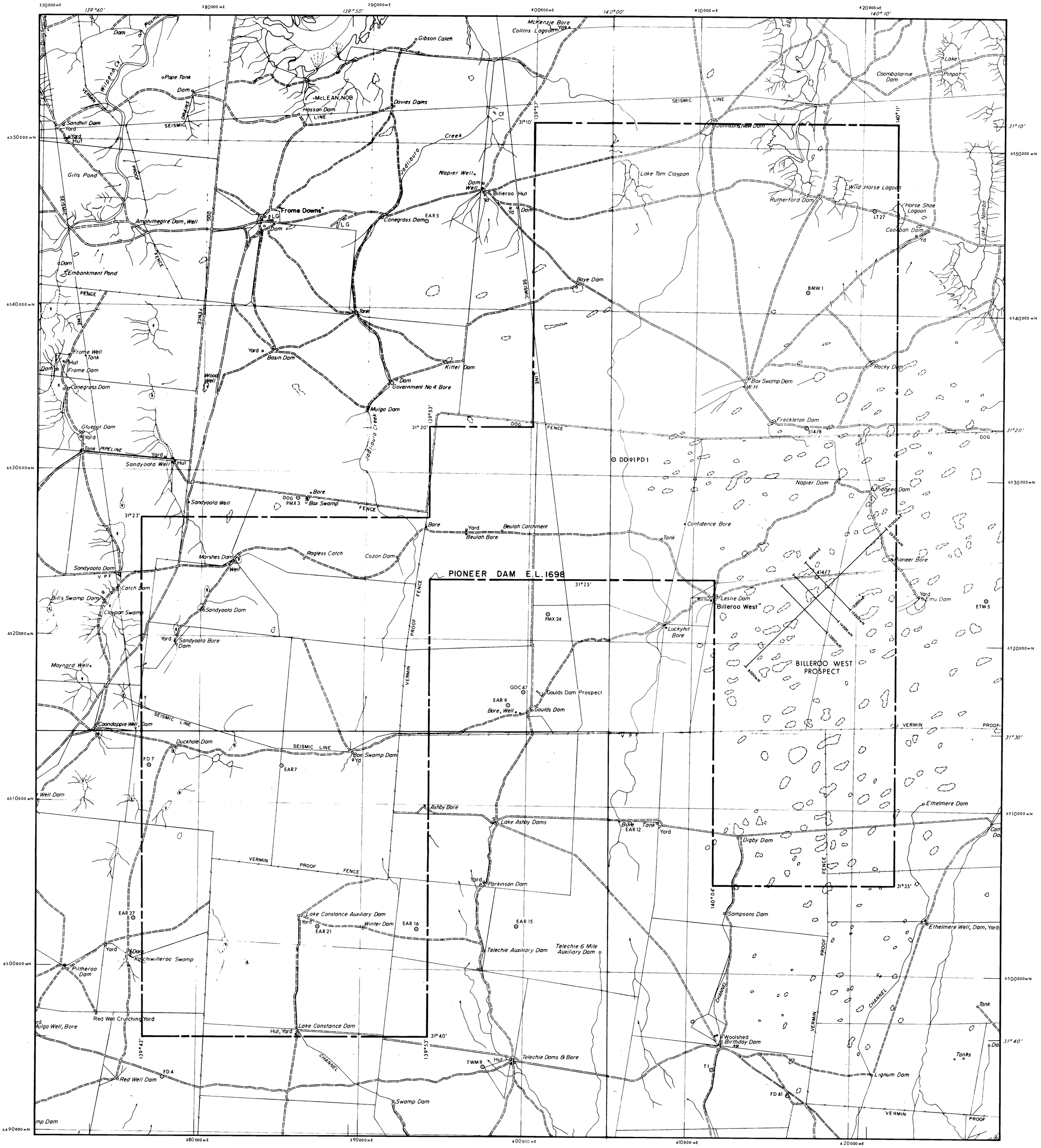
CRA EXPLORATION PTY LIMITED

PIONEER DAM EL1698 - S.A.
LOCATION PLAN

Approx. Area 804 Km²

REF.	CURNAMONA SH 54 - 14		
SCALE	1 : 250000		
AUTHOR	G.L.M.	REPORT	18264
DATE	Sept. '92	PLAN No	SAa 5392

8428-6

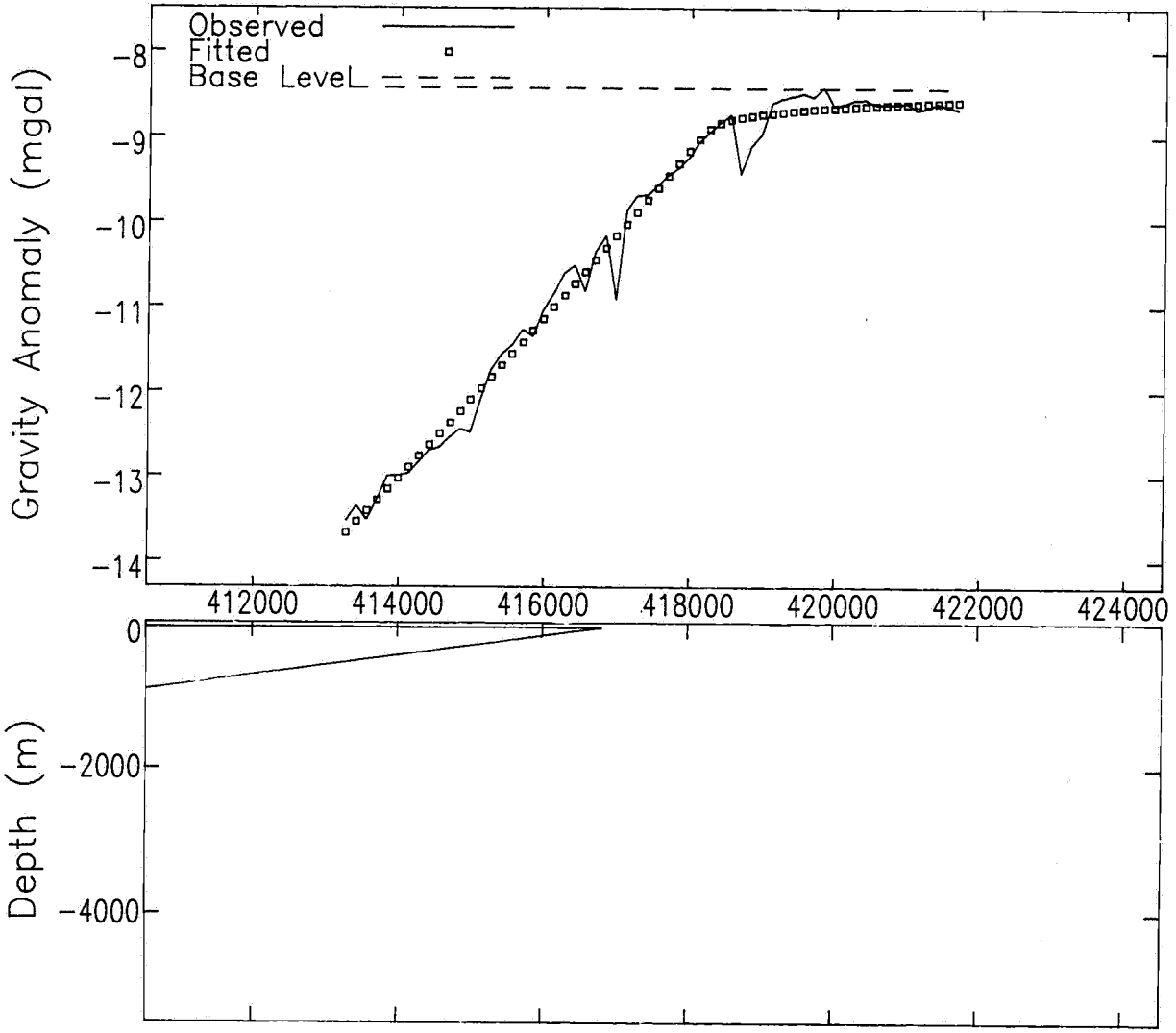


8428-6

CRA EXPLORATION PTY. LIMITED	
PIONEER DAM E.L.1698 - S.A.	
BASE MAP	
REFERENCE: CURNAMONA SH 54-14	
SCALE: 1:100 000	DRAWN: F.R.
AUTHOR G.L.M.	REPORT: 17957
DATE: Mar. 1992	PLAN NO. SAa 5488

PIONEER DAM EL 1698

BILLEROO WEST – LINE 10000 mE



COORDINATES:

Strike Perp	45 deg
Line Direction	0 deg
Scale – m	1 m

Main Direction
Main Offset
Cross Direction
Cross Offset

MODEL PARAMETERS:

Model Type		Wedge
Depth	X	65.0 m
Thickness	F	1038 m
Half Width Top	F	3517 m
Half Width Bot	F	4026 m
Shift	F	−8087 m
Density	X	−0.250 g/cc
Main Position	F	413300.6 m
Cross Position	X	6518787 m
Base Level	F	−8.429245 mgal
Base Slope	X	0 mgal/m

(F–fitted, X–fixed, L–limit)

Report No. 18264
Plan No. SAa 5899

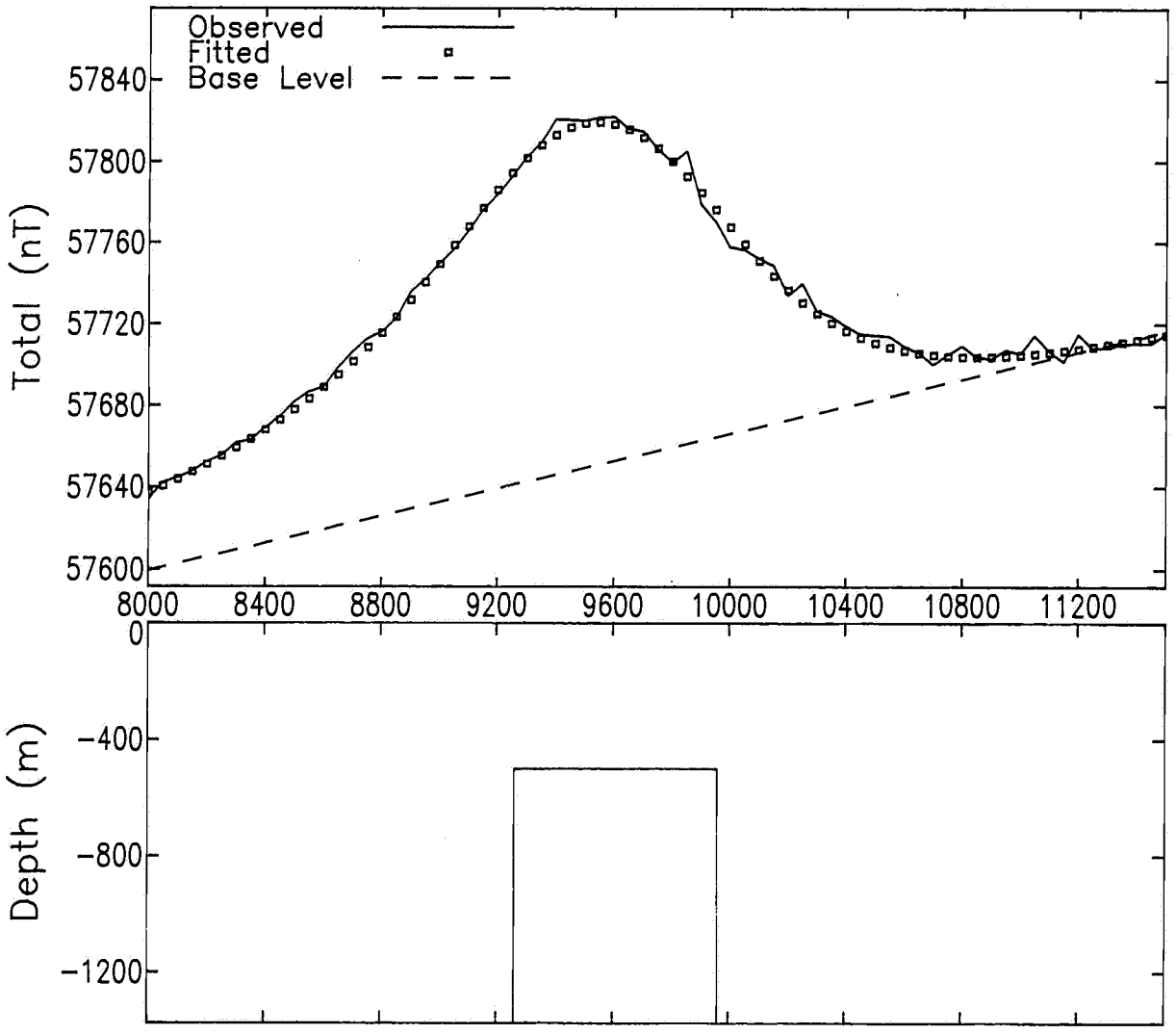
Geosoft GRAMOD–3 Modeling Result

92/08/31

0057

PIONEER DAM EL 1698

Billeroo West, Line 14000 mN



GEOMAGNETIC FIELD:

Field Strength	57500 nT
Inclination	−63 deg
Declination	7 deg

COORDINATES:

Sensor Height	2 m
Strike Perp	115 deg
Line Direction	135 deg
Main Direction	135 deg
Main Offset	0 m
Cross Direction	
Cross Offset	0 m

MODEL PARAMETERS:

Model Type		Tabular
Depth	F	500 m
Half Width	F	350 m
Dip	F	90 deg
Susceptibility	F	0.00152 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	9611.701 m
Cross Position	X	14000 m
Base Level	F	57653.29 nT
Base Slope	F	.0334607 nT/m

(F−fitted, X−fixed, L−limit)

Report No. 18264
Plan No. SAa 5900

0058

Geosoft MAGMOD−3 Modeling Result

92/07/20