CR 8850

E10WR/21/4-T

FINAL REPORT FOR THE PERIOD ENDING 25 AUGUST 1997

McARTHUR BASIN, NT

EXPLORATION LICENCE 9617

D.STEPHENS

AUGUST 1997

Tenement 9617 is held by:

BHP MINERALS PTY LTD
Level 3
3 Plain Street
EAST PERTH WA 6004

SUMMARY

EL 9617 is located on the western side of the Batten Trough, within the mid-Proterozoic McArthur Basin. The area is considered prospective for sediment-hosted base metal mineralisation. A number of small Pb prospects occur locally, hosted within the Tooganinie Formation.

During 1996, EL 9617 was covered with a regional GEOTEM survey. Several possible bedrock conductors were defined, however, drilling of a similar conductor to the immediate south within EL 7944 (which intersected deeper sections of weathering) has downgraded the prospectivity of the conductors. Therefore, no further work is warranted.

CONTENTS

Page No.

List of Appendices

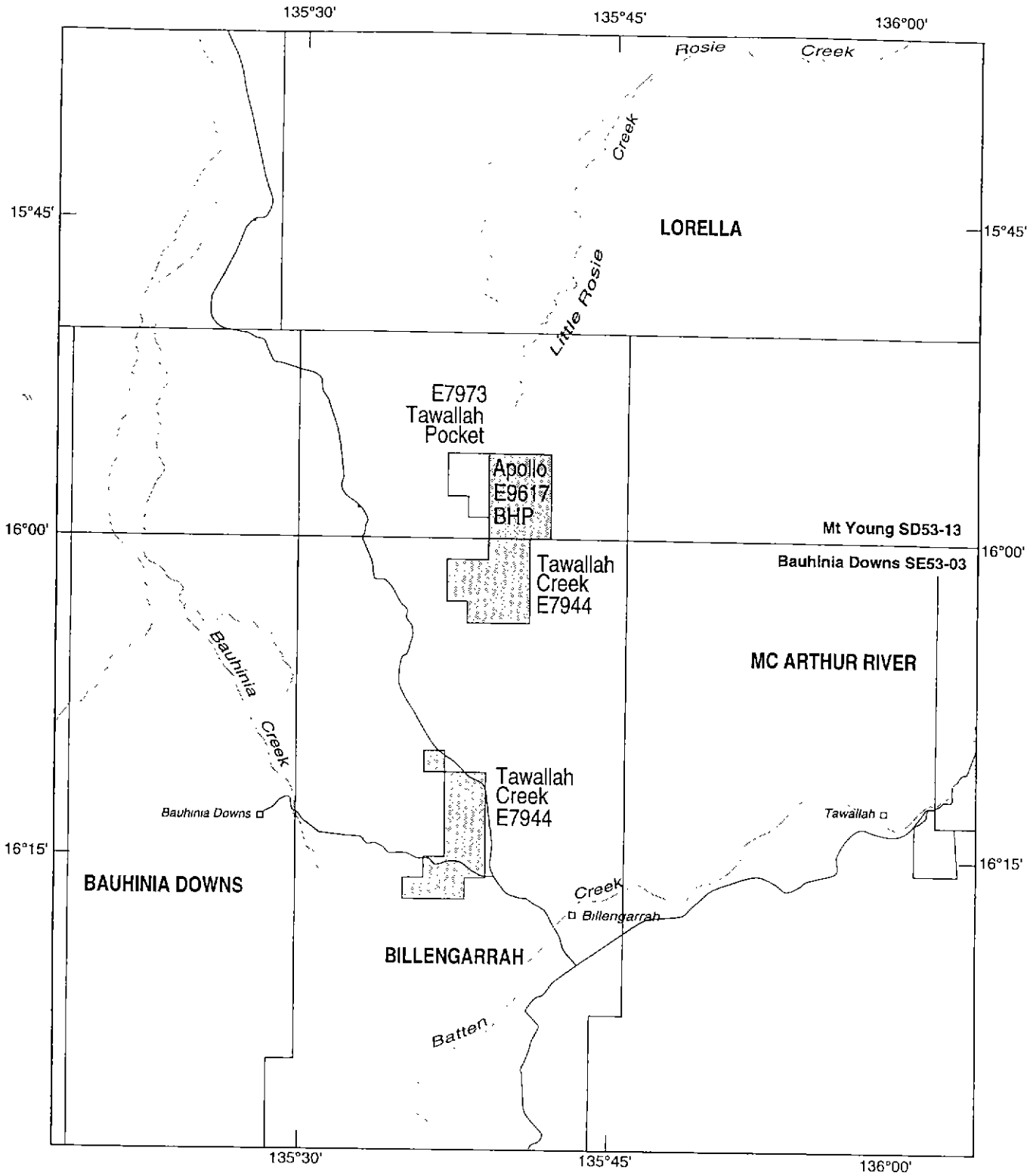
1. Expenditure Statement
2. Location plan and Grendle inversion of soundings (MR5)
3. Rock chip assays and descriptions

List of Figures

	Title	Scale	Drawing No.
1.	Location of Tenement	1:1,000,000	A4-6460
2.	GEOTEM Flight line diagram	1:250,000	A4-6162
3	Mariner GEOTEM survey-location of anomalies		A4-6223
4	Location of rock chip samples	1:250,000	A4-6185

List of Tables

1 GEOTEM Survey Specifications



BHP Tenement

BHP - Ashton JV Tenement

Scale 1 : 250,000

0 5 10 15 20 km

UTM Projection Zone 53

Prepared : D. Stephens	BHP	Exploration - BHP Minerals BHP Minerals Pty Ltd , A.C.N 008 694 782	Centre : Perth
Drawn : S. Shephard	NORTHERN RECONNAISSANCE PROGRAM LOCATION MAP MARINER PROJECT		Drg No : A4-6460
Date : 25.8.97	EL 7944, 7973, 9617		FIGURE 1
Revised :			

1. INTRODUCTION

This report covers all work conducted by BHP Minerals on Exploration Licence (EL) 9617.

Total expenditure within EL 9617 has amounted to $16,973 (see Appendix 1).

Work conducted by BHP Minerals within EL 9617 has consisted of regional coverage by a 25 Hz GEOTEM electromagnetic survey designed to test for conductive base metal mineralisation.

Several possible bedrock conductors were defined but were later downgraded after drilling of a similar feature to the south (EL 7944) encountered strongly weathered and clay rich rocks within a local deeper zone of weathering.

1.1 Location and Access

EL9617 is located approximately 80 km north-northwest of Cape Crawford Roadhouse in the Gulf Region of the Northern Territory.

The licence is located on the southern edge of the Mount Young 1:250,000 map sheet area (Fig. 1).

The licence area is accessed by a formed gravel road which runs between Cape Crawford and Nathan River Homestead to the north and then a small station track which dissects the Tawallah Pocket area.

1.2 Rehabilitation

All exploration within EL 9617 was of a non-disturbing nature

2. GEOLOGY

Outcropping geology in EL 9617 includes the lower parts of the McArthur Group (Tatoola Sandstone, Tooganinie Formation, Amelia Dolomite and Mallapunyah Formation)

The area is considered prospective for sediment-hosted base metal mineralisation. A number of small Pb prospects occur locally, hosted within the Tooganinie Formation and enhance the prospectivity of this area. The best of these prospects is the Apollo occurrence where galena and minor barite occur within fractures and fenestrae within silicified dolomites. Weak copper mineralisation also occurs to the south hosted within the Amelia Dolomite.

3. GEOTEM SURVEY

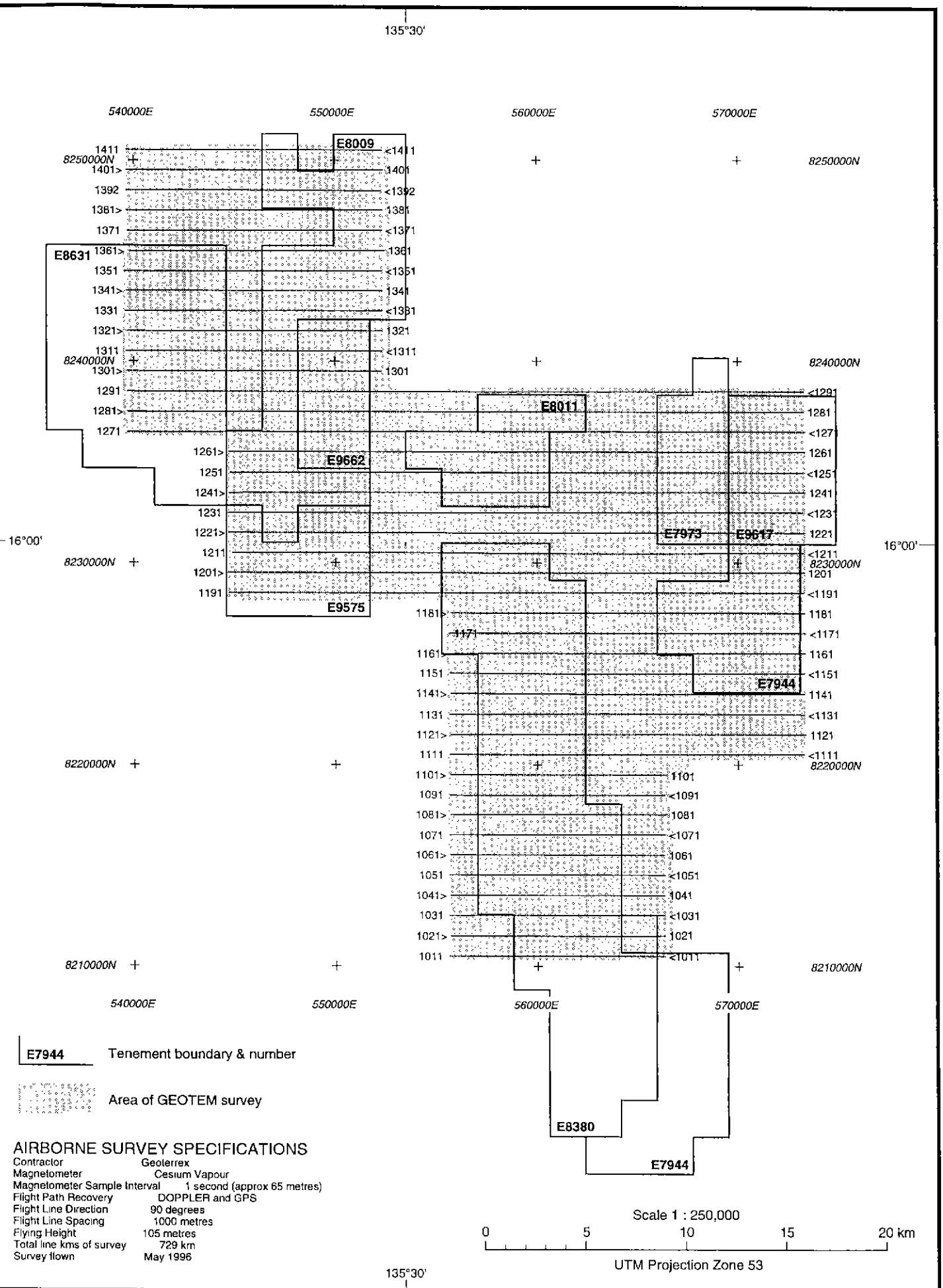
As part of a regional assessment of the Mariner-Tawallah Pocket area, Geoterrex were contracted to fly a regional 25 Hz GEOTEM electromagnetic survey. The survey was flown in 1996 on east-west lines spaced 1 km apart and was designed to test for conductive base metal mineralisation.

Survey specifications are presented in Table 1and a flight line diagram is shown on Figure 2. TEM profiles have been previously supplied to the Mines Department (BHP Company report 8792) along with digital data.

Several possible bedrock conductors were defined from the survey (MR 5,6 and 7) and are shown on figure 3. MR 5 was the best of these anomalies with the GEOTEM indicating a large (2km x 2km) conductor, with a resistivity of 20 ohm-m at a depth of 80-100m. MR 6 and MR 7 appear to coincide with Cretaceous overburden and the Mallapunyah Formation respectively.

TABLE 1
GEOTEM SPECIFICATIONS

Aircraft	-	CASA C212-200 Turbo Prop							
Magnetometer	-	Scintrex Cesium Vapour Optical Absorption							
Resolution	-	0.01 nT							
Cycle Rate	-	1.0 second							
Sample Interval	-	60 metres							
Electromagnetic System	-	GEOTEM III Time Domain EM							
Transmitter Base Frequency	-	25 Hz							
Receiver	-	x and z, dual axis receiver coil in towed bird							
Cycle Rate	-	4 msec							
Sample Interval	-	9 metres							
Window mean times (msec)	-								
em1	0.4609	em2	0.4766	em3	0.4922	em4	0.5156	em5	0.5469
em6	0.5859	em7	0.6328	em8	0.6875	em9	0.7578	em10	0.8438
em11	0.9453	em12	1 0625	em13	1.2031	em14	1.3750	em15	1.5938
em16	1.8594	em17	0.0469	em18	0.0781	em19	0.1094	em20	0.1406
Data Acquisition	-	RMS GR33 Thermal Dot Matrix Recorder							
	-	GEODAS Digital Acquisition System							
Flight Line Direction	-	090 - 270 degrees							
Flight Line Spacing	-	1,000 metres							
Mean Terrain Clearance	-	105 metres							
Navigation	-	GPS satellite positioning / Doppler							



AIRBORNE SURVEY SPECIFICATIONS

Contractor	Geoterrex
Magnetometer	Cesium Vapour
Magnetometer Sample Interval	1 second (approx 65 metres)
Flight Path Recovery	DOPPLER and GPS
Flight Line Direction	90 degrees
Flight Line Spacing	1000 metres
Flying Height	105 metres
Total line kms of survey	729 km
Survey flown	May 1996

Scale 1 : 250,000

0 5 10 15 20 km

UTM Projection Zone 53

Prepared : D.Stephens	BHP	Exploration - BHP Minerals BHP Minerals Pty Ltd , A.C.N. 008 694 782	Centre : Perth
Drawn : R.J.Clark	NORTHERN PLATFORMS PROGRAM - MARINER GEOTEM SURVEY		Drg. No. : A4-6162
Date : 6.12.96	GEOTEM SURVEY LOCATION AND FLIGHT LINES		FIGURE 2
Revised :			

3.1 Protem Sounding Survey

In order to obtain better depth control on the conductivity at MR 5, Geoterrex were contracted to complete two PROTEM soundings over the site. A location plan and Grendl inversion are presented in Appendix 2.

Data were acquired using a digital PROTEM receiver, TEM37 transmitter and a single component air-cored coil. Readings were taken at frequencies of 25 Hz, with 6.25 Hz. Two sounding were collected, using 200 m x 200 m loops. Five readings were taken for each loop, one at the centre of the loop and others 200 m north, south, east and west of the loop centre.

GRENDL inversions of the two soundings are shown below. They both indicate a layer of approx 15 ohm-m resistivity at a depth of 35 to 40 m, which is 30 to 50 m in thickness.

Sounding 1 (10000E / 5000N)

---------- 0 m
11 ohm-m
---------- 10 m
100 ohm-m
---------- 40 m
15 ohm-m
---------- 90 m
1000 ohm-m

Sounding (20000E / 10000N)

---------- 0 m
10 ohm-m
----------10 m
100 ohm-m
----------35 m
15 ohm-m
----------65 m
1000 ohm-m

Following the discovery of a zone of deeper weathering within EL 7944 to the immediate south, it was decided that the other conductors were not worthy of follow-up work and were probably situated within zones of stronger weathering.

MARINER GEOTEM SURVEY

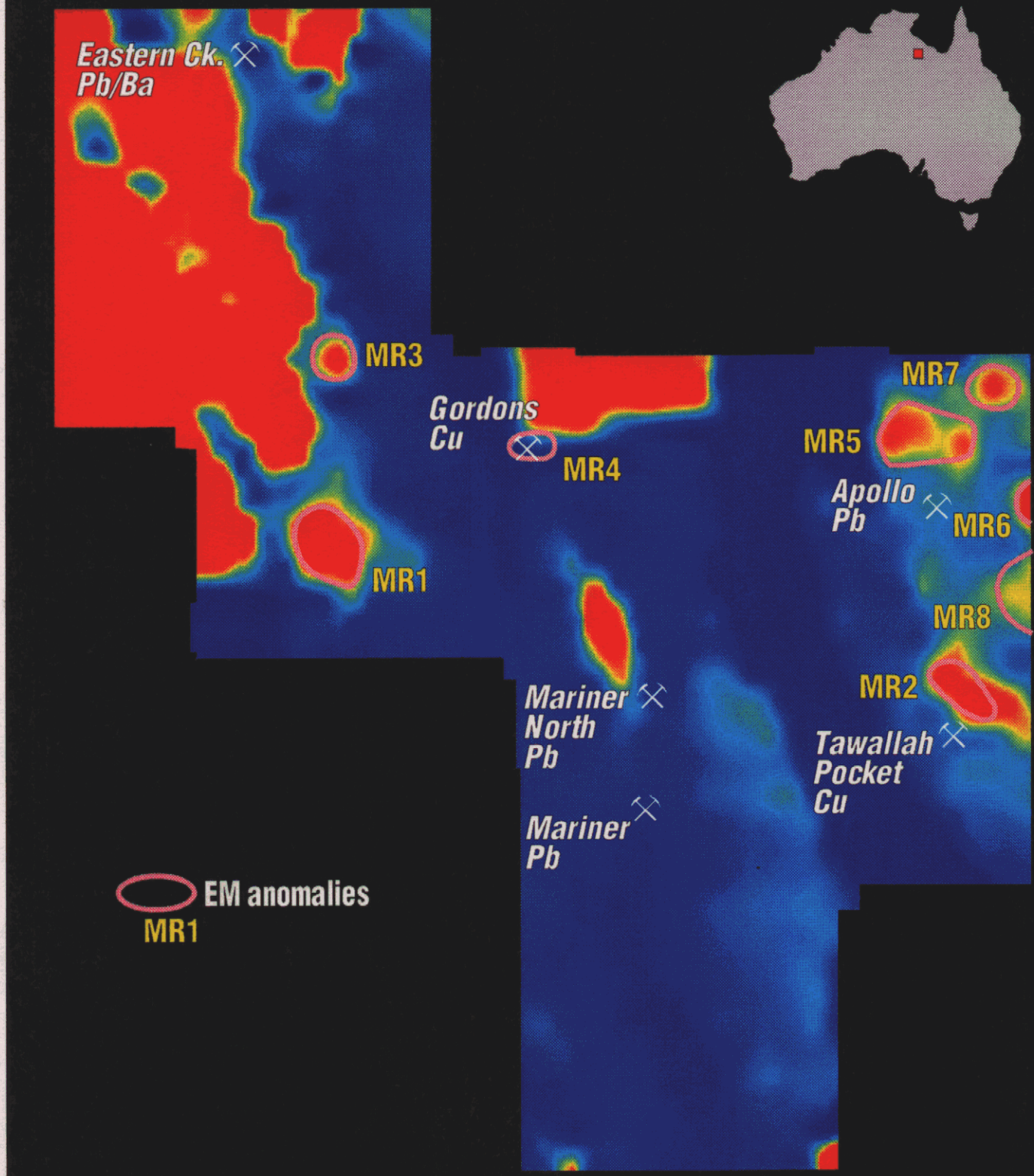
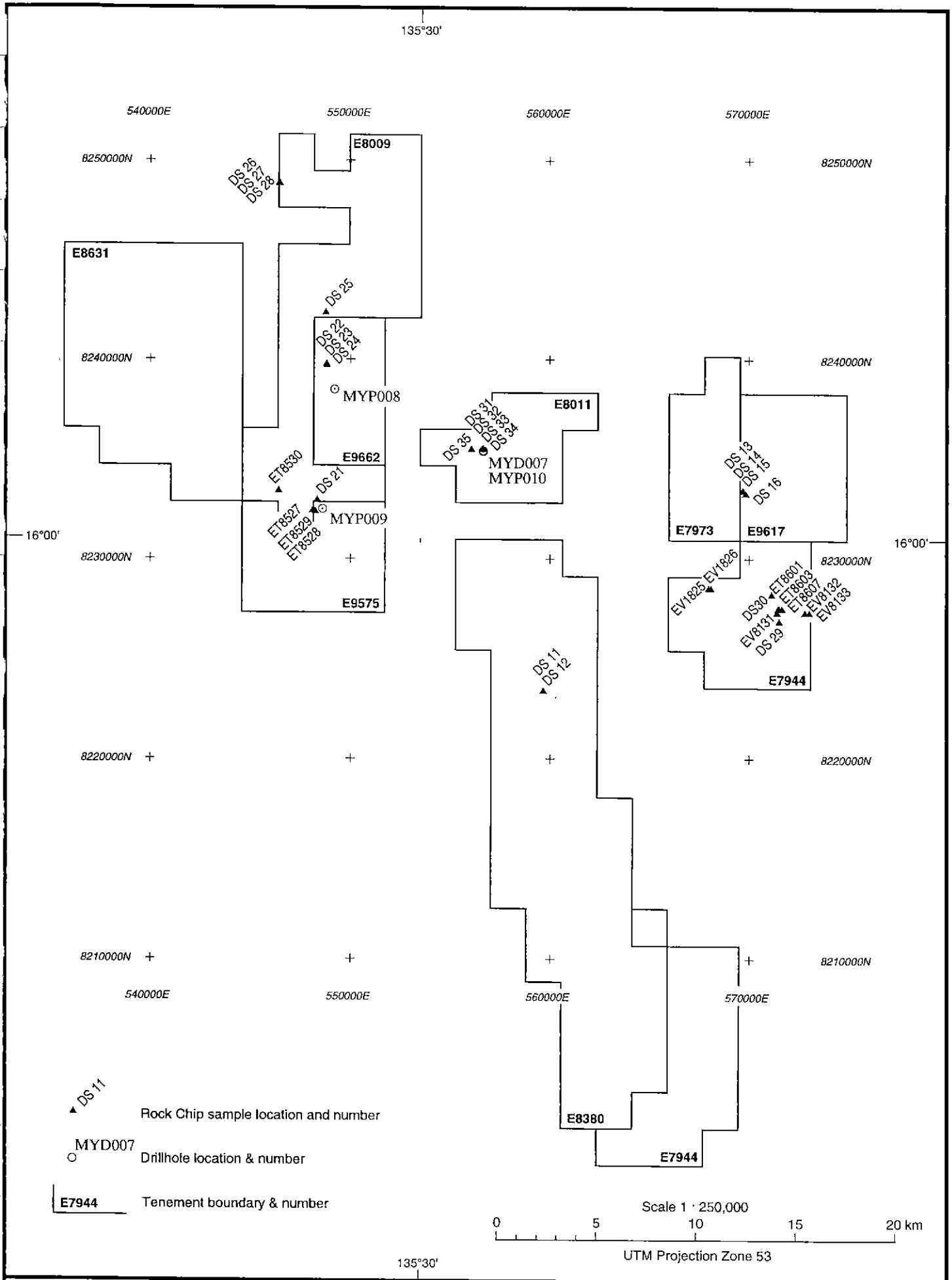


Fig.3

A4-6223.cdr 2/97



Prepared : D.Stephens	BHP	Exploration - BHP Minerals BHP Minerals Pty Ltd , A C N 008 694 782	Centre . Perth
Drawn : R.J Clark	NORTHERN PLATFORMS PROGRAM MARINER PROJECT		Drg. No : A4-6185
Date : 20.1.97	LOCATION OF ROCK CHIP SAMPLES & DRILLHOLES		FIGURE 4
Revised :			

4. Rock Chip Geochemistry

During general reconnaissance four rock chip samples were collected from the Apollo prospect.

Samples were sent to Analabs and analysed for Cu, Pb, Zn, As, Ag, Fe, Mn, P, Cd, Co, Cr, Bi, Mo, Ni, Sb, Th, U and V (lab method GI-201). The distribution of samples is shown on Figure 4, while the rock chip descriptions and assay results are presented in Appendix 3.

As expected, high Pb values were recorded from the Apollo prospect.

4. CONCLUSIONS AND RECOMMENDATIONS

As part of a regional assessment of the base metal potential of the Tawallah Pocket area, a large GEOTEM survey was flown. It was designed to test for conductive base metal mineralisation. Several conductors were defined that were interpreted to be bedrock features. However drilling within EL 7944 to the south indicated that the anomalies within EL 9617 were likely to reflect zones of deeper weathering. Therefore, no further work is required within the Tawallah Pocket area.

APPENDIX 1

EXPENDITURE DETAILS

E9617 - APOLLO

8 October 1996 to 25 August 1997

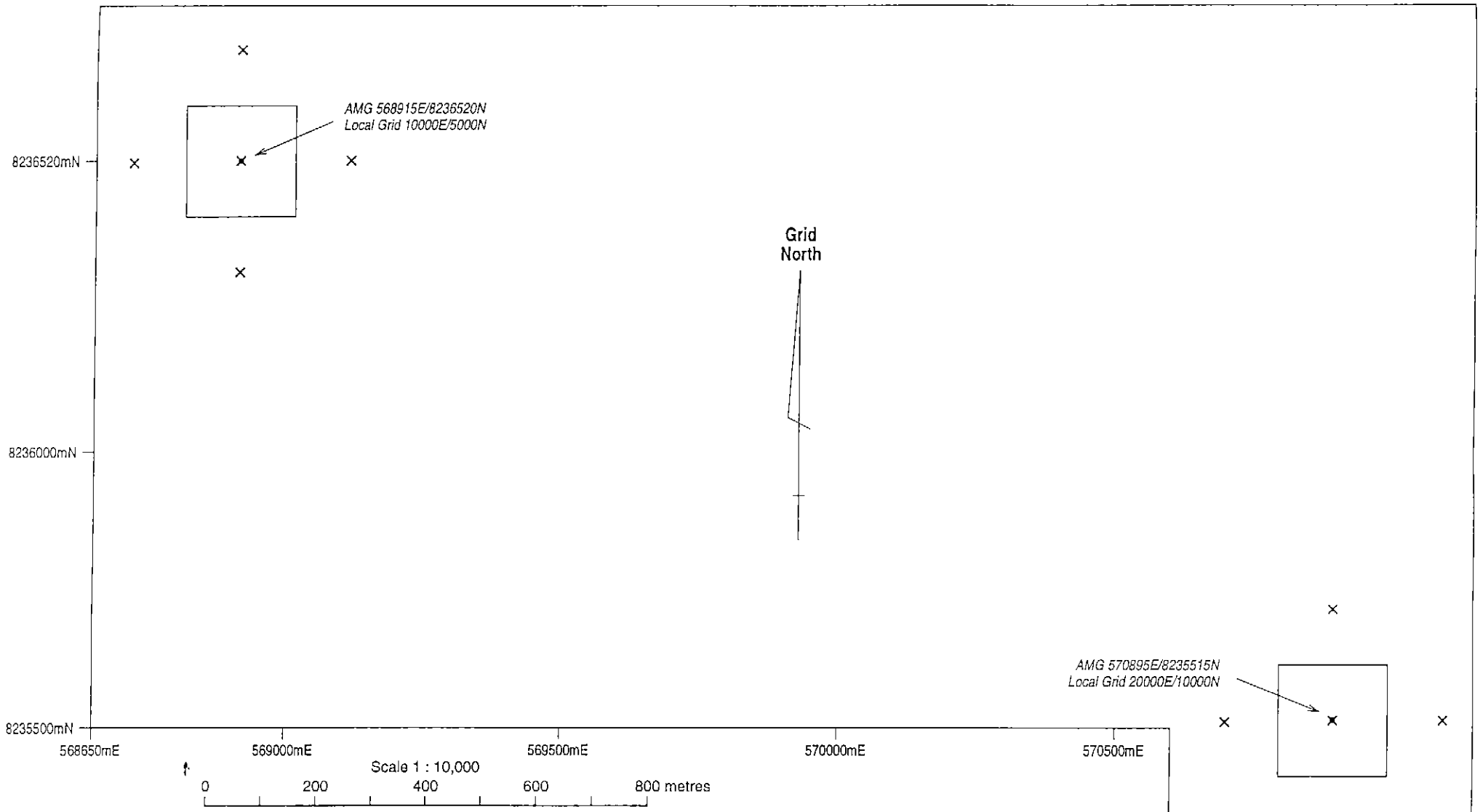
Wages and Salaries	3,945
Field Support	3,383
Vehicles	391
Equipment	527
Geophysics	1,975
Office Expenses	328
Other	1,471
Library	48
In-House Services:	
Geophysics	996
Drafting	1,080
Sub-Total	**14,144**
20% of Total for Corporate Overheads	2,829
TOTAL	**$16,973**

REF \\MINXPFR_SRV04\MINXDATA\USER HOME DIRECTORIES\RICHARDS\NON CONFIDENTIAL\EXPENDITURE STATEMENTS\ANNUAL\1997\APOLLO-9617.DOC

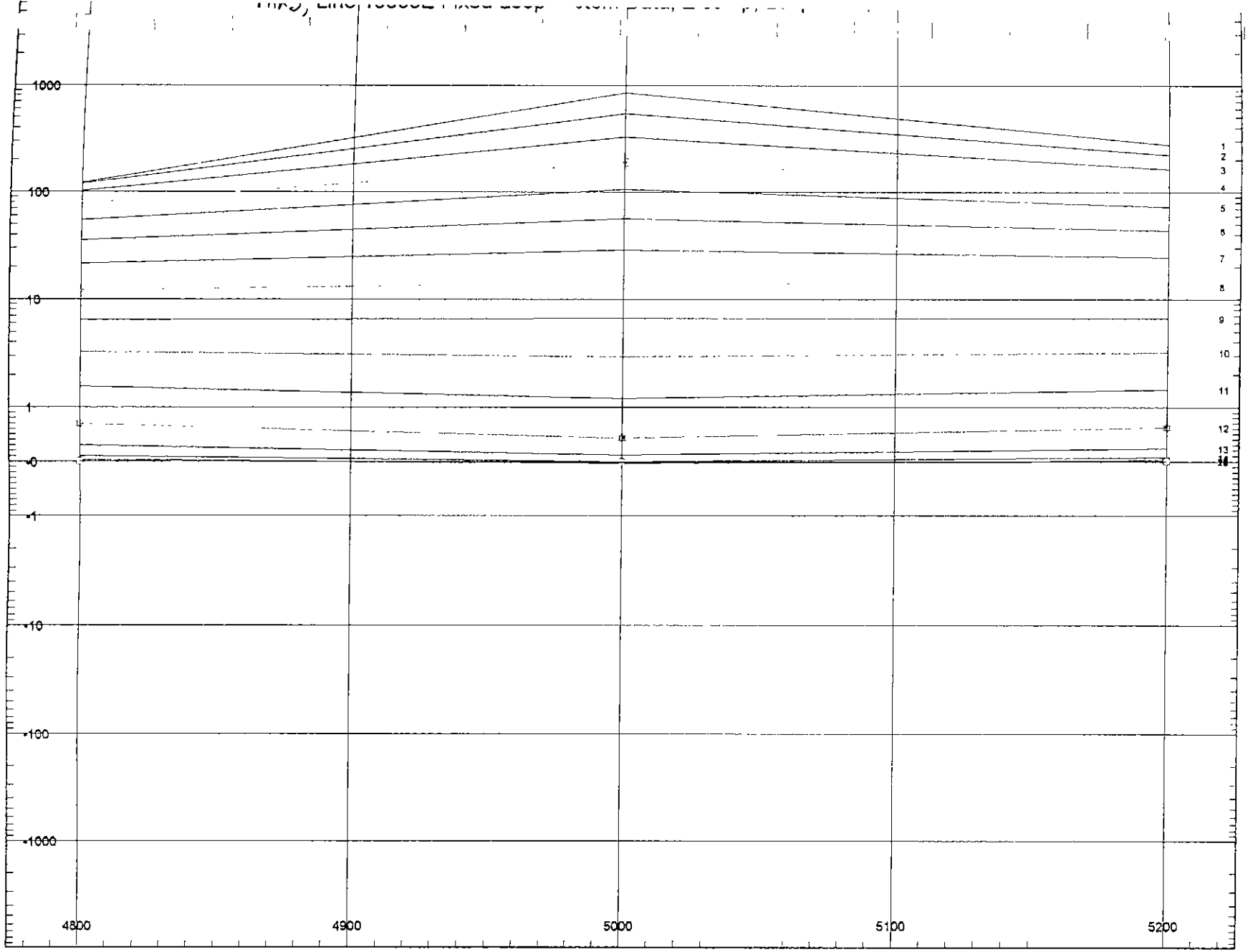
APPENDIX 2

LOCATION PLAN AND GRENDLE INVERSION OF SOUNDINGS (MR5)

MR5



Prepared : T.Kerr	BHP	Exploration - BHP Minerals BHP Minerals Pty Ltd A.C.N. 008 694 782	Centre : Perth
Drawn . A.R.Veale	NORTHERN PLATFORMS MARINER PROJECT		Drg. No A4-6222
Date : 5-2-97	ANOMALY MR5 TEM SOUNDING LOCATION MAP		FIGURE
Revised :			

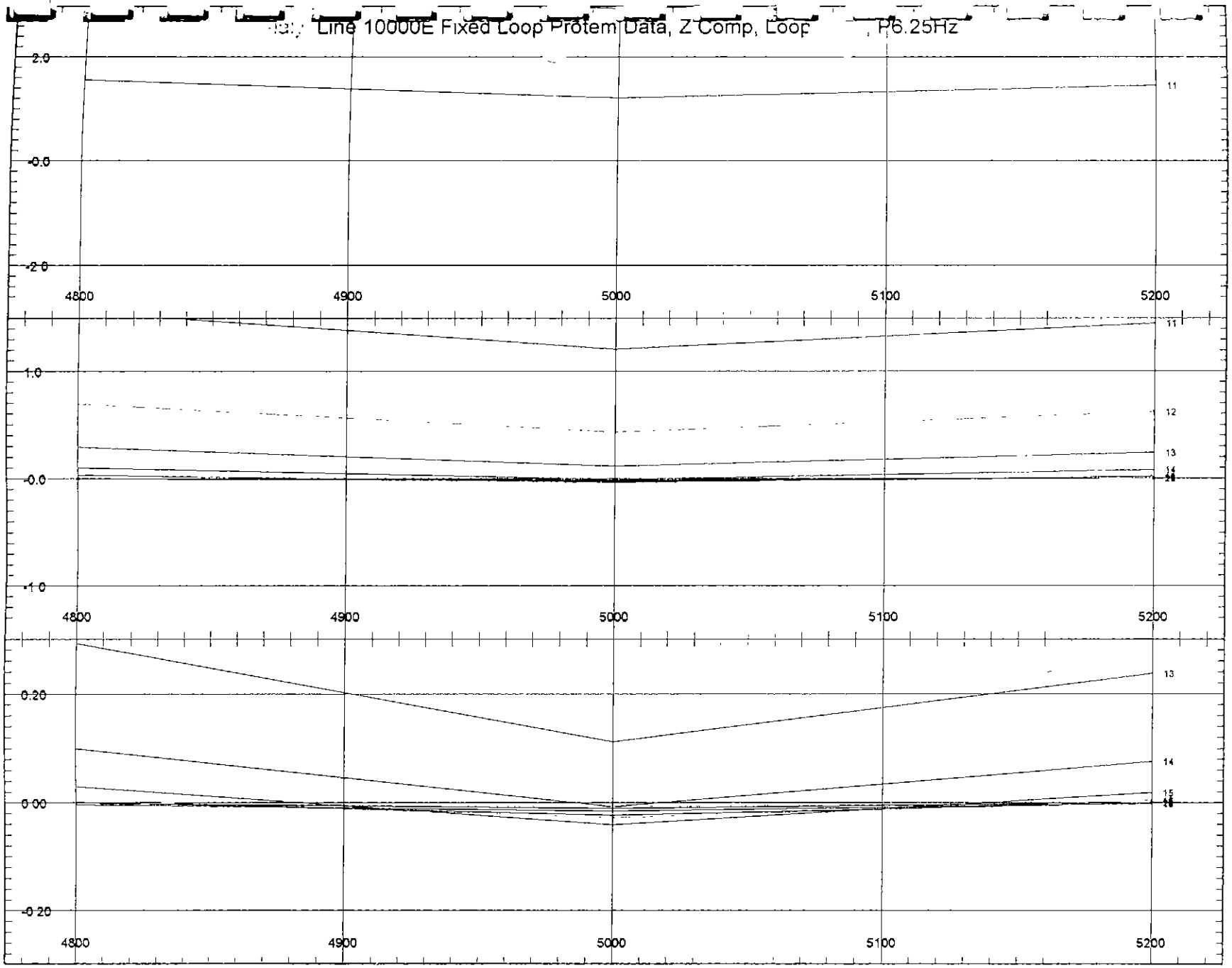


Profile

Sounding 1

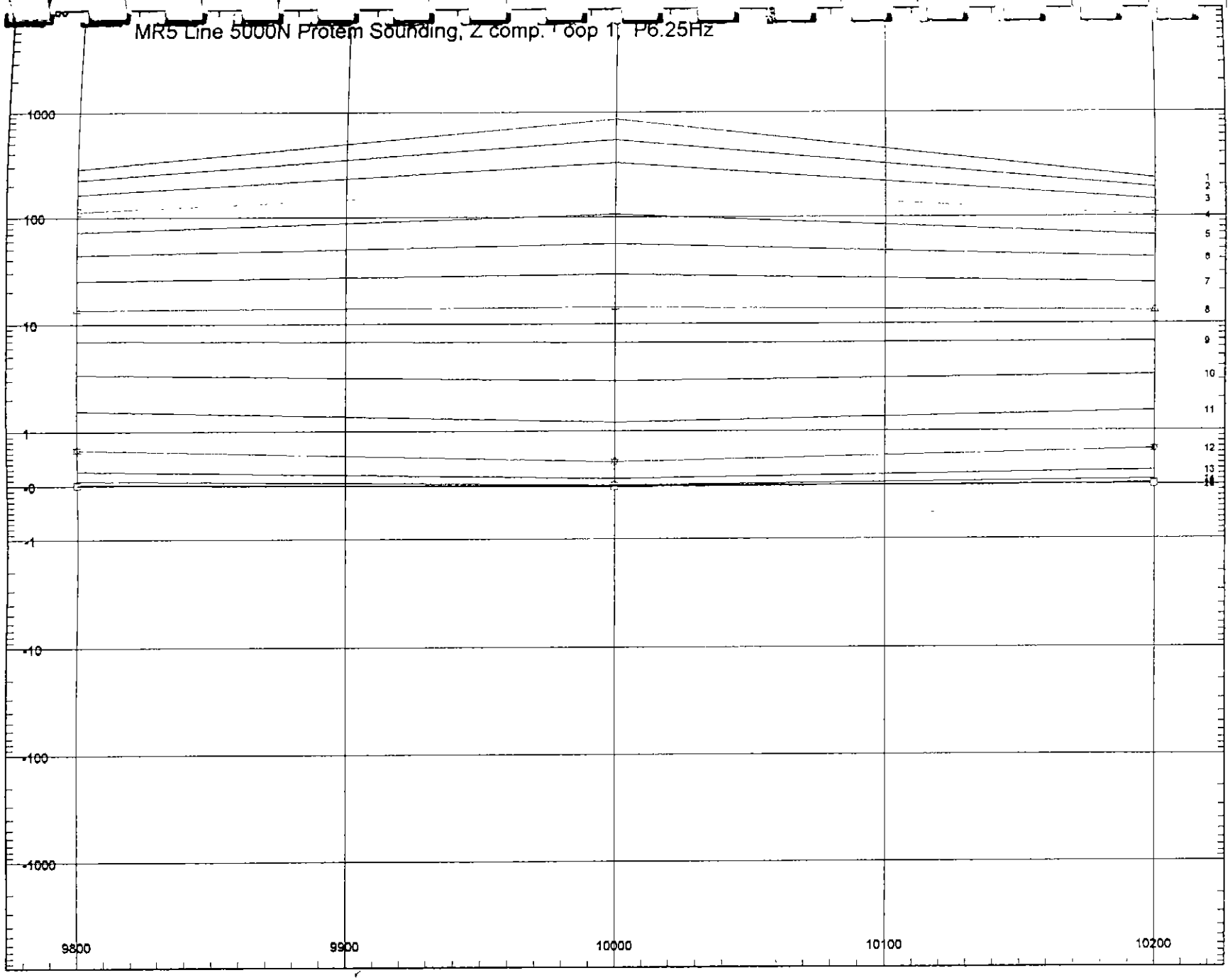
10 000E / 5 000N

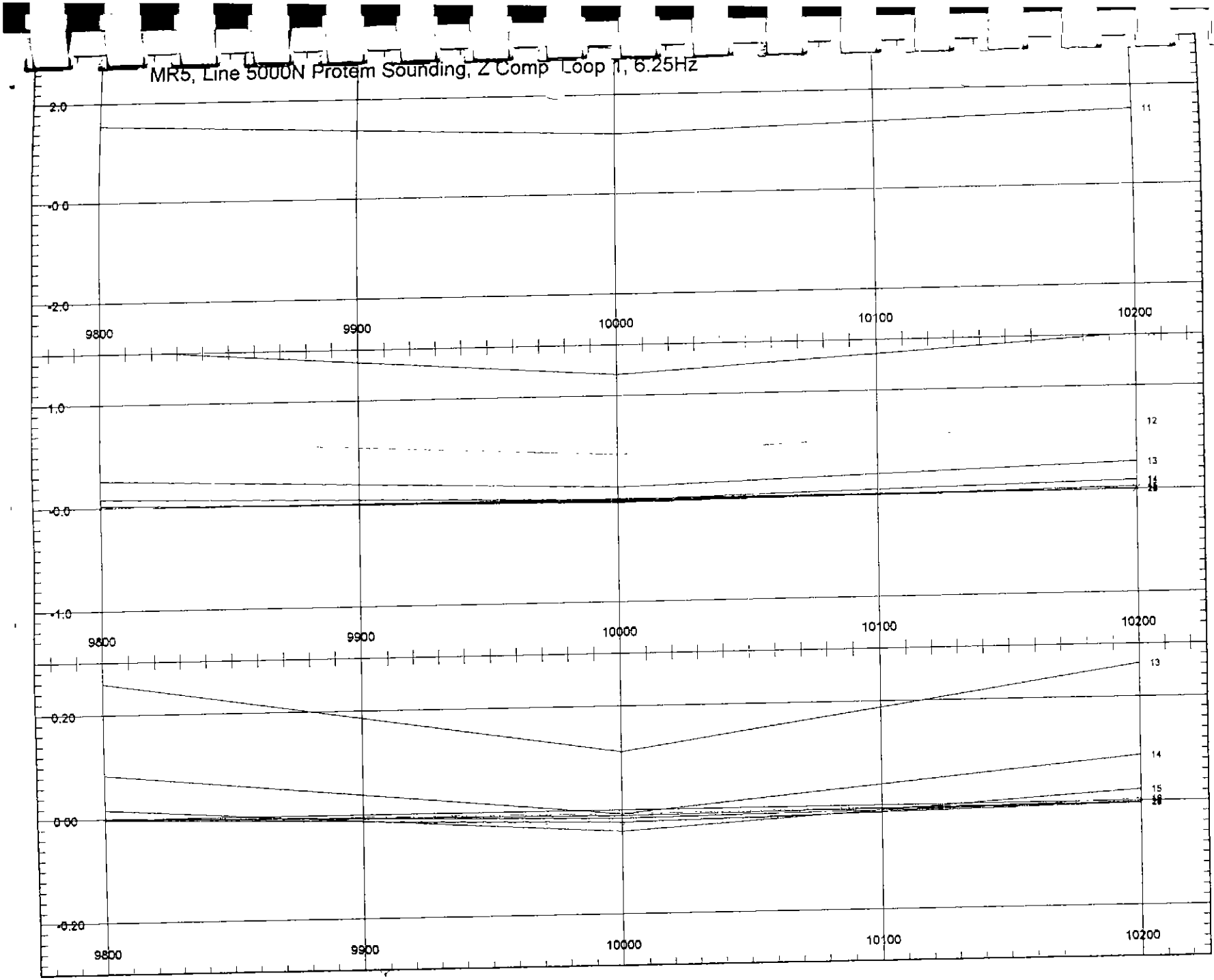
↑ use this one for out of loop correction (5200N, 10 000E)

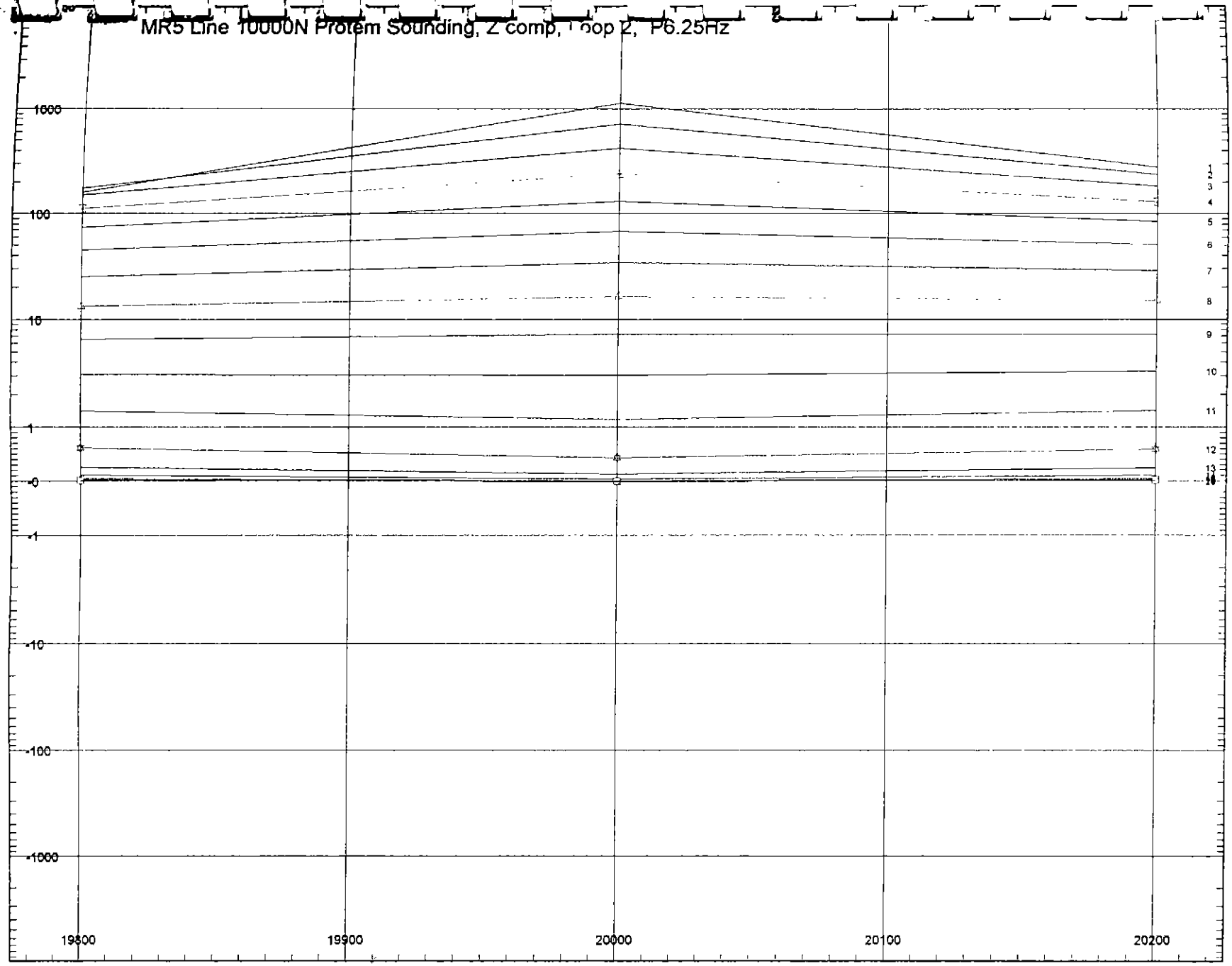


Profile
Sounding 1

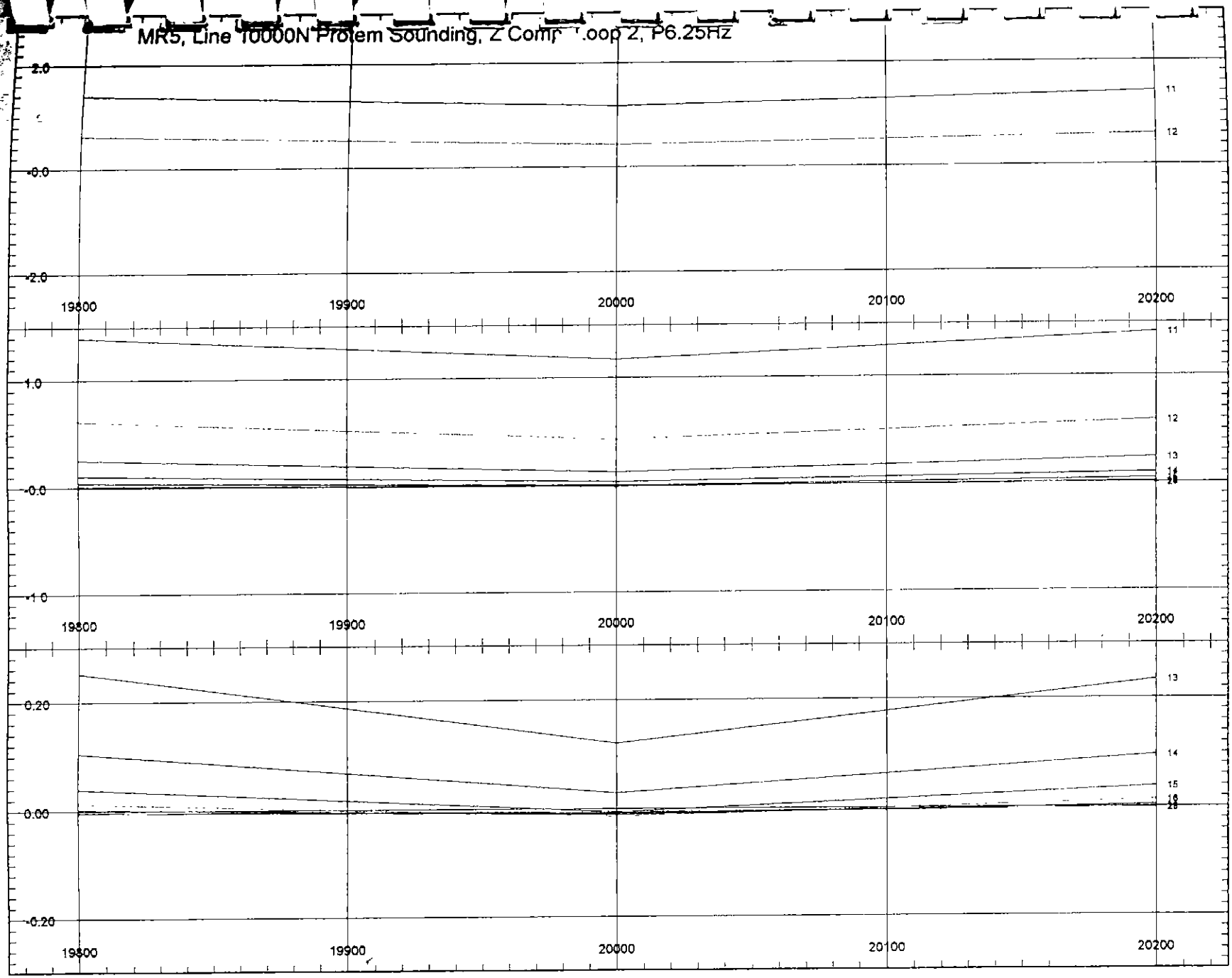
10000E / 5000N

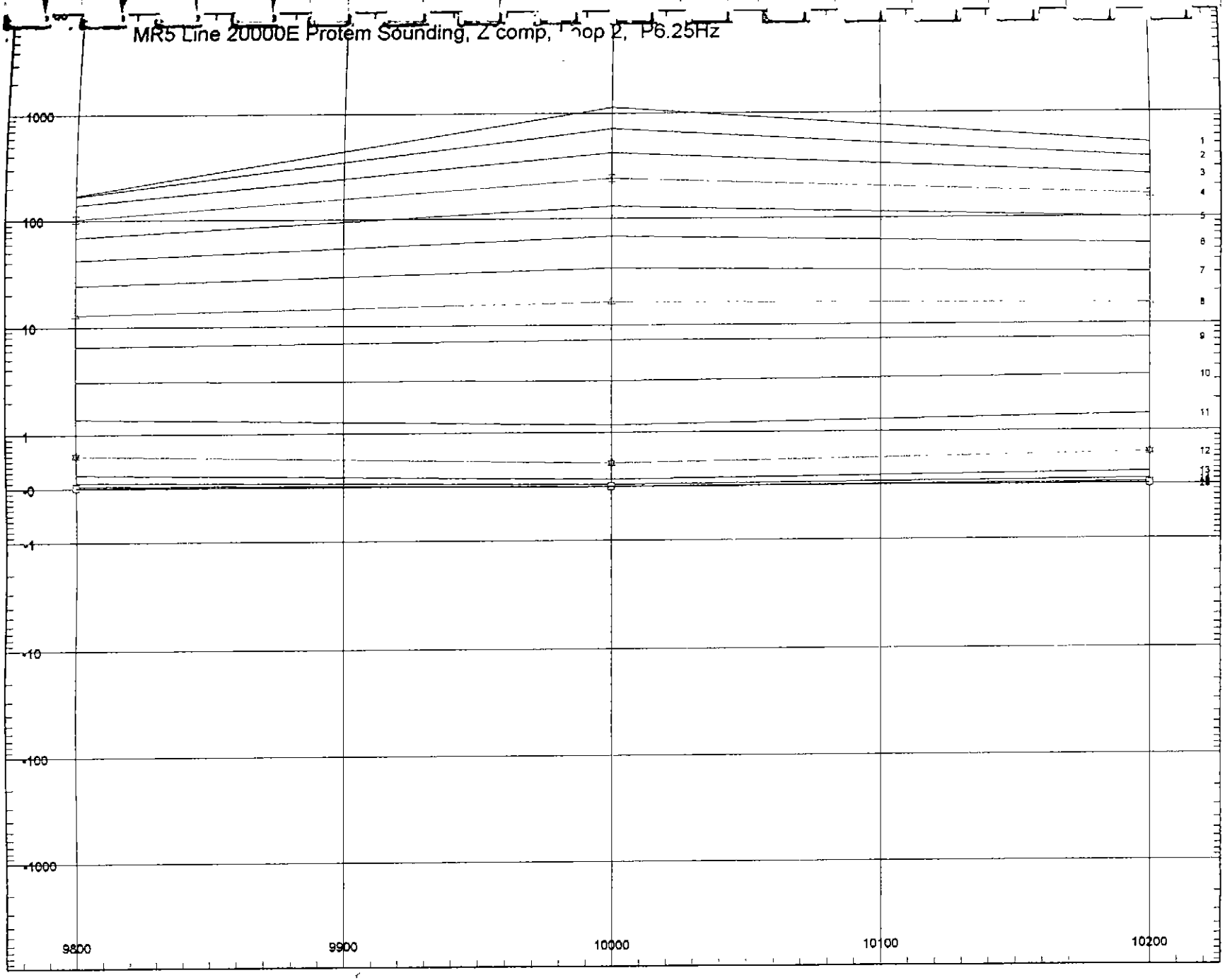

MR5 Line 5000N Protem Sounding, Z comp. Loop 1, P6.25Hz
1000
100
10
1
0
-1
-10
-100
-1000
9800
9900
10000
10100
10200
1
2
3
4
5
6
7
8
9
10
11
12
13

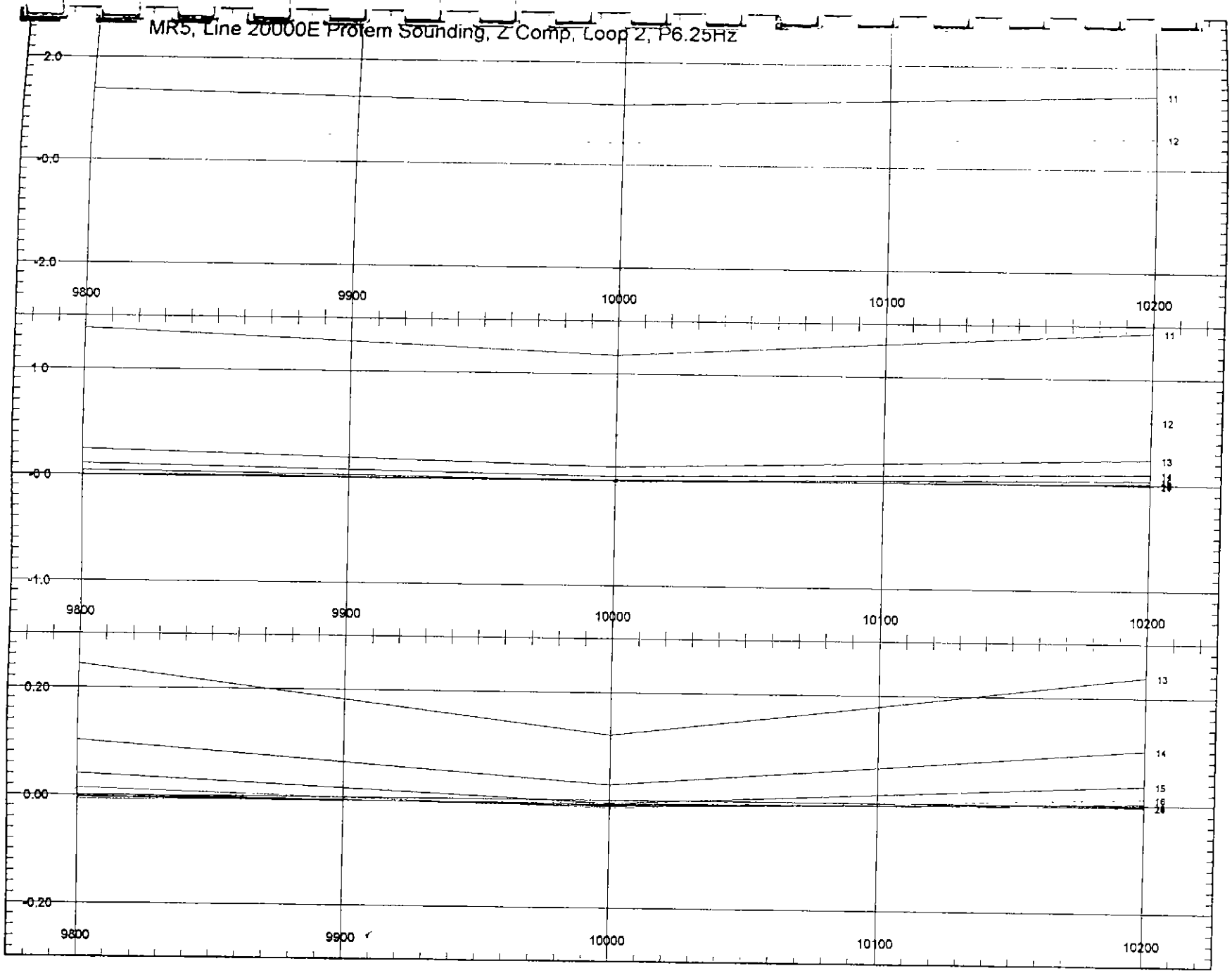

MR5, Line 5000N Protem Sounding, Z Comp Loop 1, 6.25Hz
2.0
0.0
-2.0
9800
9900
10000
10100
10200
11
12
13
14
15
1.0
0.0
-1.0
0.20
0.00
-0.20


MR5 Line 10000N Protem Sounding, Z comp, Loop 2, P6.25Hz
1000
100
10
1
-0
-1
-10
-100
-1000
19800
19900
20000
20100
20200
1
2
3
4
5
6
7
8
9
10
11
12
13

Loop 2


MR5, Line 10000N Protem Sounding, Z Comp
Loop 2, P6.25Hz
2.0
0.0
-2.0
19800
19900
20000
20100
20200
11
12
1.0
-0.0
-1.0
13
0.20
0.00
-0.20
14
15


MR5 Line 20000E Protem Sounding, Z comp, Chop 2, P6.25Hz
1000
100
10
1
0
-1
-10
-100
-1000
9800
9900
10000
10100
10200
1
2
3
4
5
6
7
8
9
10
11
12
13


MR5, Line 20000E Protem Sounding, Z Comp, Loop 2, P6.25Hz
2.0
0.0
-2.0
9800
9900
10000
10100
10200
11
12
1.0
0.0
-1.0
13
0.20
0.00
-0.20
14
15
16

SOUNDING: 5000 : Vers 2
5000 : . 10001E, 5000N .
25Hz, 4 lyr, 3 pts out

8.8 ohm.m — 7.8 m. — 7.8 m.

(93.5 ohm.m) * 50.3 m.

58.1 m.

18.8 ohm.m 35.0 m.

* 93.1 m.

(1782 ohm.m)

STD ERR= 3.2% : S= 3 S

5000A2

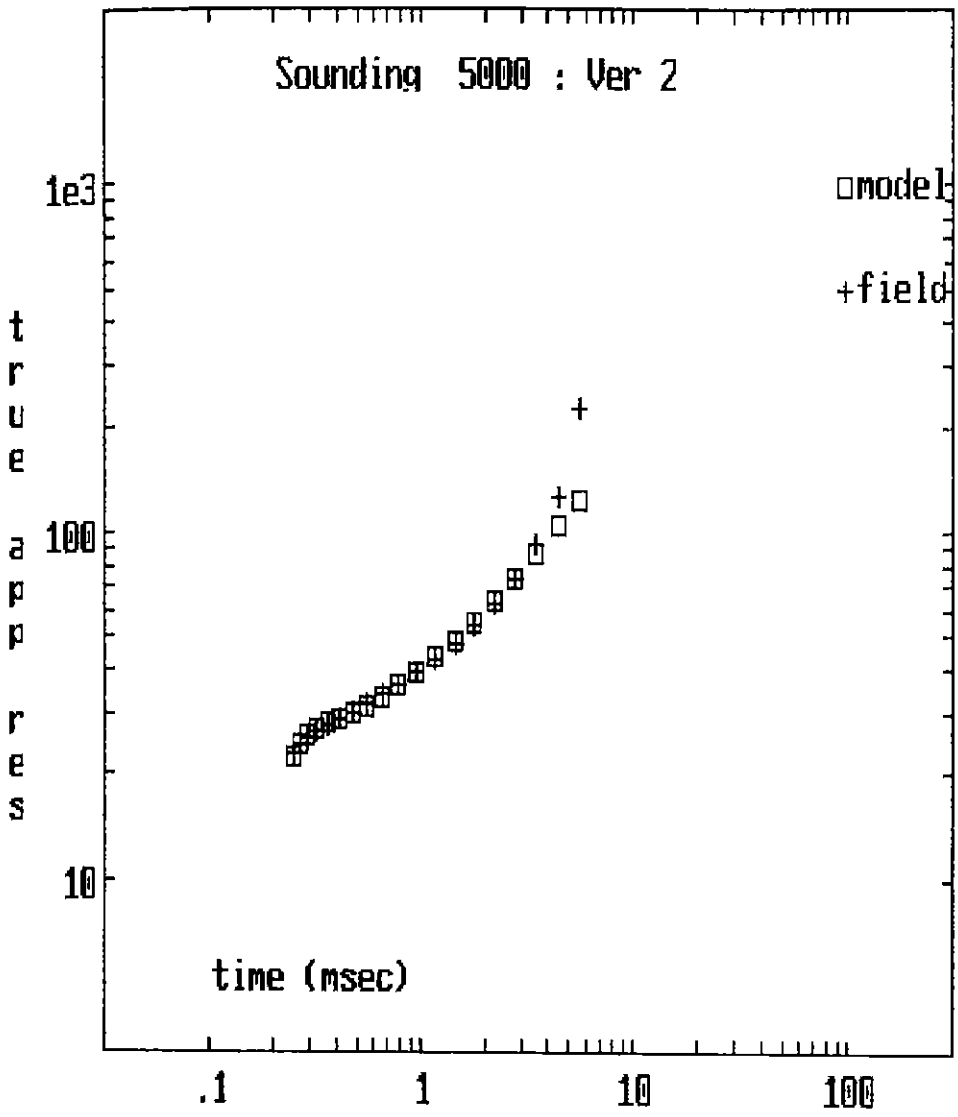
8.8

(93.5)

18.8

(1782)

E= 3%
S= 35



MR5

Sounding 1

25 Hz

3 pts out

SOUNDING: 5000 : Vers 3
5000 : , 10000E, 5000N .
P6.25Hz, 4 lyr

10.6 ohm.m 9.4 m. 9.4 m.

(101 ohm.m) 48.4 m.

57.8 m.

19.4 ohm.m 34.9 m.

* 92.7 m.

(1037 ohm.m)

STD ERR= 4.1% : S= 3 S

5000E3

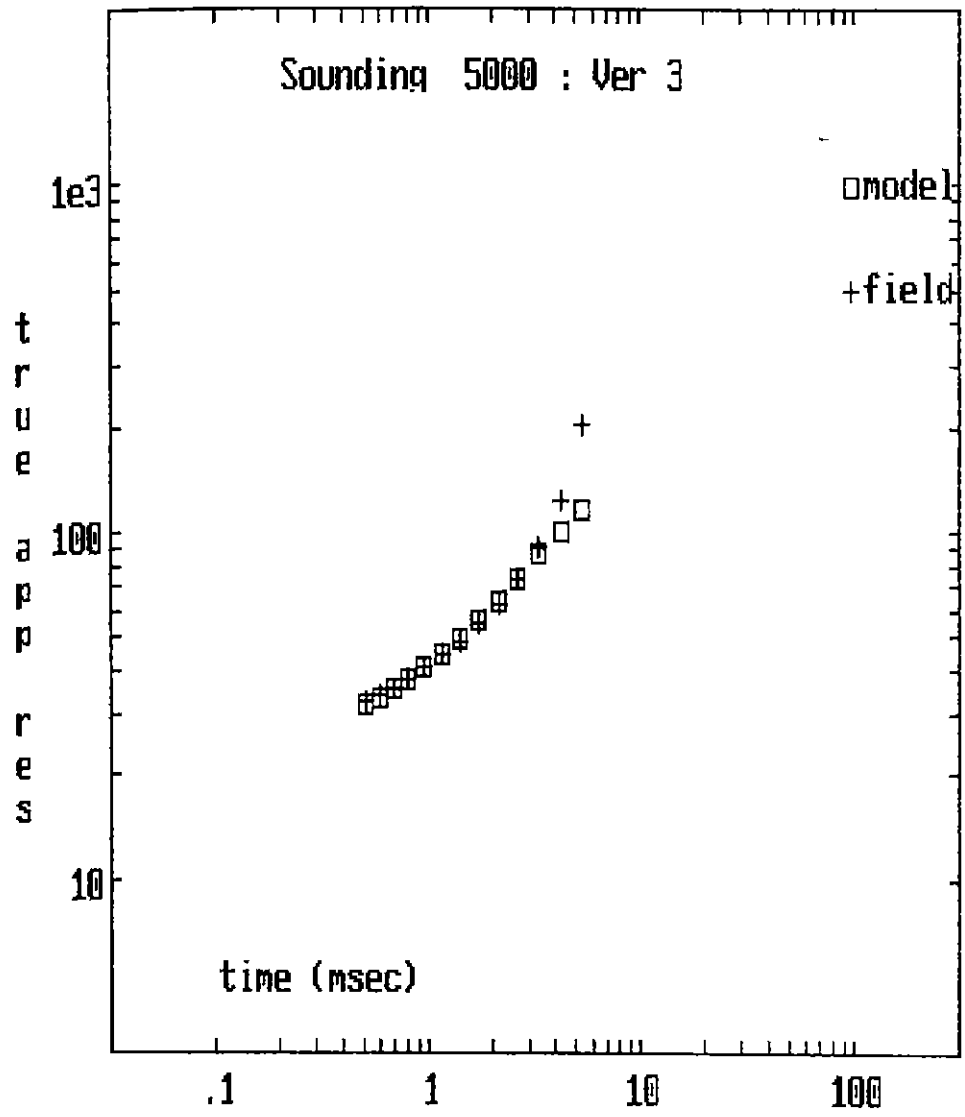
10.6

(101)

19.4

(1037)

E= 4%
S= 3S

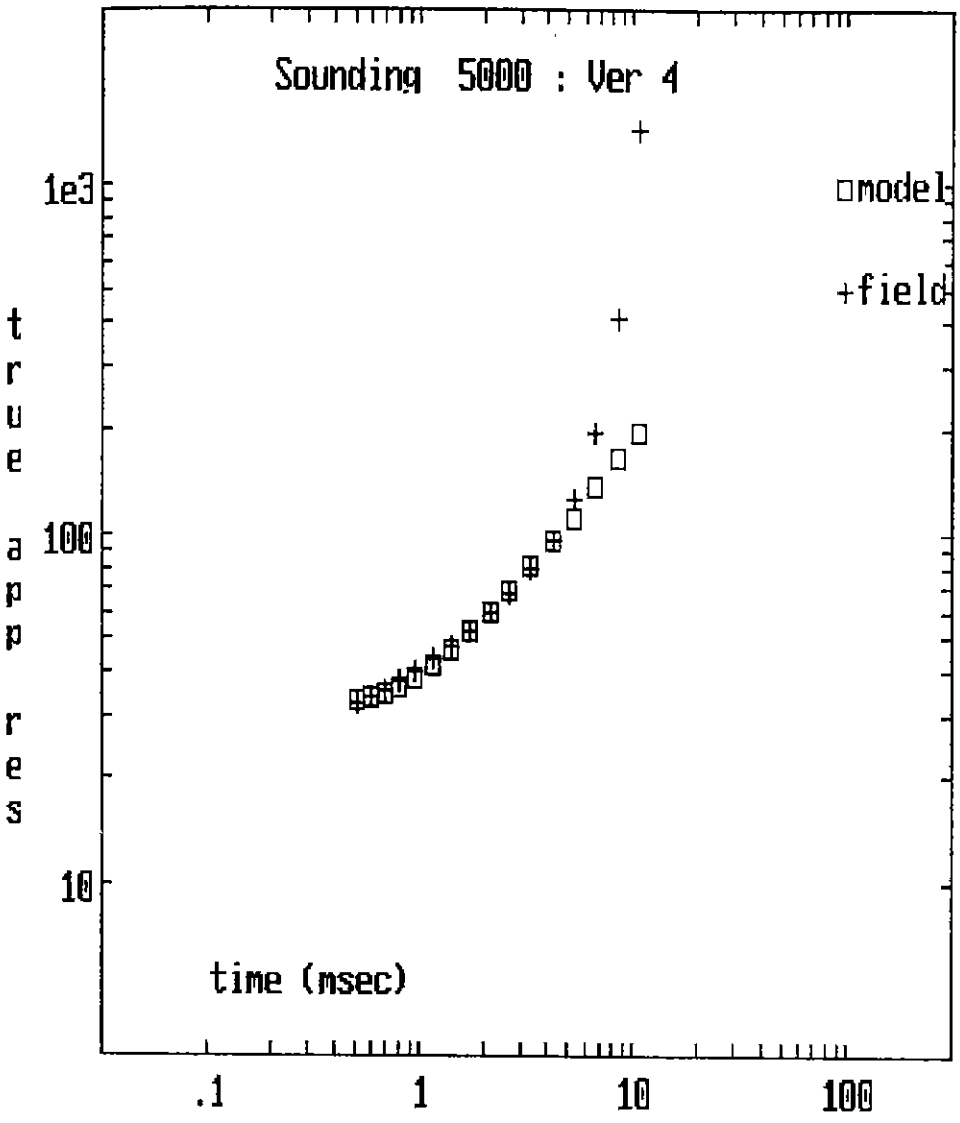


MR5

Sounding 1

P6· 25 Hz

9 Pts out



MR5

Sounding 1

6.25 Hz

Loop Corrected

SOUNDING: 5000 : Vers 4
5000 : . 10000E, 5000N .
Loop Corrected

(15.2 ohm.m) (6.9 m) (6.9 m)

(112 ohm.m) 45.4 m.

52.3 m.

14.0 ohm.m 34.8 m.

* 87.1 m.

(1829 ohm.m)

STD ERR= 7.3% : S= 3 S

5000A4

[15.2]

(112)

14.0

(1829)

E= 7%
S= 35

SOUNDING: 1000 : Vers 1
1000 : . 20001E. 10000N.
25Hz. 4 lyr

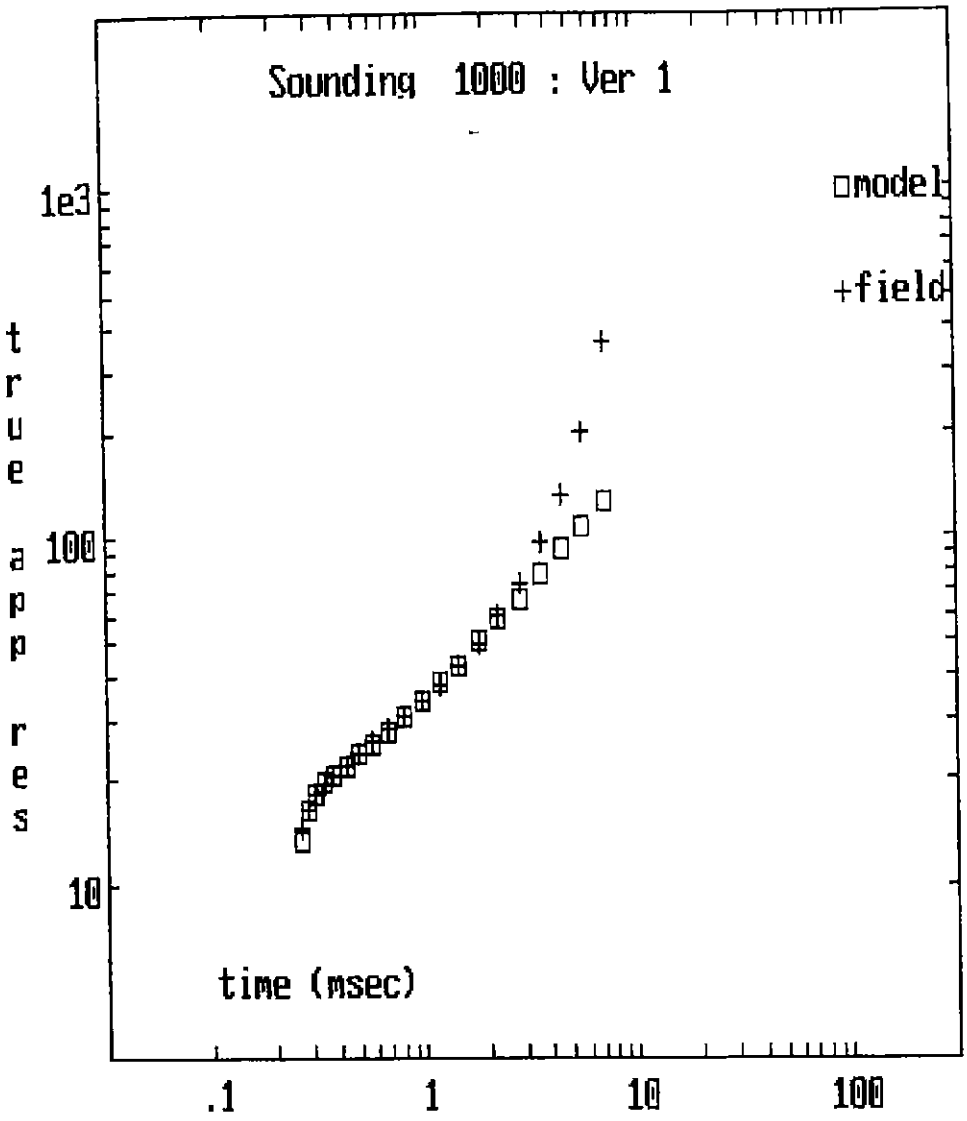
9.6 ohm.m	10.5 m.	10.5 m.
(90.8 ohm.m)	28.5 m.	39.0 m.
18.2 ohm.m	31.7 m.	* 70.7 m.
(523 ohm.m)		

STD ERR= .9% : S= 3 S

1000A1

9.6
(90.8)
18.2
(523)

E= 1%
S= 35



MR5

Sounding 2

25 Hz

6 pts out

SOUNDING: 1000 : Vers 2

1000 : . 20000E, 10000N.

6.25Hz, 4 lyr

11.5 ohm.m (8.5 m. } 8.5 m.)

(97.0 ohm.m) 22.3 m.

30.8 m.

13.8 ohm.m 28.6 m.

* 59.5 m.

(1221 ohm.m)

STD ERR= 8.6% : S= 3 S

1000A2

11.5

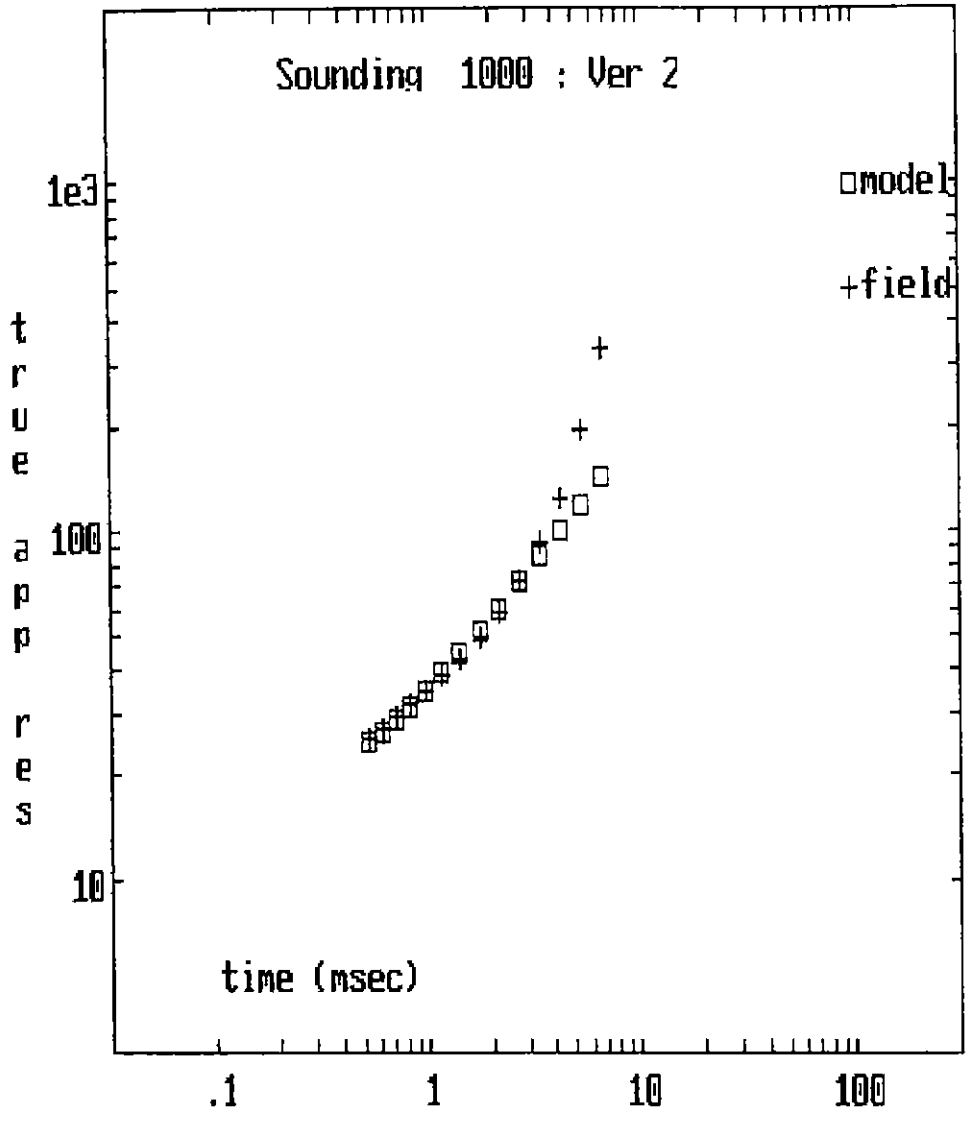
(97.0)

13.8

(1221)

E= 7%

S= 3S



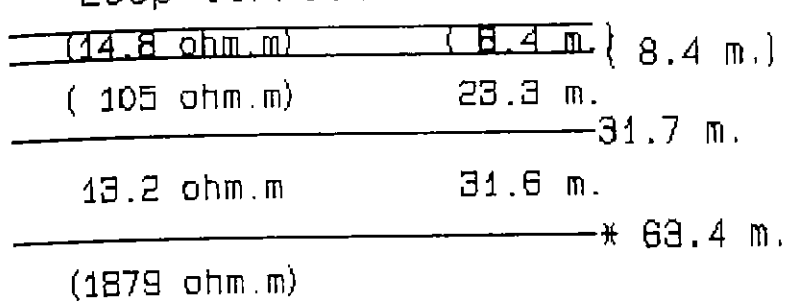
MR5

Sounding 2

6.25 Hz

9 pts out

SOUNDING: 1000 : Vers 3
1000 : , 20000E, 10000N.
Loop Corrected



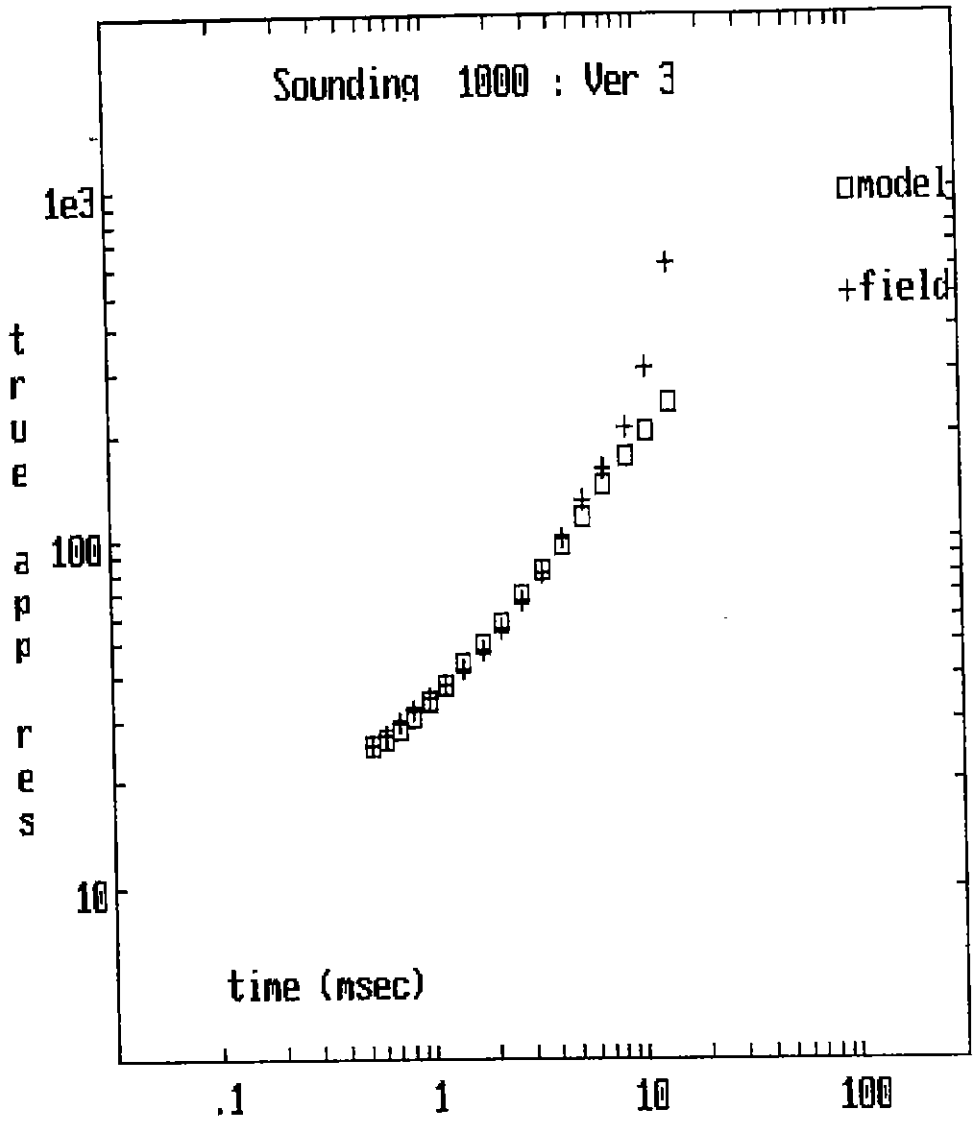
STD ERR= 6.7% : S= 3 S

)

1000A3

(14.8
(105)
13.2
(1879)

E= 7%
S= 3


Sounding 1000 : Ver 3
□model
+field
1e3
100
10
true app res
time (msec)
.1
1
10
100

APPENDIX 3

ROCK CHIP ASSAYS AND DESCRIPTIONS

Sample No	Easting	Northing	Sample description
DS 13	569680	8233410	Silicified dolomite with disseminated galena occuring along bedding planes. Minor cerrusite and pyromrphite
DS 14	569682	8233410	Silicified dolomite with disseminated galena occuring along bedding planes. Minor cerrusite and pyromrphite
DS 15	569685	8233410	Silicified dolomite with disseminated galena occuring along bedding planes. Minor cerrusite and pyromrphite
DS 16	569830	8233260	Silicified dolomite with fine grained galena replacing algal rich layers

Sample No	Ag	As	Bi	Cd	Co	Cr	Cu	Fe	Mn	Ni	P	Pb	Sb	Th	U	V	Zn
DS 13	13	34	X	2	X	12	407	7450	88	X	2110	69500	X	0.75	1.78	112	795
DS 14	20	23	X	X	X	11	645	8200	101	X	830	136100	X	0.72	1.86	53	101
DS 15	20	36	X	X	X	11	912	8050	92	X	1970	142300	10	0.48	1.71	80	109
DS 16	9	17	X	X	X	12	189	7750	132	X	180	600000	X	0.57	0.41	4	131
	GI201	GI201	GI201	GI201	GI201	GI201	GI201	GI201	GI201	GI201	GI201	GI201	GI201	GS201	GS201	GI201	GI201