CONTENTS ENVELOPE 8004

TENEMENT: E.L. 1454.

TENEMENT HOLDER: Aberfoyle Resources Ltd.

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Aberfoyle Resources Limited

Incorporated in Victoria

EXPLORATION DIVISION

Balah 61

ADELAIDE OFFICE: 91 BEULAH ROAD NORWOOD S.A. 5067 Phone: (08) 363 1636 Facsimile: (08) 363 1409 1st Floor 123 Camberwell Road Hawthorn East Victoria 3123 Australia Telephone: (03) 882 2226

Telephone: (03) 882 2226 Facsimile: (03) 813 1086 Telex: AA38646

The Director General, Department of Mines and Energy, P.O. Box 151, Eastwood. SA. 5063.

7th June, 1988.

Dear Sir,

RE: EXPLORATION LICENCE 1454, BALAH

REPORT FOR THE FIRST QUARTER,

ending 7 March, 1988.

Work in the first Quarter has comprised preparation of base maps and planning for a RAB programme to investigate the potential of the EL for heavy mineral sands.

This planned prgramme should commence in the second Quarter.

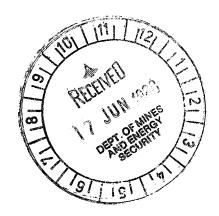
A statement of expenditure is attached.

Yours faithfully, ABERFOYLE RESOURCES LIMITED, Exploration Division,

M. G. Teatre

M.G. Teakle. Project Geologist.

MGT/maf. Att. cc. KERD.



BALAH EL 1454

SUMMARY OF EXPENDITURE
FOR THE QUARTER ENDED 7 MARCH, 1988.

GEOLOGY	255.00
RAB DRILLING	42.49
TENURE	229.56
OTHER SERVICES	227.52
INDIRECT COSTS	113.16
TOTAL	867.73

Prepared by HR.

Aberfoyle Resources Limited

Incorporated in Victoria

EXPLORATION DIVISION

Balah 61.

ADELAIDE OFFICE: 91 BEULAH ROAD NORWOOD S.A. 5067 Phone: (08) 363 1636

Facsimile: (08) 363 1409

1st Floor 123 Camberwell Road Hawthorn East Victoria 3123 Australia Telephone: (03) 882 2226

Facsimile: (03) 813 1086

Telex: AA38646

The Director General, Department of Mines and Energy, P.O. Box 151, Eastwood. SA. 5063.

30th June, 1988.

Dear Sir,

RE: EXPLORATION LICENCE 1454, BALAH

Report for the second Quarter ending 7 June, 1988.

No field work was conducted in this Quarter.

A RAB drilling programme to investigate the potential of the EL for heavy mineral sands will commence in the third Quarter.

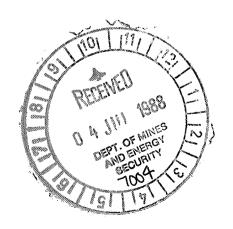
A statement of expenditure is attached.

Yours faithfully, ABERFOYLE RESOURCES LIMITED, Exploration Division,

M. G. Teame

M.G. Teakle. Project Geologist.

MGT/maf. Att. cc.KERD.



BALAH EL 1454

SUMMARY OF EXPENDITURE FOR THE QUARTER ENDED 7 JUNE, 1988.

GEOLOGY	423.60
OTHER SERVICES	50.52
INDIRECT COSTS	71.11
TOTAL	545.23

Prepared by HR.

Aberfoyle Resources Limited ADELAIDE OFFICE:

Incorporated in Victoria

EXPLORATION DIVISION

Balah 61

ADELAIDE OFFICE: 91 BEULAH ROAD NORWOOD S.A. 5067 Phone: (08) 363 1636 Facsimile: (08) 363 1409 1st Floor 123 Camberwell Road Hawthorn East Victoria 3123 Australia Telephone: (03) 882 2226

Telephone: (03) 882 2226 Facsimile: (03) 813 1086 Telex: AA38646

The Director General
Department of Mines and Energy
PO Box 151
EASTWOOD SA 5063

6th December 1988

Dear Sir

EL1454 Balah

REPORT FOR THE THIRD QUARTER ending 7 September 1988

A RAB drilling programme commenced during the Quarter and was still in progress at the end of the Quarter.

Results to date indicate that the target Pliocene sands generally contain only trace amounts of heavy minerals. Best intersections have been 6m at 3.47% heavy minerals in Hole BL02-064, and 4m at 2.39% in Hole BL02-066. In-house mineralogical study shows that the mineral assemblages are dominated by goethite and ilmenite.

A full technical report will be submitted at the end of the fourth Quarter.

A statement of expenditure is attached.

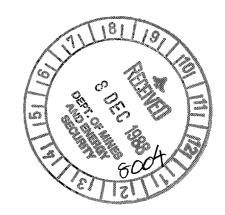
Yours faithfully ABERFOYLE RESOURCES LIMITED Exploration Division

MG Teakle

Project Geologist

M. G.Tealle

MGT/maf Att cc KERD



BALAH EL 1454

SUMMARY OF EXPENDITURE FOR QUARTER ENDED 7TH SEPTEMBER 1988.

GEOLOGY	3,792.69.
RAB DRILLING	64,159.32.
PERCUSSION DRILLING	35.00.
OTHER SERVICES	2,594.03.
INDIRECT COSTS	10,586.98.
	The state of the s
TOTAL	\$81,168.02.

Prepared by HR. 18-10-88.

ABERFOYLE RESOURCES LIMITED

EXPLORATION DIVISION

EXPLORATION LICENCE 1454

"BALAH"

REPORT FOR THE QUARTER ended 6 December, 1988.

Distribution:

SADME	(1)
Hawthorn	(1)
Adelaide	(1)

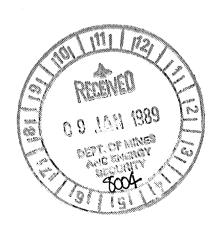
Prepared By:

MG Teakle Senior Geologist

JAC Painter Geologist

Issued By:

JA Anderson Regional Manager



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4.	EXPLORATION PROGRAMME 4.1 DRILLING AND SAMPLING 4.2 HEAVY LIQUID SEPARATIONS	2 3			
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APPENDICES

Appendix A

Cross sections. (Legend included)

F I G U R E S

Figure 1	Location Plan	(in	text)
Figure 2	Licence Details		
Figure 3	RAB Line Locations		
Figure 4	Heavy Liquid Separation		

SUMMARY

RAB drilling on Exploration Licence 1454 Balah consisted of 345 holes along 69.4km of traverse for a total of 4,776m. Drill holes encountered the target horizon of Upper Pliocene Parilla Sand, but the sand contained only trace amounts of heavy minerals.

1 INTRODUCTION:

This report describes exploration carried out by Aberfoyle Resources Ltd on Exploration Licence 1454 Balah during the period 7 December 1987 to 6 December 1988.

The Balah licence was secured by Aberfoyle to explore for heavy mineral sands following encouraging results in similar geological environments elsewhere in the Murray Basin.

Research of South Australian Department of Mines and Energy Open File reports revealed that there had been no previous exploration for heavy mineral sands in the Balah area.

Exploration consisted of a RAB drilling programme having the objective of locating economic quantities of heavy minerals at shallow depth in Pliocene sands.

2. LOCATION AND TENURE:

Exploration Licence 1454 Balah was granted to Aberfoyle on 7 December 1987 for a term of one year. The licence covered approximately 225 square kilometres centred some 40km north east of Morgan (Fig.1,2).

On 7th December 1988 the term expired and the licence was allowed to lapse.

3. GEOLOGY:

The geology of the area covered by the Balah Exploration Licence is shown mainly on the Chowilla 1:250,000 geological sheet (Rogers, 1977), and partly on Renmark (Firman, 1972).

A succession of Quaternary and Tertiary sediments more than 100m thick rests unconformably on Mesozoic and Palaeozoic sediments, which in turn overlie Proterozoic basement.

Oldest Tertiary sediments are Paleocene to Eocene marine carbonaceous sand and sandy clay of the Renmark Beds and Buccleuch Beds. They are overlain by fossiliferous marine sediments of Oliqocene to Lower Pliocene Age, consisting of the Ettrick Formation, Mannum Formation, Pata Limestone (Morgan Limestone) and Bookpurnong Beds. These sediments, mainly calcareous silty sands and limestones, are often clayey and generally glauconitic. Pliocene sands complete the Tertiary sequence. These are the Loxton Sands and Parilla Sand, generally fine to medium and coarse grained sands with some clayey sand. Rogers (1977) and Firman (1972) described the sands as fluviatile, however work done by Aberfoyle elsewhere demonstrated at least a substantial marine component which hosts near-shore heavy mineral concentrations.

Tertiary sediments do not outcrop in the licence area, but are everywhere overlain by a variable veneer of Quaternary sediments. Lower Pleistocene Blanchetown Clay outcrops in places. It is a pale brown and mottled red-brown silty clay, commonly overlain by thin Bungunnia Limestone, with modular and sheet calcrete of Bakara Soil being more widespread. Most of the area is blanketed by Late Pleistocene sands consisting of Pooraka Formation, a red-brown clayey sand with gravel lenses, a transitional red-brown silty sand, and, uppermost, the Woorinen formation, a pale red-brown silty quartz sand forming eastwest trending linear dunes. Many units are covered by a thin overlay of Recent Bunyip sand.

The Pliocene Parilla Sand and Loxton Sands are considered the most likely horizon for accumulations of heavy minerals, and were the main target of the drilling programme.

4. EXPLORATION PROGRAMME:

4.1 Drilling and Sampling:

RAB drilling was carried out between July 1988 and October 1988 by HA and JE Wilson of Cobar, NSW. The drill used was an Investigator Mk5 Air rig rated at 250cfm and 120 psi. Holes were drilled vertically to a target depth of 18m using a 100mm diameter blade bit. A number of holes collapsed and were abandoned before reaching target depth.

Holes were spaced mainly at 200m intervals along four traverse lines ranging in length from 6.4 to 28.6km. Traverses were located along the sides of mainly secondary roads. Traverse locations are shown in Figure 3.

Three hundred and forty five holes were drilled along 69.4 line km for a total of 4,776m.

Grab samples of 100-150 grams were collected from 2m intervals. One sample from each interval was bagged and retained for subsequent heavy mineral determination. A second sample was panned on-site and heavy mineral concentration was visually estimated.

4.2 <u>Heavy Liquid Separations</u>

Experience gained in earlier work has resulted in the practice of submitting samples for heavy mineral determination only when visual estimates of panned samples indicate more than 1% heavy minerals in the sample.

In this investigation only trace amounts of heavy minerals were observed in most panned samples. Consequently only 44 samples were submitted for analysis from 9 holes on Line BLO2. Heavy Liquid separation was carried out by AMDEL using the method shown schematically on the flow chart (Fig.4). Mineralogical examination was limited to rapid inhouse scanning.

5. RESULTS:

The results of drilling are presented as cross sections along traverse lines (Appendix A). Heavy mineral contents, when determined, are shown on the cross sections.

Drill holes on Lines BLO3 and BLO4 in the southern part of the area show a sequence of sand, clayey sand to sandy clay up to 8m thick overlying fine to medium grained quartz sand. The sand is generally clean and uniform to the bottom of the hole, but in places becomes more or less clayey. No calcrete or significant induration was encountered. This unit is thought to be the target Pliocene sand. However only trace amounts of heavy minerals were observed.

Lines BL01 and BL02, which tested the western and northern parts of the area, encountered in general a much more clayey sequence, and many holes show clay and sandy clay to the full depth tested (18m). Concentrations of heavy minerals were encountered in several sandy lenses along Line BL02, but the lenses were of limited thickness and lateral extent, and the concentrations are not economic.

Of the 44 samples submitted for analysis from Line BLO2, the best results were 4.58% heavy minerals over 4m in Hole BLO2-064, and 2.54% over 6m in Hole BLO2-108. Examination of the higher grade separations determined the assemblages to be subeconomic as they are dominated by iron oxides and ilmenite.

6. CONCLUSIONS AND RECOMMENDATIONS:

The drilling programme carried out on Exploration Licence 1454 Balah has not located economic quantities of heavy mineral sands. It is recommended that this licence be relinquished.

7. EXPENDITURE:

Expenditure on Exploration Licence 1454 Balah for the year December 1987 to December 1988 was \$80,854.22. A statement of expenditure appears on the following page.

8. REFERENCES:

- Firman, J.B. (Compiler) 1972 RENMARK, South Australia. Explanatory Notes, 1:250,000 geological series. Sheet SI/54-10. Geological Survey South Australia.
- Rogers, P.A. (Compiler) 1977 CHOWILLA, South Australia. Explanatory Notes, 1:250,000 geological series. Sheet SI/54-6. Geological Survey South Australia.

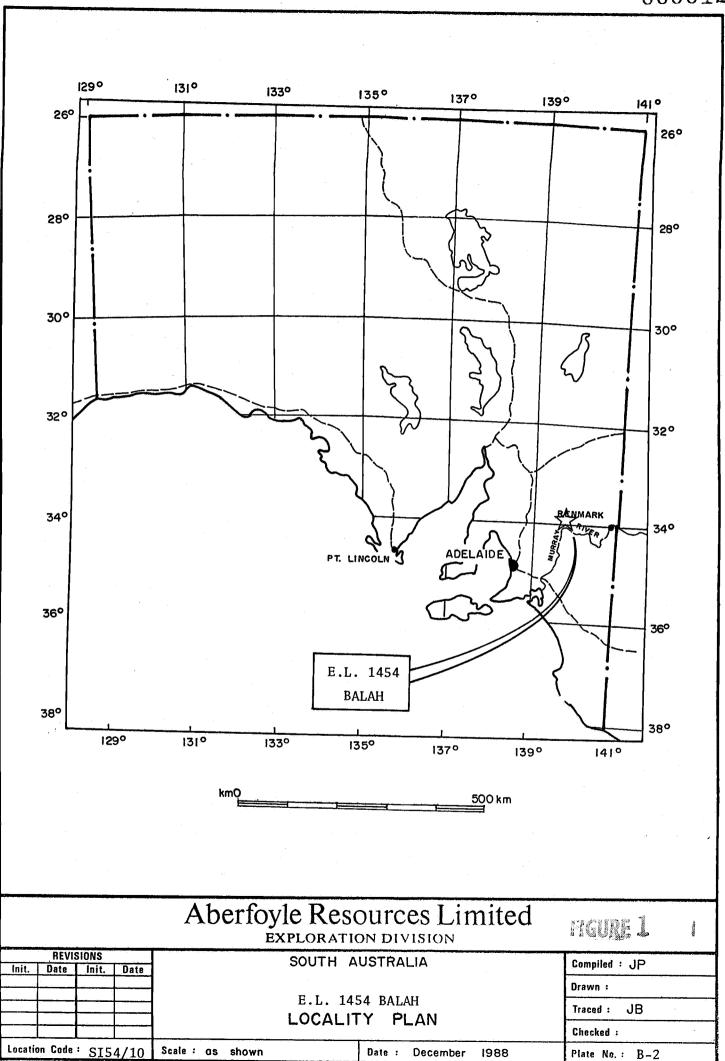
BALAH EL 1454

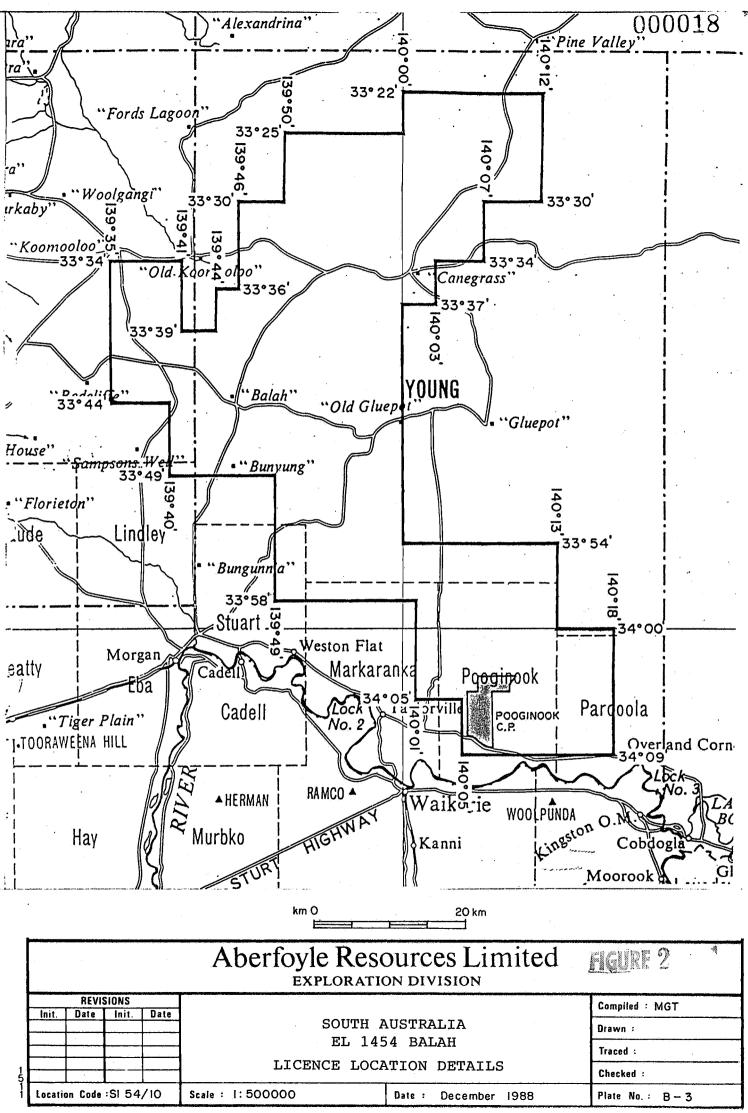
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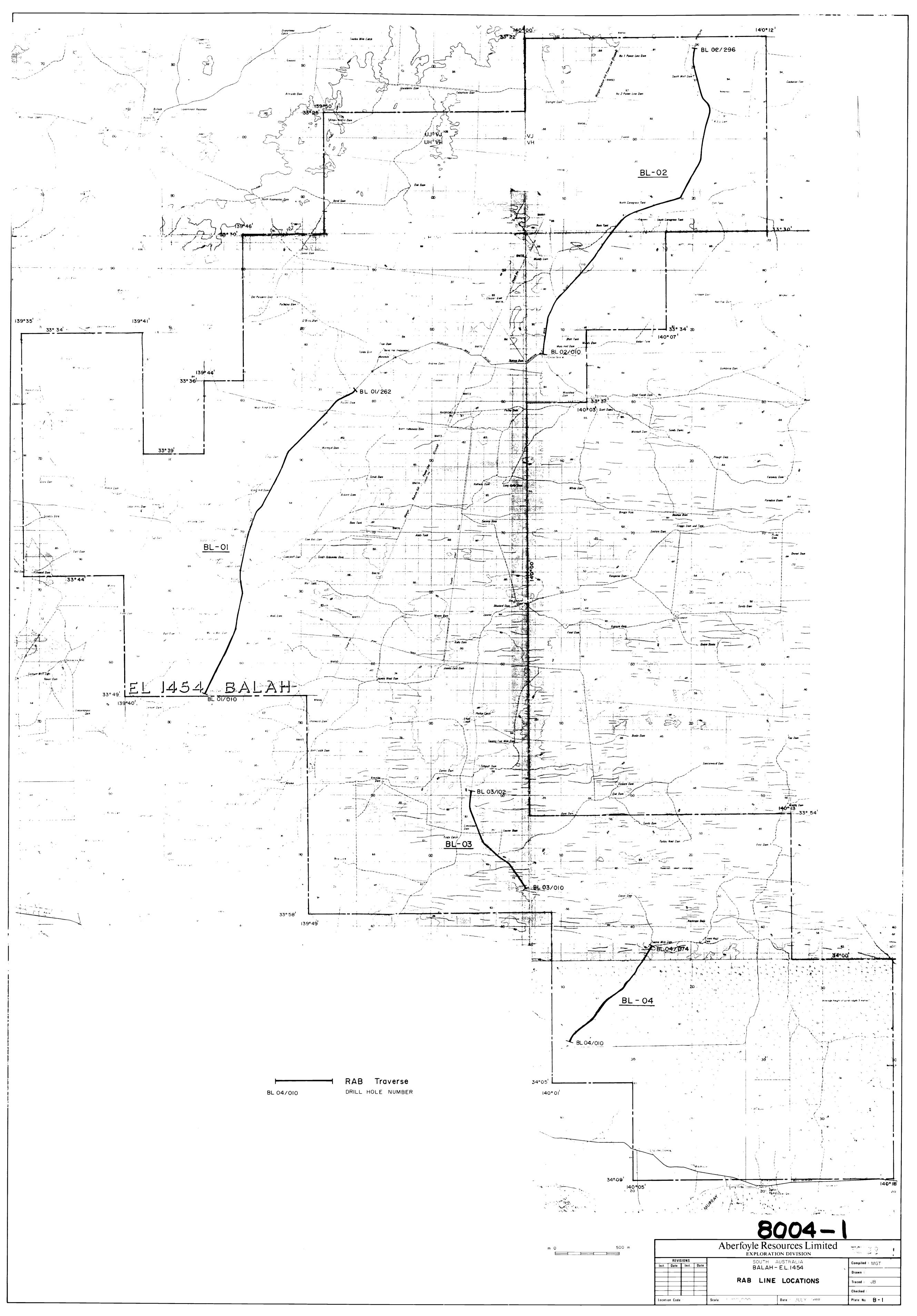
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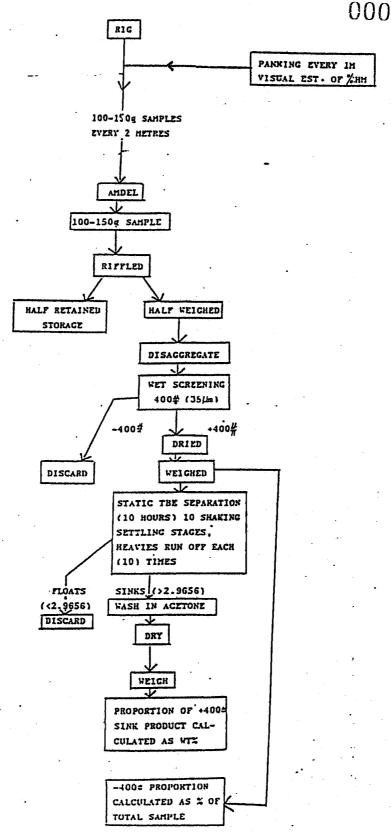
TOTAL

\$80,854.22 ?82580.98 Based on total
of quarterly
expenditures









				A	berf	Toyle Res		es Limited	FIGURE 4
lnit.	REVI:	SIONS Init.	Date	ľ		SOUTH	AUSTRAL	IA	Compiled :
			Date		•				Drawn:
					FLOW CHART OF HEAVY LIQUID SEPARATION		Traced :		
		<u> </u>		<u> </u>			Checked :		
Locatio	on Code	:		Scale :	NTS		Date :	December 1988	Plate No. :

APPENDIX A

CROSS SECTIONS

BALAH

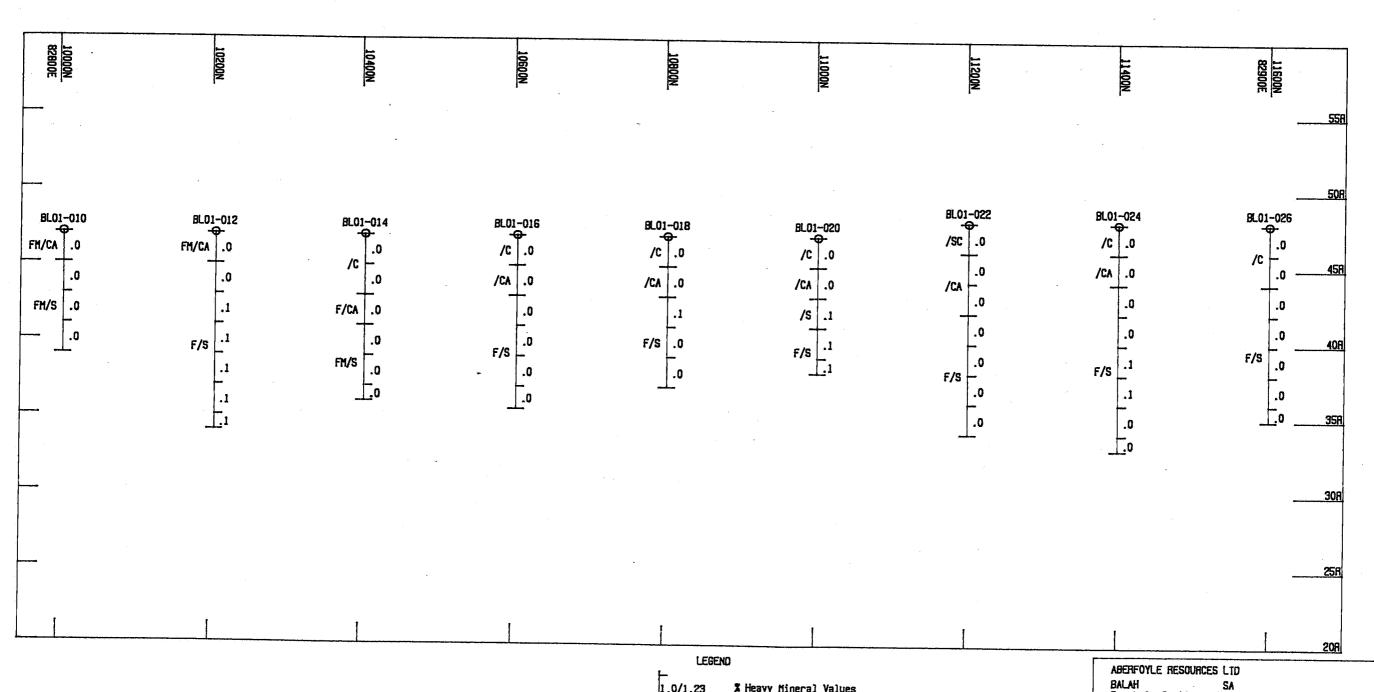
EL 1454

/CA - calcrete
/C - clay
/CS - clayey sand
/S sand
/SC - sandy clay

F/ - fine
FM/ - fine to medium
M/ - medium

M/ - medium
MC/ - medium to coarse
C/ - coarse
VC/ - very coarse

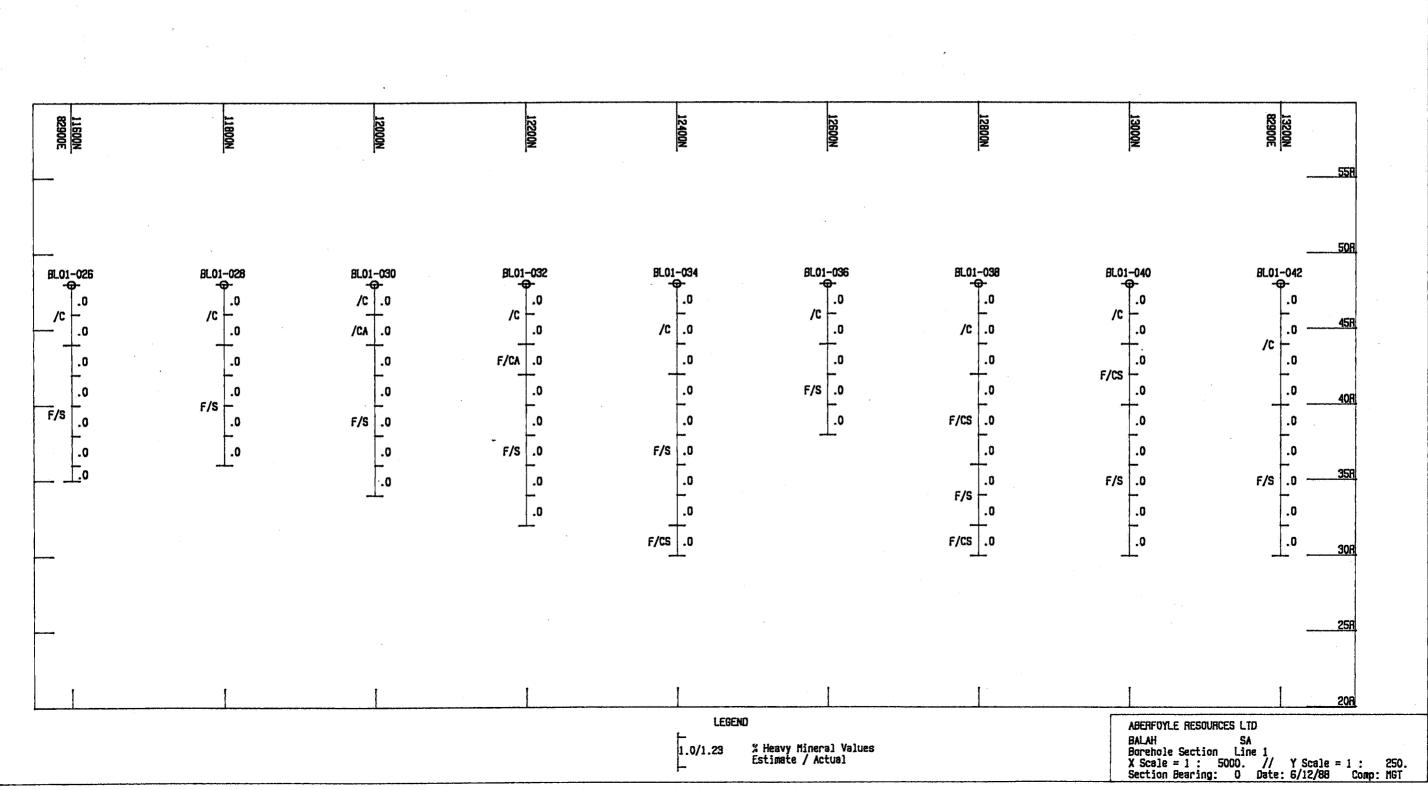
% HMS estimate



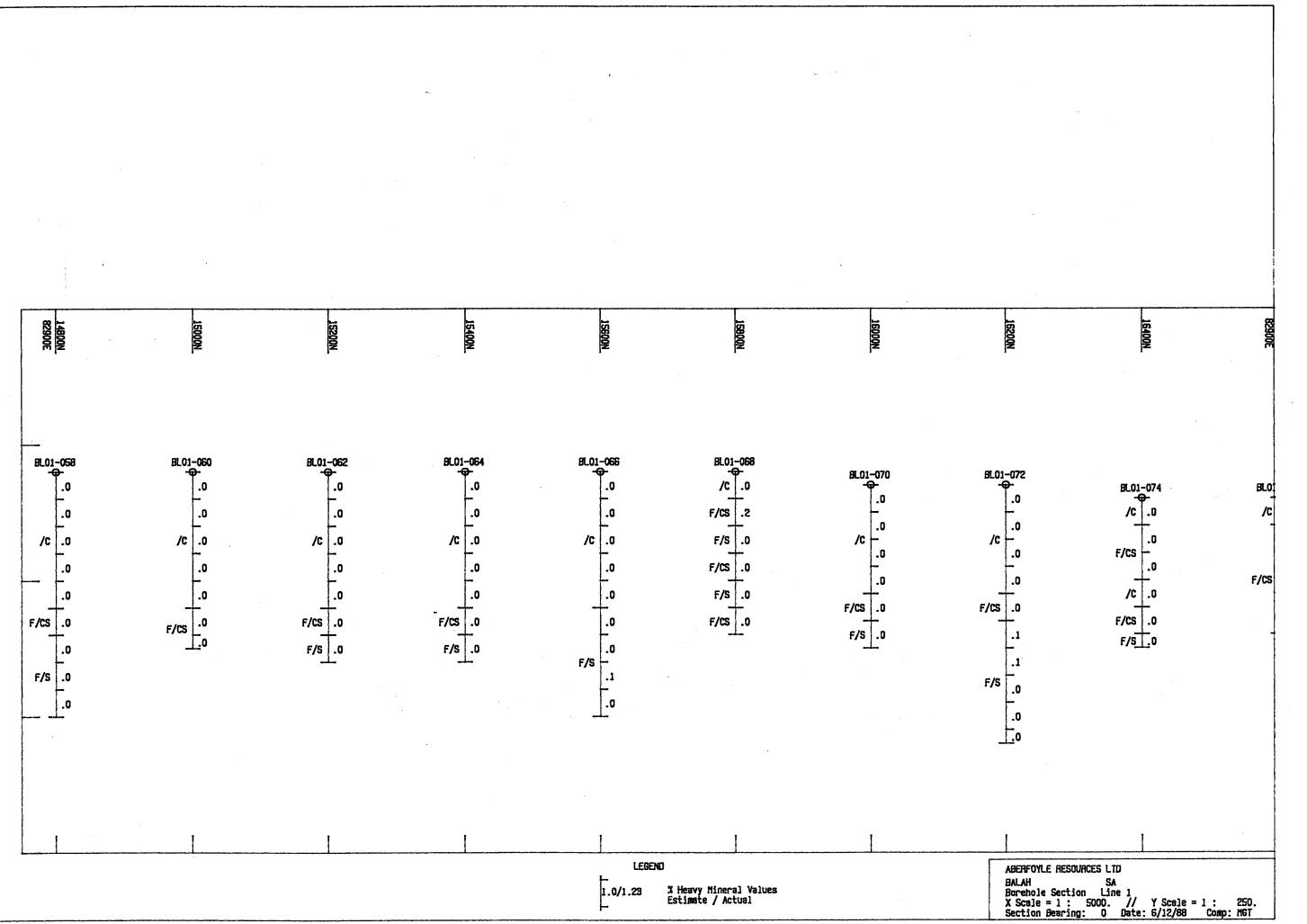
ABERFOYLE RESOURCES LTD

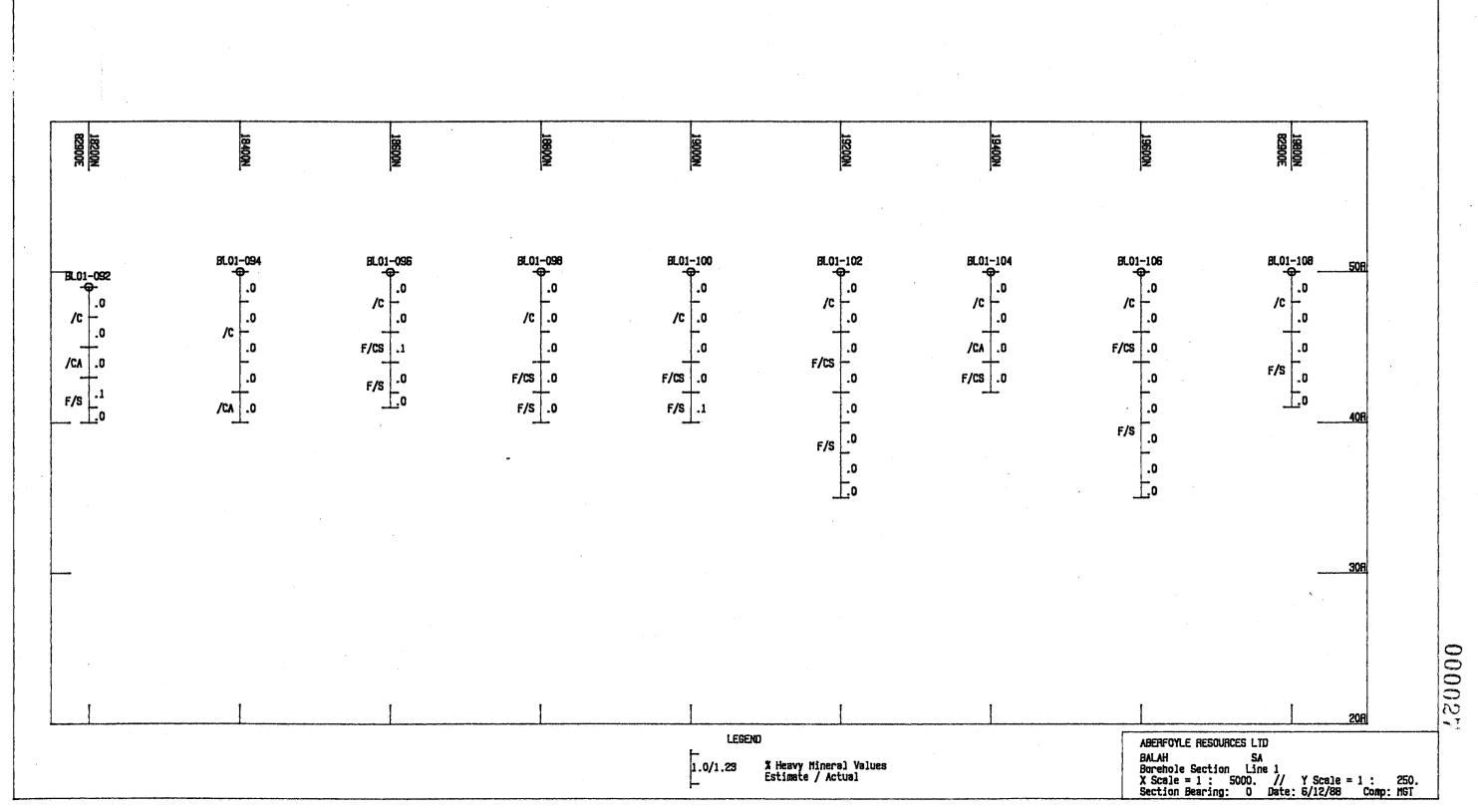
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Borehole Section Line 1

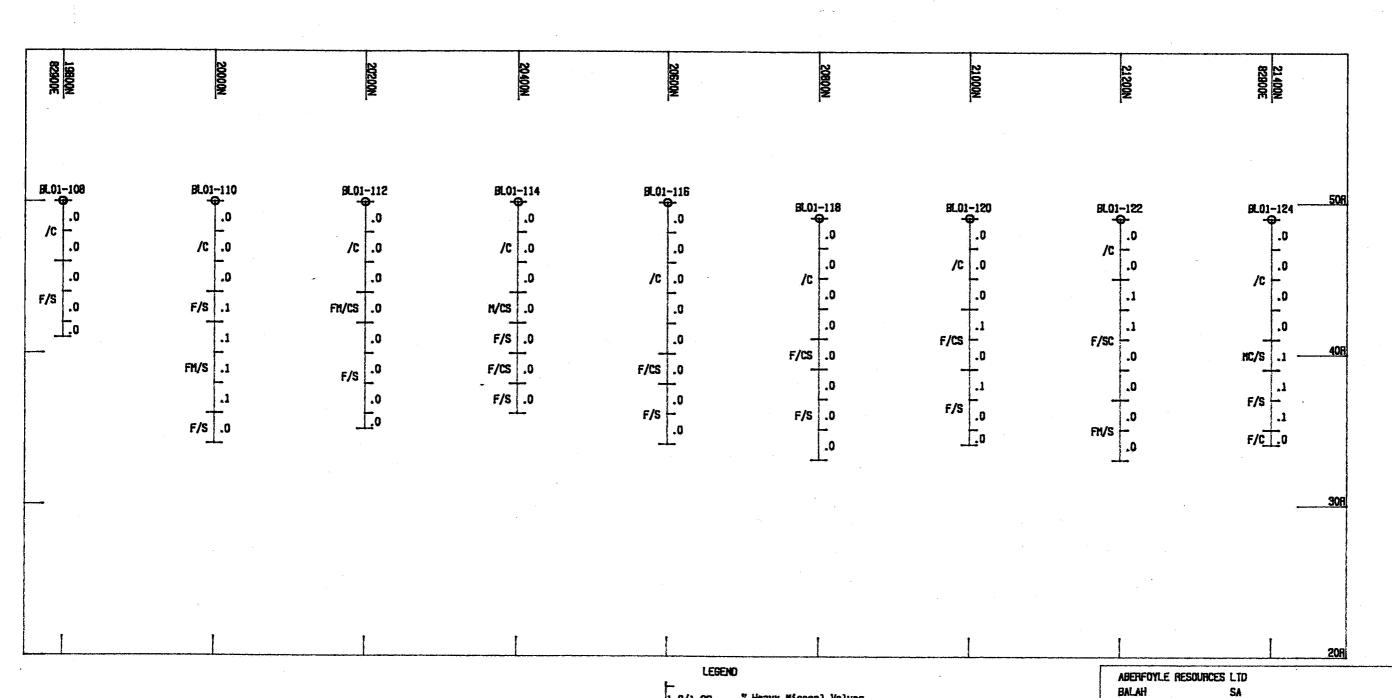
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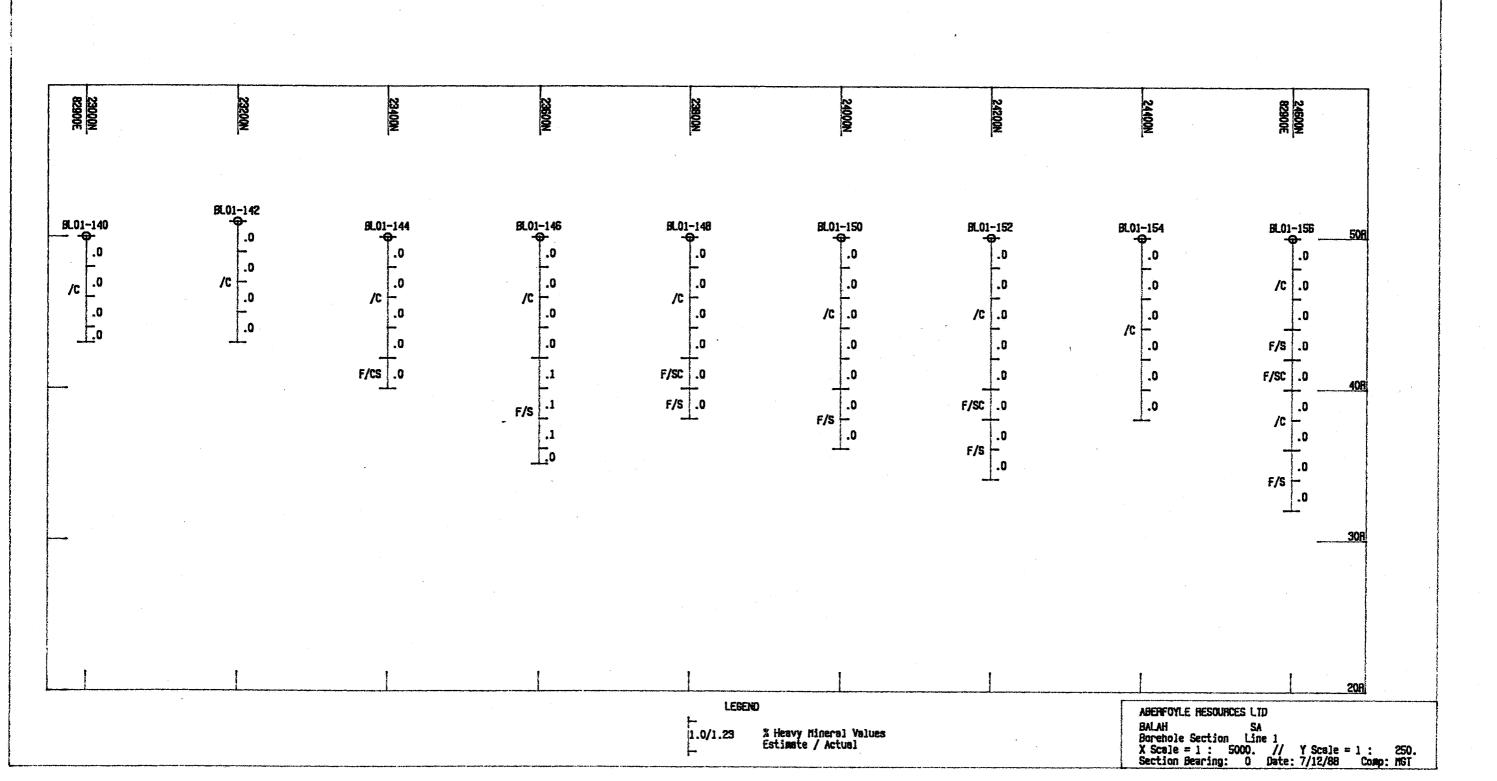


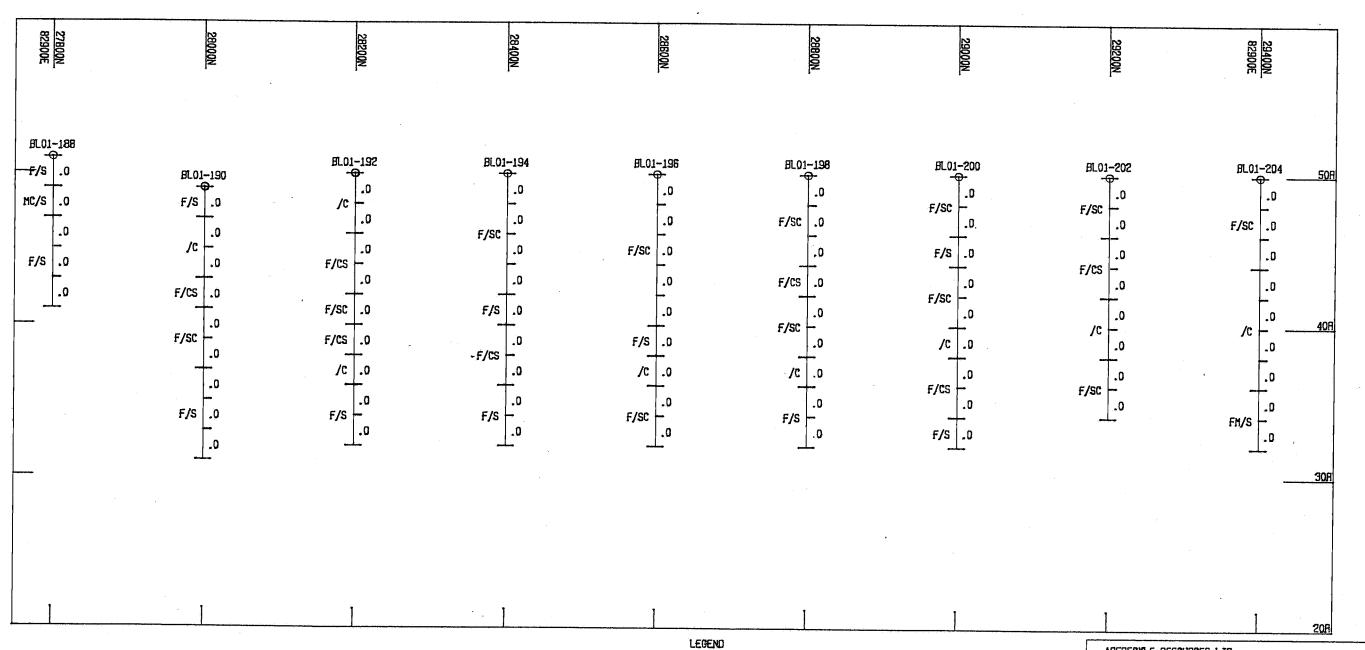




% Heavy Mineral Values Estimate / Actual 1.0/1.23

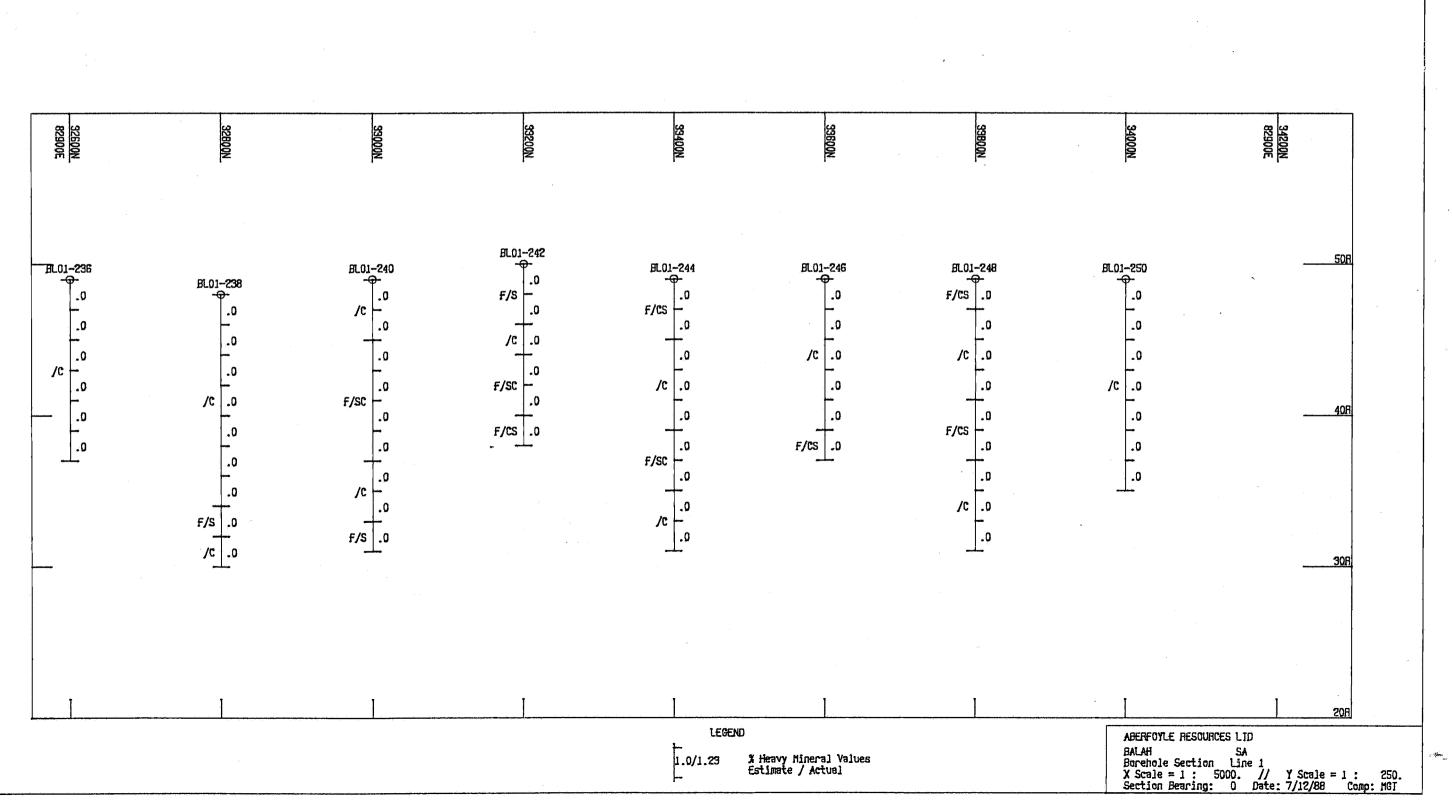
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Borehole Section Line 1
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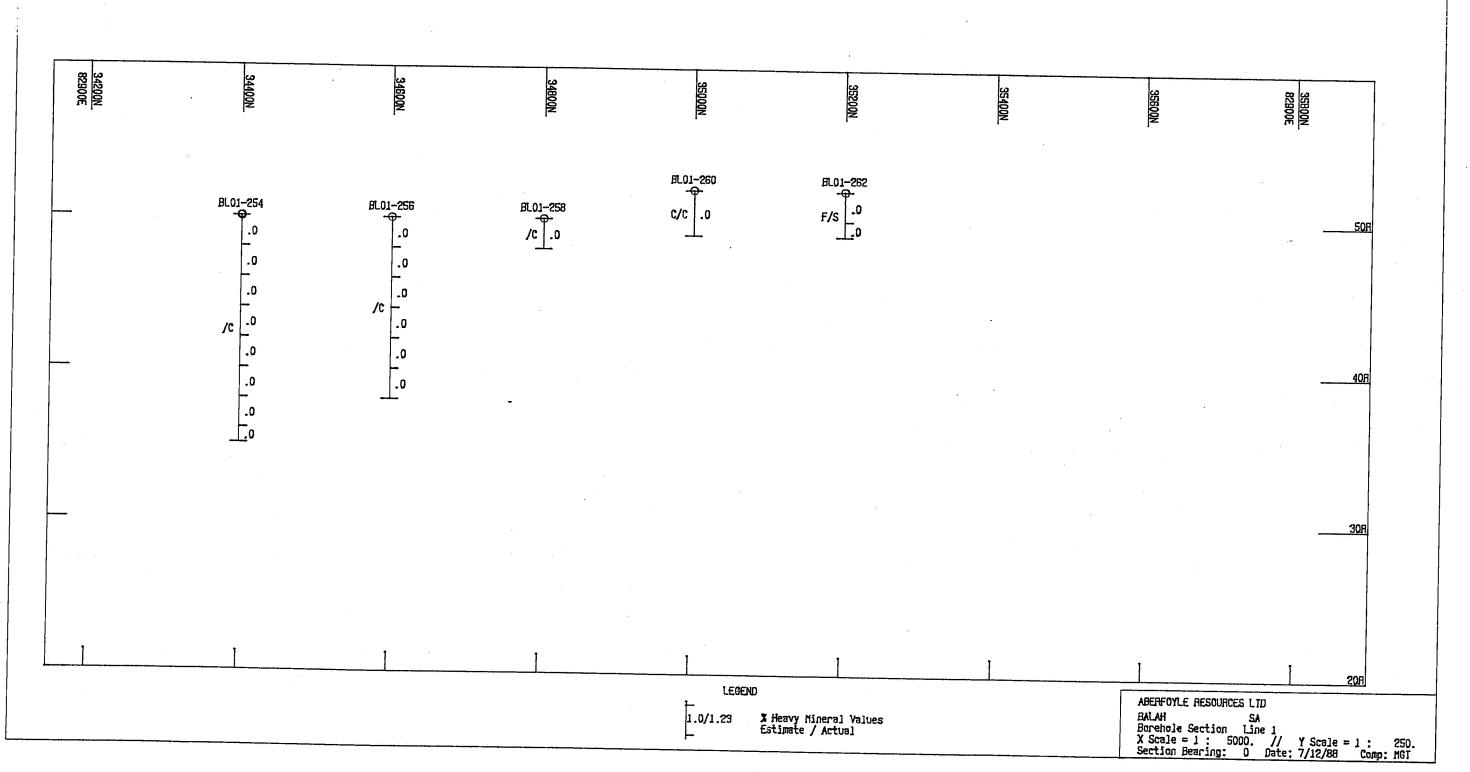


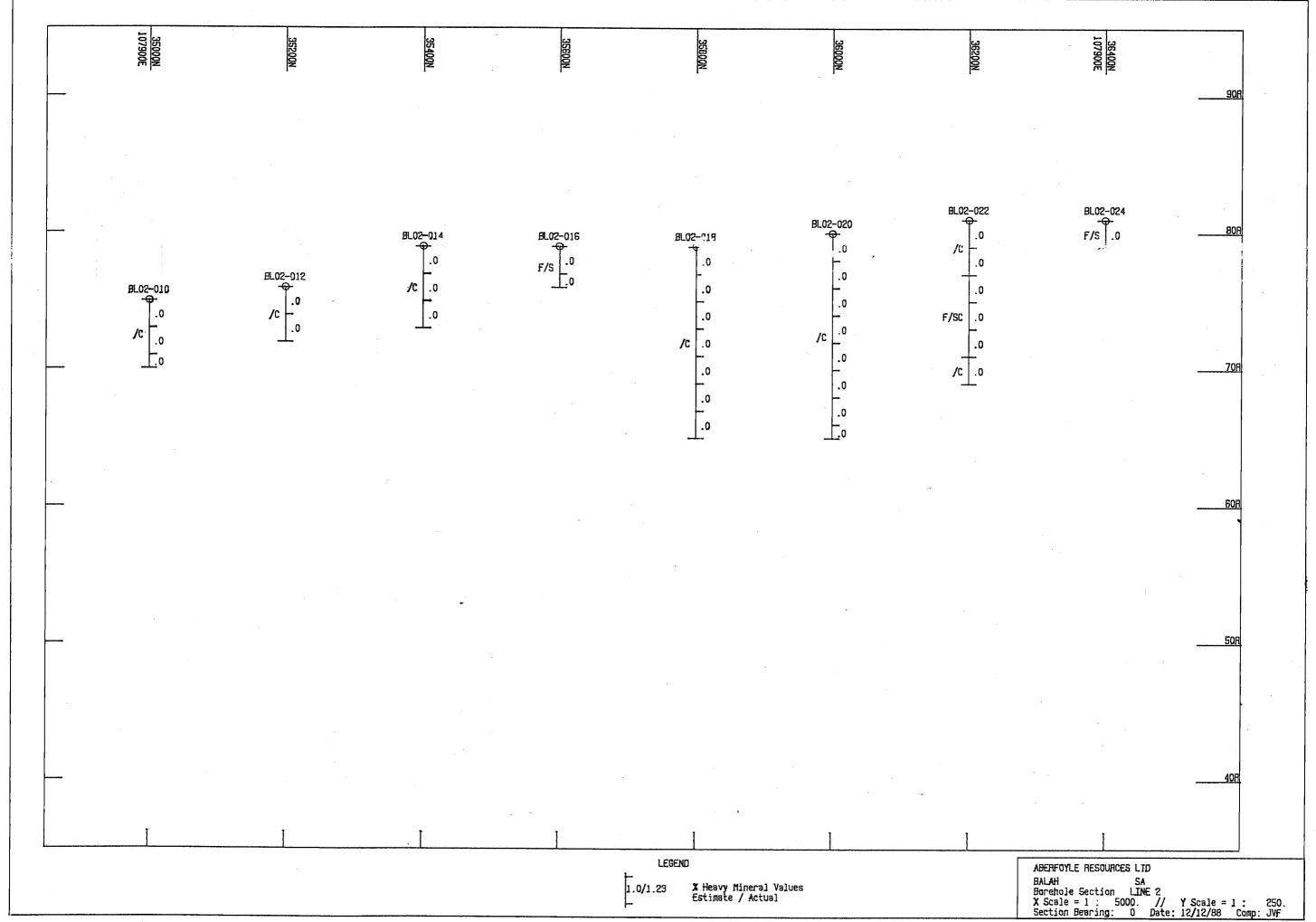


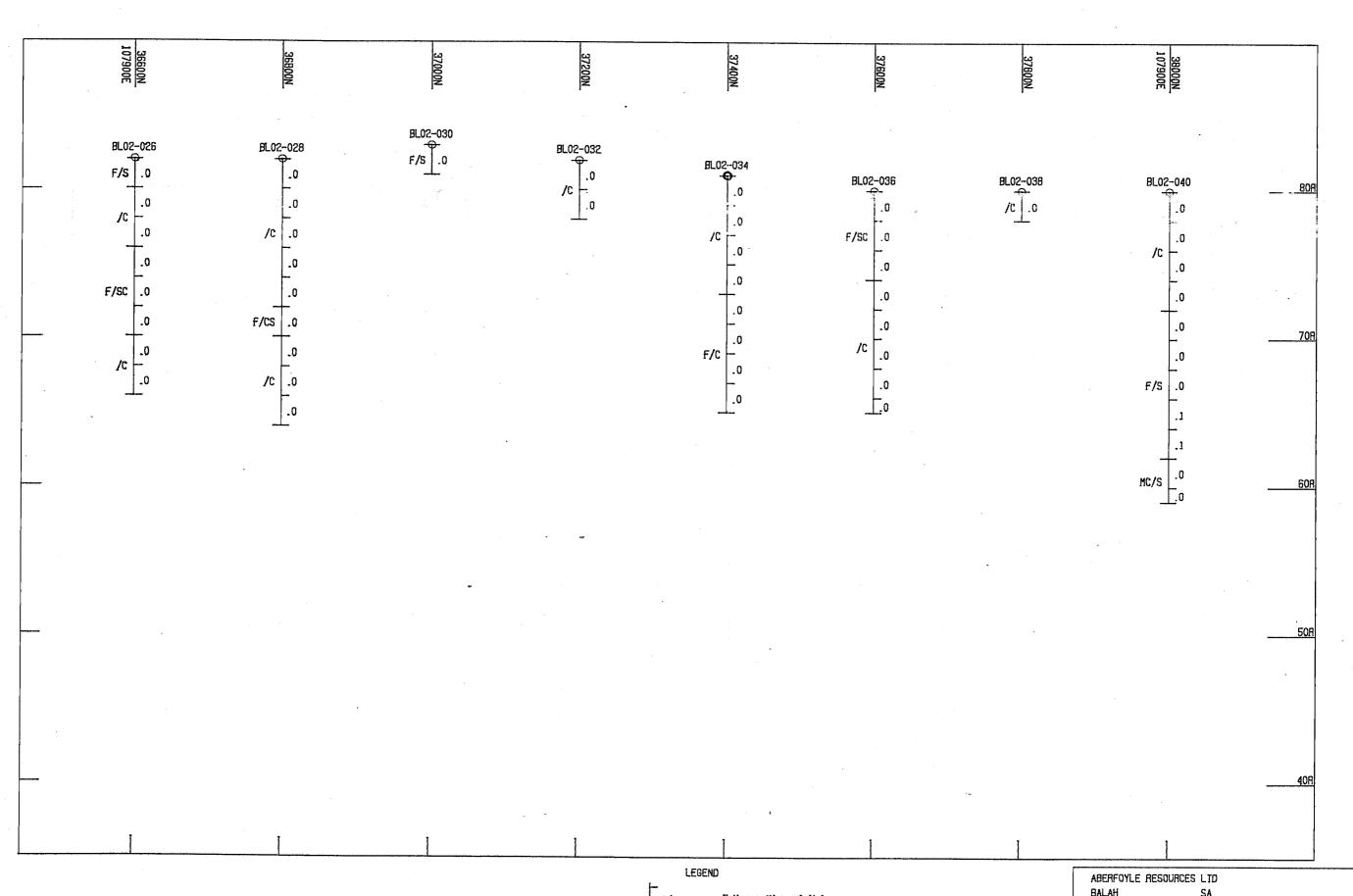
1.0/1.23

% Heavy Mineral Values Estimate / Actual



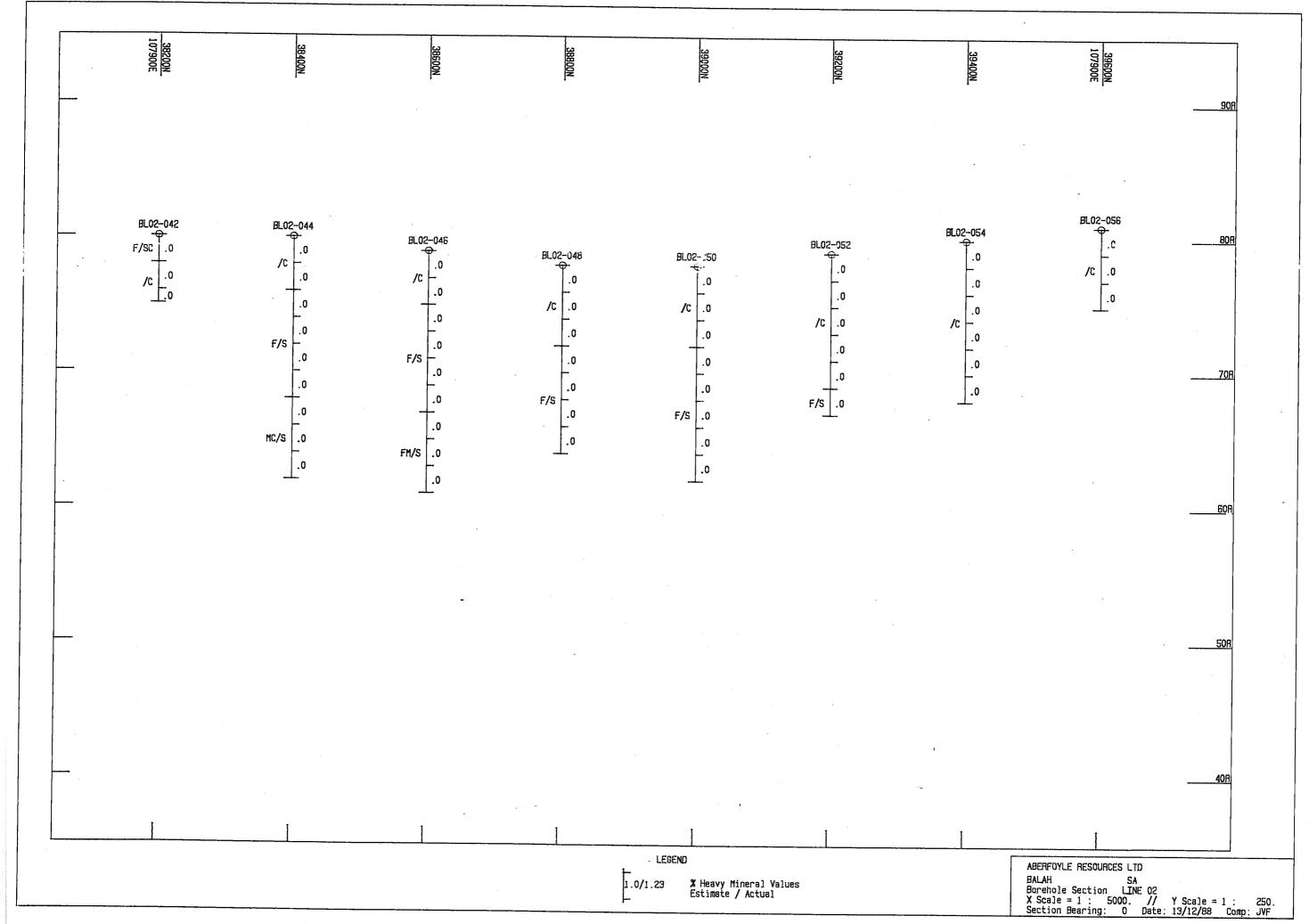


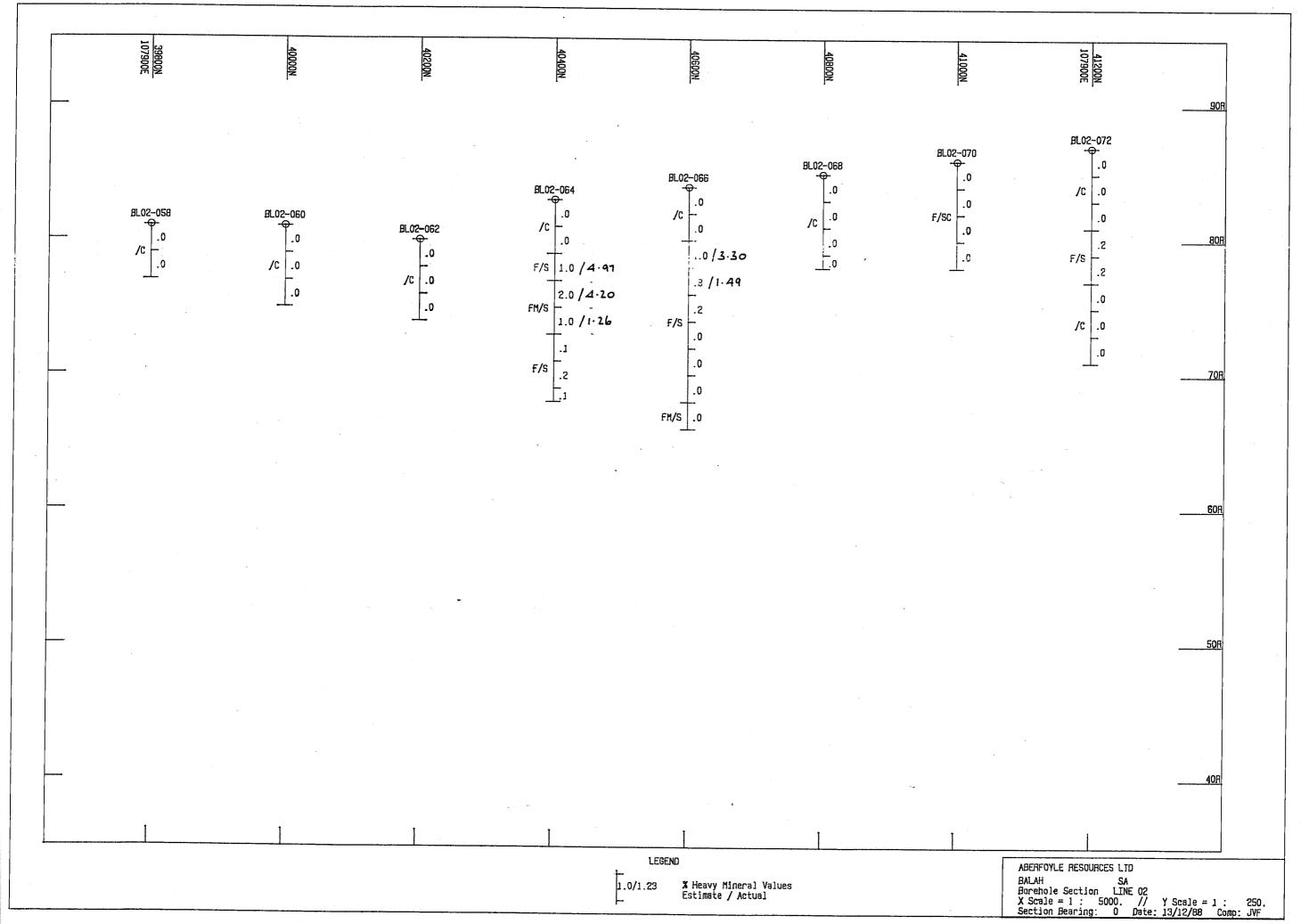


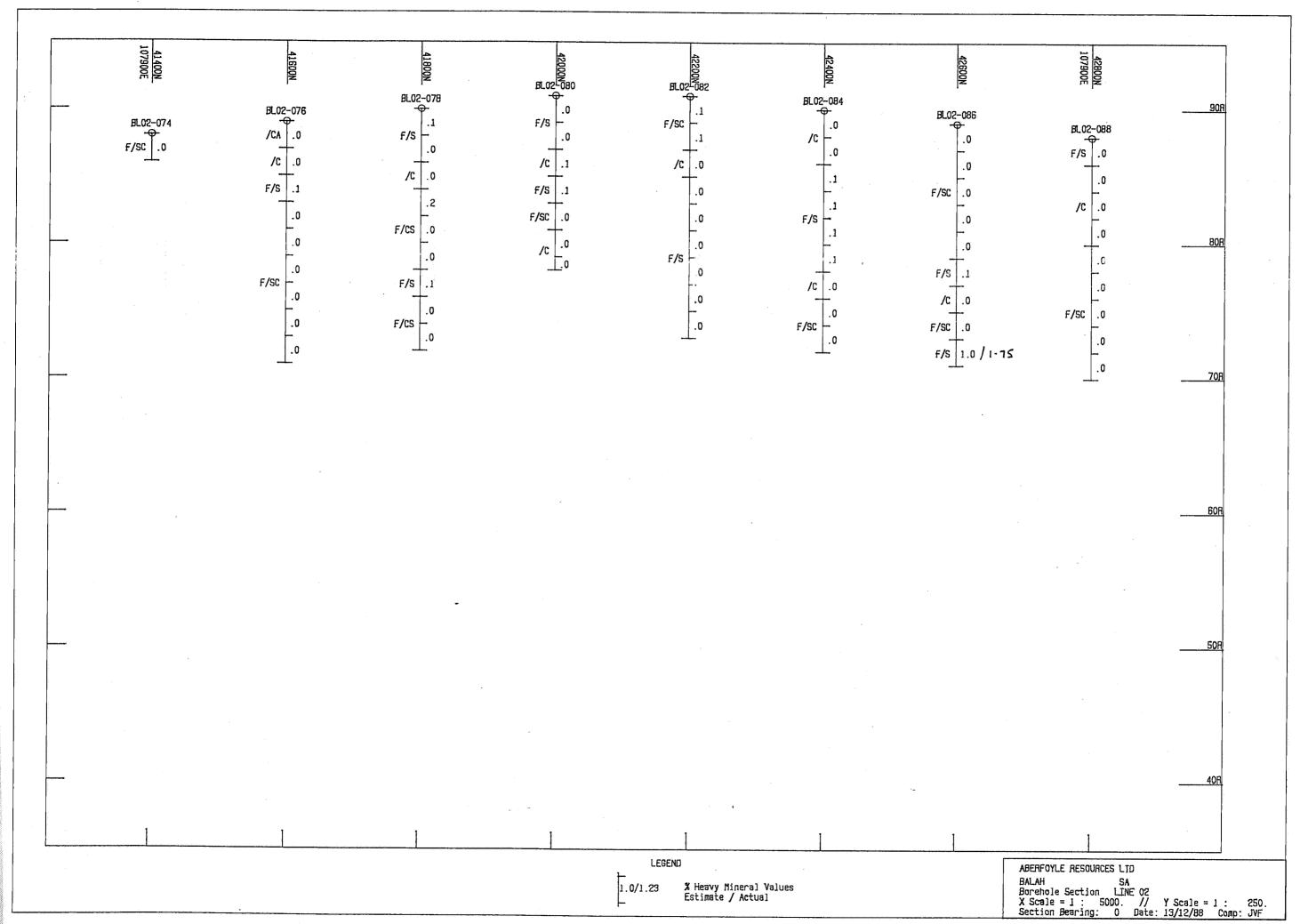


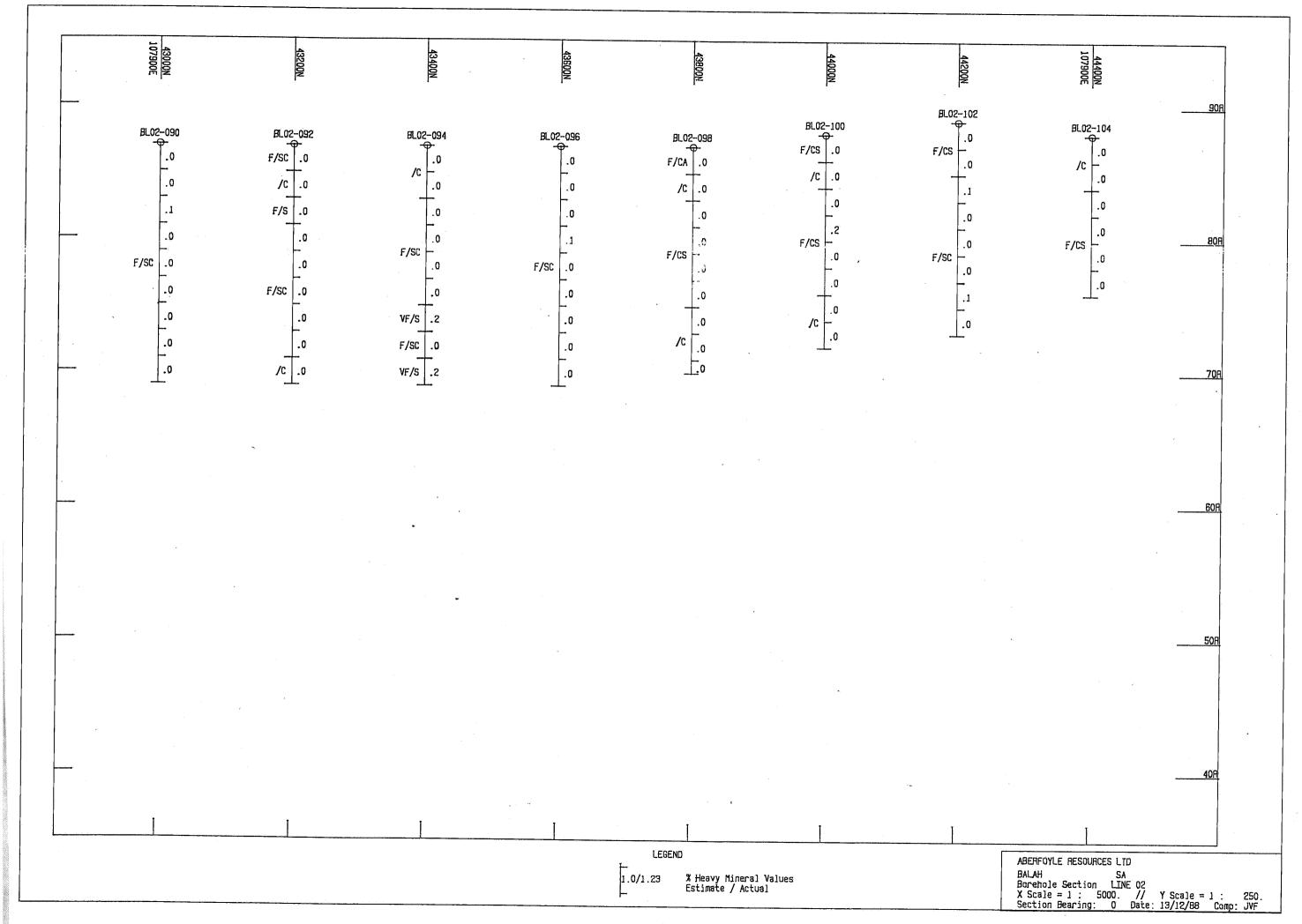
% Heavy Mineral Values Estimate / Actual ABERFOYLE RESOURCES LID

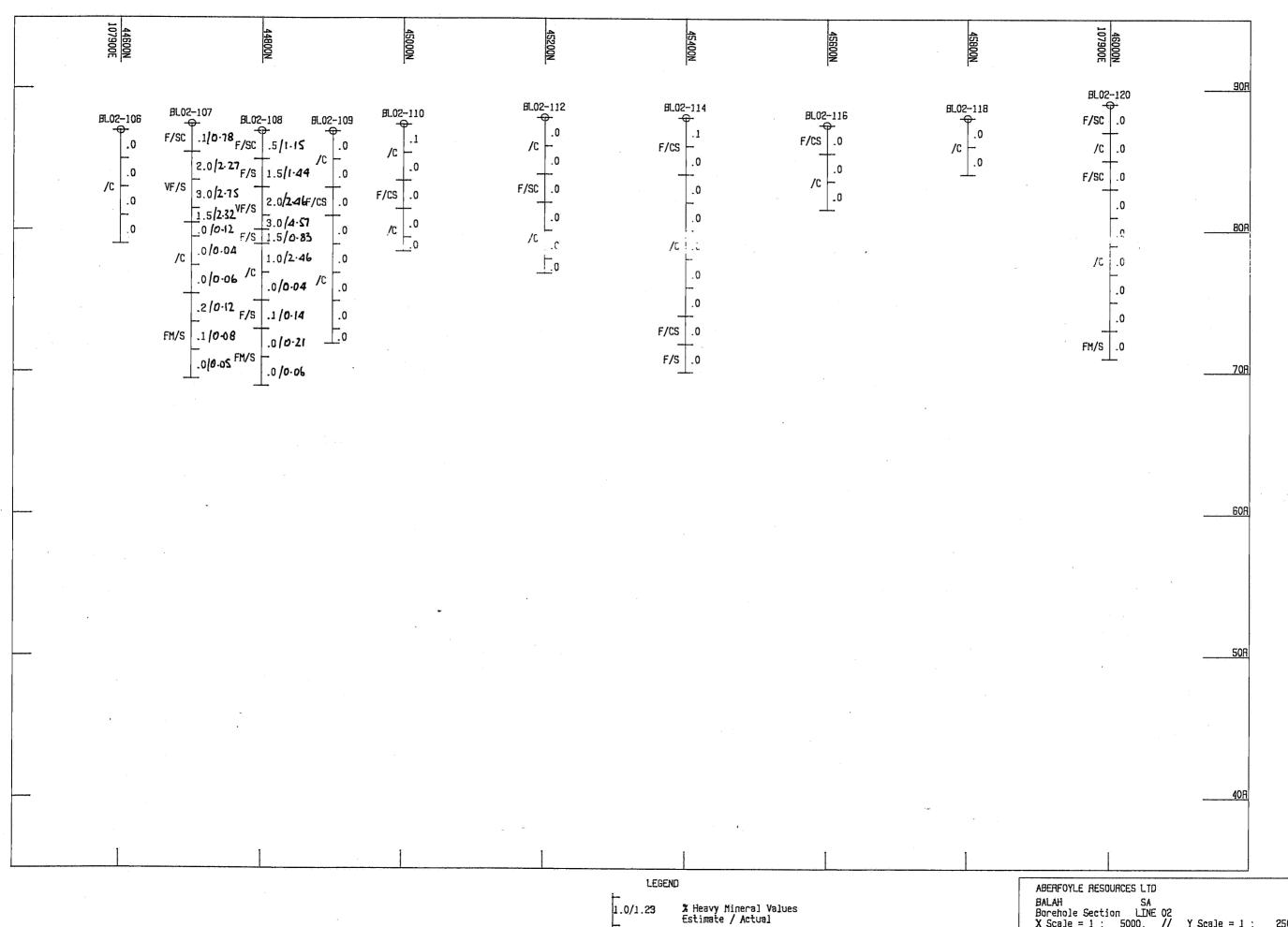
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Borehole Section LINE 2
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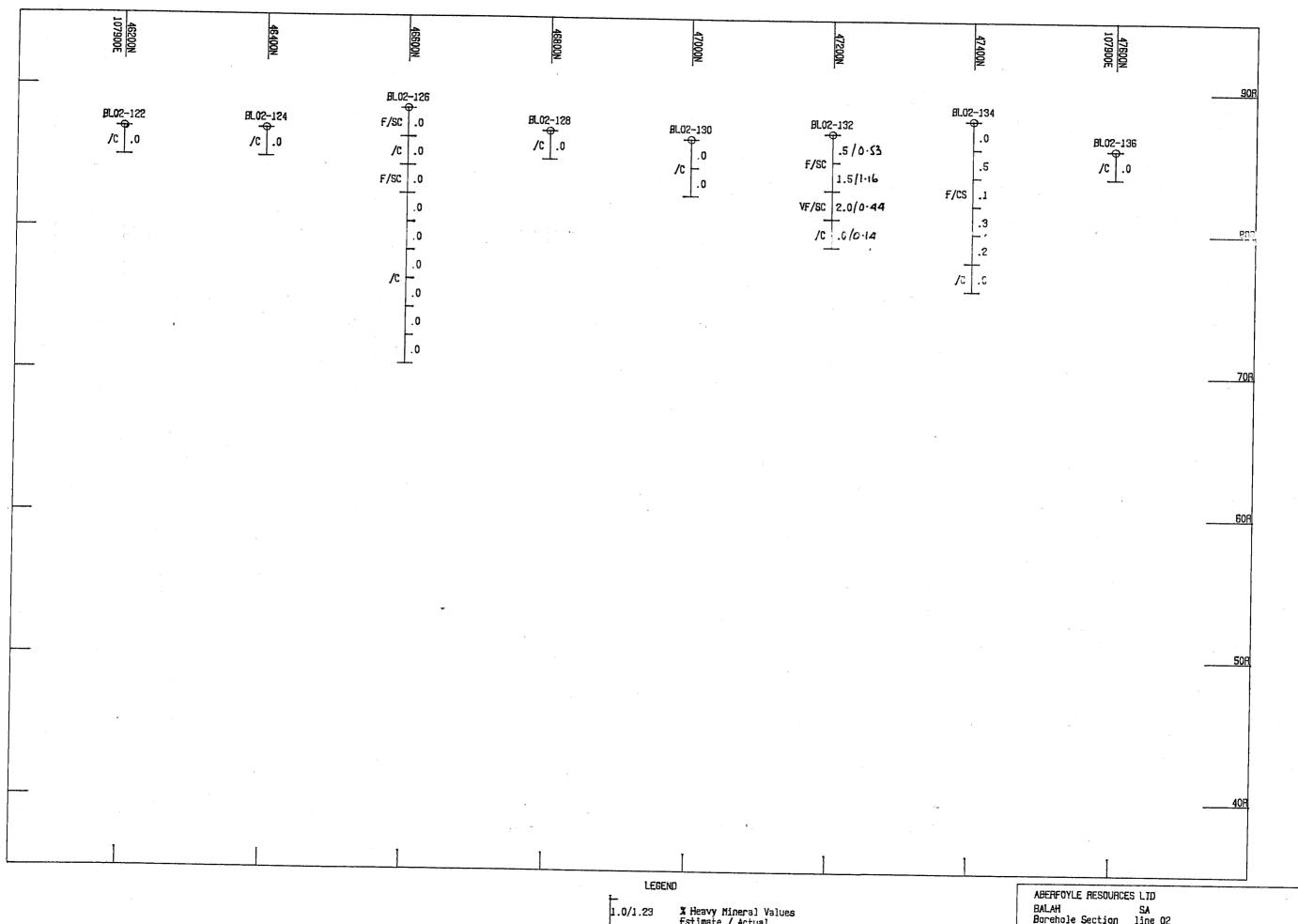






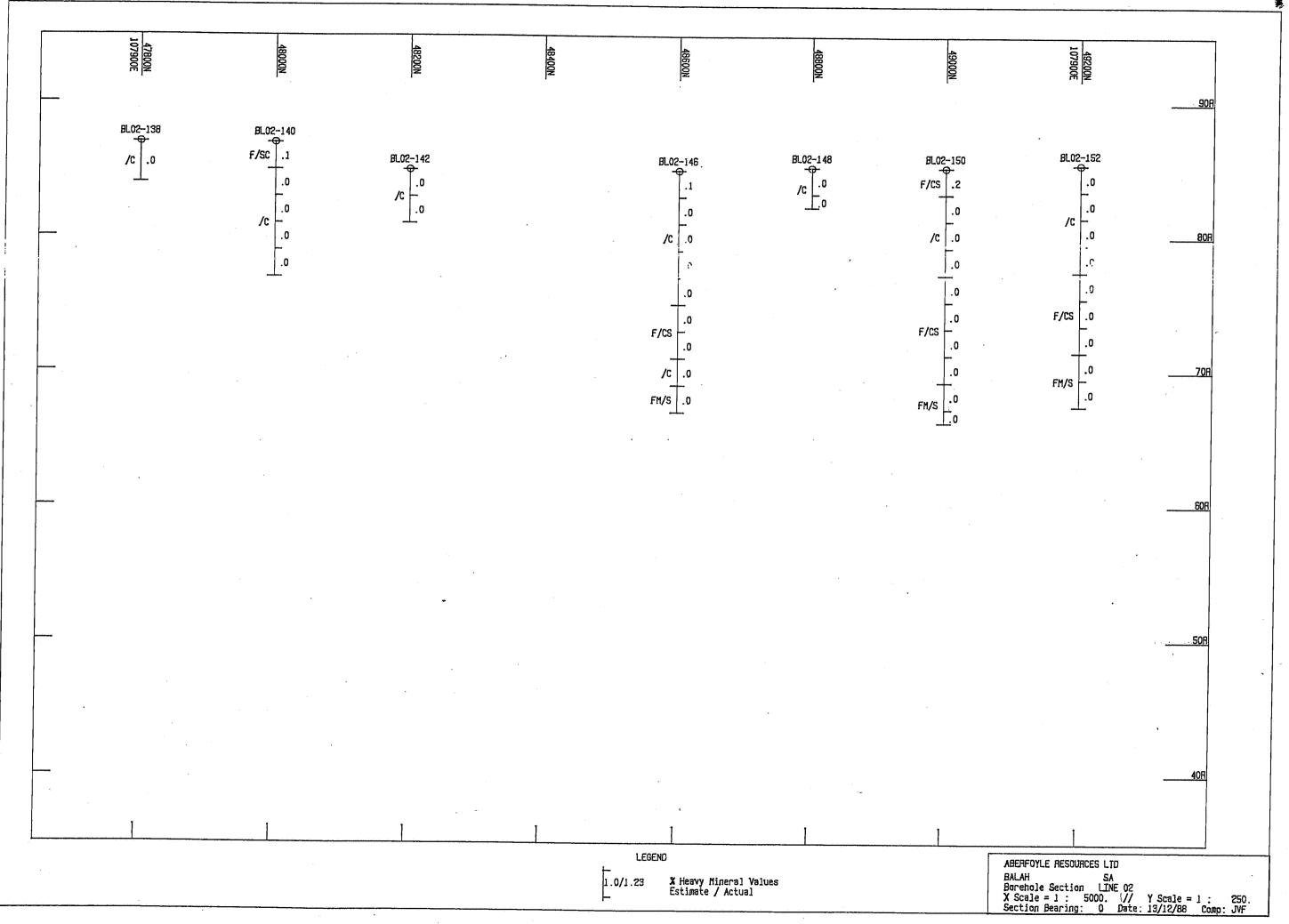


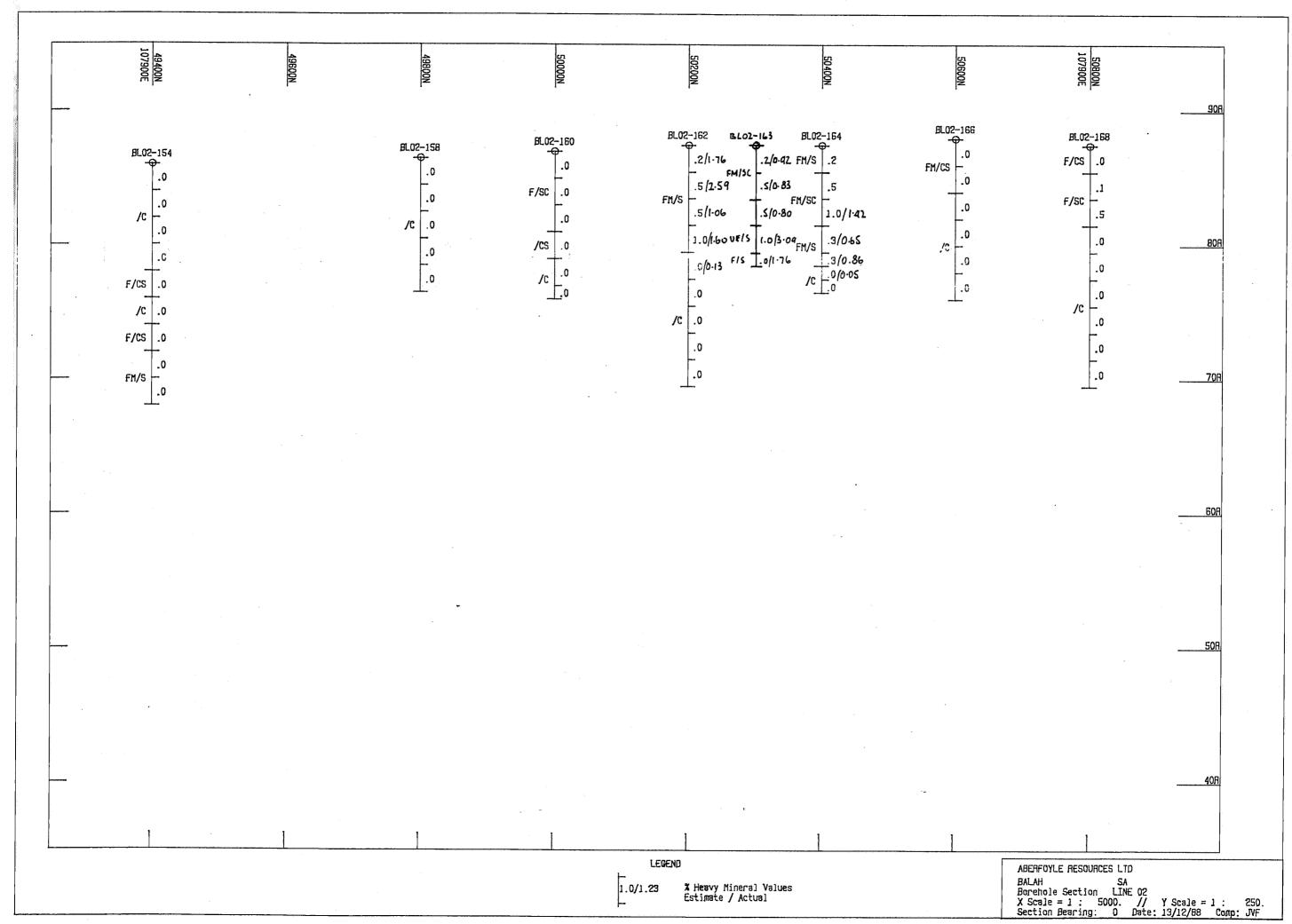
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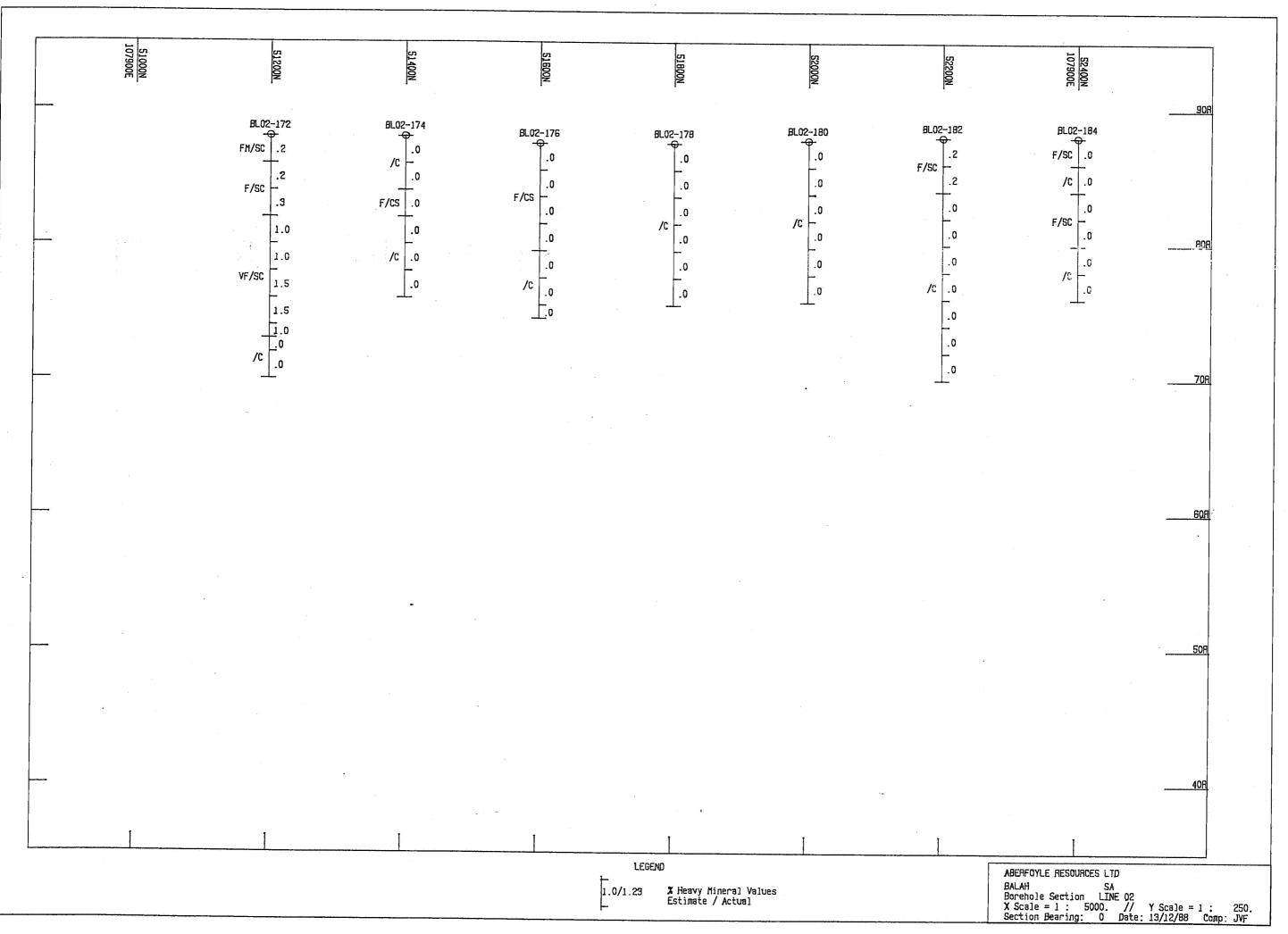


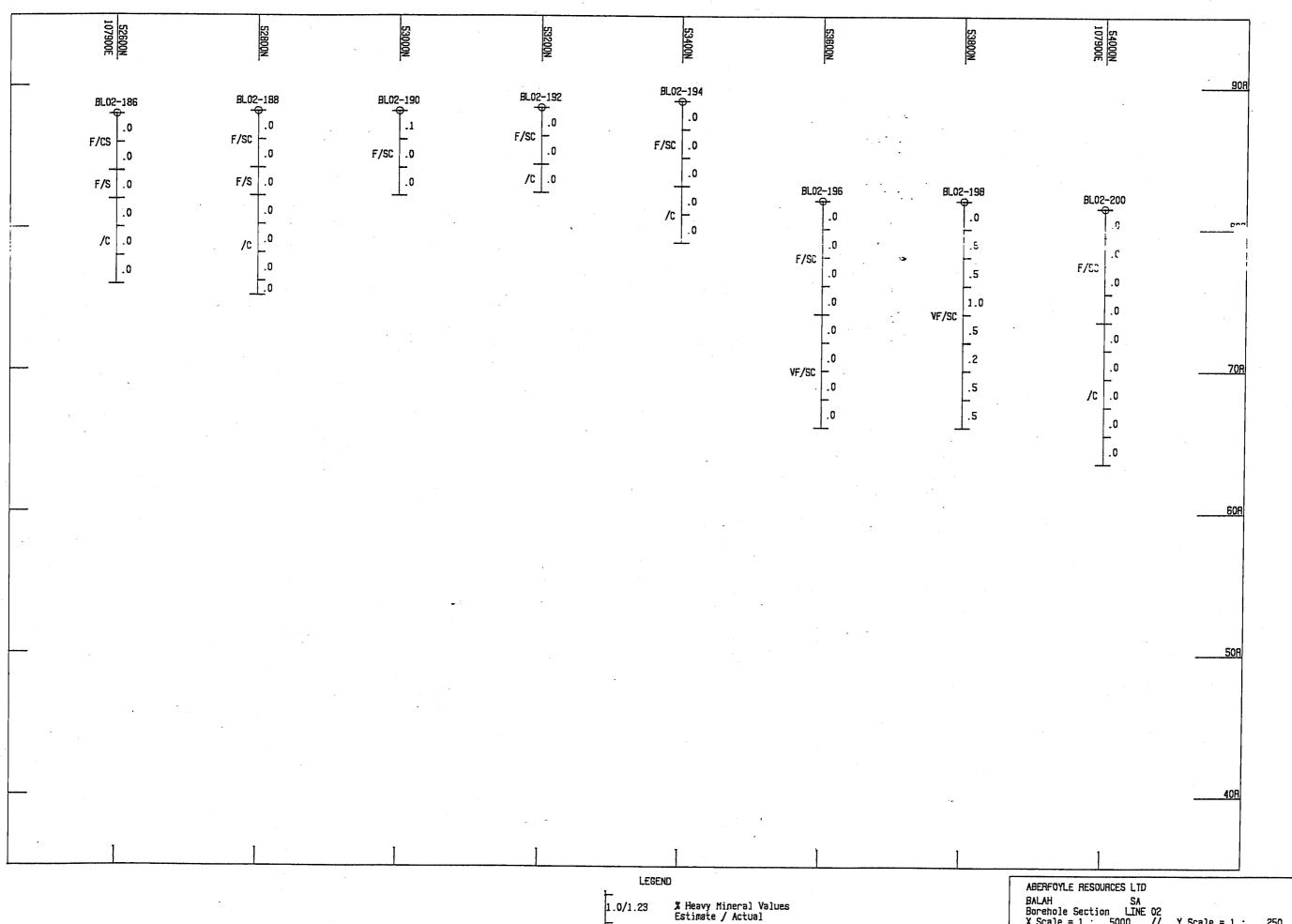
% Heavy Mineral Values Estimate / Actual

BALAH SA
Borehole Section line 02
X Scale = 1: 5000. // Y Scale = 1: 250.
Section Bearing: 0 Date: 13/12/88 Comp: JVF









BALAH SA
Borehole Section LINE 02
X Scale = 1 : 5000. // Y Scale = 1 : 250.
Section Bearing: 0 Date: 15/12/88 Comp: JVF

