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CRA EXPLORATION PTY.LIMITED.

FINAL REPORT MINERAL LEASE 19M/76

LLL AND B SYNDICATE BALFOUR, TASMANIA.

DUPLICATE FILE

Author: T.W.Dickson

Date: January, 1983.

Copies: P.Laan, M.Laan,N.Langsford,
W.Baker Syndicate.
Department of Mines, Tas.
Geopeko (2 Copies)
CRAE Melbourne
CRAE Hobart
CRAE Burnie

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1. SUMMARY

Over the period January 1979 to December 1982, detailed investigations involving geological mapping, jacro bedrock sampling and various geophysical surveys were carried out over the Balfour Grid. Within the area of the M.Laan, P.Laan, N.Langsford and W.Baker Syndicate lease 19M/76 this work led to a detailed investigation of the potential of quartz veining on Specimen Hill. Diamond Drill hole DD82 BC8 was collared in 19M/76 and traversed through it into the adjacent lease 121M/67. Six other diamond drill holes were developed in leases surrounding 19M/76 held by other Syndicates.

The quartz veins on Specimen Hill contain appreciable values of tin and tungsten. Average vein thickness is 7.5 centimetres and the average grade of all vein material intersected is 0.8% Tin and 1.02% Tungsten. However, the average vein content is only 0.66% and as sections with higher vein densities are widely scattered, it is believed that the area is unsuitable for bulk open pit mining and upgrading of photometric ore sorting.

2. INTRODUCTION

This report details work carried out on Mineral Leases 19M/76 from the period January to December 1982, and refers to the results of all work previously carried out between December 1978 and December 1982.

The LLL and B Syndicate Balfour option agreement was dated 27th June, 1978 and it is one of a number of farm in - joint venture agreements negotiated between CRA Exploration Pty.Limited and various syndicates in the Balfour area -

P.Laan and S.Caddy
Mining Lease 73M/77

P.Laan and Estate of W.Baker (L and B Syndicate)
Mining Leases 20M/76, 72M/77, 103,/77 104M/77, 8M/78, 57M/78
SPL's 774 and 781.

M.Laan and N.R.Langsford (Balfour Agreement)

Mining Leases 120M/67, 121M/77, 10M/73, 1M/76, 2M/76, 93M/77, 94M/77
95M/77.

P.Laan M.Laan, N.R.Langsford, W.Baker

Mining Lease 19M/76

J.Holloway and R.South

Mining Lease 59M/68, 4M/74.

S.Tatlow (Agreement 1)

Mining Lease 63M/68

S.Tatlow (Agreement 2)

Mining Lease 58M/68

All the above agreements are part of the Rocky Cape Joint Venture between CRA Exploration Pty.Limited and Geopeko.

The township of Balfour is situated approximately 16km inland from Temma Harbour and lies some 50km south of Smithton.

The programme of work carried out within LLL and B Syndicate Leases includes.

- Geological mapping and both regional and detailed scales.
- Airbornemagnetic and Dighem surveys with detailed ground follow-up including I.P. S.P. and magnetic surveys.
- Jacro auger bedrock geochemical sampling programme.
- The development of 7 diamond drill holes in areas surrounding 19M/76

Previous reports submitted to the L and L Syndicate are -

- CRAE Report 9755, T.M.Porter "The Balfour - Specimen Hill Programme Six Monthly Report to June, 26th 1979"
- CRAE Report 9991, T.M.Porter "The Balfour - Specimen Hill Programme Six Monthly Report to December 26th 1979"
- CRAE Report 10467, A.D.McKay and M.F.Flis "Results of Geophysical Surveys in the Balfour Area, N.W.Tasmania, November, 1980".

- CRAE Report 11206, P.Heithersay, Mineral Lease 19M/76, Balfour Tasmania, Report for Twelve Months Ending 31st December, 1981.
- N.R.Langsford (for CRAE) Geology and Mineralisation, Specimen Hill Area, Balfour Tasmania, 27th November, 1982.

3. CONCLUSIONS

An extensive and intensive exploration programme has been carried out throughout the Balfour leases.

A total of seven diamond drill holes have been developed to test specific targets in the Balfour area. Three of these holes were drilled in the Specimen Hill area immediately south of 19M/76.

Specimen Hill was considered to have potential for bulk mining of quartz veining with subsequent upgrading by photometric ore sorters. However, the vein density and distribution appear insufficient to allow economic development of the deposit.

There are no other untested geological, geochemical or geophysical targets within the L and L Syndicate leases and no further drill testing of the area is warranted.

4. RECOMMENDATION

CRA Exploration Pty.Limited and Geopeko have withdrawn from the L and L Syndicate option agreement as from Monday 13th December, 1982.

5. PREVIOUS WORK

BHP conducted detailed investigations in the Specimen Hill area during 1963-64. They carried out detailed geological mapping with magnetic and gravity surveys and took peat and gravel samples to define surface areas where tin mineralisation appeared strongest. They dug a number of costeans (unsuccessfully) and developed six diamond drill holes for a total of 825 metres.

Four holes were drilled to test quartz veining on Specimen Hill and two holes BC5 and 6 were drilled to test broad magnetic anomalies to the north and south of Specimen Hill. Weakly disseminated pyrrhotite was intersected and remnant magnetic susceptibility measurements suggested that remnant magnetism of the pyrrhotite was sufficient to explain the size of the anomalies.

From 1969 - 1973 ACI extensively tested the Murrays Reward line of workings, a line of old copper workings occurring along the eastern margin of the Balfour leases. ACI put down at least 15 shallow drill holes and proved the existence of a small, low grade, discordant copper-quartz-dolomite body, striking north-west and dipping 50 to 60 degrees west. It contains 0.8% copper with dimensions of 220 metres length, 270 metres depth and five metres width. Grade and thickness were reported to decrease along strike to the north-west.

Exploration by the CRAE-Geopeko joint venture commenced in 1979 with the establishment of a 2.6km by 0.65km grid. The following work has been carried out and reported to the leaseholders.

Geological mapping at 1:5000 scale (CRAE Report 9755) at 1:2500 scale (CRAE Report 11206) together with detailed mapping at 1:1000 scale of selected areas at Specimen Hill and Peter's Ridge (Report by N.R.Langsford).

Geochemistry - initial rock chip sampling (Report 9755), Jacro auger bedrock sampling (Reports 9991 and 11206) and selective vein sampling (Report by N.R.Langsford).

Geophysics - aeromagnetic survey, ground magnetics and I.P.(Report 9755) follow-up I.P. and S.P. surveys (Report 9991), Dighem (multi-coil E.M.) survey of March 1980 and summary of geophysics (Report 10467).

A summary of all geophysical data together with the location of all Balfour drill holes is given in Plan TASH 822 accompanying this report.

6. 1982 WORK PROGRAMME

During 1982 the whole area of Specimen Hill was remapped in detail (at 1:1000 scale) by N.R.Langsford, and an attempt was made to bulk sample individual areas of quartz veining. This work led to an increase in surface area of tourmalinisation and brecciation and led to the development of a diamond drill hole DD82 BC8 to test the Specimen Hill zone at depth.

Following this work a detailed examination was made of all veining on Specimen Hill to see if bulk mining and ore sorting was at all possible.

6.1 Specimen Hill Mapping (Plan TASH 994)

Langsford's detailed mapping has confirmed the stratigraphy originally established by Heithersay (CRAE Report 11203). The oldest unit, Lithofacies 1 of Heithersay and Matrix Creek Beds of Langsford, is a massive to faintly laminated siltstone - sandstone black shale unit. It dips and faces west along the western flank of Specimen Hill and is separated from the overlying east facing Specimen Hill siltstone by a major fault.

The Specimen Hill siltstone is about 400 metres thick. It consists of an upper and lower unit of banded "pyjama" siltstones separated by a more massive siltstone - quartzite unit. Conformably overlying the Specimen Hill siltstone is the Balfour Shale, a thinly regularly laminated green chloritic siltstone - shale unit. The stratigraphy is summarised in Plan TASH 1139.

The dominant structure is a broad open anticline trending approximately 330° magnetic and plunging 60° south. The eastern limb dips steeply east and is quite regular but the Southern flank is more complex and is sheared out along the Specimen Hill fault. This fault which dips steeply east is deep seated and probably one of the major structural features of the area. It contains minor tin mineralisation in silicified siltstone within the fault zone itself, and the quartz veining so prominent on Specimen Hill are either parallel to the fault plane itself or parallel to a number of associated feather faults.

On Specimen Hill the proximity of the fault and anticlinal axis has resulted in a major area of brecciation and tourmalinisation. The zone covers an area of about 50,000 square metres and has resulted in partial to almost complete replacement of the siltstones. Quartzite beds are broken and completely disoriented in the northern section of the zone but are rarer and less broken in the south. Tin content of the breccia averages only 240 ppm while tungsten averages only 40 ppm. There are however occasional high grade pods of quartz-cassiterite-tourmaline mineralisation - Langsford lists two examples at 9520N 10090E and 9560N 10090E. The mineralisation in each case consisted of a quartz cassiterite pod 3-5 metres long, up to 30 centimetres thick with 10-15 centimetre halo of disseminated cassiterite crystals.

The bulk of the mineralisation on Specimen Hill however occurs in quartz veining which ranges in thickness from mere threads to occasional large veins one metre in thickness. Langsford recognises five types of quartz veins.

Quartz with a selvage of black cassiterite grains and no cassiterite within the vein.

Veins with coarse brown zoned cassiterite in central section of the vein and commonly a mica selvage.

Coarse grained wolframite-quartz-arsenopyrite-pyrite veins with complete lack of cassiterite.

Quartz-wolframite veins often very vughy on the surface.

A thick, flat lying, quartz-wolframite-cassiterite sulphide vein on the west flank of Specimen Hill. BHP drilled four diamond drillholes DDB 1-4 to evaluate this vein.

Heithersay (Report 11203) suggested that the quartz veining on Specimen Hill as intersected in DD81 BC1 and 2 trended 300° magnetic and dipped shallowly (0-35°) east.

However, very few flat veins can be seen on Specimen Hill and a stereoplot of veining prepared by Langsford suggests that the great majority of veins are steep 75 to 85° to the north and west. The dominant strike is 070° magnetic with a spread to other peaks at 050° 100° and 130° magnetic.

6.2 Diamond Drilling

DD82 BC8 was drilled to evaluate the tourmaline-breccia-quartz vein zone on Specimen Hill at depth. The hole was collared at 8770N 10090E and drilled -60 degrees to 167° magnetic. A detailed drill log and assay sheet is appended with the report and a drill section is shown on Plan TASH 1125). It has commenced within 19M/76 and passed into 121M/67 at depth.

The hole passed through pyjama siltstones and quartzites to 130metres, laminated siltstones to 222.5 metres and through silicified and tourmalinised siltstones to a total depth of 300 metres. A major fault zone - The Specimen Hill fault was encountered at 293 metres. A total of 33 quartz veins with a thickness greater than 1 centimetre were encountered but there appeared to be no abnormal concentration of veins in any one section of the hole. A weighted average of all vein material intersected in the hole ran 1830 ppm Tin 2300 ppm Tungsten, 6.1% Arsenic, 5200 ppm Copper, 1830 ppm Zinc and 7.5 ppm Silver.

6.3 Evaluation of Specimen Hill Veining

The most potential target in the Balfour area was considered to be the bulk mining of quartz veining on Specimen Hill with subsequent upgrading by photometric ore sorters. Holes DDB1 to 6 drilled by BHP and holes DD81 BC1,2,4,6 and DD82 BC8 drilled by CRAE/Geopeko have been used to evaluate this potential.

Data on vein density, vein thickness, bulked assay data and volume of core available at various vein density cut offs is listed in Tables 1 to 4. These figures can be compared with those from Mt. Carbine where photometric ore sorters are used to separate quartz vein material from barren dark shales.

At Mt. Carbine, a swarm of steeply dipping quartz veins ranging from 20mm to 1 metre in width occur in dark micaceous grey-wackes of the Hodgkinson Formation.

The veins average about 1% WO_3 and form 8 - 10% of the rock volume. A cut of grade of 4% veining is used in mining and after primary crushing to sizes between 150 and 20 mm, about 80% of the shale gangue is rejected by the ore sorters.

The major points of comparison are -

	<u>Mt. Carbine</u>	<u>Balfour</u>
Average vein content	8 - 10%	0.66%
Vein width (a) Range	2cm to 1 metre	1cm to 67 cms
(b) Average	10 - 20 cms	7.64 cms
Average grade	1% WO_3 (0.79%W)	0.8%Sn 1.02%W
% Vein mineralised	10 %	42 %

It is obvious that although the Balfour veins are higher grade, they are very much thinner and that the vein density is very much less.

Theoretically, ore sorters can upgrade quite low concentrations of material and as the grade of the vein quartz is considerably higher than Mt. Carbine, there was still an element of hope. However, it is very likely that the abundant clean white quartzite would be sorted with the quartz and seriously lower the grade of the concentrate. Even more important however, is the fact that the sections with higher vein densities are widely scattered through the drill holes. Table 4 clearly shows that even in applying a vein density cut off as low as 0.5% veining the "ore grade" sections are widely scattered, and that only three sections DDB 2 (120 - 180 feet), DDB 6 (420 - 480 feet), and DD81 BC4 (130 - 150 metres) are adjacent sections above the cut off grade. See also Plans TASH 959 - 964.

There is simply no way that widely scattered "ore sections" like these could be mined in an open pit operation.

7. KEYWORDS

Tin, Tungsten, veins, Drill Diamond, Geology, Ore Sorting.

Location: Burnie 1:250 000 Sheet SK55-3

8. LIST OF TABLES

Table 1.	Vein Densities	Specimen Hill Drilling
Table 2.	Vein Thickness	" " "
Table 3.	Assay Data	" " "
Table 4.	Preparation of Core effected by different cut off densities.	

9. LIST OF PLANS

Balfour Tenements Locality Plan	TASh 585
Summary of Geophysical Data	TASh 822
Geological Plan Specimen Hill	TASh 994
Summary of Balfour Stratigraphy	TASh 1139
Diamond Drill Section DD82 BC8	TASh 1125
Vein Density and Assay Data DDB5	TASh 959
" " " " " DDB6	TASh 960
" " " " " DD81 BC1	TASh 962
" " " " " DD81 BC2	TASh 961
" " " " " DD81 BC4	TASh 964
" " " " " DD81 BC6	TASh 963

10. LIST OF APPENDICES

- Appendix 1. Diamond Drill Log DD82 BC8.
 Appendix II. Petrographic Description DD82 BC8.

TABLES 1 - 4

TABLE 1. VEIN DENSITIES

Hole No.	Depth of Hole (m)	All Veins			Veins + 1 Cm		
		No. of Veins	Total Thickness (Cms)	%Vein Material	No. of Veins	Total Thickness (Cms)	%Vein Material
BHP DDB1	88.6	NA			6	116.0	1.31
2	73.2	NA			4	53.0	0.71
3	30.0	NA			1	43.0	1.40
4	167.5	NA			7	152.0	0.91
5	283.2	160	176.5	0.62	32	114.0	0.47
6	182.9	96	367.0	2.00	19	331.7	1.81
DD81 BC1	119.0	21	23.8	0.20	6	11.0	0.10
2	210.5	60	122.8	0.58	16	85.0	0.40
3	143.1	NA					
4	210.4	22	74.8	0.35	14	68.0	0.32
5	100.0	NA					
6	274.6	25	93.0	0.34	17	86.5	0.32
DD82 BC7		NA					
8	300.0				33	330	1.10

Weighted average vein content for all veins + 1Cm = 0.66%.

Data for holes DDB1 - 4 from graphic logs, remainder from detailed written logs.

N.A. Not Applicable

TABLE 2 VEIN THICKNESS

(includes only veins thicker than 1cm)

Hole No.	Number of Veins	Thickness Range Cms	Average Thickness Cms
BHP DDB 1	6	9 - 46	19.3
2	4	6 - 30	13.2
3	1	7 - 43	43.0
4	7	9 - 55	21.7
5	32	1 - 20	2.84
6	19	1 - 67	17.46
DD81 BC 1	6	1 - 6	1.10
2	16	1 - 30	2.05
3	NA		
4	14	1 - 15	3.09
5	NA		
6	17	1 - 10	3.72
7	NA		
8	33	1 - 15	9.48
Weighted Average for all holes			7.64

N.A. Not Applicable

TABLE 3 ASSAY DATA

A/. BHP Drilling

Hole No.	Total Thickness of Quartz (Cms)	Length Weighted Assay	
		% Sn	% W
DDB 1	116.0	0.87	1.78
2	53.0	0.33	0.23
3	43.0	1.41	1.19
Weighted Average		0.84	1.27

Note. No assay data available for DDB4. Veins not assayed seperately in DDB5 and 6 and no W assay available. Low values reported as trace only, so that vein assay cannot be re calculated.

B/. CRAE/GEOPEKO Drilling (Holes 1 - 6)

Hole No.	Total Thickness of Quartz (Cms)	Length Weighted Assay	
		% Sn	% W
DD81 BC1	11.0	0.07	0.14
2	85.0	0.06	1.12
4	68.0	0.69	0.55
6	86.5	1.67	0.78
Weighted Average		0.79	0.80

Note. Holes BC 3,5 and 7 not applicable. For the above veins have not been assayed seperately. Vein assay has been calculated by subtracting back-ground value from each one metre assay value, recalculating the remainder to the total vein width for that interval and weighting that result to allow for vein angle to core axis. For example - One 5cm quartz vein at 30° to axis within a one metre assay interval of 1200 ppm tin and a background of 200 ppm tin gives a re-calculated vein assay of 1% tin.

015

C. CRAE/Geopeko DD82 BC8

Hole No.	Total Thickness of Quartz (Cms)	Length Weighted Assay	
		% Sn	% W
DD82 BC8	313	0.18	0.23

Note. All quartz veins greater than 2 cms have been assayed separately for this hole.

The data from all three sources agrees fairly closely and when bulked together give an average assay for quartz vein material as

0.81% Tin and 1.02% Tungsten

TABLE 4. Proportion of core effected by different cut off densities.

Hole No.	Number of 10 metre core intervals effected at cut off				
	4%	3%	2%	1%	0.5%
DDB 1	2	2	2	3	3
2	1	1	1	2	2
3	1	1	1	1	1
4	1	1	1	5	5
5	1	1	2	3	5
6	1	1	1	2	3
DD81BC1	-	-	-	-	1
2	-	-	1	3	4
4	-	-	-	2	4
6	-	1	1	2	3

Note. The individual sections above the cut off level are all scattered. Only at 1% cut off level do any sections adjoin. They are -

60 ft between 120 and 180 feet in DDB2
 60 ft between 420 and 480 feet in DDB6
 20 metres between 130 to 150 in DD81 BC4

APPENDIX I

DIAMOND DRILL LOG DD82 BC8

616020

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 2/

TENEMENT NAME ROCKY CAPE No. 177

PLAN - MAP REFERENCE BALEFUR GRID

CO-ORDINATES 9770 N AZIMUTH 167° M DRILLERS PARRY COMMENCED 9/11/92 DEPTH 300.0m HOLE No. DD92 B19

RL COLLAR 10090E INCLINATION -6.0° DRILL TYPE BOYLES COMPLETED 20/11/92 CASING LEFT NIL DPO No(s)

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)								
From (M)	To (M)										Pb	Zn	Cu	Ag	As	Bi	W	Sn	
30	31.6				White silty fg silicified sandstone, faintly laminated Core broken.	2-5% fg pyrite.	931152	31.5	32.6	1.1	55	1500	230	*	1500	*	26	102	
						31.2. 2mm quartz - asp - minor cp vein.													
31.6	34.2				As for 3-18m.														
						34m LCA 20°													
34.2	35.6				Thinly lam grey siltstone.														
35.6	38				"Pjama" siltstones.	31.5 - 32.6m Dark grey fg pyritic quartz, grades down to white lam. silic s/s 5-10 py, minor sp.													
						33.5m 2mm quartz - asp vein 35° LCA													
					Broken core, slickensides, minor clay.	33.5 - 33.7 Shear zone													
						35m 2mm quartz - asp vein. minor py.													
						38m LCA 40°	931163	41.3				300	120	1500	6.5	7.0%	320	*	193
						44m LCA 45°	931164	42.7				135	155	1.77%	17	2.5%	165	*	124
38	39.2				Thinly lam grey siltstone.		931153	43.4	43.5	0.1	95	85	1000	1.5	3.45%	10	*	957	
						41.3m 2cm quartz - asp - py vein													
39.2	55.4				"Pjama" siltstones.	43.4 - 10cm quartz - py - asp vein. Wolframite in selvage.													
						49-49.2 quartz - asp - py vein	931165	49	49.2	0.2	420	385	435	10.0	2.9%	480	*	1650	

023

616024

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 6/

TENEMENT NAME ROCKY CAPE No. 177PLAN - MAP REFERENCE BALFOUR GRIDCO-ORDINATES 9770N
10020E AZIMUTH 167°M DRILLERS PARRY COMMENCED 9/11/82 DEPTH 300m HOLE No. DP22 B12RL COLLAR..... INCLINATION -60° DRILL TYPE BOYLES COMPLETED 20/11/82 CASING LEFT NIL DPO No(s).....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)									
From (M)	To (M)										Pb	Zn	Cu	Ag	As	Bi	W	Sn		
					"Pyjama" siltstones.	99m bedding 20° LCA														
						104 25°														
					105m NQ - BQ	109 //														
						112 15°														
						119 10°														
130	-2225				Thinly laminated dark grey siltstones, thinly bedded. Laminations commonly irregular. Pale siliceous s/s interbedded 1-2cm thick. No dyklets etc characteristic of "Pyjama" siltstones.	132 //														
						137 10°														
						134.6m 1cm irreg qtz-py vein 20° LCA.														
						139.9m 4cm qtz-carb-py asp vein 45° LCA	931175	139.9		0.04	75	620	4950	0.5	129%	70	200	65		
						140.7 5mm qtz-py-asp-vein 30° LCA.														
						142.2 - 145.5m. Silicified siltstone. 5% disseminated py minor po. Irreg. qtz veining.														
						143.8 - 144m. Q-carb-asp-py-wo vein 30° LCA.	931160	143.8	144.0	0.2	375	8100	4300	6.0	12.1%	600	4780	1340		
144	1445				Grey pyritic quartzite.															
						144-144.5 Grey f.g quartzite silicified; 5-10% py	931161	144	144.5	0.5	50	465	1150	0.5	440	110	431	1200		
						157.9-158 Qtz-asp-carb-ep vein 20° LCA.	931162	157.9	158	0.1	95	7500	9800	4.5	145%	200	25	1540		

025

616026

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 8/

TENEMENT NAME ROCKY CAPE No. 177PLAN - MAP REFERENCE BALFOUR GRIDCO-ORDINATES 9770N 10090E AZIMUTH 167°M DRILLERS PARRY COMMENCED 9/11/82 DEPTH 300m HOLE No. PP. 2- B12RL COLLAR..... INCLINATION -60° DRILL TYPE BOYLES COMPLETED 20/11/82 CASING LEFT NIL DPO No(s).....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)										
From (M)	To (M)										Pb	Zn	Cu	Ag	As	Bi	W	Sn			
					Thin lam. siltstones.	208.5 py films on joints.															
						213.8 - 214 Silicified zone, irregular quartz veins with asp, py.	931178	213.8	214.0	0.2	245	50	305	2.5	1348	20	55	1280			
						216 1cm qtz-asp-py vein, 20° L.C.A.															
2225	300				Dark brown to gray hard fg silicified siltstone. Laminations preserved.	222.5 - 300. Zone of intense silicification, minor tourmalinization. Up to 5% fg carbonate. 5-10% dissem py, po.															
						227.2m. 2cm qtz-py-asp vein 65° L.C.A.															
						233.8 - 234.1 qtz-asp-py-cp vein, 35° L.C.A.	931179	233.8	234.1	0.3	290	4750	1.10%	2.5	160%	440	x	346			
						234.5 - 235. Irreg. py vein in dark brown silicified tourmalinized? Siltstone. Thin irreg. carb veins, minor dissem po. Vein 2cm wide, L.C.A.	931193	234.5	235.0	0.5	65	545	2750	2.5	2000	10	24	1790			

APPENDIX IIPETROGRAPHIC DESCRIPTIONS

SAMPLE NO.	931194	237.6 metres
	931195	245.8 "
	931196	251.8 "
	931197	271.8 "
	931198	282.6 "
	931199	292.3 "

030

Central Mineralogical Services



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Telephone 42 5659

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C.R.A. Exploration Pty. Ltd.
P.O. Box 138
BURNIE / TAS. 7320

9th December, 1982

REPORT CMS 82/12/1

YOUR REFERENCE:	D.P.O. No. 30216
DATE RECEIVED:	2nd December, 1982
SAMPLE NOS.:	931194 - 931199
SUBMITTED BY:	G.B. Weber
WORK REQUESTED:	Petrology

Copy to:
The Chief Geologist
C.R.A. Exploration Pty. Ltd.
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REPORT CMS 82/12/1

Six samples of diamond drill core were received for petrological examination, and brief descriptions and results are compiled in the attached table. Descriptions incorporate data from stereobinocular and petrological microscopic examination of representative thin-sections and offcuts, and include interpretative comments.

Summary

All six samples are representative of a weakly polymetamorphic pelitic sediment sequence. Relict primary features indicate a weakly dolomitic, quartzose to subarkosic, shale-parted siltstone as the primary lithology. Individual samples reflect rather conspicuous detrital opaques and zircon, which may be significant in terms of stratigraphic correlation.

Metamorphic features may be summarised as mild hornfelsing (albite-epidote hornfels facies) and semi-contemporaneous metasomatism followed by a weak, low-grade "regional" metamorphism. Metasomatic phases are fine-grained schorl, impregnating shaly partings/interbeds, and sideritic carbonate as a replacement of dolomite. Minor shear-related quartz and adularia-ankerite veinlets postdate an earlier generation of minor quartz veinlets with accessory traces of chalcopyrite. A few samples include disseminated fine-grained pyrrhotite which, in part, appears to represent a contact-related replacement of "syngenetic" pyrite.

Overall, this suite exhibits affinities with the low-grade contact-metamorphosed/metasomatised pelites marginal to, for example, the Renison mineralisation. Cassiterite was not detected, but assays for Sn may be warranted.

D. Cowan, B. Sc.

CENTRAL MINERALOGICAL SERVICES

Sample No.	Classification - Composition	Fabric	Accessories	Comments
931194 (T.S. 44713)	<u>Tourmalinised Pelite.</u> Quartz and semi-sericitic muscovite with varying proportions fine-grained green-brown schorl. Disseminated fine-grained Fe-sulphides. Minor quartz veinlets, impregnations of sideritic carbonate.	Relict, massive to shale-parted/laminated silty clastic. Mildly hornfelsed, mildly sheared.	Relict detrital muscovite flakes, zircons. Traces metasomatic phlogopite, minor trace chalcopyrite.	Contact-metamorphosed/metasomatized argillaceous siltstone with mild discordant subsequent shearing. Fe-sulphide apparently syngenetic; chalcopyrite in quartz veinlets.
931195	<u>Tourmalinised Pelite.</u> Quartz-sericite hornfels similar to 931194, with partly tourmalinised shaly interbeds. Disseminated fine pyrrhotite (after ?pyrite). Minor quartz veinlets with siderite, pyrrhotite, chalcopyrite.	Hornfelsic with relict slightly/relatively quartzose silty bedding laminations. Mildly crenulated/stressed.	Relict detrital muscovite, zircon. Disseminated leucoxenic flaky opaques.	Close affinities with 931194. Main contrast is the relatively mild post-hornfelsing/tourmalinisation stress. Partly recrystallized veinlet quartz.
931196	<u>Metapelite.</u> Quartz and semi-sericitic muscovite with minor impregnations, films of sideritic carbonate, fine-grained schorl. Disseminated fine-grained pyrrhotite.	Weakly hornfelsic, incipiently sheared. Relict faintly laminated silty pelitic.	Traces chalcopyrite (in carbonate clots, films). Relatively conspicuous detrital zircons.	Relatively mildly hornfelsed, weakly metasomatized quartzose silty pelite. Relict features closely analogous to 931194 and particularly 931195.
931197	<u>Metapelite.</u> Mildly hornfelsed sericitic quartzose pelite similar to 931195, 931196, but weakly feldspathic. Weakly stained with metasomatic schorl and cloudy sideritic carbonate. Thinly disseminated opaques.	Similar to 931194, with a relatively marked high-angle discordant slaty cleavage.	Rare relict detrital zircons, muscovite flakes, late quartz veinlets (along slaty cleavage).	Mildly hornfelsed/metasomatized pelite analogous to 931196. Opaques are recrystallized detrital, concentrated into very thin "placers".
931198	<u>Metapelite.</u> Quartz and semi-sericitic muscovite with minor sericitised/chloritised feldspar, partly chloritised dolomite. Disseminated opaques. Thinly disseminated very fine metasomatic schorl.	Relatively laminated (shale-parted) silty clastic with mildly sheared hornfelsic overprint.	Relatively conspicuous detrital zircons.	Mildly hornfelsed, subsequently incipiently sheared subarkosic, weakly dolomitic pelite (shale-parted siltstone) with conspicuous detrital opaques, zircon. Only incipiently
931199 (T.S. 44718)	<u>Metapelite.</u> Quartz and semi-sericitic muscovite with disseminated poikilitic clots of sideritic carbonate, minor schorl. Disseminated opaques. Minor late veinlets of adularia and ankeritic carbonate.	Mildly hornfelsic, weakly sheared, shale-parted silty clastic.	Detrital zircons, muscovite flakes. Traces dolomitic carbonate (corroded/replaced by siderite).	Typical weakly poly-tourmalinised. metamorphic pelite reflecting contact related siderite impregnations, incipient tourmalinisation, subsequent adularia-ankerite veining.

033

SMITHTON

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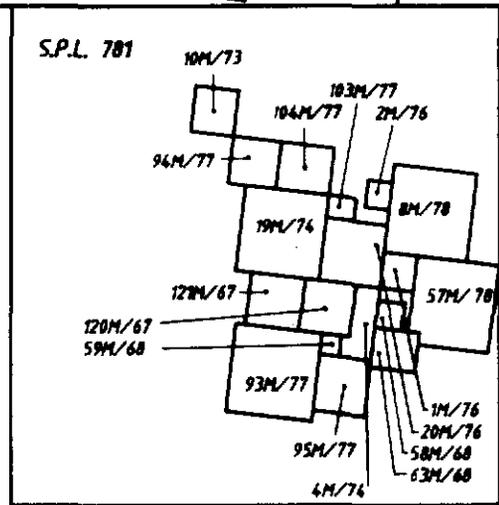
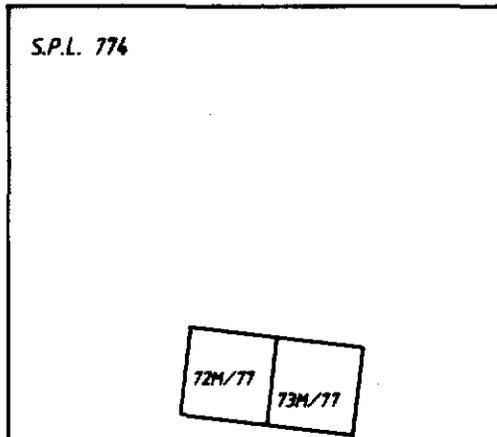
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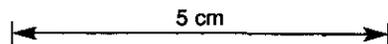
TEMMA

□ S.P.L. 774
□ S.P.L. 781

AMG328200E
5378580N



SCALE 1 : 50 000



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AMG REFERENCE POINTS ADDED

CRA EXPLORATION PTY. LIMITED

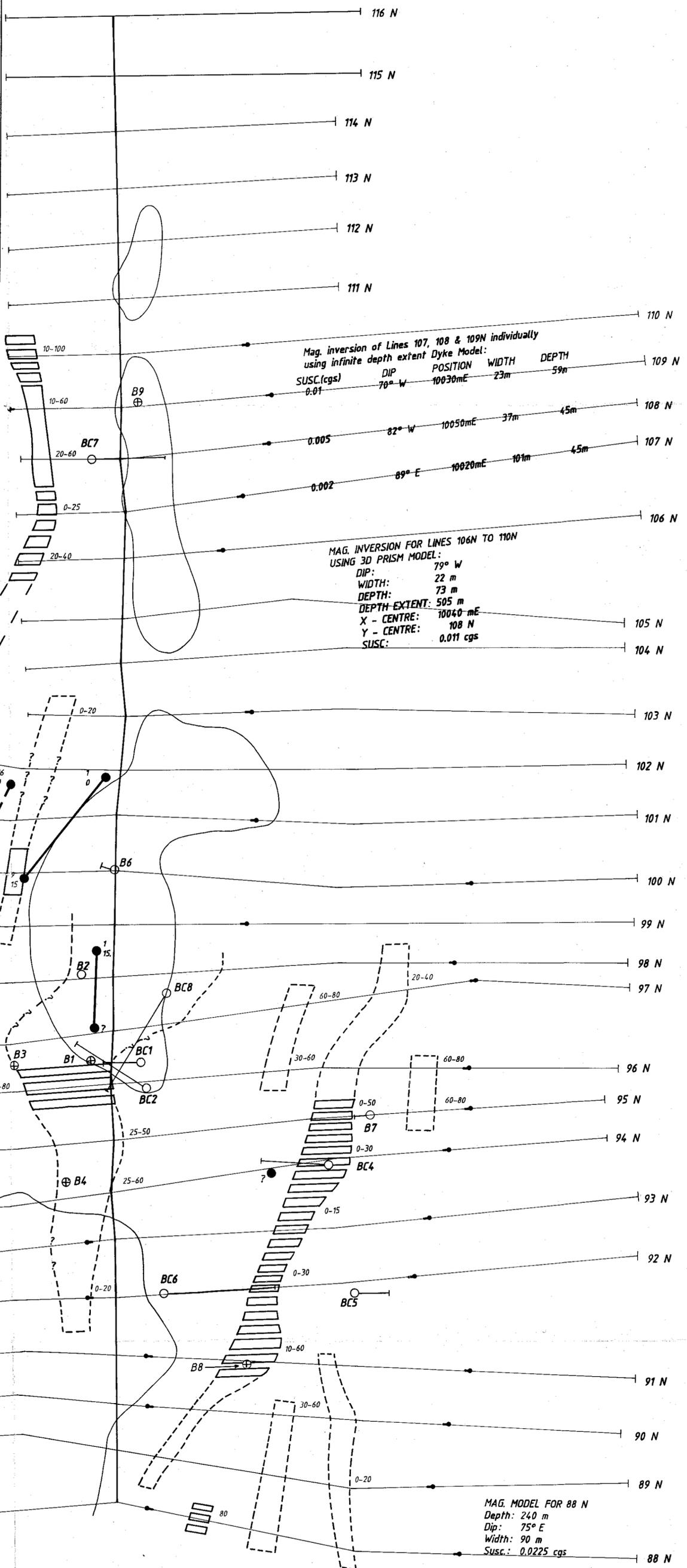
BALFOUR TENEMENTS

LOCALITY PLAN

Ref. s SK55 - 3	83-1933R
Scale. AS SHOWN	Drawn. R. T.
Author. T. W. D.	Report N°. 11912
Date. 16th Feb. 1982	Plan N°. TASH 585

LEGEND

- LINES SURVEYED WITH I.P.
- I.P. ANOMALY - DEFINITE (10-30)
 (Approx. depth range if shallow or depth to top if deep, in metres)
- PROBABLE (4 boxes)
- POSSIBLE (2 boxes)
- POSSIBLE EXTENSION (2 boxes with ?)
- GROUND MAGNETIC ANOMALY OUTLINE (APPROX 300nT ABOVE BACKGROUND) (irregular shape)
- DIGHEM AIRBORNE E.M. ANOMALY (7 - (conductivity in mhas)
 30 (min. depth to modelled dyke body in metres))
- DRILL HOLE (B7)



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5 cm

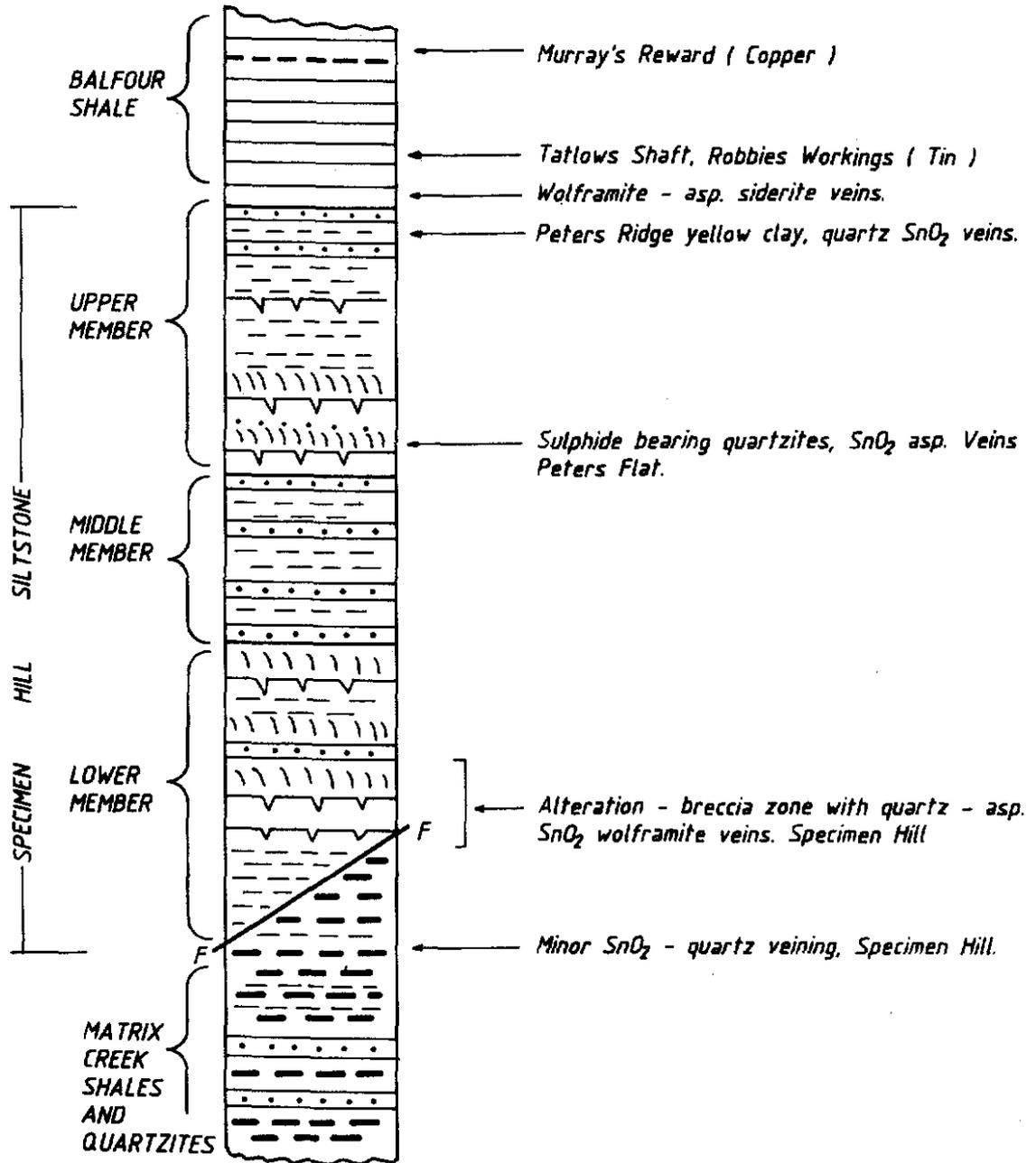
CRA EXPLORATION PTY. LIMITED

BALFOUR

SUMMARY OF GEOPHYSICS

Ref:	SKS1 - 3	83-1933 R
Scale:	1 : 5000	Drawn: R. T.
Author:	M. F. F.	Report No. 11912
Date:	22 - 7 - 1982	Plan No. TASH 822

MINERALISATION



616037

- ==== Regularly lam. green siltstone.
- Massive to laminated siltstone
- ||||| "Pyjama" siltstone
- Quartzites sandstones
- Black shales, siltstones.

CRA EXPLORATION PTY. LIMITED		
DIAGRAMATIC STRATIGRAPHIC COLUMN SPECIMEN HILL AREA		
Ref:	SK55 - 3	83-1933 R
Scale:		Drawn: R. T.
Author:	N. R. L.	Report N°: 11912,...
Date:	JAN 1983	Plan N°: TASH 1139

037

DD 82 BC 8
9770 N
10090 E

-60°

"Pyjama" Siltstones

Pyritic quartzite 55.4-57.9
2.5 m @ 0.7% Tin

Sandstone / Quartzite

Sandstone / Quartzite

"Pyjama" Siltstone

130 m

Laminated Siltstone

thin quartzite interbeds.

222.5 m

Silicified and Tourmalinised
Siltstones approx. 5% Pyrite.

300 m
E.O.H.

FAULT ZONE

— Quartz Vein

- - - Geological Boundary

5 cm

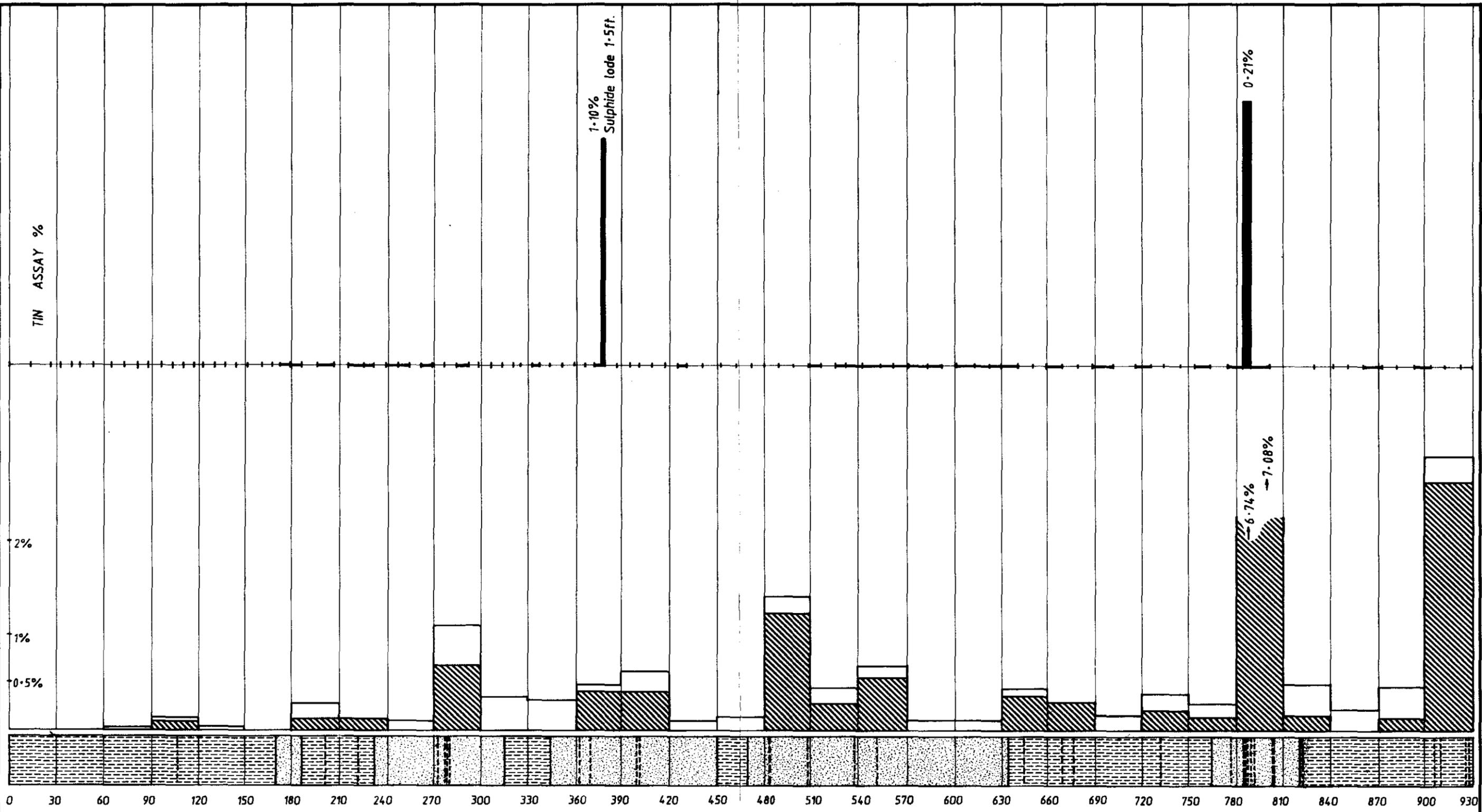
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SPECIMEN HILL BALFOUR
GEOLOGICAL SECTION

DD 82 BC 8
Plane of Section 167° Magnetic

Ref:	SK55 - 3	83-1933R
Scale:	1 : 1000	Drawn: R. T.
Author:	T. W. D.	Report N°: 11912.
Date:	JAN 1983	Plan N°: TASH. 1125

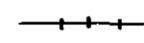
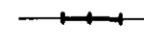
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MEASUREMENTS IN FEET

 Banded Quartzite
 Shale

 All Veins
 All Veins + $\frac{1}{2}$ inch.

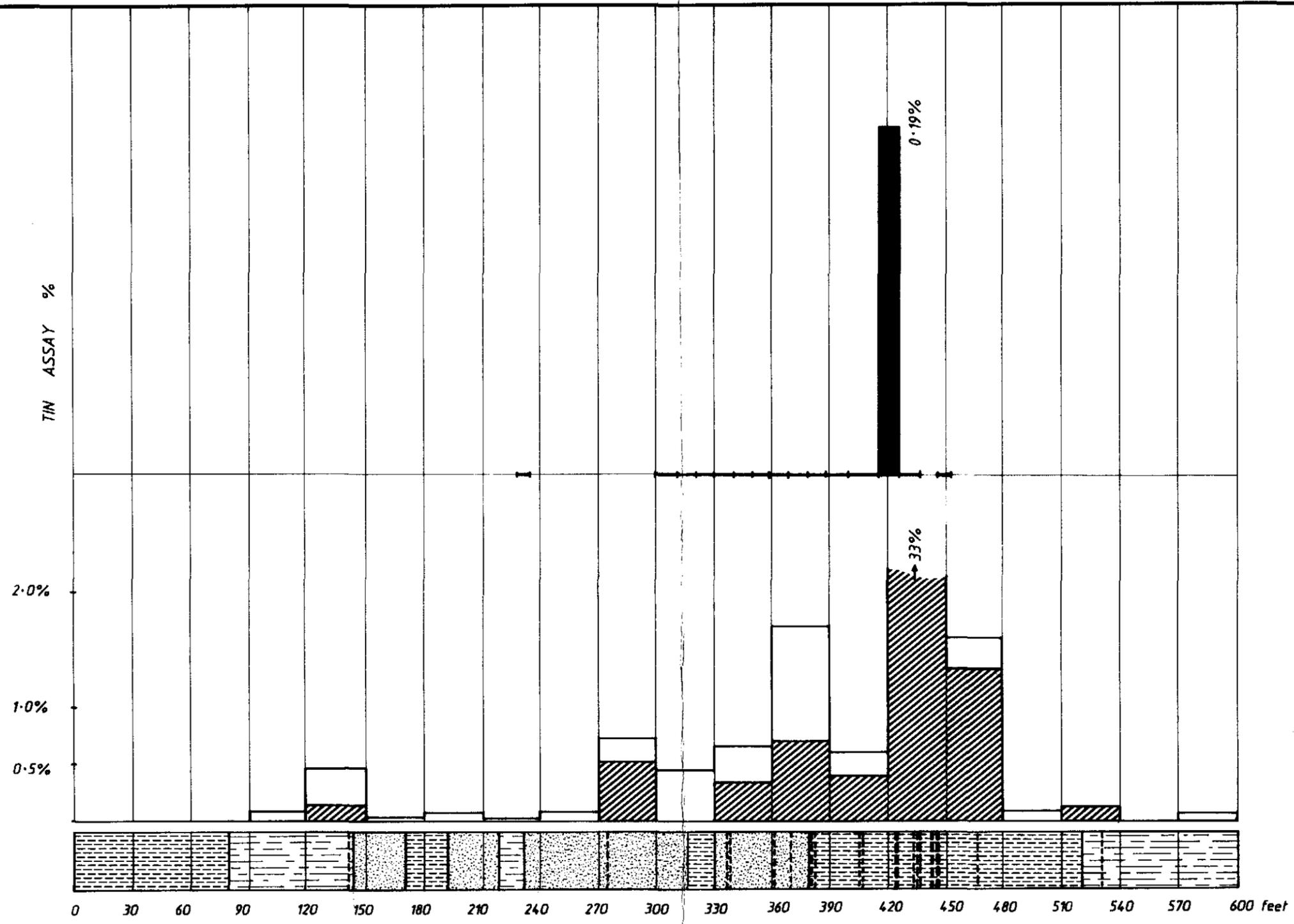
 Tin not detected
 Trace Tin

5 cm

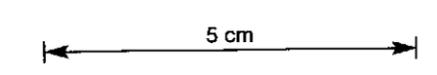
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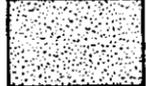
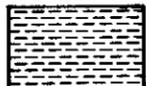
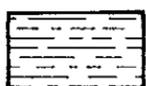
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SCALE. 1 : 750	DRAWN. R. T.
AUTHOR. T. W. D.	REPORT N°. 11912,
DATE. 30 - 11 - 1982	TASH N°. 959

830

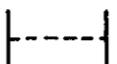


616040



-  Banded Quartzite
-  Shale
-  Siltstone

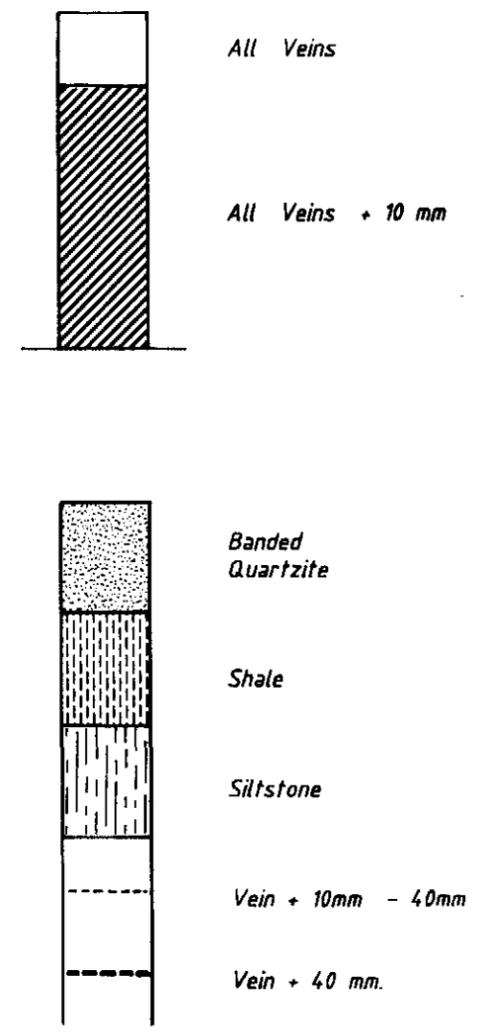
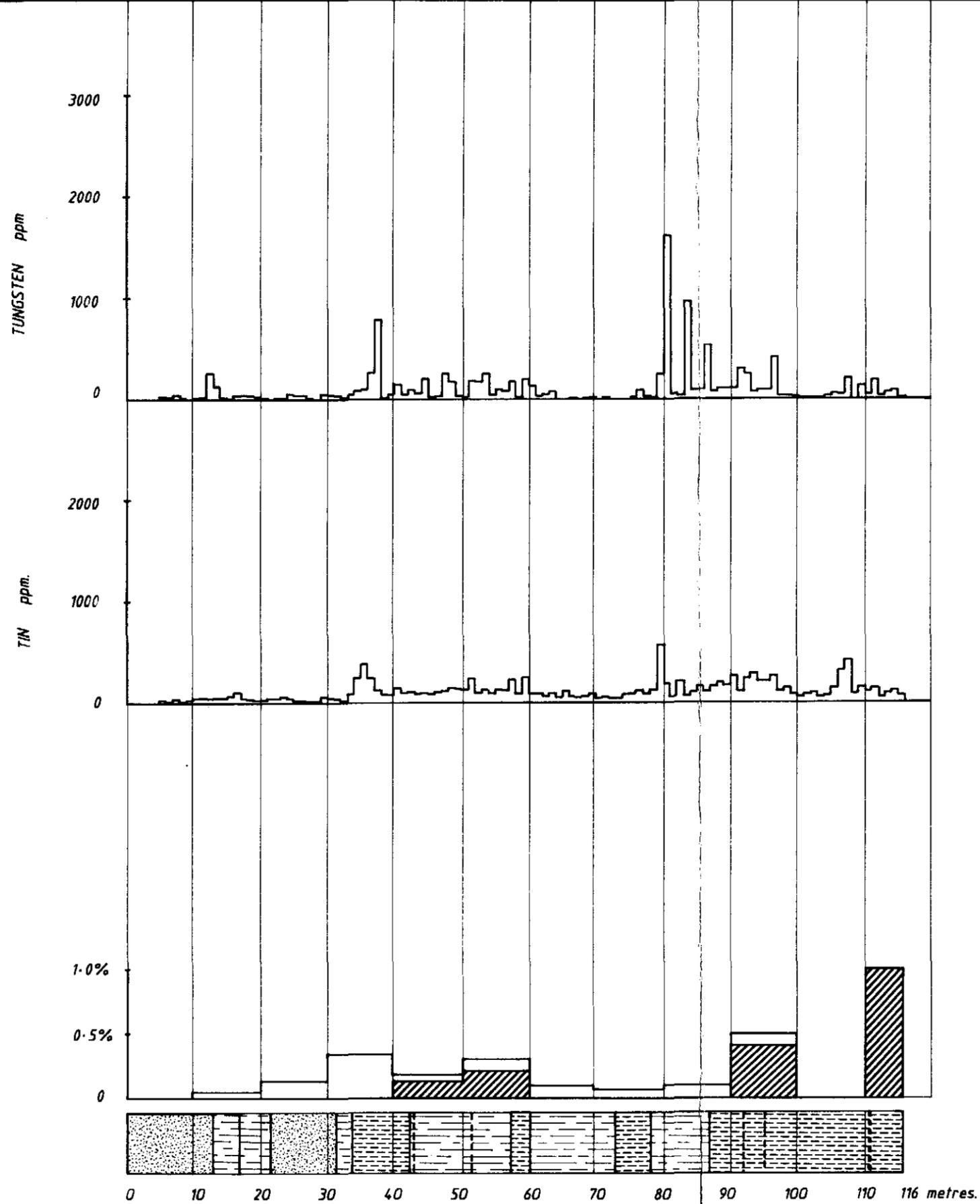
-  All Veins
-  All Veins + $\frac{1}{2}$ inch

-  Tin not Detected
-  Trace Tin
-  Vein + $\frac{1}{2}$ inch - 2 inch
-  Vein + 2 inch

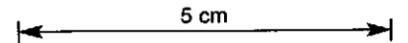
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AUTHOR. T. W. D.	REPORT N°. 11912
DATE. 30 - 11 - 1982	TASH N°. 960

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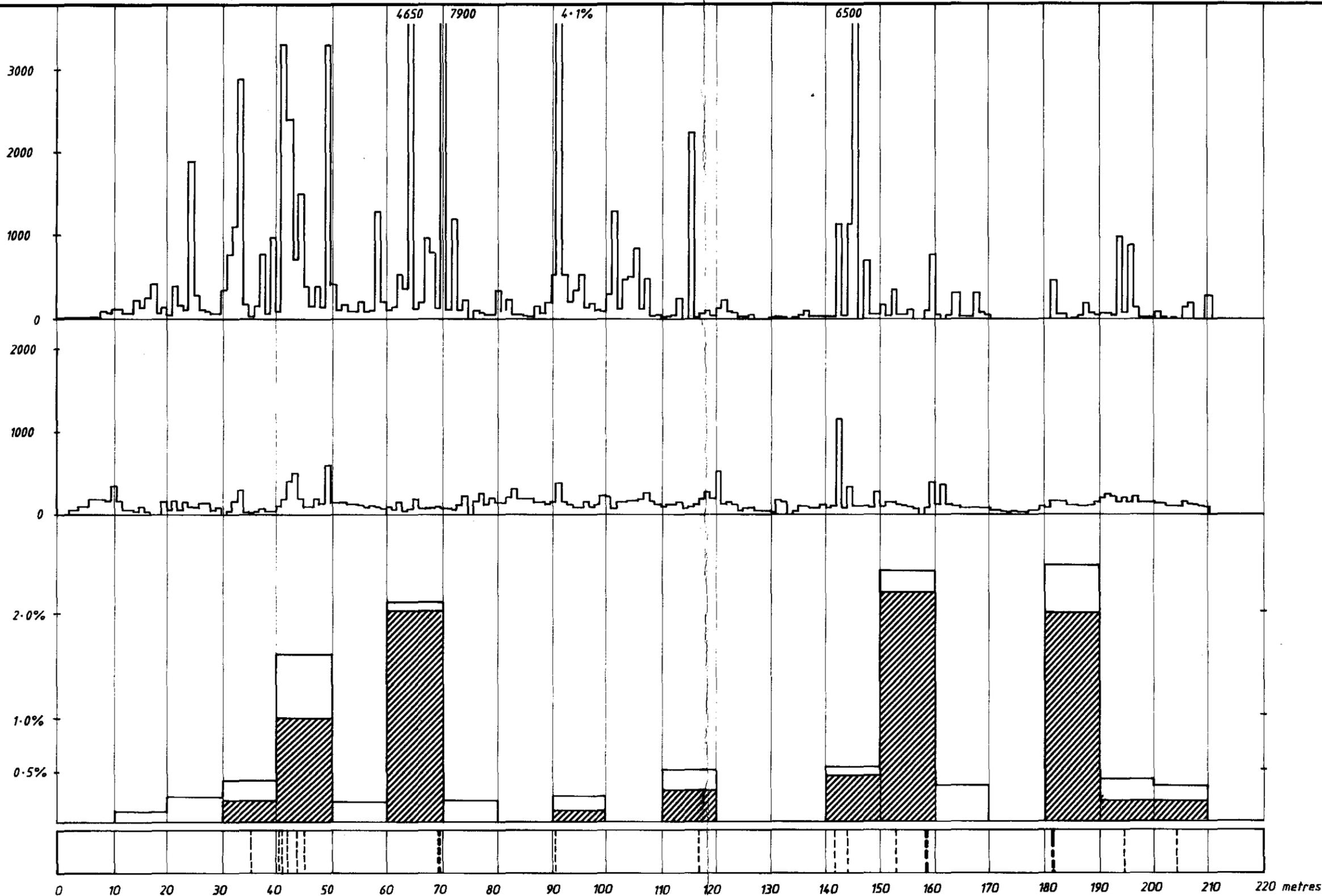
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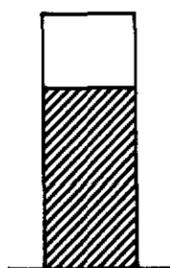
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AUTHOR. T. W. D.	REPORT N°. 11912,
DATE. 1 - 12 - 1982	TASh N°. 962

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TIN ppm.

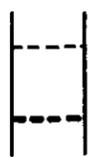


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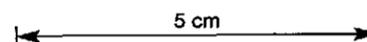
All Veins

All Veins
+ 10 mm



Vein +10 mm, -40 mm.

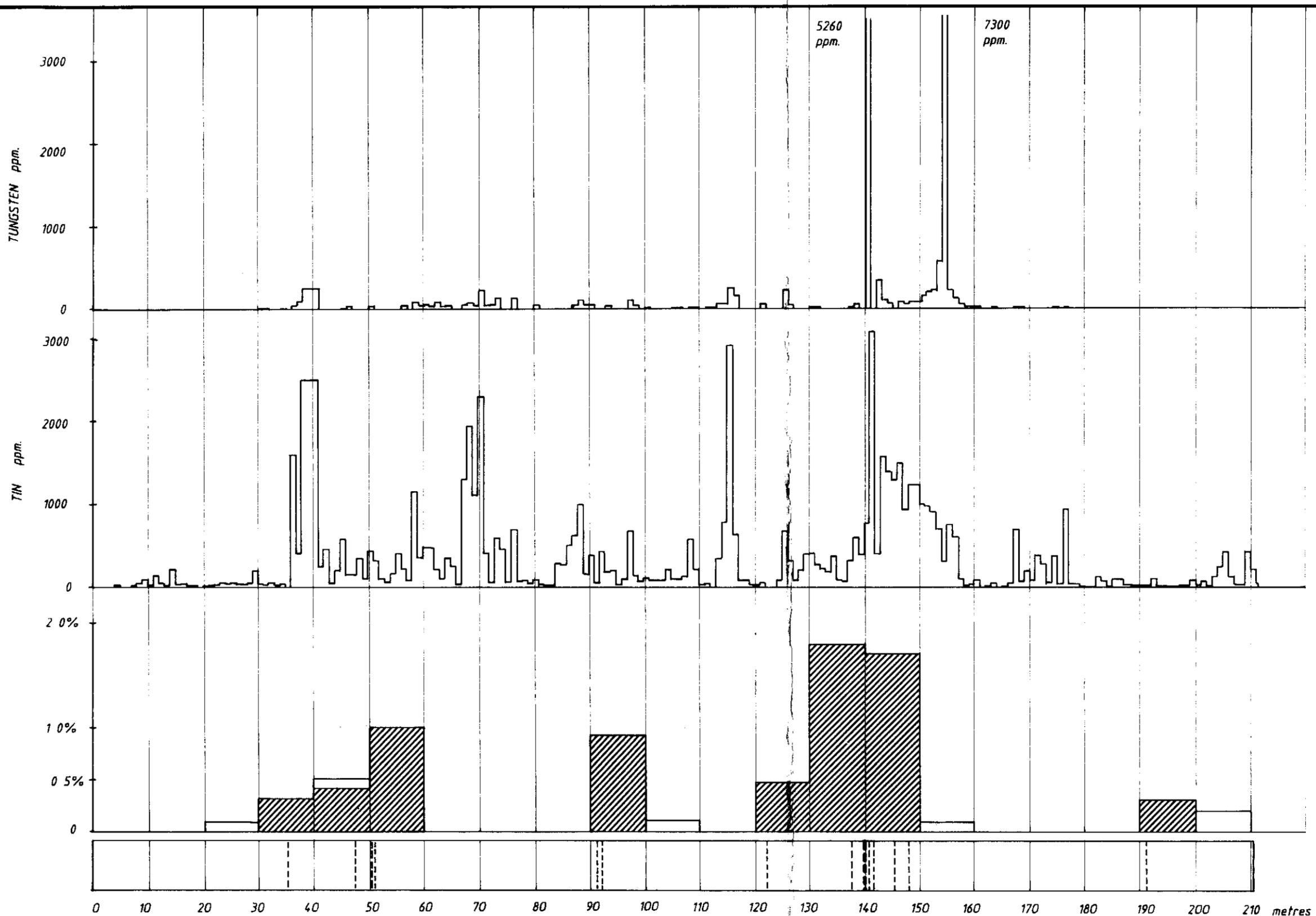
Vein +40 mm.



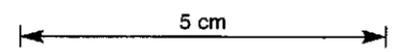
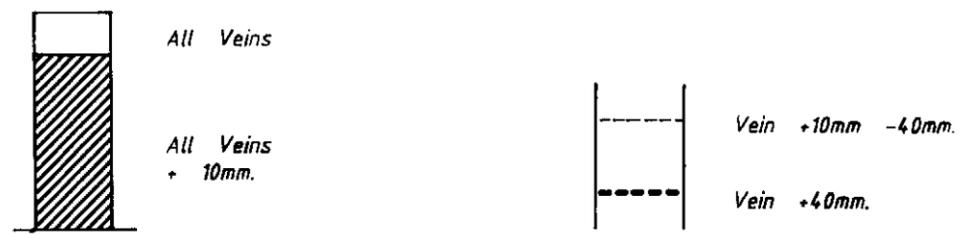
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BALFOUR AREA
NORTH WEST TASMANIA
DD 81 BC 2
VEIN DENSITY & ASSAY DATA

REF.	SK55 - 3	83-1933R
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AUTHOR.	T. W. D.	REPORT N°. 11912.
DATE.	30 - 11 - 1982	TASH N°. 961

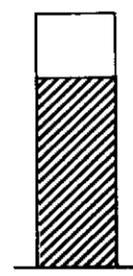
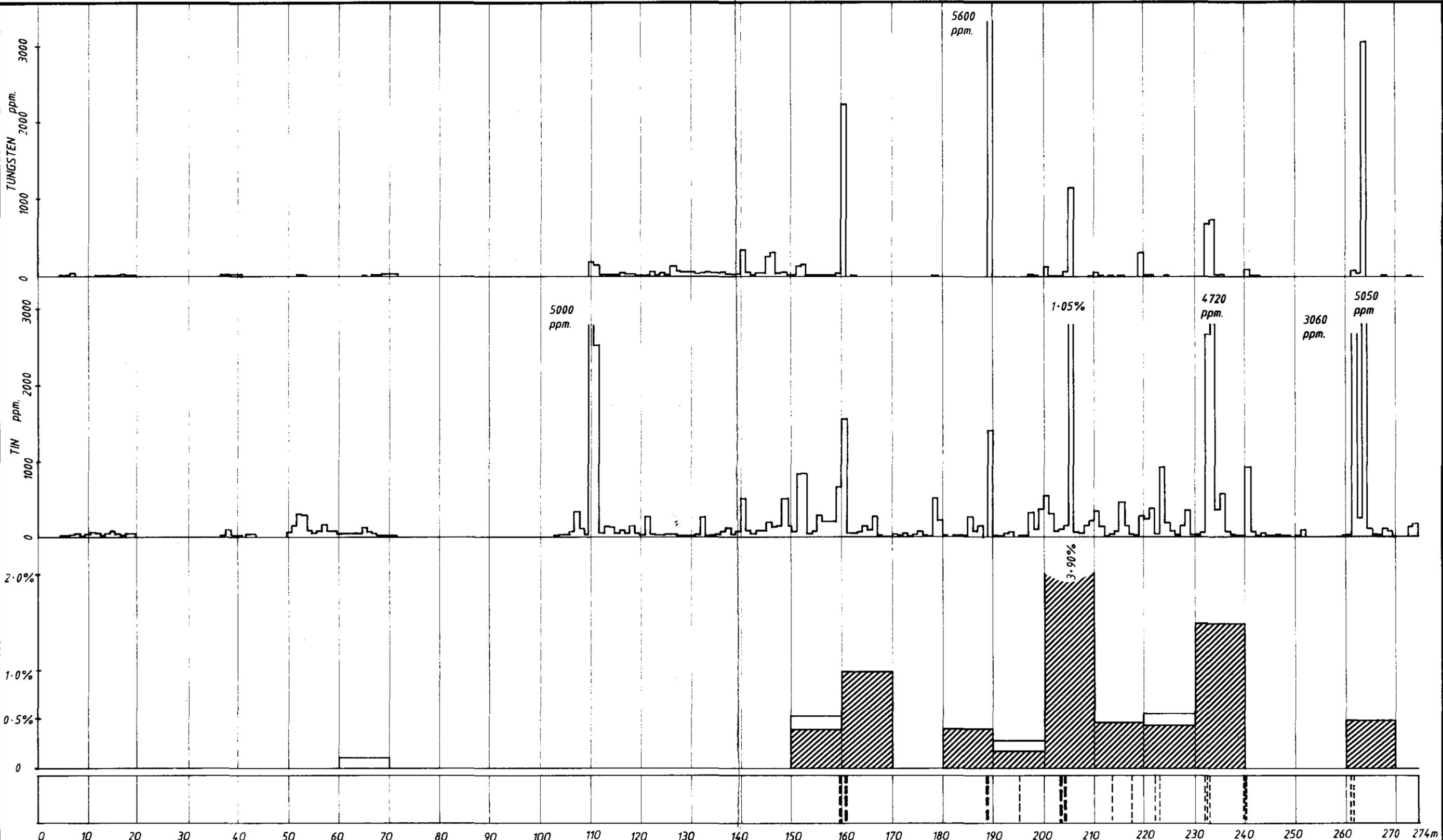


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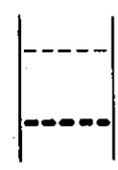
CRA EXPLORATION PTY. LIMITED			
BALFOUR AREA			
NORTH WEST TASMANIA			
DD 81 BC 4			
VEIN DENSITY & ASSAY DATA			
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SCALE.	1: 750	DRAWN.	R. T.
AUTHOR.	T. W. D.	REPORT N ^o . 11912.	
DATE.	1 - 12 - 1982	TASh N ^o .	964

042



All Veins

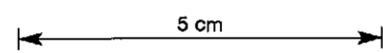
All Veins
+ 10 mm



Vein +10mm, -40mm.

Vein +40mm.

616044



CRA EXPLORATION PTY. LIMITED	
BALFOUR AREA NORTH WEST TASMANIA DD 81 BC 6 VEIN DENSITY & ASSAY DATA	
REF. SK55 - 3	83-1933R
SCALE. 1 : 750	DRAWN. R. T.
AUTHOR. T. W. D.	REPORT N°. 11912,
DATE. 1 - 12 - 1982	TASh N°. 963

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