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TESTING OPERATIONS ON
RINGAROOMA FLATS
NORTH OF ARBA HILL

Testing operations on
Ringarooma Flats north of
Arba Hill

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Introduction

The Ringarooma Flats north of Arba Hill include tin-bearing drifts of the Main and Arba deep leads and their tributaries. The principal testing of them was by drilling and five campaigns were carried out in the past. In recent years, two geophysical surveys were conducted.

History of Testing Campaigns

The first known testing was the drilling by the Tasmanian Department of Mines in 1930 and 1931. Eight holes were put down, six being in one line trending north-westerly and the other two in an east west line about 1300 feet to the south-west. A total of 1496 feet was drilled. All holes were bottomed.

The second testing campaign was drilling by the Tasmanian Department of Mines 1937. Nine holes were drilled, six being in an east-west line (southern line) that was an easterly continuation of the 1931-32 line of two holes (No.7&8). The other three holes were in a parallel line (northern line) about 150 feet to the north of the other line. The total footage drilled was 1060. All holes except No.4, were bottomed.

A drilling campaign was conducted by Briseis Consolidated N.L. in 1938, but it is not known whether it was for that company, or on behalf of some other company. The drilling was in the same general area as the drilling by the Department of Mines in 1930-31 and 1937 as far as the first three lines (no.1to3) were concerned, but the fourth line (No.4) was about 46 chains to the west of the second line. The lines were north-south ones and 14 holes were drilled. The total footage was 465.5 The deepest holes were 50 and 75 feet and it is certain that none was bottomed.

In 1957, Mr. J.H. Rattigan investigated the Arba lead on behalf of Rio Tinto Australian Exploration Pty.Ltd. His investigations included a geological survey and consideration of results of previous drilling campaigns including the three referred to above, and also a campaign by Briseis Consolidated Co for Burma Malay Co. near the Arba workings at the south-eastern portion of Arba Hill. Mr. Rattigan gave consideration to the possibility of dredging the Ringarooma Flats between Branhholm and Derby, but did not carry out any investigations other than attaining the results of the first three drilling campaigns referred to above.

In 1965, Utah Development Company had a geophysical survey (induced polarisation) made, and a plan prepared showing the I.P. traverses and resistivity contours. Seven holes were drilled and according to a hand-written note on the plan, two (No.20 & 21) were drilled by a Failing 1500 plant, one (No.200) by a percussion plant, and four A130-A.133) by an Auger. The same note stated that the holes were not bottomed, and the small amount of information about the depths of the holes supports that view.

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Six of the holes were drilled from sites along the western part of I.P. traverse (No.15), but that traverse is more or less along the lines drilled by the Department of Mines in 1937, and the Utah holes could be regarded as being along a line representing the western extension of the Northern line of the 1937 drilling.

In 1970, a topographical and geological survey was made of Arba Hill and its surroundings by A.C.A. Howe Australia Pty. Ltd on behalf of United Petroleum Reserves N.L. in accordance with or recommendation in an earlier report by A.C.A. Howe. In 1971 a gravity survey was made on the level country around the hills, and paralalled to, but 500 feet from the base of Arba Hill. The objects of these surveys were to locate the Arba or Branhholm Creek deeplead under Arba Hill so that testing by drilling could be undertaken. Such drilling was done later in 1971.

The gravity survey included the flats to the north of Arba Hill, but although some results were given, the plan showing the observation stations has not been supplied to Mineral Holdings Australia by United Petroleum Reserves. Little information resulting from the gravity survey can therefore be given about the flats north of Arba Hill

REPORTS ON THE AREA AND ON THE TESTING CAMPAIGNS

The first report on the area is the following Bulletin (No35) of the Geological Survey of Tasmania.

The Sub-Basaltic Tin Deposits of the Ringarooma Valley by P.B. Nye, 1925.

This report gives the results of a geological survey. As far as it is known no testing had been carried out up to that date, but the drilling campaigns of the Department of Mines in 1930-31 and 1937 were, in part at least, based on the results of the above survey.

The 1930-31 drilling results are described in the following typewritten report of the Department of Mines.

Report on the boring campaign on the Arba Lead, Branhholm, by P.B. Nye, 21/6/1933

The 1937 drilling results are described in the following typewritten report of the Department of Mines Report on Boring Campaign on Arba Lead, Branhholm by F. Blake, 13/4/1938. The results of the 1938 drilling by Briseis Consolidated are given in the following typewritten reports of Rio Tinto Australian Exploration Pty. Limited.

Notes on Edward's Area proposition, by J. H. Rattigan, 29/11/1957

Further Notes in the Arba (Branhholm Creek) Lead, by J.H. Rattigan.

That drilling campaign is referred to in the following typewritten report of A.C.A. Howe Australia Pty. Limited. Preliminary Report on the Arba Lease 16OP/M County of Dorset, Branhholm, Tasmania, by A.C.A. Howe Australia Pty. Limited, January, 1971. The testing campaign by Utah Development was probably described in a report, but a copy has not yet been obtained. A copy of a plan which no doubt accompanied a report shows the I.P. traverses, the resistivity contours and the positions of the drill holes (but no details of the holes).

This campaign is briefly referred to in the report by A.C.A. Howe quoted above, and the results of two drill holes (No.20&21) are given in it.

The gravity survey for United Petroleum Reserves is described in the following typewritten reports

Arba Tin Prospect, Blankholm - Review of Gravity Data by S.J. Watson. 29th March, 1971.

Notes on Progress of the Arba Prospect, Tasmania by United Technical Services Pty. Ltd by Bruce W. Menzel, 1st June, 1971. (S.J. Watson was a geophysicist hired by United Technical Services, a subsidiary of United Petroleum Reserves N.L. B.W. Menzel is a geologist with United Petroleum Reserves)

RESULTS OF THE TESTING CAMPAIGNS (see plates 1 and 2)

The 1930-31 Drilling by Department of Mines, the following results have been taken from report by P.B.Nye. 21/6/1933:

TABLE No. 1

Number of Hole	Depth		Average value of Ground in ozs of tin oxide per cub.yd		
	of hole	to bottom	To Depth of		To total depth of drifts
	Feet	Feet	feet	value	Value
1	176	170	119	0.48	0.45
2	154	149			0.51
3	191	180	98	1.388	0.75
4	198	190	112	0.67	0.47
5	203	198	119	0.73	0.44
6	206	203	84	0.48	0.20
7	184	173	119	0.74	0.59
8	182	174	91	0.44	0.34

The results show that the ground was tin bearing in each hole, but that the values were low. The highest result was 1.388oz of tin oxide per cubic yard in hole 3 between the surface and 98 feet. This hole (No.3) has the highest value (0.75oz per cubic yd.) over the full depth of the drifts the figures show that the upper part of the ground had higher values than the lower part.

The depths of bedrock in holes 2, 1, 3, 4, 5, & 6 indicate fairly deep ground with the depth increasing from No.2 No.6. The section tends to suggest that the line of holes is across the Main Lead, and that any gutter is near hole 6 or to the north or north-west of that hole. However another possibility is described under the 1937 drilling holes 7 & 8 will be considered in conjunction with the 1937 drilling.

The 1937 Drilling by Department of Mines.

The following results have been taken from report by F. Blake, 13/4/38

TABLE No. 2

Number of Hole	Depth		Average value of ground in ozs of tin oxide cub.yd 70%sn		
	of hole	to bottom	To Depth of	Grade	To bottom of drifts
	feet	feet	feet		
Southern line	{ 1	153	148		1.100
	{ 2	145	142	79 $\frac{1}{3}$	4.200
	{ 3	105	99	68	3.021
	{ 4	144	144	79 $\frac{1}{3}$	3.035
	{ 5	106	102	68	1.931
	{ 6	58	54		
Northern Line	{ 7	58	54		1.325
	{ 8	142	138	79 $\frac{1}{3}$	4.960
	{ 9	149	146	79 $\frac{1}{3}$	3.041
				1/4

Note Hole No.4 was not bottomed.

The results show that the ground was tin-bearing in every hole. The values were fairly low but up to four times the values in the 1930-31 drilling. The highest value was the upper 79½ feet in hole 8, which contained 4.96 oz of tin oxide per cub.yd, and hole 2 a value of 2.91oz of tin oxide per cubic yard. As for the 1930-31 drilling, the upper part of the ground was higher grade than the lower part.

The drilling was along two east-west lines, the Southern one having holes 1 to 6 (holes 7 & 8 in the 1930-31 drilling from a western extension of the line) and the Northern one having holes 7, 8 & 9. The Southern line showed a gutter near hole 4, and another either between the 1930-31 holes 7 and 8 or to the west of hole 8. The Northern line indicated a gutter probably between holes 8 & 9; this would be a north-easterly extension of the gutter near hole 4. This gutter is not revealed on the line of the 1930-31 drilling and it seems improbable that extended easterly and to the east of the 1930-31 line. The gutter therefore probably trends north-westerly and parallel and close to the line of the 1930-31 holes.

At the western end of the Southern line, there is a deep and wide gutter either between holes 7 & 8 (1930-31 drilling) or to the west of hole 8. This could be the northern extension of the Arba lead.

The 1938 Drilling by Briseis Consolidated N.L.

The following results have been taken from Plate 1 attached to J. H. Rattigan's 1957 report.

TABLE No.3

	Hole	Depth Feet	Grade	Hole	Depth Feet	Grade
Line 1	{ 1	32	0.26	10	75	0.06) Line 3
	{ 2	30	0.20	11	25	0.07)
	{ 3	26	0.12	12	30	0.055)
	{ 4	25	0.20	13	33'	Nil } Line 4
Line 2	{ 5	20	Nil	14	12	Nil }
	{ 6	40	trace			
	{ 7	50	trace			
	{ 8	26	0.18			
	{ 9	41.5	0.16			

The units used for the grade are not stated but they are probably "lb of cassiterite concentrates per cub.yd." because those units are used by Rattigan in connection with the Burma Malay bore-holes on the south-eastern side of Arba Hill. (and are shown on his Plate 3.)

The drill holes are all shallow, and were probably designed to test the ground for sluicing or shallow dredging. The depths were mostly between 20 and 40 feet, only two being 50 feet or more. The two deepest holes were No.7 (50feet) and No.10 (75 feet).

The values were low and only three holes were 0.20 lb per cub.yd. or more. These three holes were an line 1 (4Holes) which was the only line to give consistent values. The only other holes with comparable values were No.8 & 9, so that the holes with better values were confined to the south-eastern part of the drilling area.

This drilling campaign gave no information about the Main lead to the north of Arba Hill.

The 1965 Testing and Drilling Operation by Utah Development Co. No report has been obtained in regard to these operations, and nothing can be said as to the results of the I.P. survey. The plate showed resistivity contours, but no other details are available. In the A.C.A. Howe Australia report of January, 1971, it was stated. "The results of the I.P. traverses are inconclusive and contain insufficient detail regarding the methods used.

The following information regarding the drill holes was taken from the Utah Development map and from the A.C.A. Howe Australia report referred to in the previous paragraph. The positions (see plate) and numbering of the drill holes were obtained from the map and the values and depths from the A.C.A. Howe report.

TABLE NO. 4

Number of Hole	Depth feet	Average value of ground lb./TIN / cub. yd
20	93	0.037
21	128	0.029
A130		
A131		
A132		
A133		
200		

I.P. was used to try & delineate basement. These results were not reproducible due ground water/clay influences - it was decided I.P. did not work under conditions prevailing. Res. Comm.

It is doubtful if any of the holes reached bedrock. The values of the two holes were low. The results gave no information about the Main lead, Arba lead or any other lead to the north of Arba Hill.

The 1970 and 1971 operations of United Petroleum Reserves N.L.

This company conducted topographical, geological and gravity surveys and some sampling and drilling. The only survey that could have given any information about the area north of Arba Hill, was the gravity survey. Unfortunately, neither a detailed report nor a plan showing the gravity stations has been made available.

In S.J. Watson's report of 29/3/1971, three anomalies that could be due to basement undulations, were reported. One of these (Anomaly 2) was stated in correspondence to occur in the extreme north-west of the area. The description of this anomaly in Watson's report was "This anomaly is at gravity station 104. It represents a mass deficiency equivalent to 1.0 milligals. The reading is legitimate. It is unusually sharp, and can be interpreted as a channel 100 feet wide and 100 feet deep. The bedrock lies at a very shallow depth.

The sharpness of the anomaly is a puzzling feature, and the picture is not the ideal upon which the original model was made. It is such a strong anomaly that it should be included in further investigation."

This anomaly is too shallow to represent the northerly extension of the Arba Lead. Moreover its position is probably too far to the west to represent the extension of that lead.

It would appear, therefore, that the gravity survey gave no information about the Arba and Main leads in the area north of Arba Hill.

SUMMARY AND CONCLUSIONS

General testing campaigns have been conducted on the Ringarooma Flats to the north of Arba Hill. The campaigns included geophysical surveys and drilling. The geophysical surveys included an I.P. survey made for Utah Development (and by virtue of which resistivity contours were drawn) and a gravity survey by S.J. Watson through A.C.A. Howe for United Petroleum Reserves. The resistivity contour plan of Utah Development was available, but showed no special features. No report was available but in the A.C.A. report it was stated that "The results of I.P. traverses were inconclusive".

The gravity survey for United Petroleum Reserves showed an anomaly representing a narrow and steep sided but shallow gutter in the flats to the north-west of Arba Hill. This gutter is too shallow to represent a northerly extension of the Arba lead or a part of the Ringarooma lead. It probably therefore represents a small tributary lead.

The drilling campaigns by Briseis Consolidated and Utah Development were to shallow depths only, and not to bedrock. Therefore, though they gave some information about the Ringarooma River gravels and the upper parts of the drifts of the deep leads, they gave little or no information about the positions of the leads.

The drilling campaigns of the Department of Mines in 1931-32 and 1937 included, except for one hole, drilling to bedrock, and therefore, gave information about the depths and values of the drifts. They also gave indirect evidence in regard to the positions of the Arba and Main deep leads.

The No.1 to No.6 line of the 1930-31 drilling indicates that bedrock slopes downwards from No.1 to No.6, and that any lead is near or to the north-west of No.6 hole. The line is clearly on the southern side of the Main lead and gives no indication of the Arba lead.

The east-west line represented by Nos 1 to 6 holes of the 1937 drilling and Nos 7 and 8 of the 1930-31 drilling shows that the deepest ground is at No.8 of the 1930-31 drilling. The deep ground of the 1930-31 No.6 hole (203 feet) is therefore to the west or north-west of the No.8 hole of the 1930-31 drilling. The Main lead is certainly to the north-west of the No.8 hole of the 1930-31 drilling, and the Arba lead may probably be to the west of that hole.

On the line of Nos 1 to 6 holes of the 1937 drilling there is a gutter near No.4 hole (not bottomed at 144 feet). This gutter would have to pass near, and to the east of, No.9 hole of the 1937 drilling.

If this north-easterly course was maintained this gutter would have to pass between the No.6 hole of the 1937 drilling and the No.2 hole of 1930-31 drilling. Such a course is possible but not considered likely, and drilling would be necessary to prove if the gutter trends to the north-east. Another possibility is that the lead would trend to the north-west and trend more or less parallel to the line of the Nos 1 to 6 holes of the 1930-31 drilling and be on the south-western side of that line.

All information available about each drill hole has been given above. Averages for each line or group of holes will be given below.

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LINE OF HOLES NO 1 TO 6 OF 1930-31 DRILLING (see Table No.1)

Full thickness of Drifts 6 holes, average value of 0.5 oz per cub.yd. over average depth of 181 feet.

Richer upper parts of drifts 5 holes, average value of 0.74oz.per cub. yd over average depth of 106 feet.

Line of holes Nos 1 to 6 of 1937 drilling and Nos 7 and 8 of 1930-31 drilling (see Tables No 1 and 2)

Full thickness of drifts 8 holes, average value of 1.36 oz per cub. yd. over average depth of 129.5 feet

Richer upper parts of drifts 6 holes, average value of 2.06 oz.per cub.yd. over average depth of 84.1 feet

Line of Holes No.7,8 and 9 of 1937 drilling (see Table No.2)

Full thickness of drifts , 3 holes, average value 1.99 oz. per cub.yd. over average depth of 112.7 feet

Richer upper parts of drifts 2 holes, average value of 2.27 oz per cub. yd. over average depth of 79.3 feet

BRISEIS CONSOLIDATED 1938 (see Table 3)

Line	Number of holes	Average value (lb.per.cub.yd.)	Average depth feet
No 1.	4	0.20 (3.2 oz)	28.1
No 2.	5	0.006 (0.1oz)	35.5
No.3	4	0.03 (0.50oz)	25.0

UTAH DEVELOPMENT, 1965 (see table No.4)

Details are available for only two holes (20 & 21) These averaged 0.03 lb per cub yd. (0.5 oz) over 110.5 feet.

The testing campaigns have, therefore, not given much information about the positions of the Main and Arba deep leads. The greatest depth of drifts proved was 203 feet in No.6 hole of the 1930-31 drilling. The Main lead is probably not far to the north or north-west of that hole. The Arba lead is possibly to the west of the No.8 hole of the 1930-31 drilling.

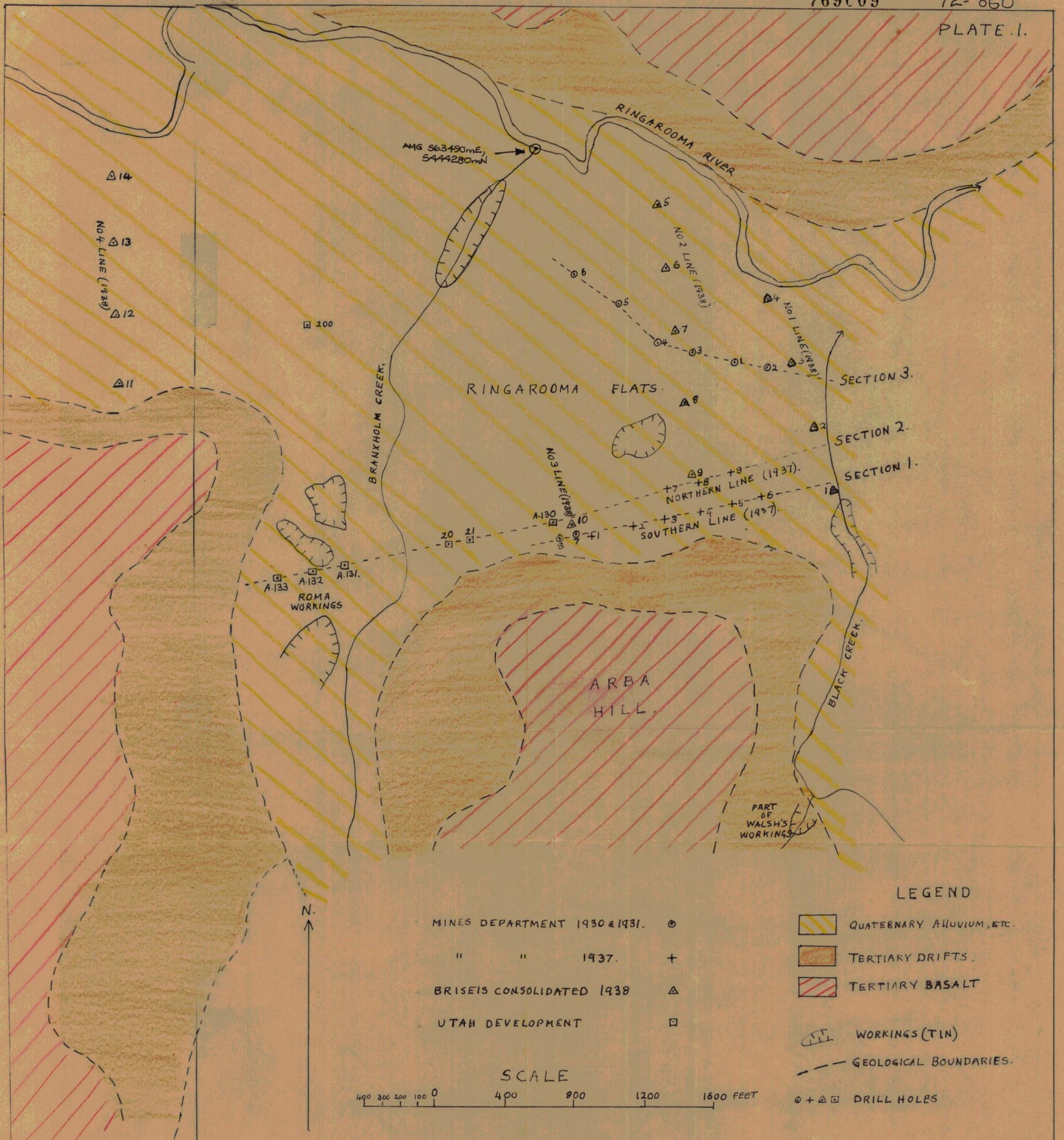
The tin contents of the drifts were generally low.The line of holes including the Nos 1 to 6 holes of the 1937 drilling and Nos 7 and 8 of the 1930-31 drilling fave the highest grade namely 1.36oz per cubic yard over and average depth of 129.5 feet. The highest grades for the full depth of drifts in any hole was for hole No.2 of the 1937 drilling, namely 2.91 oz. of tin oxide per cubic yard.

The upper parts of the drifts were, in general of higher grade than the lower parts. The highest grade for any part of a hole was 4.2 oz of tin oxide per cubic yard over the top 79¹/₃ feet in the No.2 hole of the 1937 drilling

Further drilling would be necessary to determine the positions and courses of the Arba and Main deep leads, and to determine the average grade and depth of the drifts to the north of Arba Hill and especially the grade and depth along the courses of the Arba and Main deep leads.

P. B. NYE

P. B. NYE.



MINES DEPARTMENT 1930 & 1931. ○
 " " 1937. +
 BRISELS CONSOLIDATED 1938 △
 UTAH DEVELOPMENT □

LEGEND

QUATERNARY ALLUVIUM, ETC.
 TERTIARY DRIFTS.
 TERTIARY BASALT
 WORKINGS (TIN)
 GEOLOGICAL BOUNDARIES.
 ○ + △ □ DRILL HOLES

SCALE
 400 800 1200 1600 FEET

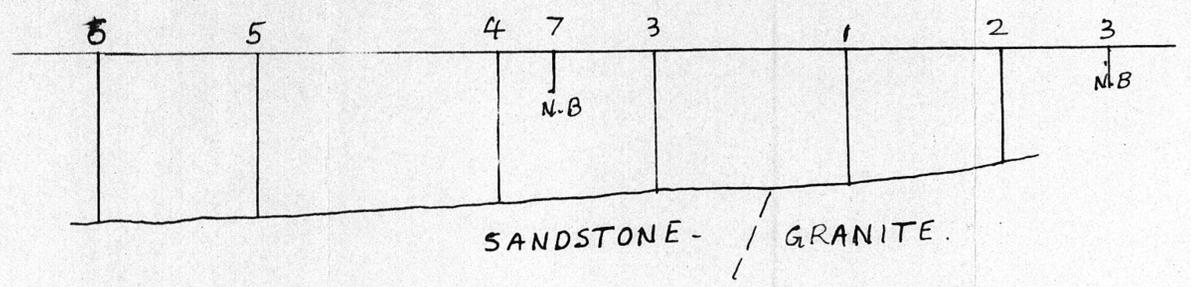
DRILLING CAMPAIGNS NORTH OF ARBA HILL
 (BASED ON EARLIER REPORTS & PLANS)

Abel
 28/2/72.

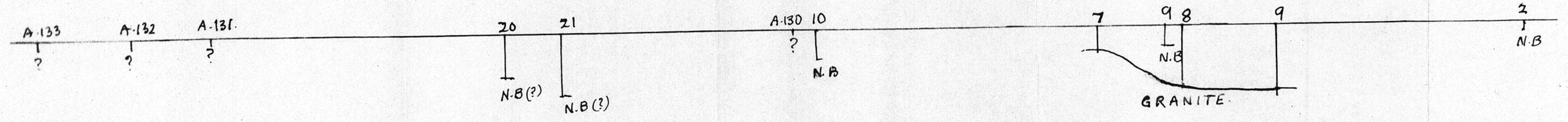
5 cm

AMG REFERENCE POINTS ADDED

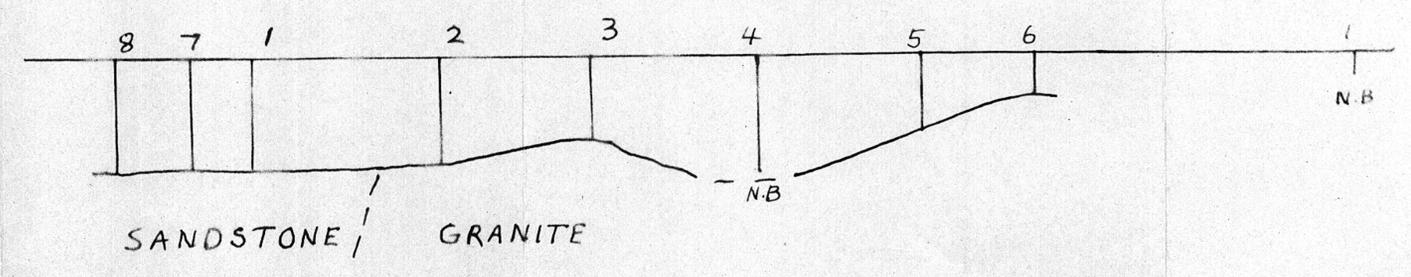
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SECTION No. 2.



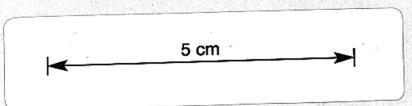
SECTION No. 1.



SECTION LINES.
DRILLING CAMPAIGNS NORTH OF ARBA HILL.

SCALE
1 INCH = 200 FEET.

N.B. NOT BOTTOMED.



AB, Kye.
28/2/72