

Minor Diamond Drilling Investigations

Pine Creek Area, N.T. 1978 - 79

by

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GATES PROSPECT, N.T. (TUNGSTEN)

Summary

Following an application for drilling assistance at Gates Prospect in March, 1978, the Drilling Section, Department of Mines and Energy, drilled two diamond holes, totalling 338 metres, between October and December, 1978.

Gates Prospect is one of a series of highly siliceous greisen or quartz rock bodies which lie along the western contact of the Yeuralba Granite. Wolfram mineralisation occurs where north-north-west shears and to a lesser extent north-east shears intersect the quartz rock bodies. Gates Prospect is the largest of these quartz rock bodies and was drilled to test its potential as a low-grade wolfram deposit.

Diamond drilling indicated that the quartz rock bodies were much smaller than previously estimated. No significant disseminated wolfram mineralisation was encountered in either the quartz rock bodies, the greisen, or the underlying granite, in the two drill holes.

As a result of diamond drilling Gates Prospect appears to have little potential as a low-grade wolfram deposit.

Introduction

An application for drilling assistance at MLs 201D - 206D, 254D and 255D and MC's 38D and 39D was made by W.J. Fisher on behalf of Secured Loans and Developments Limited in March, 1978. A drilling programme of 400 metres was subsequently approved. Diamond drilling was carried out between October and December, 1978 and consisted of two holes totalling 338 metres.

Location and Access

Map : Eva Valley 1:100,000 Topographic Survey Sheet 5469
Co-ordinates : Lat. 14° 15' 20"
 Long. 132° 43' 00"
Universal Grid Reference : KE 540224

Vehicle access from Katherine is by the Stuart Highway to the Maranboy turn-off. The gravel Maranboy road is followed for 17 kilometres to the Eva Valley turn-off, turning left the road is followed for 23 kilometres to another left turn-off, this track is followed for a further 16 kilometres to Gates Prospect. The last 5 kilometres of the track may become impassable during the "wet" season.

Geology

The geology of the Yeuralba wolfram deposits has been extensively described by Hossfeld (1939) and Shannon (1971) and a brief summary is given below.

Tourmaline and topaz-bearing lodes are located in, and immediately adjacent to, the western edge of the Yeuralba Granite. The granite is intruded into extensively altered greywacke and shale of the Lower Proterozoic Burrell Creek Formation, and is hydrothermally altered along major fracture zones trending north-east and north-north-west. Greisen, quartz-tourmaline and quartz-topaz-tourmaline lodes are closely associated with the fracture zones. In addition to wolfram, the lodes may contain some cassiterite, scheelite, fluorite, apatite and bismuth and copper minerals.

Gates Prospect has the largest surface expression of the quartz-tourmaline lodes and as such was considered to have potential as a low grade wolfram deposit. Known wolfram mineralisation at Gates is associated with cross-fractures and the richest section at Almych's open cut occurs at the intersection of two sets of fractures. All the workings at Gates appear to be close to either shale contacts or shale roof pendants in the quartz rock.

Previous Investigations

The Yeuralba field was worked for wolfram and tin between 1924 and the 1950's. Mining methods were limited to small-scale gouging from lode and eluvial material. Total recorded production up to 1952 was about 25 tonnes of WO_3 concentrates, and 12 tonnes of Sn concentrates, with recovered grades of 1.2% WO_3 and approximately 5% Sn.

The Yeuralba mineralisation was first described by Hossfeld (1939), the Bureau of Mineral Resources subsequently mapped and sampled the main mineralised occurrences (Walpole and Drew, 1935). The wolfram lodes were tested by Euralba Mining N.L. around 1970. In these investigations a bulk sample of ore, immediately south of Gates Prospect, was mined and the geology of the lodes was mapped in detail. More recently Secured Loans and Developments Limited and Nord Resources (Pacific Pty. Limited) have actively explored in the area.

Diamond Drilling Results

Two holes totalling 338 metres were completed by the Drilling Section. Excellent recovery was achieved throughout both holes but drilling progress was slow due to the hard and massive nature of the igneous rocks encountered. All core was geologically logged and 28 split core samples, representing all the quartz rock and greisen intersections in both drill holes, were forwarded to the East Point Laboratories, Department of Transport and Works for assay. The samples were assayed for tungsten only.

Both holes were sited to intersect several fracture zones and could be considered as testing the areas of greatest inferred potential for mineralisation within Gates Prospect.

D.D.H. 1 was inclined 60° on a bearing of 180° magnetic and drilled to a depth of 200 metres. Quartz lode material was intersected between 0 and 13.4 metres with further quartz-greisen between 13.4 and 25 metres. A pink-grey medium to coarse grained granite was intersected throughout the remaining 175 metres. No significant fracture zones were noted and similarly no wolframite was observed in any of the drill core. Assay results indicate no tungsten in either the quartz lode or the greisen.

D.D.H.2 was inclined 60° on a bearing of 90° magnetic and was drilled to a depth of 138 metres. Quartz lode was intersected between 0 and 5.5 metres, greisen between 5.5 and 30 metres and granite for the remainder of the hole. Again no significant fracture zones and no wolframite were observed in the drill core. Minor tungsten values were recorded between 2 and 4 metres.

Conclusions and Recommendations

Two diamond drill holes designed to test the potentially highest grade sections of Gates Prospect failed to intersect any significant tungsten mineralisation. Tungsten assay detection limits were unacceptably high but still have no bearing on the results as given. The drilling showed that the quartz lode and greisen bodies at Gates Prospect are much more limited than previously inferred and that surface cross-fracturing does not persist to any significant depth.

No further drilling at Gates Prospect is recommended as drilling has indicated that the prospect has no potential for the development of an economic low-grade, open-cut tungsten mining operation.

References

- | | | |
|---|------|--|
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APPENDIX I

GATES PROSPECT, YEURALBA N.T.

DIAMOND DRILL HOLE ASSAYS

<u>Hole</u>	<u>Interval</u> (metres)	<u>W%</u>	<u>Interval</u> (metres)	<u>W%</u>
<u>D.D.H.1</u>	0 - 1	-0.1	14 - 15	-0.1
	1 - 2	-0.1	15 - 16	-0.1
	2 - 3	-0.1	16 - 17	-0.1
	3 - 4	-0.1	17 - 18	-0.1
	5 - 6	-0.1	18 - 19	-0.1
	6 - 7	-0.1	19 - 20	-0.1
	7 - 8	-0.1	20 - 21	-0.1
	8 - 9	-0.1	21 - 22	-0.1
	9 - 10	-0.1	22 - 23	-0.1
	10 - 11	-0.1	23 - 24	-0.1
	11 - 12	-0.1	24 - 25	-0.1
	12 - 13	-0.1	25 - 26	-0.1
	13 - 14	-0.1	137.4-137.6	-0.1
	<u>D.D.H.2</u>	0 - 1	-0.1	15 - 16
1 - 2		-0.1	16 - 17	-0.1
2 - 3		0.2	17 - 18	-0.1
3 - 4		0.1	18 - 19	-0.1
4 - 5		-0.1	19 - 20	-0.1
5 - 6		0.1	20 - 21	-0.1
6 - 7		-0.1	21 - 22	-0.1
7 - 8		-0.1	22 - 23	-0.1
8 - 9		-0.1	23 - 24	-0.1
9 - 10		-0.1	24 - 25	-0.1
10 - 11		-0.1	25 - 26	-0.1
11 - 12		-0.1	26 - 27	-0.1
12 - 13		-0.1	27 - 28	-0.1
13 - 14		-0.1	28 - 29	-0.1
14 - 15	-0.1	29 - 30	-0.1	

NOTE: -0.1 denotes less than detection limit.

APPENDIX II

GATES PROSPECT, YEURALBA N.T.

GEOLOGICAL DRILL LOG SUMMARIES

<u>Interval</u> (metres)	<u>D.D.H.1</u>
0 - 13.4	Quartz - Aplite <u>lode?</u> with inclusions and blebs of tourmaline. 10.75 - 10.9m Quartz filled fracture with mica and tourmaline.
13.4 - 15.6	Quartz-mica-epidote-feldspar <u>greisen</u> .
15.6 - 17.0	Quartz-feldspar-epidote <u>greisen</u> with numerous dark blebs of tourmaline.
17.0 - 19.3	As for 13.4 - 15.6m. Some blebs of dark tourmaline.
19.3 - 24.0	Quartz-mica-epidote-limonite <u>lode?</u> with some inclusions of tourmaline.
24.0 - 24.5	<u>Quartz-mica-tourmaline rock</u> .
24.5 - 199.7	Quartz-mica-feldspar <u>greisen</u> grading to <u>medium grained granite</u> at 25.0m Then pinkish grey medium to coarse grained granite. Some narrow tourmaline and mica-rich bands. 136.2-137.4m Pegmatite consisting predominantly of pink K-feldspar with minor inclusions of epidote. 137.4-137.6 Quartz-feldspar-mica-tourmaline vein.

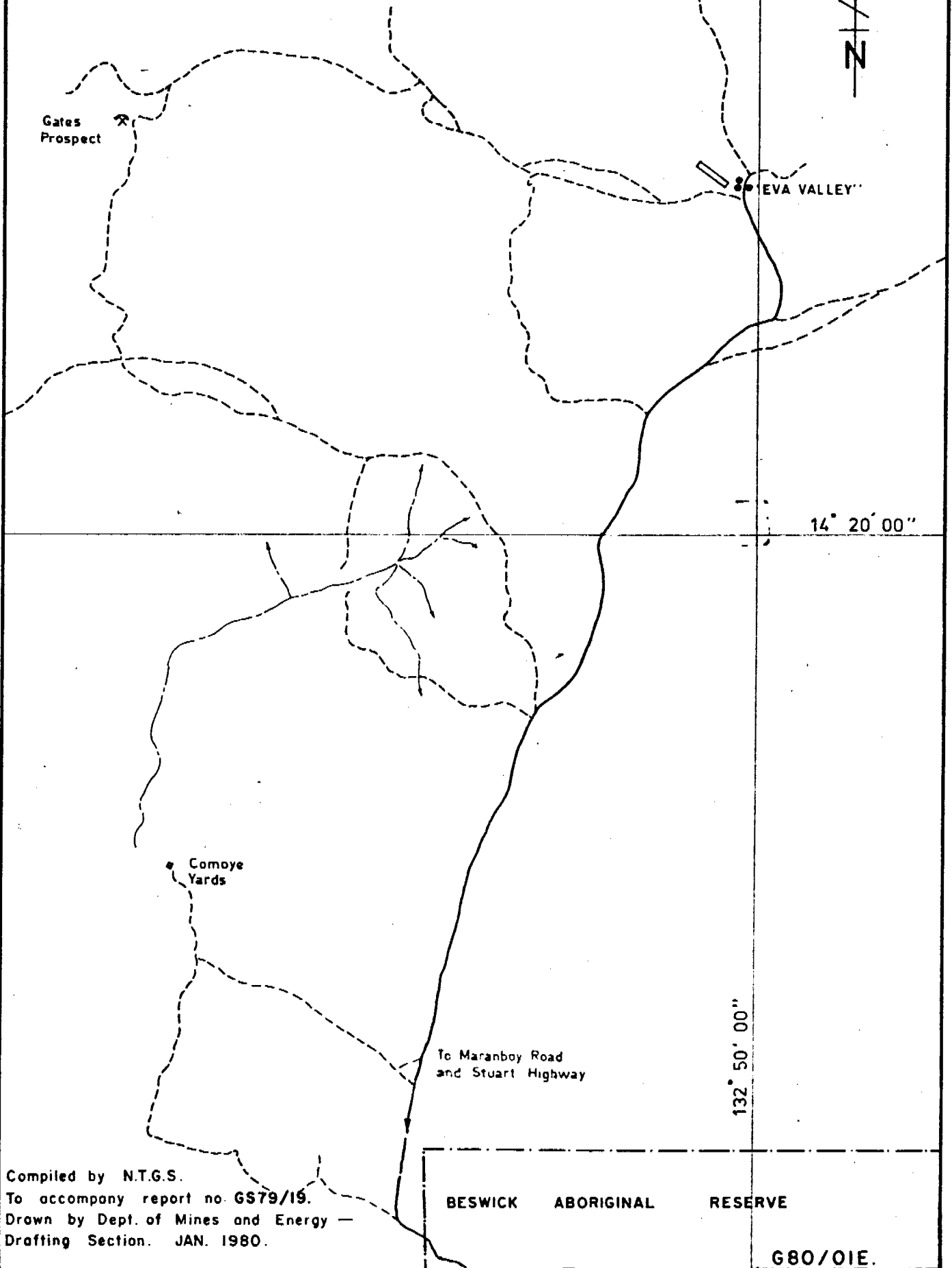
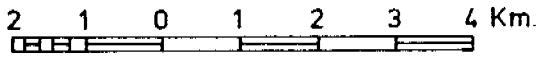
D.D.H.2

0 - 5.5	Very broken quartz-aplite <u>lode?</u> with some inclusions of coarse tourmaline.
5.5 - 11.6	Quartz-mica-limonite-tourmaline <u>greisen</u> , very broken in some sections.
11.6 - 23.0	Quartz-mica greisen.
23.0 - 30.35	Quartz-mica-feldspar greisen.
30.35-138.4	Grey and then pink medium-coarse grained <u>granite</u> .

LOCATION PLAN - GATES PROSPECT -
YEURALBA. N.T.

PLATE 1.

Scale 1:100,000

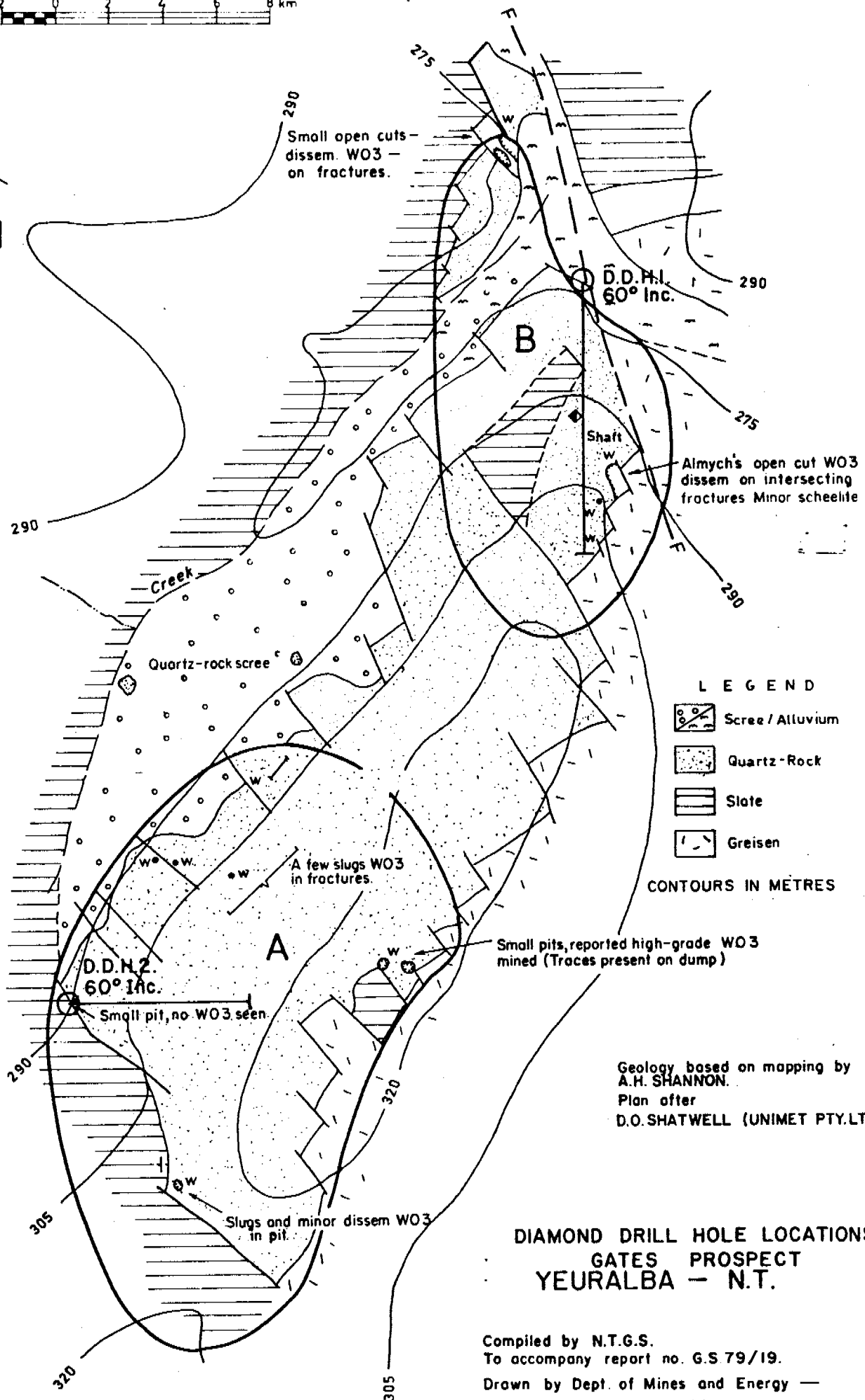
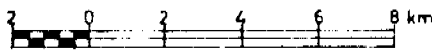


Compiled by N.T.G.S.
To accompany report no. GS79/19.
Drawn by Dept. of Mines and Energy -
Drafting Section. JAN. 1980.

BESWICK ABORIGINAL RESERVE

G80/OIE.

Scale 1:2,000



LEGEND

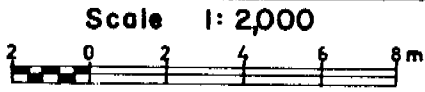
- Scree / Alluvium
- Quartz-Rock
- Slate
- Greisen

CONTOURS IN METRES

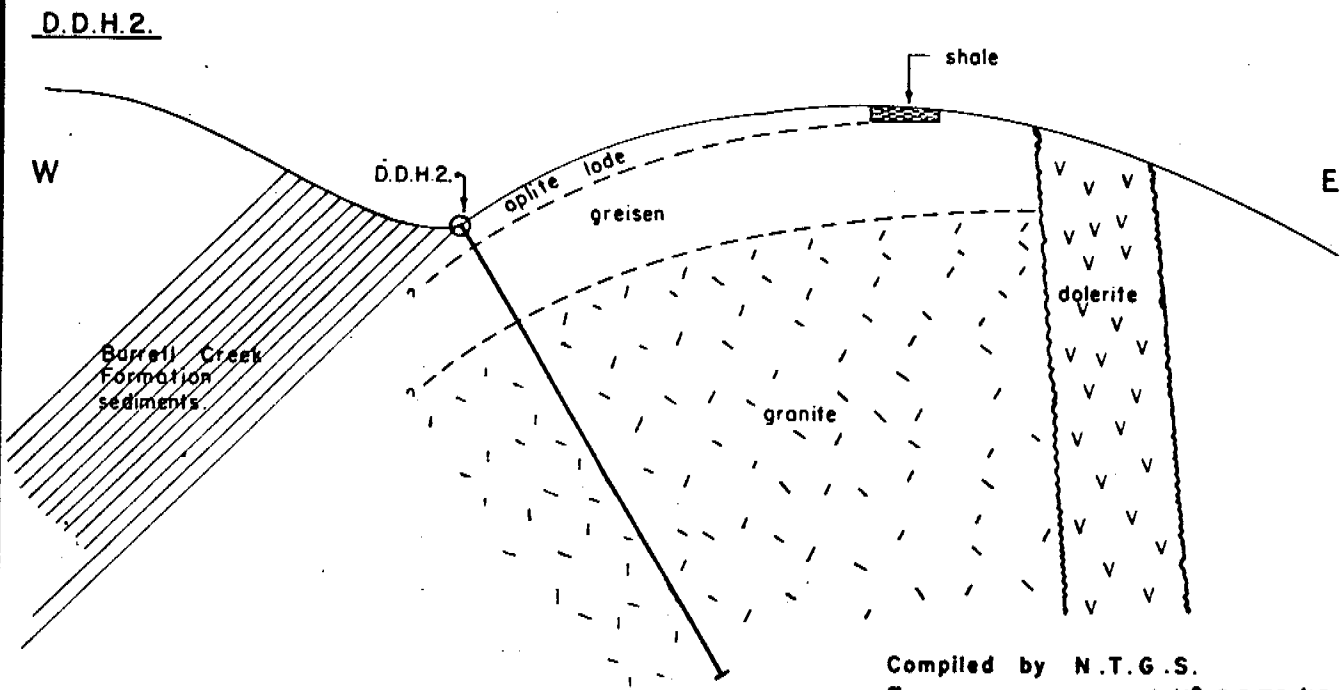
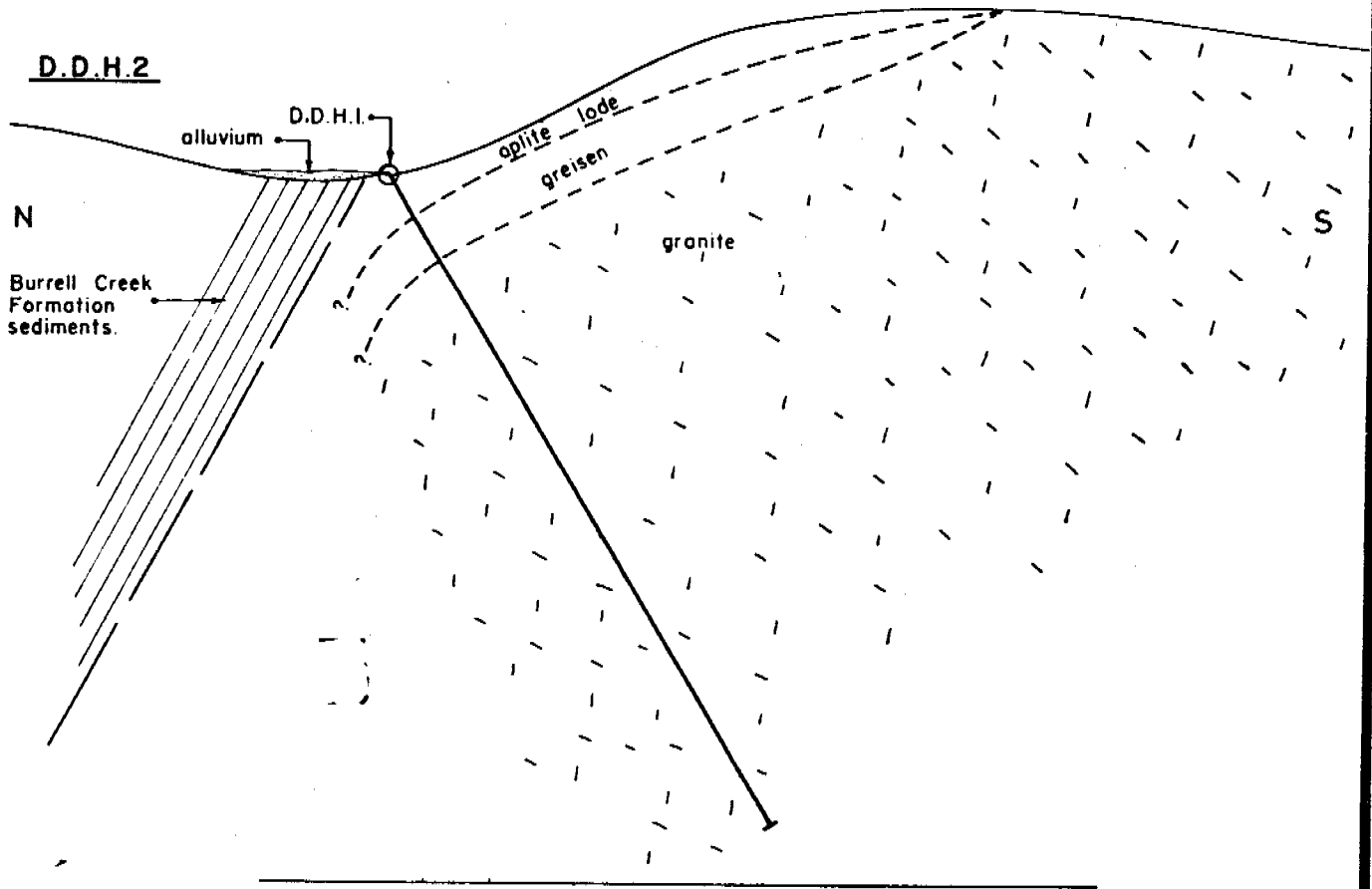
Geology based on mapping by
 A.H. SHANNON.
 Plan after
 D.O. SHATWELL (UNIMET PTY.LTD.)

**DIAMOND DRILL HOLE LOCATIONS
 GATES PROSPECT
 YEURALBA - N.T.**

Compiled by N.T.G.S.
 To accompany report no. G.S 79/19.
 Drawn by Dept. of Mines and Energy —
 Drafting Section. JAN. 1980.



IDEALISED DRILL SECTIONS
GATES PROSPECT
YEURALBA - N.T.



Compiled by N.T.G.S.
To accompany report N° G.S.79/19.
Drawn by Dept. of Mines and Energy
Drafting Section. JANUARY 1980.

ROSEMARY MINE, N.T.

SUMMARY

Following an application in April, 1979 for further drilling assistance at the Rosemary Tin Mine, Department of Mines and Energy, Drilling Section drilled one 100 metre hole in 1979.

Tin mineralisation was intersected in the drill hole in quartz veins between 78.5 and 78.8 metres and in highly sheared carbonaceous pyritic shale between 79.4 and 80.7 metres.

Indicated reserves of approximately 20 tonnes of contained tin have been defined between the surface and tin lode intersections in D.D.H. 5 (previous drilling) and D.D.H.6 (1979 drilling).

INTRODUCTION

An application for further drilling assistance at ML 227A was made by the leaseholder M.R. Millwood in April, 1979. This application was subsequently approved. D.D.H. 6 totalling 100 metres was drilled to test for a northern extension of the mineralised lode in 1979.

LOCATION AND ACCESS

Map : McKinlay River 1:100,000 Topographic Sheet 5271 Series R621

Co-ordinates: Lat. 13° 24' 30"

 Long. 131° 46' 20"

Universal Grid Reference : HL 002161

Vehicle access from Darwin is by the Stuart Highway to the Fountainhead turn-off and then by gravel road via Mt. Wells. The turn-off to the mine is about 15 kilometres from Mt. Wells on the Mt. Harris road. A track leading south-east and then south from the turn-off for about 3 kilometres leads to the mine. The McKinlay River crossing 13 kilometres from Mt. Wells is often impassable during the "Wet" season.

GEOLOGY

The geology of the mine area has been previously described by Newton and Shields (1977), however regional mapping by the Bureau of Mineral Resources in 1979 has resulted in a revision of the stratigraphic units in the area.

Briefly the mine is now considered to lie close to the contact between the Kapalga Formation and the Gerowie Tuff and some tuff marker beds have been noted within the sedimentary units in the mine area.

PREVIOUS WORK

Previous work between 1967 and 1976 has been summarised by Newton and Shields (1977). Details of diamond drilling carried out during 1976 are included in the same report.

In 1977 295 tonnes of ore were treated to yield 0.92 tonnes of tin, whilst operations ceased at the mine in 1978. Mining re-commenced in 1979 and 717 tonnes of ore were treated to yield approximately 2.35 tonnes of tin.

The 1979 operations effectively exhausted reserves in the southern section of the lode which prompted the drilling of the northern extension of the lode with a view to determining whether a viable, limited-scale, underground mining operation could be undertaken.

DIAMOND DRILLING RESULTS

One 100 metre drill hole was completed by the Drilling Section in 1979. Apart from some losses in weathered near surface material good core recovery was achieved despite fairly difficult drilling conditions. All core was geologically logged and 11 split core samples were forwarded to the East Point Laboratories, Department of Transport and Works for assay. The samples were assayed for tin only.

D.D.H.6 The hole was designed to test the continuation of the lode 60 metres north of the most northern lode outcrop at a vertical depth of 60 metres.

Interbedded carbonaceous shales and silicified siltstones or fine-grained tuffs were encountered throughout the hole. Two zones of tin mineralisation were intersected. Between 78.5 and 78.8 metres some narrow quartz veins with abundant pyrite were encountered which assayed 0.42% tin between 78.4 and 78.9 metres. The main lode zone was intersected between 79.4 and 80.7 metres and consisted of a highly sheared carbonaceous shale with abundant pyrite and graphite. A best assay of 0.51% tin was recorded over the interval 79.4 to 79.9 metres. Combining both mineralised sections a lode zone of true width 2.3 metres and average assay value 0.23% tin has been defined over the interval 78.4-80.9 metres.

D.D.H.6 provided the first lode intersection in relatively fresh rock from the mine. That the main lode zone occurs within a pyritic and graphitic carbonaceous shale may be coincidental, however it may indicate that the lode is confined to a particular sedimentary unit. Further drilling investigations in fresh rock should clarify any such association.

INDICATED RESERVES

From the lode intersections in D.D.H.6 and D.D.H.5 (1976 investigations) it is possible to reasonably estimate continuous ore reserves bounded by the surface and the lode intersections in the two holes over a strike length of 65 metres. The following broad assumptions have been made in the calculation of ore reserves:

- average true width of lode 0.5 metres
- average grade of lode 0.5% Sn.
- lode density 2.8 gm/cm².

Volume of lode material 1380 cubic metres

Tonneage 3864 tonnes

Contained tin 19.32 tonnes

Further to the above indicated reserves a further 30,000 tonnes of lode material are inferred for 230 metres along strike south-east of D.D.H.5 and to a depth of 100 metres below the lode intersections in D.D.H.'s 5 and 6.

CONCLUSIONS AND RECOMMENDATIONS

Diamond drilling investigations during 1979 have confirmed a northern continuation of the lode zone at the Rosemary tin mine and have established indicated reserves of approximately 19 tonnes of contained tin over a 65 metre strike length.

The lode zone is still open north-west along strike from D.D.H.6 and further drilling is warranted. A diamond drill hole 100 metres north-west along strike from D.D.H.6 is recommended to test the continuity of the lode and to confirm whether the lode is confined to a specific stratigraphic unit as suggested in D.D.H.6. The hole should be designed to test the lode at a vertical depth of not less than 60 metres.

REFERENCES

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N.T. Geol. Surv. Rept.
 G.S. 77/7 (unpubl.)

APPENDIX I

ROSEMARY TIN MINE N.T.

DIAMOND DRILL HOLE ASSAYS

D.D.H.6

<u>Interval</u> (metres)	<u>Tin</u> (ug/g)
28.5 - 29.1	70
37.0 - 38.2	160
38.2 - 28.6	14
42.5 - 42.8	200
78.4 - 78.9	4200
78.9 - 79.4	90
79.4 - 79.9	5100
79.9 - 80.4	1000
80.4 - 80.9	1100
80.9 - 81.4	250
81.4 - 81.7	120

APPENDIX II

ROSEMARY TIN MINE, N.T.

GEOLOGICAL DRILL LOG SUMMARY

<u>Interval</u> (metres)	D.D.H.6
0 - 28.5	No core recovery.
28.5 - 29.1?	<u>Quartz vein</u> with limonite and clay filled cavities.
29.1?- 32.2	Red brown friable <u>claystone</u> .
32.2 - 37.1	Fawn oxidised <u>siltstone</u> .
37.1 - 38.2	Broken <u>quartz vein</u> material.
38.2 - 38.6	Broken <u>quartz vein</u> material.
38.6 - 42.5	Oxidised shale with narrow sandy interbands, some narrow iron-rich bands after syngenetic pyrite. Moderately fractured, fractures iron-stained.
42.5 - 42.8	Broken <u>quartz</u> material with limonitic boxworks.
42.8 - 45.8	Oxidised <u>shale</u> with narrow sandy interbands. Moderately fractured, fractures iron stained and filled.
45.8 - 49.3	Mid grey <u>silicified siltstone / fine-grained tuff?</u>
49.3 - 56.2	Grey <u>carbonaceous shale</u> with narrow lighter sandy bands, occasional chert pebbles, some narrow pyrite bands. Note: pyrite seems to be concentrated in sandier bands. Strongly graphitic along fracture and shear planes.
56.2 - 57.7	Fine grained <u>silicified siltstone / tuff?</u>
57.7 - 58.5	Grey <u>carbonaceous shale</u> as for 49.3 - 56.2m
58.9 - 59.2	Grey <u>silicified siltstone/tuff?</u> as for 45.8 - 49.3m
59.2 - 69.5	Grey <u>carbonaceous shale</u> with narrow lighter sandy interbands, numerous narrow syngenetic pyrite veins. Some chert pebbles. Some narrow quartz veins.
69.5 - 70.7	Grey <u>silicified siltstone/fine grained tuff?</u>
70.7 - 71.5	Grey <u>carbonaceous shale</u> with some brecciated fragments.
71.5 - 79.4	As for 59.2 - 69.5m. Some narrow brecciated quartz veins to 2cm. thick with chlorite and shale fragments. 5cm. quartz vein at 74.9m 78.5-78.8m. Some narrow quartz veins with abundant pyrite. 79.0-79.4m. Highly fractured and graphitic.
79.4 - 80.7	<u>Lode zone</u> . Highly sheared <u>carbonaceous shale</u> with abundant pyrite and graphite.

D.D.H.6 (contd)

Interval
(metres)

- 80.7 - 81.9 Moderately sheared carbonaceous shale, graphite along shears and some pyrite associated with quartz veining.
- 81.9 - 98.0 Grey silicified, chloritized siltstone/fine grained tuff? with numerous bands of spotted tuff and occasional carbonaceous shale bands. Some coarse tuffaceous bands.
Cavity at 93.2m.
- 98.0 - 99.7 Grey carbonaceous shale with numerous quartz veins.

APPE DIX 3

ESTIMATE OF ORE RESERVES

ROSEMARY TIN MINE, N.T.

Using information obtained from diamond drilling in 1976 and 1979, sampling by United Uranium N.L. in 1967, and mining information over the period 1967 - 1979 an estimate of reserves of tin contained in the northern section of the lode has been made. The estimate is considered conservative but because of the variable nature of the lode and the limited drill hole information it must be emphasised that it is an estimate only. The southern section of the lode is effectively worked out. The southern lode appears to be terminated by a joint or fault and the joint/fault - lode intersection plunges at a shallow angle to the north. The implied continuation of this feature or an arbitrary depth of approximately 100 metres has been taken as the limit of the lode in the northern section. It is emphasised that the lode is still open north of D.D.H. 6 (Plate 1).

The following assumptions have been made in the calculation of ore reserves:

average width of lode 0.5 metres
average grade of lode 0.5% Sn.
average dip of lode 65° to the NE
lode density 2.8 gm/cm³
price of tin \$14,000 per tonne

It should be further noted that although no lode intersection was recorded in D.D.H. 4 there was a total core loss between 20.2 - 22.6 metres which is where the lode is projected to occur.

Indicated Reserves (1)

These are calculated on an assumed continuity of the lode from the surface to the lode intersections in D.D.H.'s 5 and 6 and a continuity of the lode along the strike between these two drill holes.

Volume of lode material - $65\text{m} \times 25\text{m} \times 0.5\text{m} + 35\text{m} \times 65\text{m} \times 0.5\text{m}/2$
= 1380 cubic metres approx.

Tonnage	1380×2.8	3864 tonnes
Contained tin	$3864 \times 0.5\%$	19.32 tonnes
Value	$19.32 \times \$14000$	\$270,480

Inferred Reserves (2) & (3) (See Plate 2)

Block (2)

Volume of lode material - $35\text{m} \times 65\text{m} \times 0.5\text{m}/2 + 45\text{m} \times 65\text{m} \times 0.5\text{m}$
= 2030 cubic metres approx.

Tonneage	2030 x 2.8	5684 tonnes
Contained tin	5684 x 0.5%	28.42 tonnes
Value	28.42 x \$14000	\$397,880

Block (3)

Volume of lode material - 230m x 39m x 0.5m + 205m x 66m
x 0.5m/2 + 25m x 66m x 0.5m
= 8690 cubic metres approx.

Tonneage	8690 x 2.8	24332 tonnes
Contained tin	24332 x 0.5%	121.66 tonnes
Value	121.66 x \$14000	\$1,703,240

Total reserves

	<u>Lode material</u>	<u>Contained tin</u>	<u>Value</u>
Indicated	3864 tonnes	19.32 tonnes	\$270,480
Inferred	30016 tonnes	150.08 tonnes	\$2,101,120
Indicated & inferred	33880 tonnes	169.40 tonnes	\$2,371,600

-----ooOoo-----

As a comparison only, an estimate of reserves in the interval C'D (Plate 2) to a depth of 40 metres based on surface channel sampling by United Uranium N.L. in 1967 gives significantly higher values. A weighted average of 6 channel samples over the interval C'D gave an average width of lode of 0.6 metres with an average grade of 3.25% Sn. Assuming values persist to 40 metres then:

Block (4)

Volume of lode material	35m x 40m x 0.6m	840 cubic metres
Tonneage	840 x 2.8	2352 tonnes
Contained tin	2352 x 3.25%	76.44 tonnes
	76.44 x \$14,000	\$1,070,160

It is seen on this estimate that block 4 contains two-thirds the quantity of tin estimated for block 3 in the previous estimates. This example has been given simply to show the wide possible variations in estimates occasioned by limited sample information and the variable nature of the lode.

More detailed information on sampling and drilling results is available in the following references:

Company Report CR 67/38
N.T.G.S. Reports GS 77/7, GS 79/19

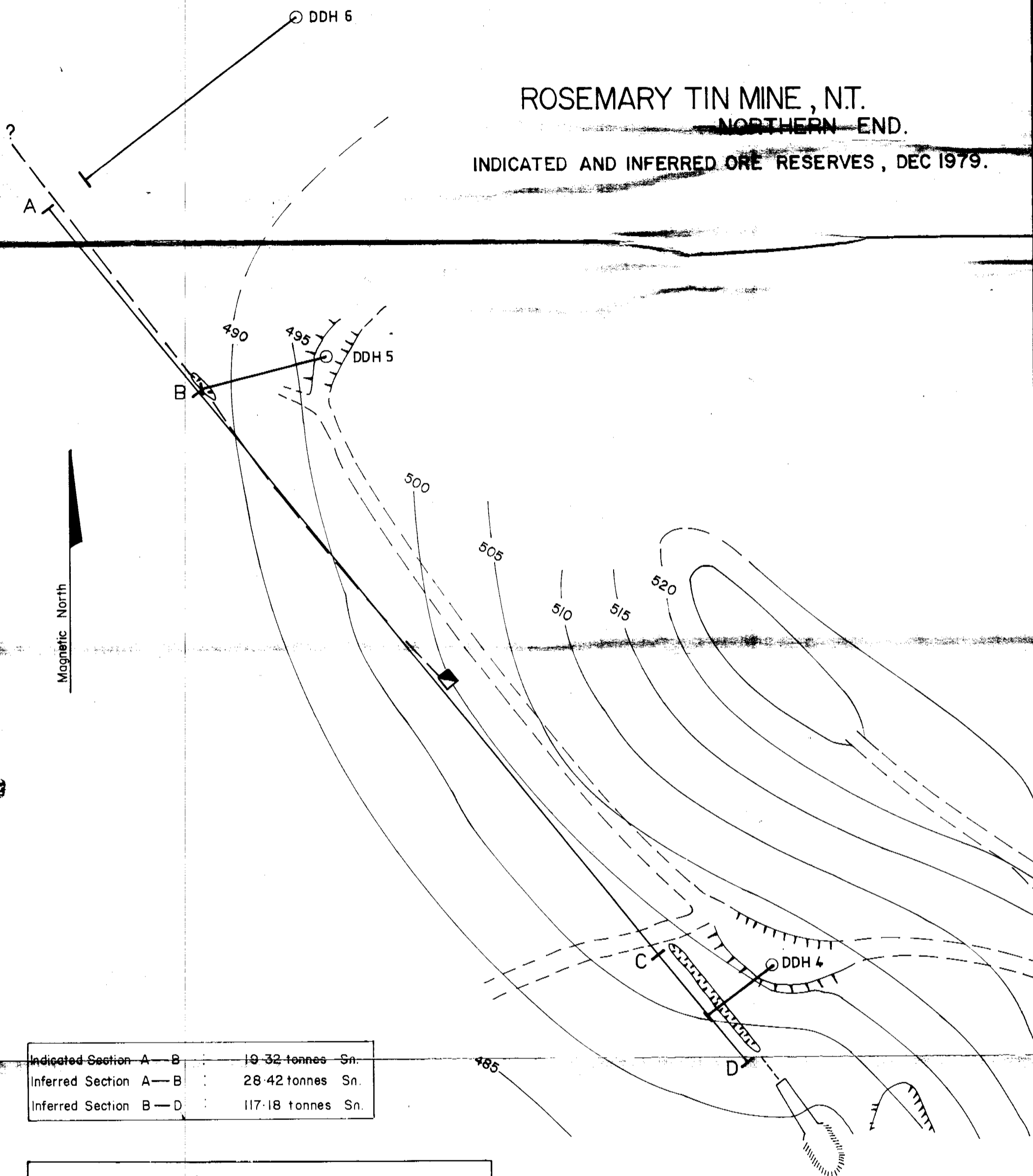
A.W. Newton

A.W. NEWTON
(Geologist)

28/12/79

ROSEMARY TIN MINE, N.T.
NORTHERN END.

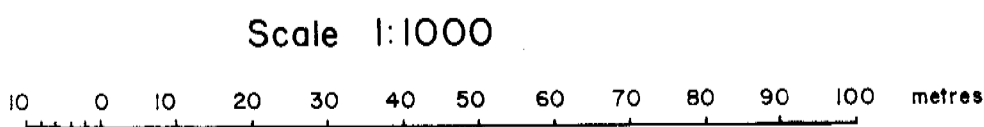
INDICATED AND INFERRED ORE RESERVES, DEC 1979.



Indicated Section A—B	19.32 tonnes Sn.
Inferred Section A—B	28.42 tonnes Sn.
Inferred Section B—D	117.18 tonnes Sn.

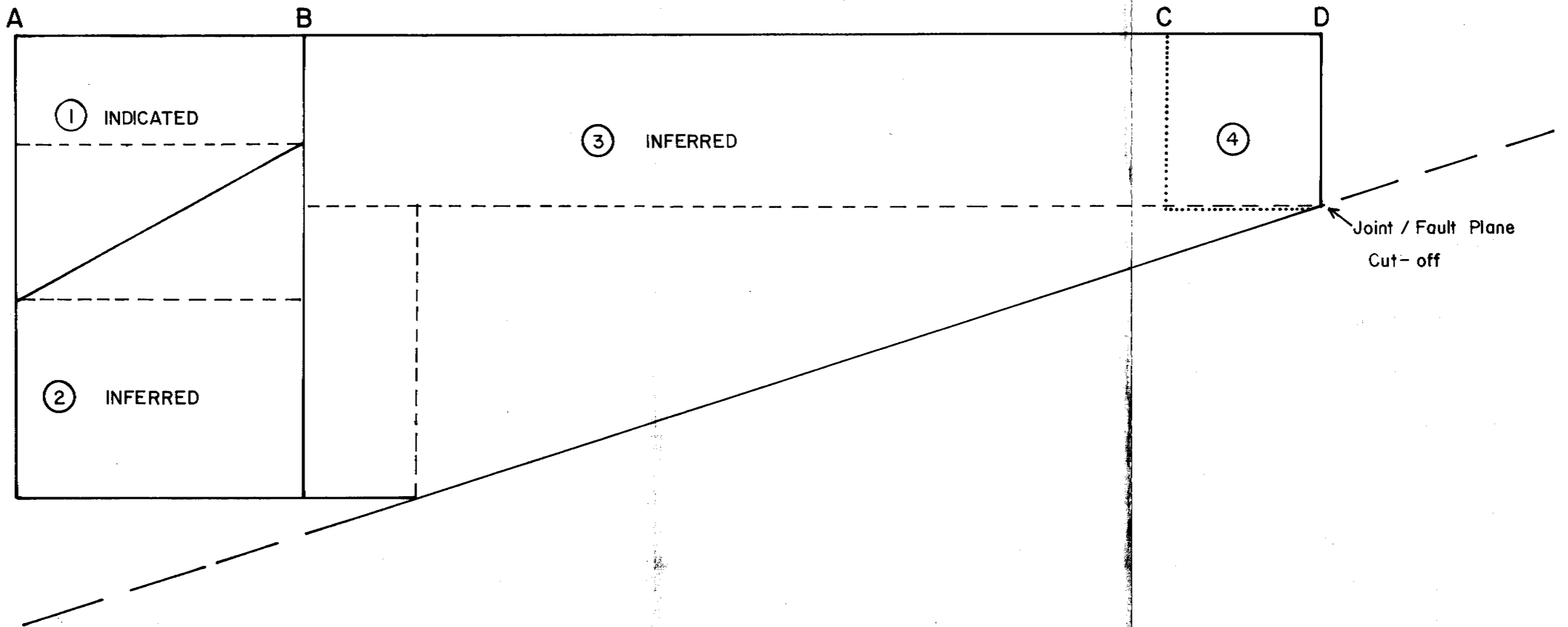
Reference

- Vertical Shaft
- Adit
- Dump or Fill
- Open Cut or Pit
- Diamond Drillhole
- 500 Topographic Contour. (Relative Elevation in Metres)



ROSEMARY TIN MINE — NORTHERN END

ORE BLOCK DIAGRAM



— Lines enclosing ore blocks
- - - Lines for calculations only
..... Line for comparative estimate only

Scale 1:1000

10 0 10 20 30 40 50 60 70 80 90 100 metres

APPENDIX 4

SUMMARY OF TIN PRODUCTION

ROSEMARY TIN MINE, N.T.

<u>Date</u>	<u>Miner</u>	<u>Ore</u> (tonnes)	<u>Concentrate</u> (tonnes)	<u>Tin Content</u> (tonnes)	<u>Tin %</u>
20/7/67	Touhy	145.6	5.23	1.74	1.20
2/11/67	"	103.9	2.36	1.27	1.22
16/7/68	"	260.0	3.44	1.67	0.64
22/10/69	"	116.0	1.93	0.86	0.74
17/4/69	"	69.7	3.16	1.40	2.01
22/10/69	"	60.0	0.61	0.28	0.47
19/3/70	"	15.0	0.71	0.34	2.27
16/9/70	Ah Toy	97.0	1.41	0.97	1.00
9/10/72 *	Casey	308.0	0.55	0.36	0.12
31/7/73 *	"	575.0	1.38	0.59	0.10
23/5/74 *	"	175.0	0.56	0.31	0.18
26/5/76 *	Millwood	141.0	0.30	0.19	0.13
13/7/76	"	215.0	7.05	4.56	2.12
7/11/76	"	274.0	3.39	1.94	0.71
May/June 77*	"	170.0	0.95	0.51	0.30"
Sept 77 *	"	125.0	0.79	0.41	0.33
May 79 *	"	205.0	0.48	0.23	0.11
June 79 *	"	217.0	0.76	0.41	0.19
Aug 79 *	"	94.0	0.35	0.17	0.18
Nov 79	"	201.0	3.2 (approx. 48% Sn)	1.54	0.76
	TOTAL	3567.2	38.61	19.75	0.55
	TOTAL (excluding development dirt)	1547.2	32.49	16.57	1.07
	Millwood TOTAL	1642.0	17.27	9.96	0.61
	TOTAL (excluding development dirt)	690.0	13.64	8.04	1.17

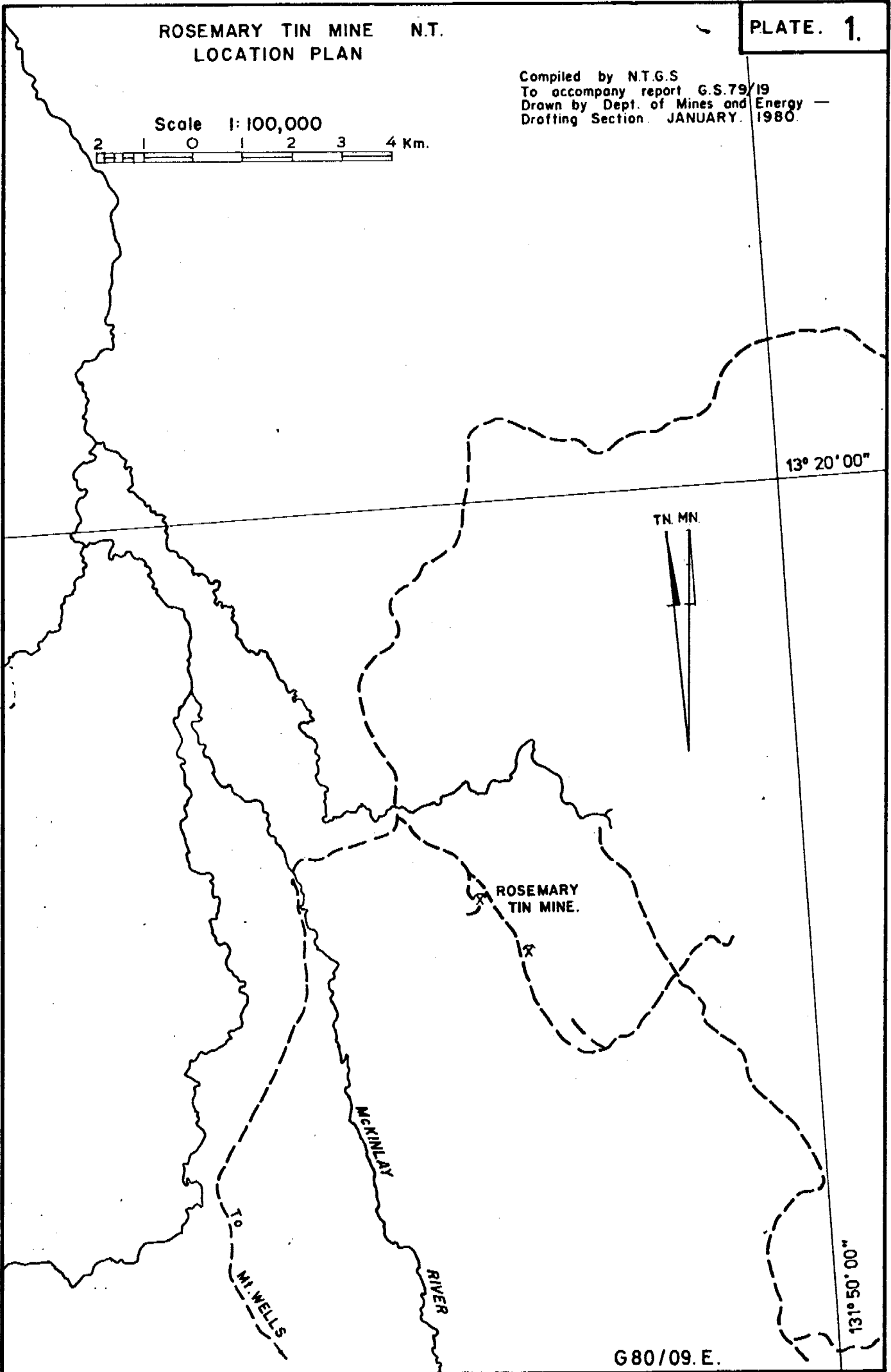
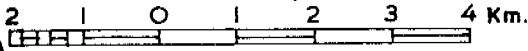
* Development dirt

ROSEMARY TIN MINE N.T.
LOCATION PLAN

PLATE. 1.

Compiled by N.T.G.S
To accompany report G.S.79/19
Drawn by Dept. of Mines and Energy —
Drafting Section. JANUARY. 1980.

Scale 1:100,000



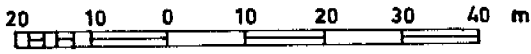
G80/09.E.

DIAMOND DRILL HOLE
LOCATION PLAN
ROSEMARY TIN MINE N.T.

Compiled by N.T.G.S.
To accompany report G.S.79/19

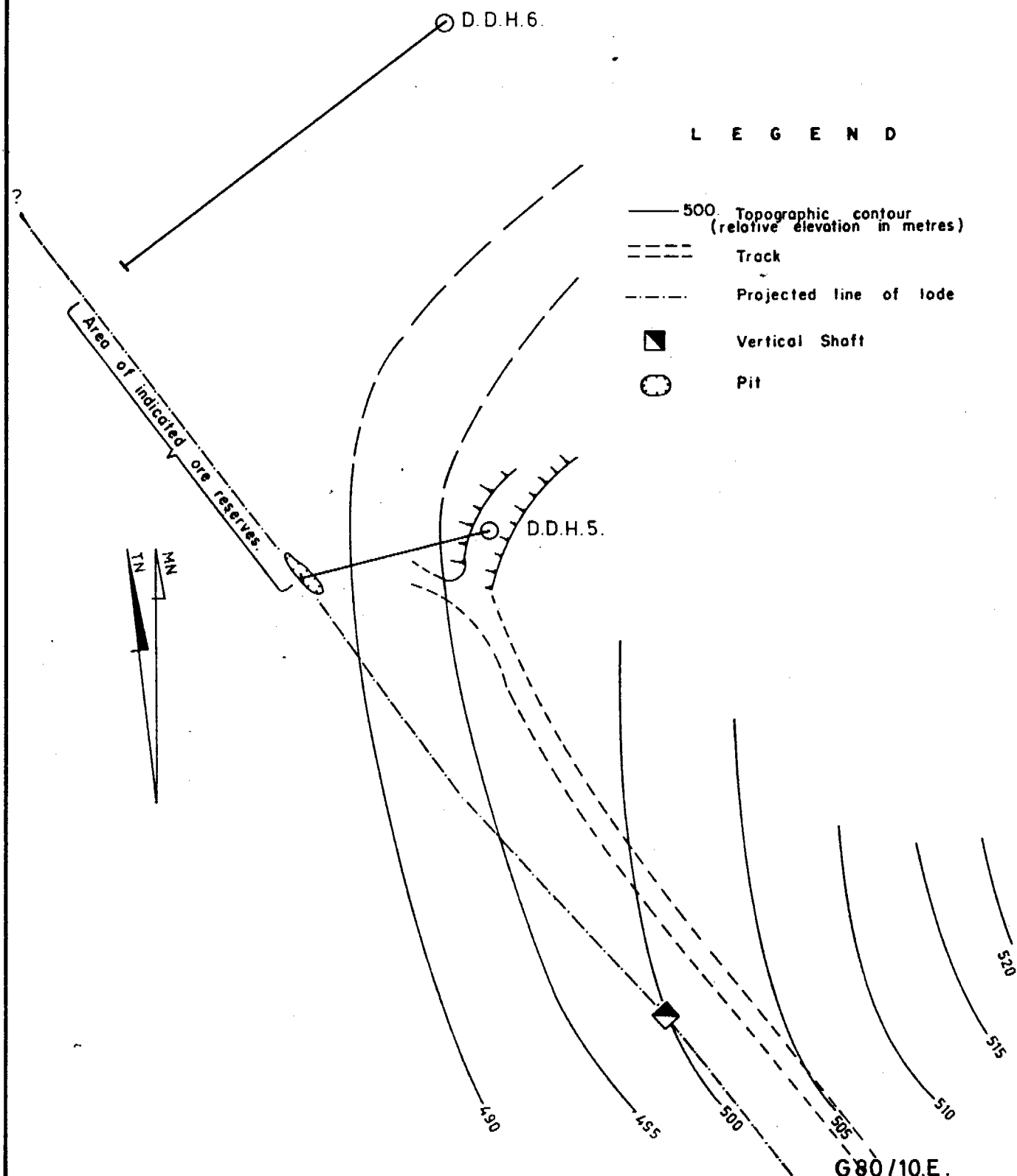
Drawn by Dept. of Mines and Energy
Drafting Section. JANUARY. 1980.

Scale 1:1000



L E G E N D

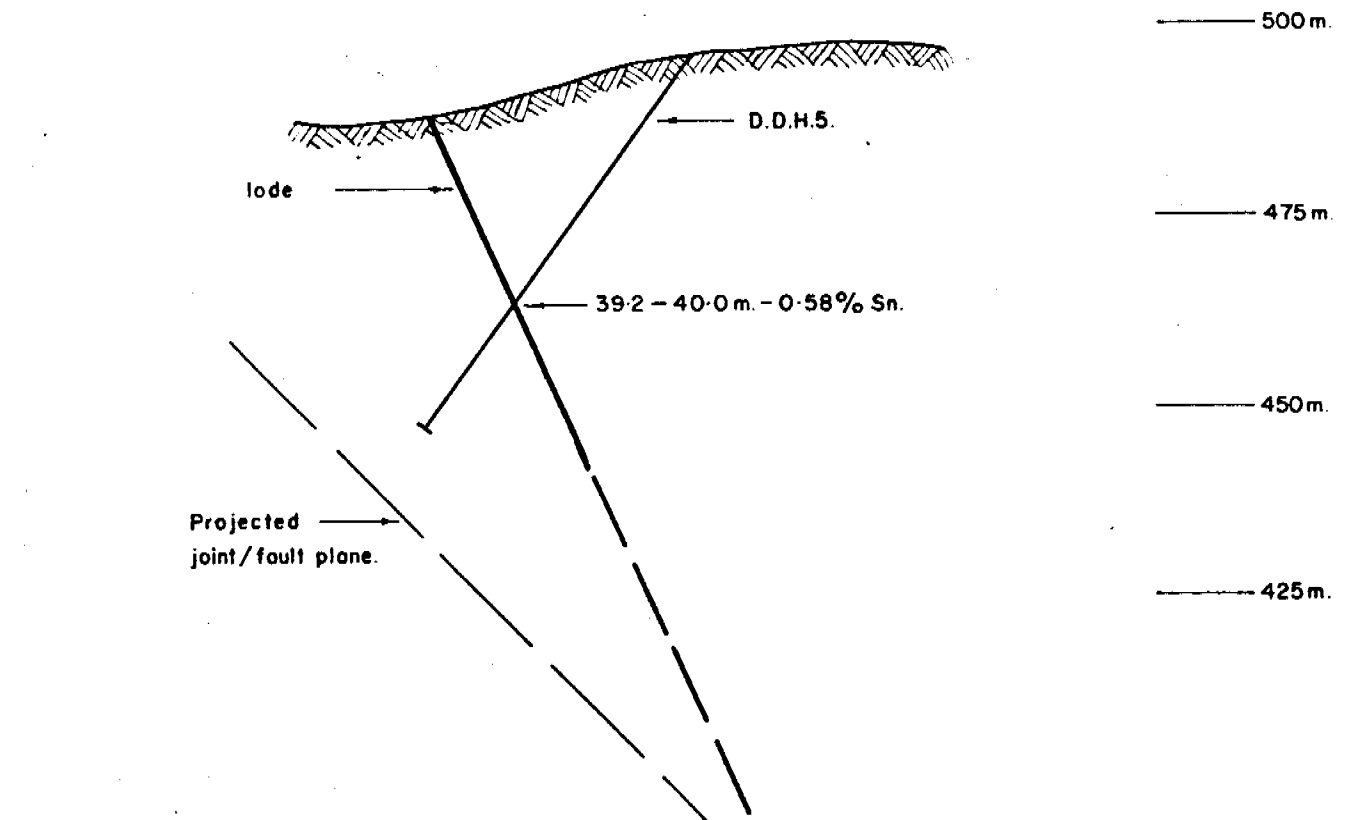
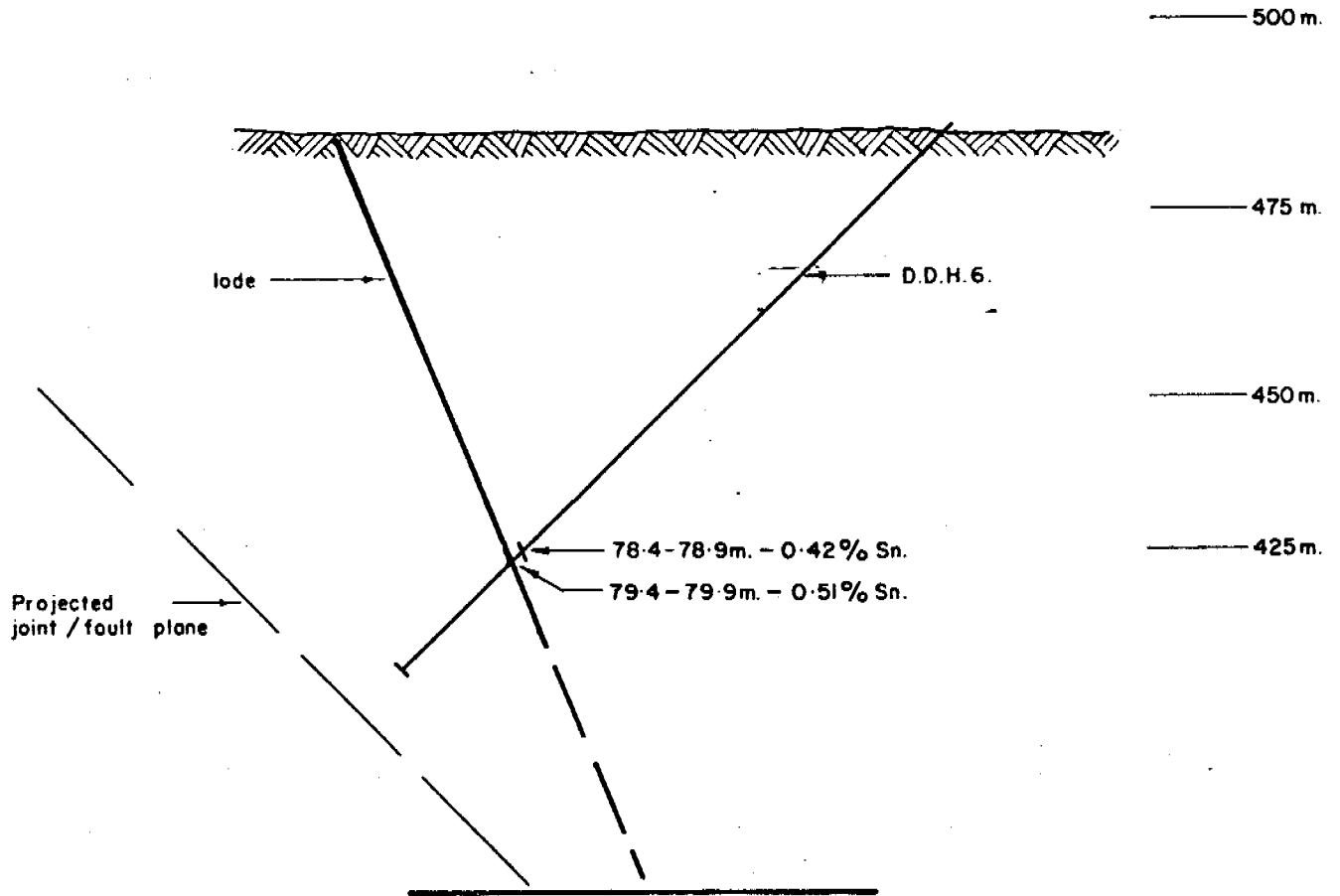
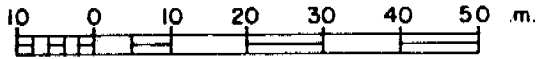
- 500 Topographic contour (relative elevation in metres)
- - - Track
- · - · Projected line of lode
- ▣ Vertical Shaft
- Pit



DRILL SECTIONS
D.D.H.s 5 & 6.
ROSEMARY TIN MINE. N.T.

Compiled by N.T.G.S.
To accompany report G.S.79/19.
Drawn by Dept of Mines and -
Energy Drafting Section.
JANUARY, 1980.

Scale 1:1,000



ELIZABETH MINE, N.T. (GOLD)

Summary

Following an application for drilling assistance at the Elizabeth Gold Mine in September, 1978, the Drilling Section, Department of Mines and Energy, drilled one diamond drill hole totalling 61 metres in August, 1979.

A three hole drilling programme had been planned to test a series of parallel quartz lodes in the mine area but due to logistical problems the programme was deferred on completion of the first hole.

Although no gold mineralisation was intersected in the one drill hole, the quartz lodes were seen to persist to some depth. In view of the reasonable size potential of the Elizabeth Mine completion of the original drilling programme is warranted.

Introduction

An application for drilling assistance at GML 180B was made by the leaseholder R.M. Biddlecombe, in September, 1978. A drilling programme of three holes totalling 200 metres was subsequently approved. One diamond drill totalling 61 metres was completed in August, 1979 at which time the remainder of the drilling programme was deferred because of logistical problems.

Plane table mapping of surface workings and environs was undertaken by officers of the Northern Territory Geological Survey in April, 1979.

Location and Access

Map : Pine Creek 1:100,000 Topographic Survey Sheet 5270

Co-ordinates : Lat. 13° 39' 20"

Long. 131° 45' 15"

Universal Grid Reference : GL979888

Vehicle access from Darwin is by the Stuart Highway to the Fountainhead turn-off and then by gravel road to Burrundie Siding. Heading south along the gravel Burrundie-Pine Creek road the mine is about one kilometre west of the road some 16 kilometres from Burrundie Siding. Flooded creeks may render the road impassable for short periods during the "Wet" season.

History and Geology

The Elizabeth Mine was discovered by Poulsen in 1875 and worked intermittently up to 1897. The mine area consisted of five shafts from 15 to 25 metres deep and some small open pits. The lode worked was a quartz reef about one metre wide striking north-north-west with a purported dip of 60° to the east. Total recorded production is 3440 oz. of gold with an average grade probably in excess of 1 oz. per ton.

The mine area is underlain by sheared sediments of the Lower Proterozoic Burrell Creek Formation. The sediments consist of greywacke and chloritic siltstones and shales, and dip steeply to the east with a general strike of about 330° magnetic. From old workings the lode appears to be either one quartz vein which has been displaced laterally some 20 metres east in the southern section or two parallel "en echelon" quartz veins. The lode system parallels the strike of the sediments and persists over a strike length of 350 metres. Further quartz lodes appear to persist along the next ridge south of the mine area.

Gold recovered from the mine presumably was in the form of free gold in quartz, however minor gold recovered from recent workings on the southernmost end of the lode appears to have been associated with sulphide material in quartz and sheared chloritic shales.

Diamond Drilling Results

D.D.H.1 was sited toward the northern end of the mine area and designed to test the continuity of the lode below an old shaft and open pit. The hole was inclined 45° on a bearing of 235° magnetic.

Core recovery was generally adequate except for a critical section between 41.75 and 43.25 metres where only 15% recovery was recorded. Greywacke and chloritic siltstone and shale were intersected throughout the hole with quartz vein intersections in the intervals 12.6 - 13.5 metres, 41.25 - 41.40 metres and 47.85 - 48.50 metres. No gold values were recorded in the quartz vein intersections but high silver values were recorded in quartz vein material in the intervals 41.25 - 41.75 metres (30 g/T) and 47.7 - 48.1 metres (14 g/T).

The surface gold-bearing quartz vein could be represented by either of the quartz veins intersected between 41.25 and 48.5 metres in which case it would be inferred that the surface lode narrows and contains no gold at depth. Equally the lode could have been intersected and lost in the interval of poor recovery between 41.75 and 43.25 metres. An alternative explanation is that the above interval represents infilled old workings. Consequently the drilling results from D.D.H.1 are inconclusive.

Conclusions

Drilling results from D.D.H.1 were inconclusive in determining whether gold mineralisation persists at depth at the Elizabeth mine. Despite the negative results obtained, it is recommended that the original drilling programme be completed because of the moderate size potential of the Elizabeth mine.

References

- | | | |
|---|------|---|
| Parkes, J.V., | 1892 | Report on the Northern Territory mines and mineral resources.
<u>S.Aust. parl. Pap. 32</u> |
| Walpole, B.P.,
Crohn, P.W., Dunn, P.R.
and Randal, M.A. | 1968 | Geology of the Katherine-Darwin Region. Northern Territory.
<u>Bur. Min. Resour. Aust. Bull.82</u> |

APPENDIX 1

ELIZABETH MINE, PINE CREEK N.T.

DIAMOND DRILL HOLE ASSAYS

D.D.H. 1

<u>Interval</u> (metres)	<u>Au</u> (g/T)	<u>Ag</u> (g/T)
12.00 - 12.50	-0.2	3
12.50 - 13.00	0.2	2
13.00 - 13.50	-0.2	2
13.50 - 14.00	-0.2	2
36.60 - 37.10	-0.2	20
41.25 - 41.75	-0.2	30
47.70 - 48.10	-0.2	14
48.10 - 48.50	-0.2	2

APPENDIX 2

ELIZABETH MINE, PINE CREEK N.T.

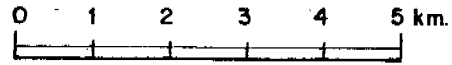
GEOLOGICAL DRILL LOG SUMMARY

D.D.H. 1

<u>Interval</u> (metres)	
0 - 3.00	No core recovery.
3.00 - 11.60	Grey-fawn <u>greywacke</u> , some siltstone and occasional thin chloritic shale bands. (95% recovery)
11.60 - 12.00	No core recovery.
12.00 - 12.60	Grey-white <u>chloritic siltstone</u> , very broken and friable, much iron-staining. (80% recovery)
12.60 - 13.50	<u>Quartz vein</u> material with iron-filled fractures and vugs. (70% recovery)
13.50 - 16.00	Grey-white <u>chloritic siltstone</u> , very broken and friable, much iron-staining. (85% recovery)
16.00 - 35.80	Interbanded grey-white and mid red-brown <u>siltstone</u> , moderately fractured with some highly fractured. Red-brown siltstone predominant below 21.0 metres. (Recovery indefinite)
35.80 - 37.10	Cream-fawn <u>sandstone</u> with some siltstone bands. (Recovery indefinite)
	36.7 - 36.9m Limonitic staining and limonite filled fractures in sandstone.
37.10 - 41.25	Grey-fawn <u>siltstone</u> , moderately fractured, iron-staining along fracture planes. (Recovery indefinite)
41.25 - 41.40	<u>Quartz vein</u> with iron-staining and cavities. (98% recovery)
41.40 - 47.85	Grey-fawn <u>siltstone</u> , some sandstone bands. Numerous cavities between 41.75 and 43.25 metres. (98% recovery except cavity interval with 15% recovery)
47.85 - 48.50	<u>Quartz vein</u> with limonite and hematite filled fractures and cavities. (80% recovery)
48.50 - 51.70	Fawn-brown oxidised <u>siltstone</u> , moderately fractured. (85% recovery)
51.70 - 60.90	Grey <u>chloritic shale</u> and <u>siltstone</u> , partly oxidised and graphitic in part, much chlorite and sericite veining in some sections. Narrow quartz veins, 52.4 - 52.5m., 53.2 - 53.25m. and 55.5 - 55.55m. (90% recovery)

ELIZABETH MINE LOCATION PLAN

SCALE 1:100 000



ELIZABETH
MINE
GML 180 B

STUART
HIGHWAY

To Mt. Wells

Burrundie
Siding

(abandoned)

To Pine Creek

To Pine Creek

13° 35'

13° 40'

131° 40'

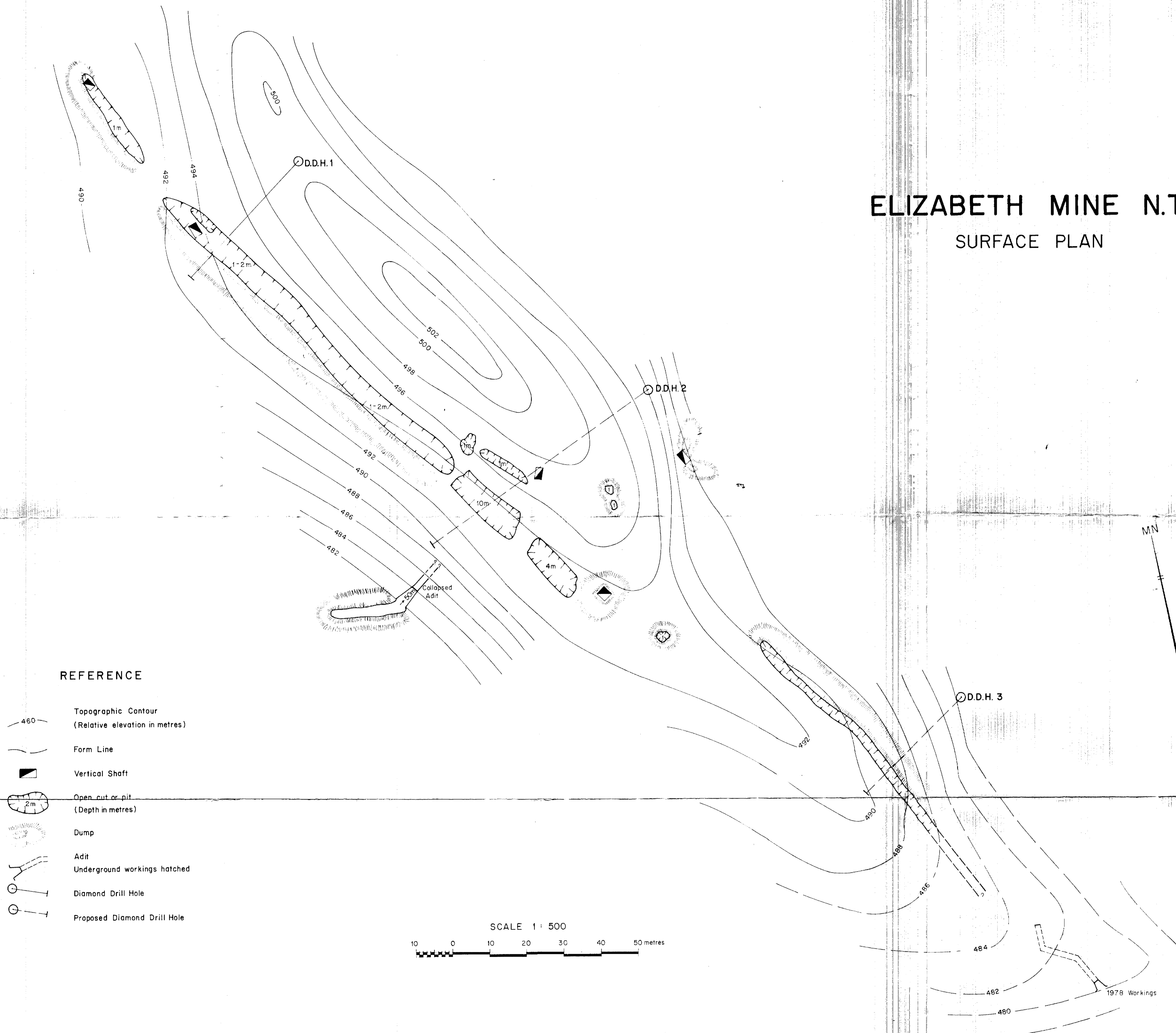
131° 45'

To Accompany
N.T.G.S. Report GS79/19

G80/15E

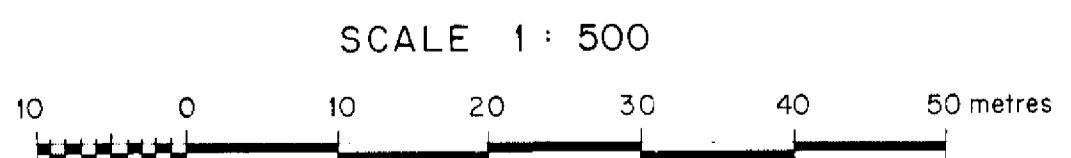


ELIZABETH MINE N.T. SURFACE PLAN



REFERENCE

- 460 Topographic Contour (Relative elevation in metres)
- Form Line
- Vertical Shaft
- Open cut or pit (Depth in metres)
- Dump
- Adit
- Underground workings hatched
- Diamond Drill Hole
- Proposed Diamond Drill Hole



BARRETS MINE, N.T. (TIN)

Summary

An application for drilling assistance at Barrets Tin Mine was made in December, 1976. Drilling Section, Department of Mines and Energy, drilled five diamond drill holes totalling 148 metres in June, 1979.

At Barrets Mine over 125 tonnes of tin concentrate have been produced from shallow scrapings and pits on an irregular pegmatite body. The drilling programme was designed to test whether economic tin mineralisation extended to depth in the pegmatite body.

No tin intersections of economic significance were encountered in holes drilled into the pegmatite body. Surface enrichment appears to have taken place in-situ at Barrets mine as tin-bearing pegmatite has been eroded. Once all loose surface material has been scraped from the pegmatite body reserves of economically recoverable tin will be effectively exhausted.

Introduction

An application for drilling assistance at ML 903B was made by the leaseholder R. Weston in December, 1976.

A drilling programme of three holes totalling 150 metres was subsequently approved. Three diamond drill holes totalling 118 metres were completed at Barrets Mine in June 1979 and a further two holes totalling 30 metres were completed at a nearby prospect.

Plane table mapping of surface workings was undertaken by officers of the Northern Territory Geological Survey in April, 1979.

Location and Access

Map : Tipperary 1:100,000 Topographic Survey Sheet 5170
Co-ordinates : Lat. 13° 34' 00"
Long. 131° 18' 00"

Universal Grid Ref:GK 491992

Vehicle access from Darwin is by the Stuart Highway for approximately 165 kilometres. Immediately east of the Bridge Creek crossing a dirt track heads in a southerly direction for about 5 kilometres to the mine site.

Geology and Mining

Barrets mine is situated on an irregular body of pegmatite intruding metamorphosed sediments of the Lower Proterozoic Burrell Creek Formation. In the mine area the sediments consist predominantly of mica schist and micaceous siltstone. The pegmatite body is elongated in a north-westerly direction and has been exposed over a length of approximately 100 metres. The width of the body appears to vary from 15 to 30 metres. The body dips to the north-east at an angle varying from 25° to 45°.

Eluvial tin mineralisation has been concentrated as the low grade tin-bearing pegmatite has been eroded. Mining of eluvial material and local concentrations of tin in the pegmatite commenced late last century and has been pursued at irregular intervals up to the present. Total recorded production is in excess of 125 tonnes of tin concentrate.

Mining operations by the current leaseholder have taken the form of machine scraping of eluvial material, with crushing and recovery of tin concentrates utilizing plant at the mine site.

Previous Investigations

In 1964 United Uranium N.L. carried out an extensive wagon drilling programme to test the lead potential of the mine. The drilling confirmed the irregular nature and persistence at depth of the pegmatite body but failed to locate lead mineralisation in economic quantities. Sampling for tin was carried out in a rather random way during the drilling programme with negative results.

Diamond Drilling Results

Three diamond drill holes totalling 118 metres were drilled at Barrets while two short holes totalling 30 metres were drilled into a similar tin-bearing pegmatite about 2 kilometres north of Barrets. Average core recovery was about 75%, core loss being occasioned by the relatively friable nature of the pegmatite and mica schist.

D.D.H.'s 1 and 2 were both commenced in pegmatite and drilled out of the body at depths of 6 metres and 25 metres respectively. Moderate and irregular background tin values were recorded in the pegmatites in both holes with best values over half-metre intervals of 440 ug/g and 550 ug/g for D.D.H.'s 1 and 2 respectively.

D.D.H.3 was commenced in sediments and intersected the pegmatite body between 11.7 and 14.8 metres. Tin values in the pegmatite were low with a best value of 200 ug/g between 12.7 and 13.2 metres. The narrow pegmatite intersection in this hole indicates either a thinning of the pegmatite body with depth at its northern end or that body may have been displaced by faulting as indicated in Plate 3.

D.D.H.'s 4 and 5 were drilled into relatively unconsolidated material at another pegmatite body about 2 kilometres north of Barrets mine to test whether sufficient tin was present to continue a small scale mining operation. Broken and friable quartz and pegmatite material was present in both holes to vertical depths of about 3 metres. Marginally workable values of tin were recorded in D.D.H.5 only.

Conclusions

Diamond drilling investigations at Barrets tin mine have confirmed that surface enrichments of tin mineralisation have resulted from the gradual erosion in-situ of the tin-bearing pegmatite body. The pegmatite body contained no economic concentrations of tin at depth in the three drill holes.

When all eluvial material has been scraped from the pegmatite body and surroundings, reserves at the mine will be effectively exhausted.

References

- | | | |
|--|------|---|
| Larsen, E. | 1964 | Recommendation to Diamond Drill the Mount Shoobridge lead lode. <u>United Uranium N.L. Co. Rept. CR 64/24</u> |
| Walpole, B.P.,
Crohn, P.W.,
Dunn, P.R. and
Randal, M.A. | 1968 | Geology of the Katherine-Darwin Region Northern Territory. <u>Bur. Min. Resour. Aust. Bull. 82</u> |

APPENDIX 1

BARRETS TIN MINE N.T.

DIAMOND DRILL HOLE ASSAYS

<u>Interval</u> (metres)	<u>Tin</u> (ug/g)	<u>Interval</u> (metres)	<u>Tin</u> (ug/g)
<u>D.D.H.1</u>			
1.45 - 2.00	100	4.50 - 5.00	-100
2.00 - 2.50	440	5.00 - 5.50	-100
2.50 - 3.00	-100	5.50 - 6.00	-100
3.00 - 3.50	-100	15.90 - 16.50	-100
3.50 - 4.00	-100	18.00 - 18.30	-100
4.00 - 4.50	-100	21.30 - 21.60	-100
<u>D.D.H.2</u>			
3.0 - 3.5	-100	14.0 - 14.5	550
3.5 - 4.0	-100	14.5 - 15.0	-100
4.0 - 4.5	180	15.0 - 15.5	-100
4.5 - 5.0	-100	15.5 - 16.0	-100
5.0 - 5.5	200	16.0 - 16.5	100
5.5 - 6.0	-100	16.5 - 17.0	-100
6.0 - 6.5	440	17.0 - 17.5	120
6.5 - 7.0	-100	17.5 - 18.0	-100
7.0 - 7.5	-100	18.0 - 18.5	180
7.5 - 8.0	-100	18.5 - 19.0	-100
8.0 - 8.5	-100	19.0 - 19.5	180
8.5 - 9.0	-100	19.5 - 20.0	-100
9.0 - 9.5	-100	20.0 - 20.5	280
9.5 - 10.0	-100	20.5 - 21.0	320
10.0 - 10.5	-100	21.0 - 21.5	-100

10.5 - 11.0	-100	21.5 - 22.0	160
11.0 - 11.5	-100	22.0 - 22.5	-100
11.5 - 12.0	-100	22.5 - 23.0	100
12.0 - 12.5	500	23.0 - 23.5	-100
12.5 - 13.0	280	23.5 - 24.0	120
13.0 - 13.5	360	24.0 - 24.5	160
13.5 - 14.0	260	24.5 - 25.0	500

D.D.H. 3

11.7 - 12.2	-100	13.7 - 14.2	180
12.2 - 12.7	-100	14.2 - 14.8	-100
12.7 - 13.2	200	26.6 - 27.3	-100
13.2 - 13.7	-100		

D.D.H. 4

3.00- 3.35	-100	3.70 - 4.30	-100
3.35- 3.70	160	4.30 - 4.80	160

D.D.H. 5

2.00- 2.45	250	3.55 - 4.20	5500
2.45- 3.00	1400	4.20 - 4.80	280
3.00- 3.55	160		

Note:

- preceding a number denotes less than the detection limit.

APPENDIX 2

BARRETS TIN MINE N.T.

GEOLOGICAL DRILL LOG SUMMARIES

<u>Interval</u> (metres)	<u>D.D.H.1</u>
0 - 1.45	No core recovery.
1.45 - 6.00	<u>Pegmatite</u> , principally quartz and pale green muscovite, chloritized felspar and occasional dark grains of iron? material.
6.00 - 8.6	Mid-grey and brown <u>mica schist</u> .
8.6 - 9.3	Very broken and friable mid-brown <u>siltstone</u> .
9.3 - 11.4	Mid-brown <u>mica schist</u> .
11.4 - 12.95	Fawn <u>siltstone</u> (tuff?) with many iron-stained fractures, some very broken sections.
12.95 - 17.2	Mid-brown <u>mica schist</u> , some broken sections with abundant iron-material along fractures.
17.2 - 19.0	Fawn <u>siltstone</u> , fairly fractured, some pebbly bands. Section with many grains of black material 18.0-18.3m.
19 - 19.90	<u>Quartz vein</u> , barren. (10% Recovery).
19.9 - 25.9	Mid-brown to fawn, fine-grained <u>sandstone/tuff</u> , some broken sections. Quartz veining between 21.3 & 21.6m. Band of brown mica-schist 21.6-22.2m (25% Recovery between 19.9 & 21.3m)
25.9 - 36.5	Mid-dark grey <u>mica schist</u> .

Note: Bedding and contacts all at about 30° to drill-hole direction.

<u>Interval</u> (metres)	<u>D.D.H.2</u>
0 - 3	No core recovery.
3 - 25	Coarse <u>pegmatite</u> , fairly broken in places, consists of two distinct types, very coarse, predominantly quartz and muscovite and finer felspar-rich material with muscovite and epidote/chlorite? Some black mafic material along fractures. (Recovery generally 95% but some poor recovery in coarse quartz-mica sections.)
25 - 35.85	Mid-dark grey <u>mica schist</u> , some sections with fairly coarse <u>mica flakes</u> - some pegmatite veining from 25-25.7m.

<u>Interval</u> (metres)	<u>D.D.H.3</u>
0 - 2.6	No core recovery.
2.6 - 11.7	Fawn-light brown <u>mica schist</u> , many sections fairly broken and fractured.
11.7 - 14.8	Coarse <u>pegmatite</u> principally quartz and green mica with K-feldspar. Some black mafic material coating fractures.
14.8 - 20.2	Mid-grey-green <u>mica schist</u> with a few, narrow silty bands.
20.2 - 26.8	Fawn fine-grained <u>micaceous sandstone</u> , many fine iron-stained fractures. Minor quartz vein 5cm. thick at 26.3m.
26.8 - 27.2	<u>Quartz vein</u> , some iron-staining on fractures.
27.2 - 45.6	Mid grey <u>mica schist</u> . Bedding/schistosity at 15° to drill direction at 30m, at 40° at 33m. Narrow pegmatite veins 32.6-32.65m, 41.8-41.85m, 48.25-48.5m.

D.D.H.4

0 - 3	No core recovery.
3 - 4.8	Broken & friable reworked <u>quartz</u> and <u>pegmatite</u> material, some coarse black grains, strongly iron-stained in part.
4.8 - 13.4	Fawn-light brown interbedded micaceous <u>siltstones and shales</u> .
13.4 - 18	Mid grey-green <u>mica schist</u> with some narrow siltstone bands.

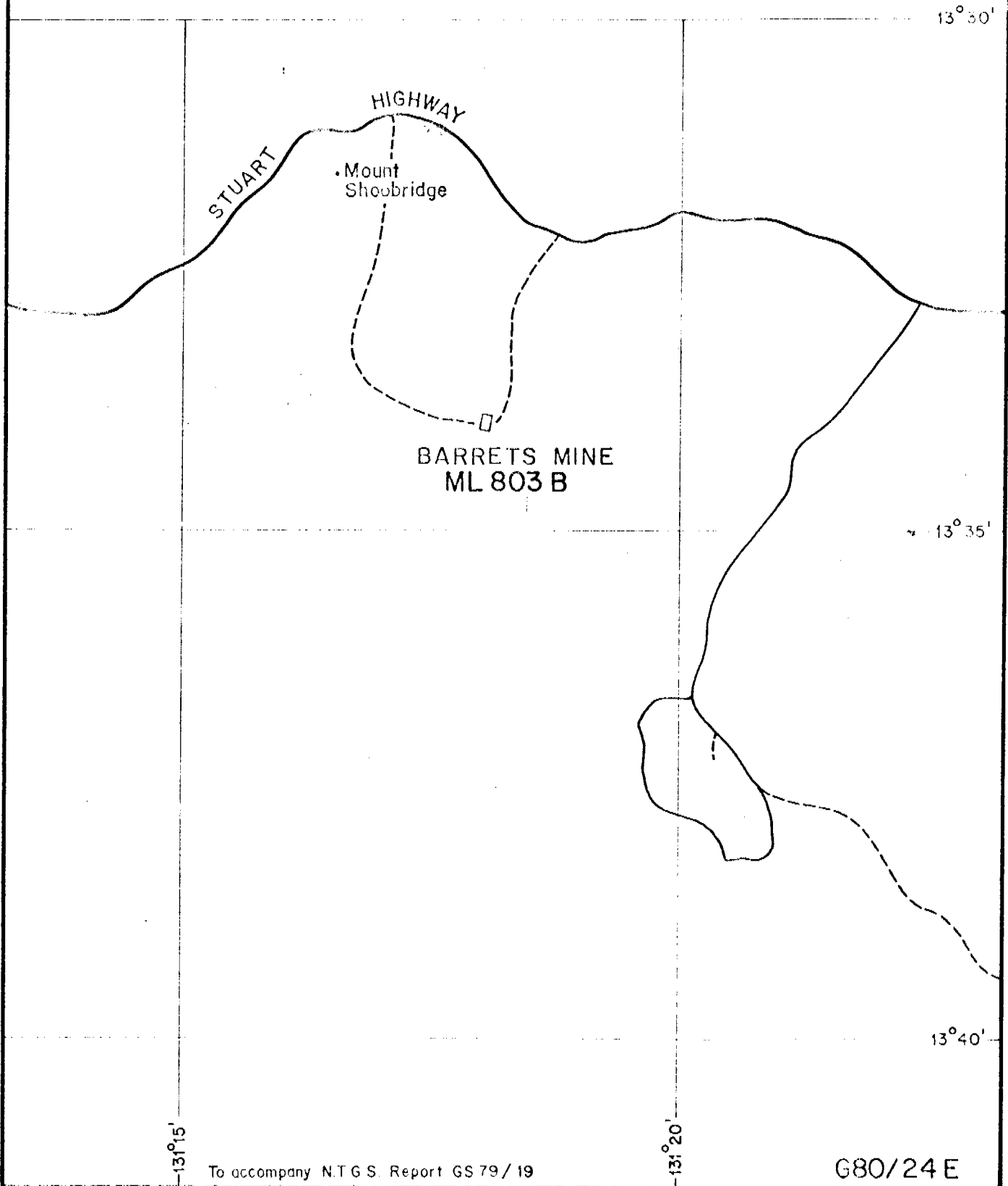
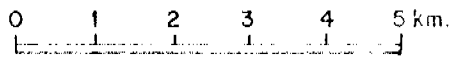
D.D.H.5

0 - 2	No core recovery.
2 - 4.6	Broken & friable, reworked <u>quartz</u> & <u>pegmatite</u> material, strongly iron-stained in part.
4.6 - 12.5	Mid brown to green-brown interbedded <u>micaceous siltstones</u> and <u>mica schists</u> .

BARRETS MINE N.T.

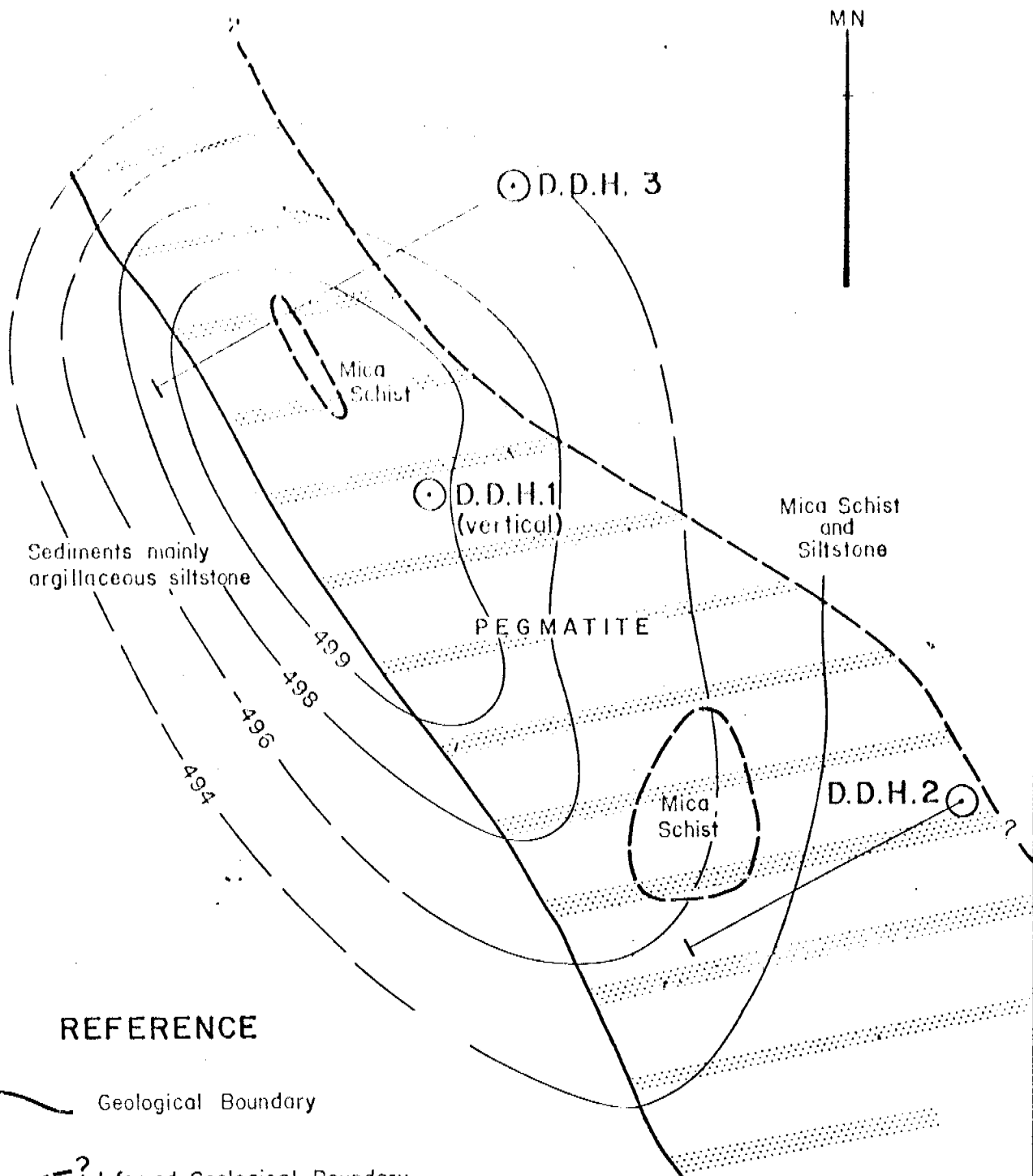
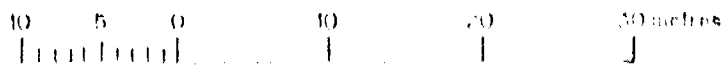
LOCATION PLAN

SCALE 1:100 000



BARNETS MINE N.T. SURFACE PLAN

SCALE 1:500



REFERENCE

- Geological Boundary
- Inferred Geological Boundary
- Topographic Contour
- 492 (relative elevation in metres)

BARRETS MINE N.T.

DRILL SECTIONS

