

# NORTHERN TERRITORY GEOLOGICAL SURVEY

## TECHNICAL REPORT

GS 81/2

MARGARET TIN MINE

BY

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Department of Mines and Energy

GS 81/2

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GEOLOGICAL MAPPING AND DIAMOND DRILLING  
AT MARGARET TIN MINE, NORTHERN TERRITORY

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SUMMARY

Following a request for assistance from the owner of M.L. 108A - known as the Margaret tin mine, geological mapping of surface exposures and underground workings was carried out in May 1974 and diamond drilling of 135.34 metres in two holes was completed beneath surface workings; towards the end of 1974.

The geology of the area is relatively simple, with the tin mineralisation being mostly confined to a fault zone about 7 metres wide. This zone varies in dip from 60° to vertical.

Host rocks belong to the Wildman Siltstone (Barramundie Group) of Lower Proterozoic age, with a granite intrusion nearby also of Lower Proterozoic age (Cullen Granite).

The underground workings exploited a lens of mineralisation within the fault zone with dimensions approximately 50 x 30 x 2 metres. This lens apparently contained coarse grained cassiterite with a grade of better than 2% tin. Department of Mines and Energy records show that some 31 tons of tin were produced from this lease between 1957 and 1977. North west from the underground workings, the fault zone contains erratically distributed cassiterite. The average grade appears to be quite low (less than ½% tin).

A twist in the fault zone where it changes from dipping 60° northeast to vertical may be responsible for the localisation of the tin mineralisation which has been worked underground.

INTRODUCTION

Plane table geological mapping of the Margaret tin mine and underground geological mapping was carried out in May 1974. This was followed by two diamond drill holes later in the year, drilled by Mines Branch rigs.

This work followed a request from the leaseholder for assistance. Sampling of some of the underground workings and surface chip sampling were also carried out.

Mapping of the underground workings was carried out by P.J. Bailey, mining engineer with the Mines Inspection section, using a theodolite and tape and compass measurements. Geological interpretation was carried out using this mapping as a base.

The complete core from both the diamond drill holes was split and assayed for tin by the East Point Laboratory, Darwin.

Diamond drill core from each hole is stored in the Department of Mines and Energy core library, Farrell Crescent Winnellie.

LOCATION AND ACCESS

The Margaret tin mine is located about 150 kilometres from Darwin in a southeasterly direction. It is 30 kilometres in a northeasterly direction from the Government Battery at Mount Wells.

Access from the Stuart Highway is via a bitumen road to Fountain Head siding, thence a formed dirt road via Grove Hill and Mt. Wells to the mine.

GEOLOGY

The general geology of the area has been described by Hays 1960: "The field is in Lower Proterozoic sediments intruded by a lobe of the Cullen Granite which also is of Lower Proterozoic age. The ore mineral is cassiterite, which occurs mainly in quartz-hematite breccias. The fissures are associated with faulting and folding. Cassiterite is also present in quartz veins and quartz breccia."

The Margaret tin mine is in rocks known as Wildman Siltstone (Needham 1978) described as: "Siltstone, in places carbonaceous at depth, red and cream laminated siltstone, minor quartzite and quartz greywacke." In the mine area, the greywacke lithology is dominant with only minor siltstone.

Mineralisation is mainly confined to a fault zone or crush zone which strikes at 145° and is vertical at the northwestern end and dips northeast at 60° at the southwestern end of the area mapped and shown on plate 1. The zone seems to have a consistent width of about 7 metres.

The change in dip and strike of the surrounding rocks on either side of the zone is quite marked. On the southwestern side of the zone the strike is from north to

northeast with shallow dips of 15 to 30 degrees. This contrasts to the strike and dip on the northeastern side of the zone where strikes range from north to northwest with dips ranging from 63 to 80 degrees.



DIAMOND DRILLING

Diamond drilling was undertaken to test the fault zone beneath the open cut operations which are to the northwest of the underground workings and on the same fault zone (see Plate 2).

Two holes were completed and both intersected the fault zone. Core from each hole was split in small intervals throughout the whole length of the hole and assayed for tin. The fault zone is considered to be that core which is mineralised and that which is obviously sheared (except for the interval 59.92 to 61.5 metres in D.D.H. 1).

Diamond drill hole number 1 intersected the fault zone from 26.4 to 49 metres (22.6 metres length) of which 3.4 metres or 15% is apparently mineralised.

In diamond drill hole number 2 the fault zone was intersected from 25.55 to 52.5 metres (26.45 metres length) of which 12.3 metres or 46% is apparently mineralised.

CONCLUSIONS AND RECOMMENDATIONS

The tin mineralisation at the Margaret tin mine is mainly confined to a fault zone which is about 7 metres wide.

*production from the*  
The underground workings indicate that a shoot within the fault zone carried values of more than 2% coarse grained tin. Further exploration could lead to more of these shoots being found.

The inclined winze which leads to the 159 metre level from the 176 metre level does not test the full thickness of the fault zone in that area and it is recommended that this area and below be tested by drilling to try to locate another ore shoot.

A twist in the fault zone from dipping 60° northeast to vertical may be responsible for the localisation of the tin mineralisation which has been worked underground.

REFERENCES

HAYS., J., - 1960

The Geology of the Mount Harris  
Tin - Field, Northern Territory  
Unpub BMR Records 1960/2

NEEDHAM., R.S., 1978

Solid Geology of the Pine Creek  
Geosyncline Northern Territory  
Preliminary Edition, Bureau of  
Mineral Resources

# GEOLOGICAL LOG OF DRILL HOLE

PROJECT MARGARET TIN MINE N.T. REMARKS \_\_\_\_\_  
 HOLE N° DIAMOND DRILL HOLE 1 CO-ORDINATES \_\_\_\_\_ R.L. GROUND \_\_\_\_\_  
 LOCATION \_\_\_\_\_ ANGLE FROM HORIZONTAL 50° DIRECTION \_\_\_\_\_

DESCRIPTION OF CORE	LOG	CORE RECOVERY %	SAMPLES TIN ASSAY IN PPM	
0-8-70 <i>Medium to coarse grained red brown arkose</i>	█	100	1.6	△100
		100	3.4	△100
		55.5	5.02	△100
5 30mm shale band	█	39	8.07	△100
		12	9.8	△100
8-07-9-80 <i>white milky quartz</i>	█	91	11.12	△100
10 9-80-26-55 <i>fine, medium and coarse grained arkose. quartz vein at 11.35 metres</i>	█	98	12.85	△100
		83	14.17	△100
		100	16.17	△100
		76	17.22	△100
		33	20.27	△100
		97	21.51	△100
		83	23.32	△100
15 20 25	█	100	25.17	△100
		96	26.37	△100
		53	27.12	1300
26-55-27-55 <i>shale with pyrite shaped cavities lined with hematite and limonite</i>	█	87	28.62	△100
27-55-39-64 <i>Mostly arkose - medium grained with rare shale bands</i>	█	100	29.42	△100
		98	30.64	△100
		98	32.47	△100
		91	34.77	△100
		100	35.52	△100
		37.5	36.72	9500
		100	38.17	600
30 35 40 39-64-48-96 <i>sheared arkose and shale with numerous quartz veins</i>	█	21	38.64	△100
		79.5	39.52	△100
		100	40.42	△100
		67	41.62	△100
		100	43.42	△100
45	█	100	44.67	△100
		100	46.71	△100
		89	48.96	△100
48-96-67-29 <i>medium - coarse arkose</i>	█	100	48.96	△100
50	REFERENCES	LOGGED BY <u>J.W.S.</u>		
		SHEET <u>1</u> OF <u>2</u>	DRAWING N° <u>080 / 198 E</u>	

# GEOLOGICAL LOG OF DRILL HOLE

PROJECT MARGARET TIN MINE N.T.

REMARKS \_\_\_\_\_

HOLE No DIAMOND DRILL HOLE I CO-ORDINATES \_\_\_\_\_

R.L. GROUND \_\_\_\_\_

LOCATION \_\_\_\_\_

ANGLE FROM HORIZONTAL 50°

DIRECTION ↘

DESCRIPTION OF CORE	LOG	CORE RECOVERY %	R.L.	SAMPLES	TN PPM
<p>50</p> <p>48.96 - 67.29 Medium to coarse arkose with shale bands.</p> <p>Bedding at 51 50° to core axis</p>		100	50.77	< 100	< 100
		100	52	< 100	< 100
		100	53.82	< 100	< 100
		100	55	< 100	< 100
		100	56.87	< 100	< 100
		100	58	< 100	< 100
		100	59.92	1.1%	< 100
		100	61.5	< 100	< 100
		100	62.97	< 100	< 100
		100	64	< 100	< 100
		100	65.17	< 100	< 100
		100	66.02	< 100	< 100
<p>66-70-67.29 White milky quartz</p> <p>67.29 metres - end of hole</p> <p>70 Pajarri surveys :</p> <p style="margin-left: 100px;">Inclination Direction</p> <p style="margin-left: 20px;">At 30 metres            51°            051°</p> <p style="margin-left: 20px;">66 metres                50°            053°</p>		100	66.81	< 100	< 100

REFERENCES \_\_\_\_\_

LOGGED BY J.W.S.

SHEET 2 OF 2

DRAWING N° G80/199E

# GEOLOGICAL LOG OF DRILL HOLE

PROJECT, MARGARET TIN MINE N.T.

REMARKS \_\_\_\_\_

HOLE N° DIAMOND DRILL HOLE 2 CO-ORDINATES \_\_\_\_\_

R.L. GROUND \_\_\_\_\_

LOCATION \_\_\_\_\_

ANGLE FROM HORIZONTAL \_\_\_\_\_

50°

DIRECTION \_\_\_\_\_

	DESCRIPTION OF CORE	LOG	CORE RECOVERY %	SAMPLING DEPTH	SAMPLES TIN PPM
0-2-20	SHALE white to red brown broken		52.3	1.72	<100
			95.2	2.35	<100
2-20-6-57	ARKOSE fine grained		62	4.69	<100
			14	5.74	<100
6-57-8-60	Quartz broken minor hematite limonite		81.7	8.00	<100
6-90-11-0	ARKOSE medium grained		100	9.66	<100
			90.9	11.00	<100
			89.9	11.00	<100
			100	11.00	<100
11-8-11-18	QUARTZ broken milky white		75.7	13.35	<100
11-18-12-0	ARKOSE medium grained-rare quartz & hematite		100	14.55	<100
12-0-12-40	SHALE grey one 4mm quartz vein		73.3	15.3	<100
12-40-20-20	ARKOSE medium grained Quartz veins at 12.55 (5mm) 15.30 (80mm) 14.60 (4 mm)		95.7	16.00	<100
				17.6	<100
				18.5	<100
			100	19.5	<100
				20.65	<100
20-20-26-60	ARKOSE graded bed, fine grained at top to coarse at bottom Quartz vein (5mm) at 25.58 with Fe lined cavities.		93.4	22.63	<100
			100	24.00	<100
26-20-26-80	Numerous pyrite casts lined with Fe. Some small Fe stained quartz veins		91.7	25.55	0.2%
26-80-28-80	ARKOSE fine to medium grained Quartz & hematite veins common (26.7, 26.75, 26.8(10mm), 26.9, 28, 28.2, 28.5, 29.9, 30)		88.1	26.75	0.8%
			89	28.34	<100
			52.1	29.80	<100
				30.76	<100
28-80-31-10	Shale with numerous quartz hematite veins.		90.9	32.85	850
31-10-32-80	ARKOSE fine to medium grained 12 small quartz veins		100	35.12	<100
32-80-32-90	SHALE soft, white		68.2	35.9	<100
				37	<100
			100	38.95	<100
38-90-41-2	Broken quartz, shale and arkose		28.6	40.00	<100
			38.2	41.31	<100
41-2-43-80	ARKOSE fine grained. Quartz veins at 41.5, 42.42, 42.5		100	43.5	160
			95.3	43.5	<100
43-80-44-30	Slate & arkose numerous quartz veins			45.05	<100
44-30-47-20	ARKOSE fine to coarse grained with shale where noted (46.30-46.90)		100	46.5	<100
47-20-47-80	Numerous quartz veins in slate & arkose			48.10	<100
47-80-49-80	ARKOSE medium grained numerous quartz veins		98.4	49.6	0.98%

50

REFERENCES \_\_\_\_\_

LOGGED BY J.W.S.

SHEET 1 OF 2

DRAWING N° G80/200E

# GEOLOGICAL LOG OF DRILL HOLE

PROJECT, MARGARET TIN MINE N.T.

REMARKS

HOLE N° DIAMOND DRILL HOLE 2 CO-ORDINATES

R/L GROUND

LOCATION

ANGLE FROM HORIZONTAL

50°

DIRECTION

	DESCRIPTION OF CORE	LOG	CORE RECOVERY %	SAMPLES	TIN PPM
50					
49-50-50-2	Slate with 5 quartz veins		98.4	51.15	210
50-2-51-55	Arkose fine grained 4 quartz veins			52.5	150
51-55-55-55	Arkose and slate		100		<100
				54.20	<100
				55	<100
55			100	56	<100
				57.25	<100
				58.5	<100
			93.5		<100
				60.35	<100
50					<100
50-45-55-05	ARKOSE coarse grained		100	62	<100
				63.4	<100
			100	65	<100
55	Black carbonaceous slate		100		<100
					<100

55-05 End of hole

70

### PAJARRI SURVEYS

Depth	Inclination	Direction
30m	51°	055°
68m	50°	056°

REFERENCES

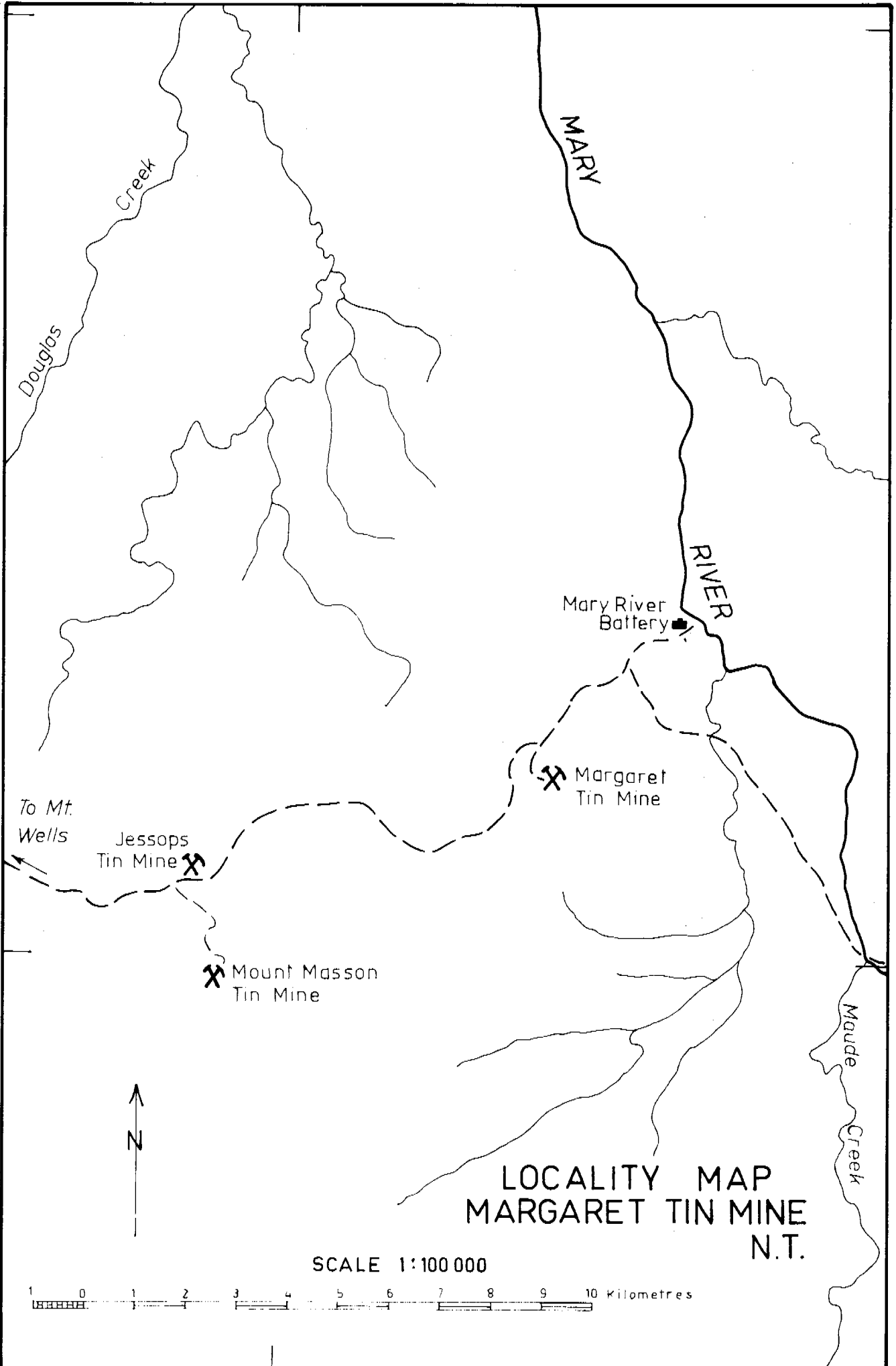
LOGGED BY J.W.S.

SHEET 2 OF 2

DRAWING N° G80/201E

131° 50'

13° 10'



13° 20'

To Mt. Wells

Jessops Tin Mine

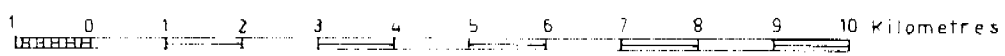
Mount Masson Tin Mine

Margaret Tin Mine

Mary River Battery

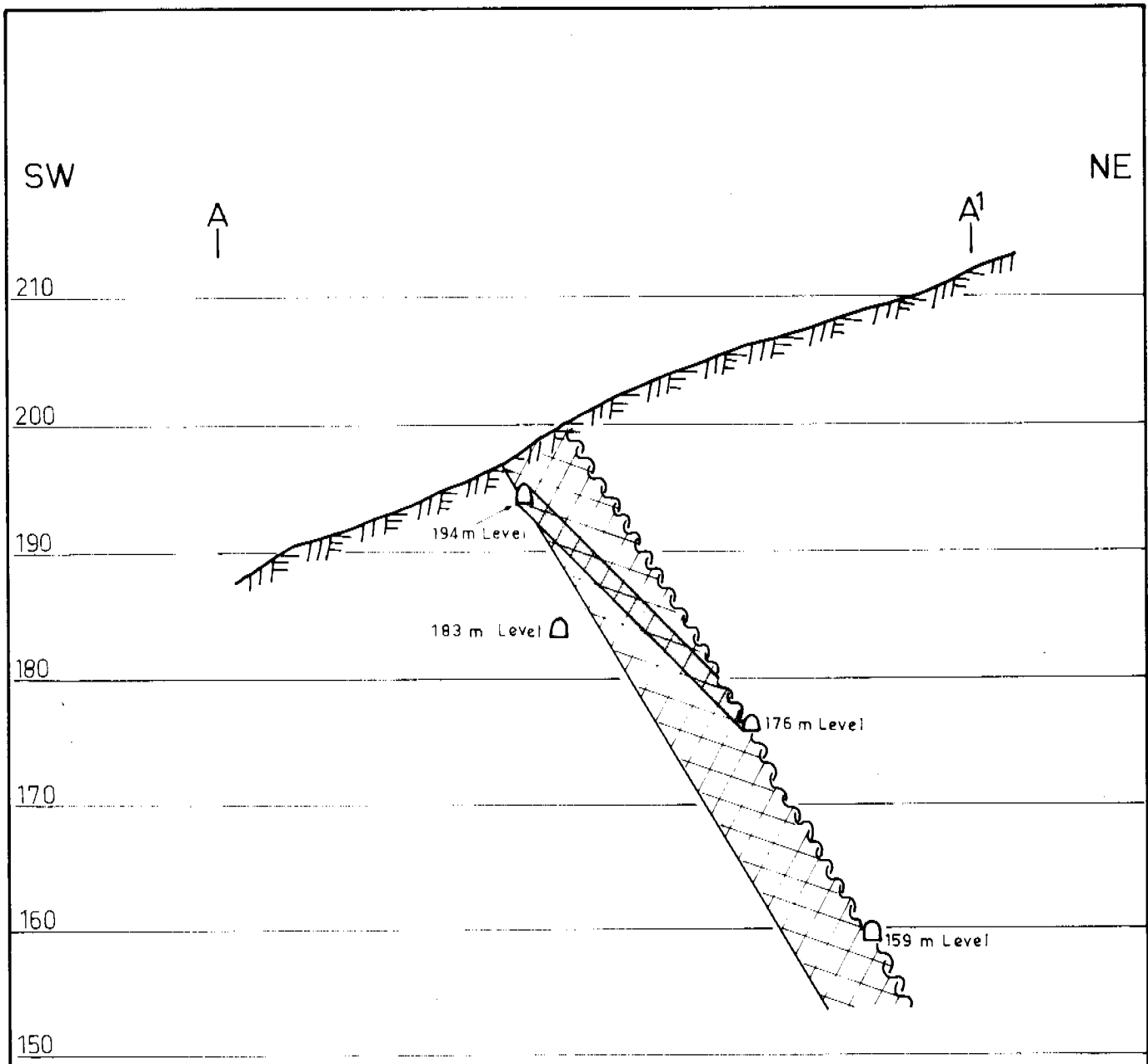
LOCALITY MAP  
MARGARET TIN MINE  
N.T.

SCALE 1:100 000



DWG. No. G79/006E





Reduced Level  
(Metres)

LEGEND

-  Ground Surface
-  Fault Zone
-  Mine Opening
-  Stopped Area

MARGARET TIN MINE N.T.  
CROSS-SECTION THROUGH MINE A-A'

Scale 1:500



SW

NE

190

180

DDH 1

170

160

150

1300 ppm Sn

140

9500 ppm Sn  
600 ppm Sn

130

Shear Zone

120

1.1 % Sn

End of Hole (67.29 m.)

110

Reduced Level  
(Metres)

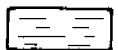
LEGEND



Ground Surface



Fault Zone



Shale

1300 ppm Sn Assay Value

MARGARET TIN MINE N.T.

CROSS-SECTION THROUGH MINE DDH 1

Scale 1:500



DWG. No. 9679/009E

SW

NE

200

190

180

170

160

150

140

130

120

110

Reduced Level  
(Metres)

Surface Chip Sample  
< 100 ppm Sn

Surface Chip Sample  
300 ppm Sn

DDH 2

2000 ppm Sn  
8000 ppm Sn

850 ppm Sn

160 ppm Sn

9800 ppm Sn  
210 ppm Sn  
150 ppm Sn

Shear Zone

End of Hole (68.05 m.)

LEGEND



Ground Surface



Fault Zone

2000 ppm Sn Assay Value

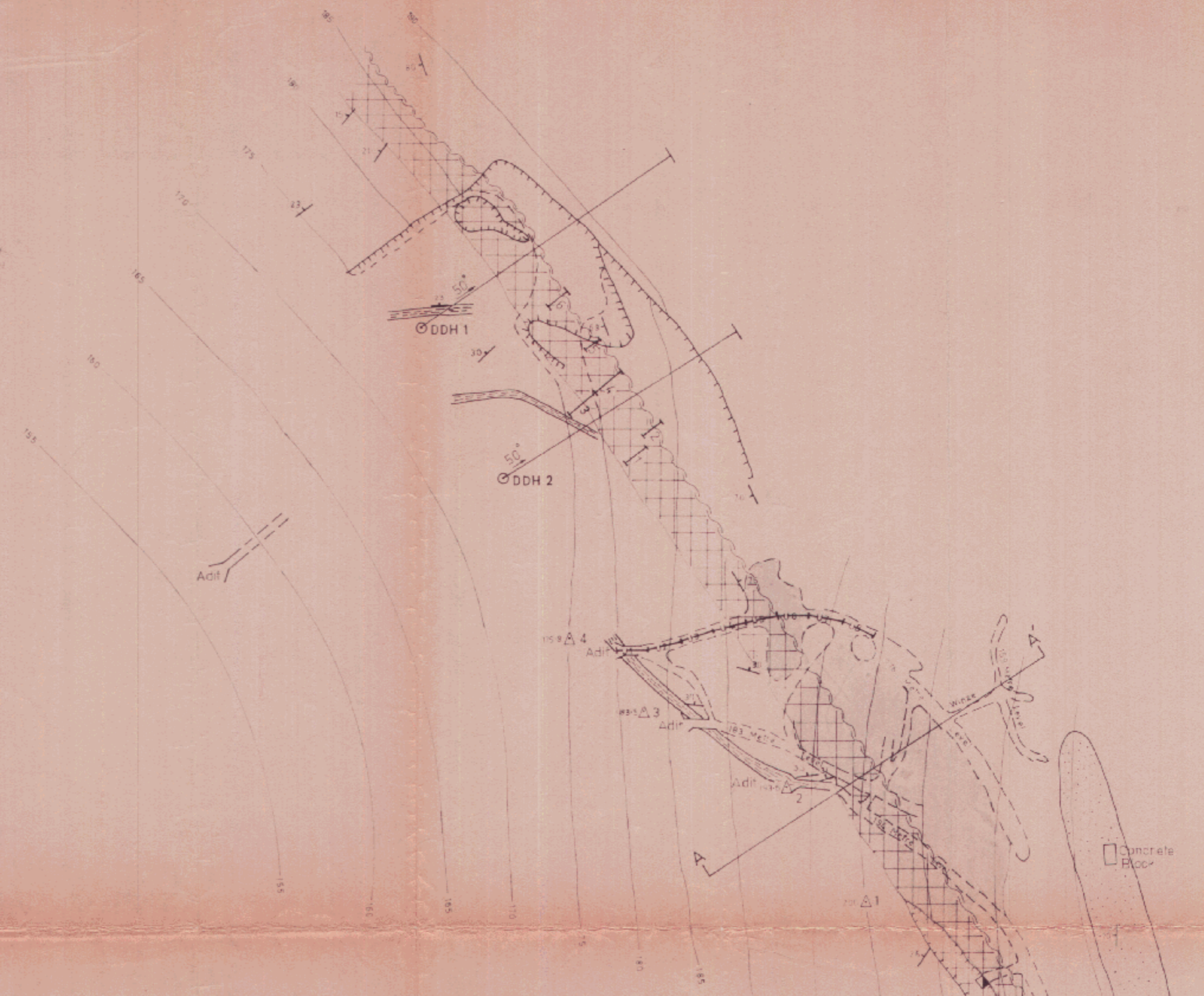
MARGARET TIN MINE N.T.

CROSS-SECTION THROUGH MINE DDH 2

Scale 1:500



DWG. No. G29/010E



ASSAYS OF CHIP SAMPLES

Sample Number	Assay %Tin
U1	0.01
U2	0.04
U3	0.01
U4	0.03
U5	0.84
U6	0.15
U7	0.04
U8	0.55
U9	0.01
U10	0.21
U11	0.05
U12	0.15

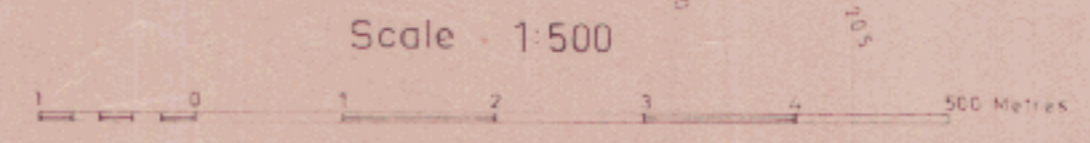
LEGEND

- Arkose
- Slate
- Chip Sample on Surface with sample number
- Chip Sample Underground (on Adit roof) with sample number
- Strike and Dip of Strata
- Outline of Open Cut Workings
- Outline of Underground Workings
- Adit Entrance
- Sloped Areas (Projected vertically to surface)
- Fault Zone
- 200— Contour Level

MARGARET TIN MINE  
SURFACE GEOLOGY AND MINE  
WORKINGS

Plane Table Survey by J.W. Shields and  
A.W. Newton. May 1974

Compiled by NT Geological Survey  
Drawn by Drafting Section, Department of Mines and  
Energy Sep 1979



Vertical Datum: Assumed at  $\Delta 1$  (200 Metres)  
Contour Interval: 5 Metres

Dwg. no. G79/007c