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FINAL REPORT
BULK SAMPLING OF
NORTHERN DEVELOPMENTS (TAS) PTY. LTD.
NORTH VALLEY PROJECT.

EL 5/63

BY
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78/SYD/07(A)
MAY, 1978.

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TABLE OF CONTENTS

		PAGE NO.
SUMMARY		
1.	INTRODUCTION	1
2.	LOCALITY	1
3.	SAMPLING PROGRAMME	2
	3.1 LOWER WARATAH RIVER VIRGIN WASH	2
	3.2 FINE TAILINGS DUMP	5
4.	RESERVE ESTIMATE - YARDAGE AND GRADE	7
	4.1 LOWER WARATAH RIVER VIRGIN WASH	7
	4.2 FINE TAILINGS DUMP	8
5.	CONCLUSIONS	8

LIST OF APPENDICES

1.	DESCRIPTION OF PLANT USED FOR TESTING PROGRAMME	9
2.	JIG PERFORMANCE DURING TESTING	10
3.	RAW ASSAY DATA	11

LIST OF TABLES

1.	PRELIMINARY PAN SAMPLES - LOWER WARATAH RIVER	3
2.	PANNED COMPOSITE SAMPLES - LOWER WARATAH RIVER	4
3.	UNPANNED COMPOSITE SAMPLES - LOWER WARATAH RIVER	4
4.	PRELIMINARY PAN SAMPLES - FINE TAILINGS DUMP	5
5.	BULK SAMPLES - FINE TAILINGS DUMP	6
6.	COMPOSITE BULK SAMPLES - FINE TAILINGS DUMP	6
7.	RESERVES - LOWER WARATAH RIVER	7

LIST OF FIGURES

1. LOCATION MAP
2. SCHEMATIC CROSS SECTION - LINES 54N, 52N, 50N

LIST OF PLATES

1.	NORTH VALLEY - CONTOUR MAP & LEASE LOCATION	Scale 1:5,000 Enclosure
2.	NORTH VALLEY - BULK SAMPLE LOCATIONS	Scale 1:2,500 Enclosure

SUMMARY

SEREM (AUSTRALIA) PTY. LTD. carried out a bulk sampling programme of the North Valley alluvial deposit at Waratah in early 1978.

Results of this programme indicate the unworked lower Waratah River area has reserves of 256,700 yds^3 of wash at a grade of 0.31 lb/yd^3, 70% free cassiterite. The overall grade is indicated at 10.20 lb/yd^3 of composite plus free cassiterite. The fine tailings dump contains approximately 240,000 yds^3 of material at a grade of 4.83 lb/yd^3, 70% cassiterite (composite + free).

The lower Waratah River area is considered not to be of interest to SEREM due to the limited reserves and the difficult mining conditions. On the other hand the fine tailings dump could be a feasible proposition if an efficient mill could be installed (or the present one modified) and the terms of the agreement with NORTHERN DEVELOPMENTS renegotiated more favourably.

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1. INTRODUCTION

SEREM (AUSTRALIA) PTY. LTD. commissioned B.R.G. M. AUSTRALIA to carry out a bulk testing programme of the North Valley at Waratah, of NORTHERN DEVELOPMENTS (TAS.) PTY. LTD. Two areas of interest - the "lower Waratah River virgin wash" and the "fine tailings dump", were subject to test pitting. Both reserves and average grade for each area were calculated.

The test work was carried out on three visits, 23rd January to 14th February; 7th to 22nd March; and 26th to 29th April, 1978. Test samples were obtained from pitting and were treated by the existing plant of NORTHERN DEVELOPMENTS.

For the lower Waratah River area, samples of jig feed, jig tailings, and jig concentrate were obtained, while for the fine tailings dump, only samples of raw feed material were collected. All samples were sent for chemical analysis.

2. LOCALITY

The North Valley alluvial deposit is situated in the valley of the Waratah River immediately to the north of Mt. Bischoff at Waratah, which is in the West Coast district of Tasmania. It lies upstream from the confluence of the Waratah and Arthur Rivers. Waratah, lying at the foot of Mt. Bischoff, is approximately 80 kg from Burnie and is served by a full width bitumen road, the Waratah Highway. This branches off the Murchison Highway 8 km to the east of Waratah and continues through Waratah to the mining communities at Luina and Savage River (See Figure 1).

The mining site is approximately 5 km from Waratah. Access is by an all weather road constructed by the previous miners, Ringarooma Mining Pty. Ltd. which descends some 300 m over 3 km. This road has a gravel surface, but is easily negotiated by large semi-trailers.

3. SAMPLING PROGRAMME

A total of 42 pits were surveyed and excavated on the lower Waratah River virgin wash and on the fine tailings dump left by the previous miners, RINGAROOMA MINING.

Pits were excavated to bedrock by a mechanical excavator on the virgin wash and with a back hoe to a maximum of 15 feet on the fine tailings dump.

3.1 LOWER WARATAH RIVER VIRGIN WASH

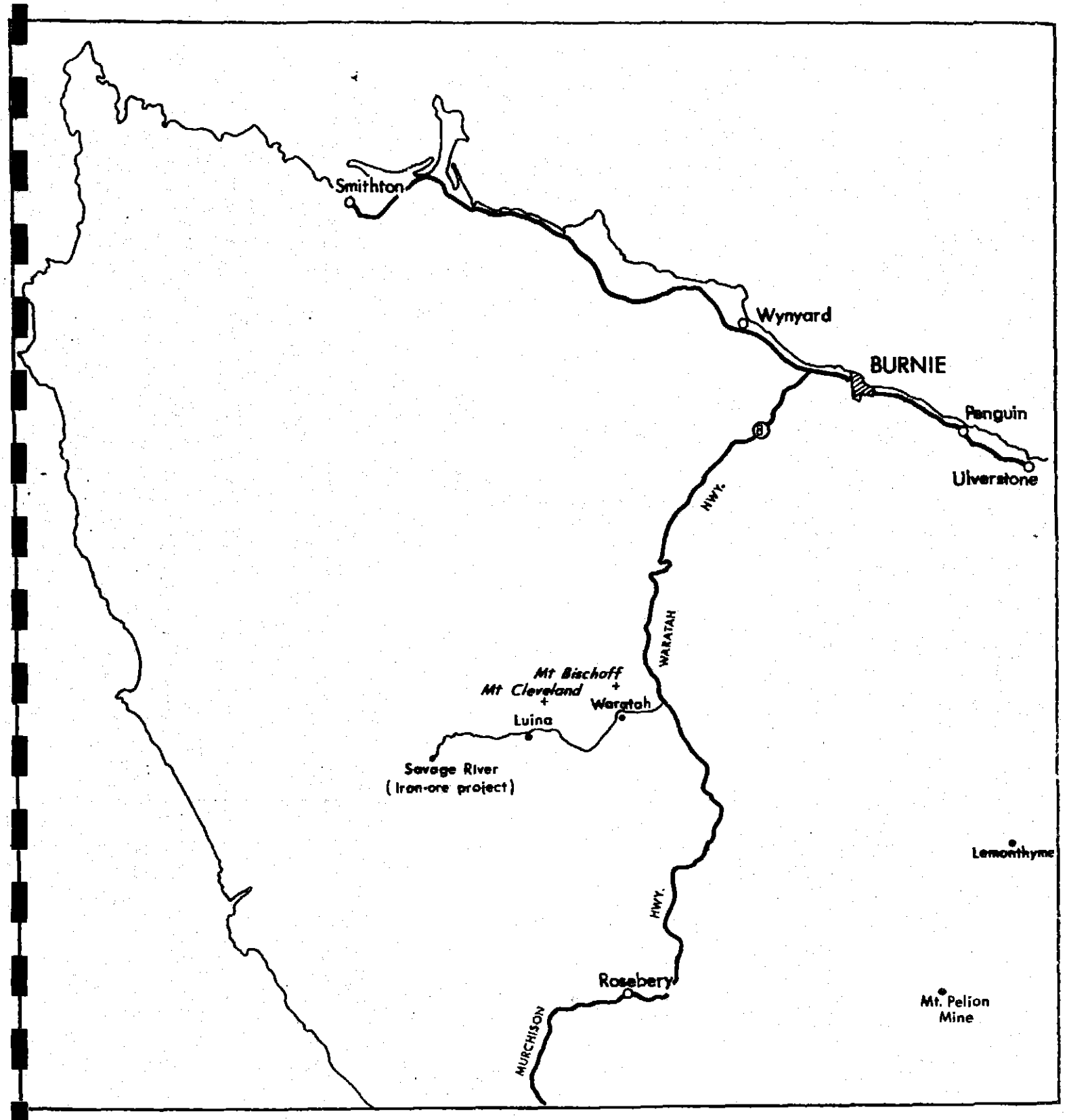
Twenty-four pits were excavated to bedrock. Samples of about 4 yd^3 average were collected and systematically treated in the existing mill.

The pits were located on a 200 m X 20 m grid to determine the volume and grade of the virgin wash.

Basement consisted of a grey/green shale and schist of Proterozoic age. The gravel wash comprises 20% large rounded pebbles or boulders up to 0.3 m in diameter, 50% by volume of smaller pebbles <0.1 m volume with only 20% sand, silt and clay making up the matrix. Approximately 0.5 to 0.8 m of clay, soil and plant debris exists as overburden in most places covering wash of 2 m average depth.

The large pebble/boulder material contains negligible tin. The small pebble material (+1 cm) contains tin as composite cassiterite in quartz and hematite and rare small nuggets. The -1 cm material contains the bulk of the tin as composite grains and free tin.

Prior to bulk sampling, ten surface samples were collected and panned to obtain a heavy mineral concentrate. The concentrate was dried, weighed and assayed for Sn. Results are shown in Table 1, with the locations of samples on Plate 1. These samples indicate the grade of free recoverable tin. Three samples, 46.5/1, 43.5/1 and 43.5/2, represent the full thickness of wash in old workings, and indicate a grade of over 2 lb/yd^3 of free recoverable cassiterite. Samples 54/5 and 54/6 are also from the full thickness of wash, but at the mouth of the Waratah River, and show



LOCALITY MAP

NORTH VALLEY ALLUVIALS WARATAH

FIGURE 1.

a decrease in grade to 0.74 lb/yd^3 of free recoverable cassiterite. RINGAROOMA MINING obtained grades of about 2 lb/yd^3 in the area adjacent to the lower Waratah River virgin wash. RINGAROOMA did not crush the wash to liberate composite tin during their milling operation; thus, higher grades should be expected.

The sampling programme, designed primarily to test for recoverable free tin, systematically treated each pit sample over vibrating screens and jigs to obtain representative samples of jig feed, jig tail and jig concentrate. Composite samples of all pits were taken of screen oversize, jig feed, jig tail, and jig concentrate. The composite samples were crushed to-30 mesh with a 3-head stamp battery and representative samples collected. One 5 litre pan sample and one 5kg bulk sample was collected for each composite sample in order to obtain a comparison of free tin to composite tin.

TABLE 1.
PRELIMINARY PAN SAMPLES - LOWER WARATAH RIVER.

Sample Location	Sample Size (litres)	Dry Wt.(g)	%Sn	Grade lb/yd^3 70% cassiterite
54/2 River Crossing	5	2.49	24.40	0.27
54/3 Surface Sand	5	21.51	0.34	0.03
54/5 Pit	10	5.00	47.20	0.53
54/6 Pit	5	5.39	38.70	0.94
Creek Channel	10	30.10	0.29	0.02
River Bank	10	3.45	50.10	0.39
47.5/4 Old Pit	10	2.84	39.60	0.25
46.5/1 Old Trench	10	42.42	26.60	2.53
43.5/1 Bank of Old Workings	5	11.17	55.60	2.79
43.5/2 Pit in bottom of Workings	5	22.32	17.00	1.70

The assay results of the panned jig samples are shown in Appendix 3(b). A schematic cross section for lines 54N, 52N, and 50N is shown in Figure 2, showing depth and grade for each pit. The average grade of the panned samples, after adjusting by 80% for boulders, is 0.31% of 70% free cassiterite, after screening to <1cm.

A dramatic increase in grade occurs after crushing to -30 mesh prior to panning. These results are shown in Table 2. The same set of samples (composite of all pit samples) were sent to a laboratory for assay after crushing to -60 mesh. These show even higher grades (Table 3).

TABLE 2.
PANNED COMPOSITE SAMPLES - LOWER WARATAH RIVER

Sample No.	Type	Concentrate Weight (g)	%Sn	*Grade lb/yd^3 70% cassiterite	Grade adjust for Volume %
A0 373	Screen oversize	265.40	42.0	53.90	10.78
374	Jig feed	93.36	28.8	13.00	2.60
375	Jig tail	30.75	25.0	3.72	0.74
376	Jig conc.	41.99	21.5	4.37	0.87

TABLE 3.
UNPANNED COMPOSITE SAMPLES - LOWER WARATAH RIVER

Sample No.	Type	% Sn	*Grade lb/yd^3 70% cassiterite	Grade adjusted for Volume %
A0 377	Screen oversize	3.00	113.49	22.70
378	Jig feed	1.35	51.02	10.20
379	Jig tail	0.37	13.98	2.80
380	Jig conc.	0.39	14.74	2.95

* Unadjusted for % volumes.

Thus, it is shown that the average head grade of 0.31 lb/yd^3 obtained by panning is substantially increased by crushing to liberate locked cassiterite, to give grades of up to 10 lb/yd^3 (jig feed grade of 51.02 lb/yd^3 adjusted for 20% of volume). Extremely high values from the screen oversize (+ 1/4 inch) indicate the true insitu grade could be considerably higher than 10 lb/yd^3.

3.2 FINE TAILINGS DUMP

Seventeen bulk samples were excavated from the dump (D1 to D18), see Plate 2. A representative sample from each location was bulked to form a composite sample of about 1 yd^3 in volume. This sample was crushed to -60 mesh using a 3-head stamp battery. Four duplicate samples were then taken for assay and one sample panned down to give a heavy mineral concentrate - also sent for assay (see Table 6).

In addition, a small grab sample was collected from each sample location in order to determine tin distribution throughout the dump. These samples were uncrushed (see Table 5).

Prior to bulk sampling, a programme of grab sampling at locations D1 to D18 was undertaken. Each sample (of 0.01 yd^3) was screened to -1/4 inch prior to panning to obtain a concentrate of primarily free cassiterite. Assays of these samples shows there is negligible free cassiterite left in the fine tailings dump - an average of 0.02 lb/yd^3 (see Table 4). With this result in mind, the bulk sampling concentrated on determining the grade of composite cassiterite.

TABLE 4.
PRELIMINARY PAN SAMPLING - FINE TAILINGS DUMP

Sample No.	Location	Concentrate Weight (g)	% Sn	Grade lb/yd^3 70% cassiterite
A0080	D1	8.86	1.00	0.04
081	D2	19.27	0.49	0.06
082	D3	21.43	0.12	0.01
083	D4	21.33	0.19	0.02
084	D5	21.98	0.17	0.02
085	D6	25.79	0.18	0.02
086	D7	25.95	0.35	0.04
087	D8	14.81	0.38	0.03
088	* D10	7.82	0.12	0.005
089	D11	4.03	0.17	0.003
A0090	D12	13.23	0.38	0.02
091	D13	15.28	0.37	0.03
092	D14	11.62	0.35	0.02
093	D15	8.31	0.42	0.02
094	D16	33.61	0.28	0.05
095	D17	11.19	0.11	0.006
096	D18	11.42	0.18	0.01

*D9 not sampled.

TABLE 5.
BULK SAMPLING - FINE TAILINGS DUMP

Sample No.	Location	Depth of Pit +	%Sn	Grade lb/yd^3 70% cassiterite	Remarks
A0387	D1	-	0.057	2.12	60' working face
388	D2	6'	0.042	1.59	40' face
389	D3	6'	0.14	5.29	10' face
A0390	D4	6'	0.17	6.35	
391	D5	8'	0.18	6.88	
392	D6	8'	0.11	4.23	
393	D7	8'	0.13	5.03	
394	D8	8'	0.06	2.38	
395	D9	3'	0.082	3.18	
396	D10	4'	0.036	1.32	
397	D11	-	0.056	2.12	10' face
398	* D13	16'	0.018	0.79	
399	D14	16'	0.048	1.85	
A0400	D15	8'	0.034	1.32	
401	D16	16'	0.066	2.38	
402	D17	16'	0.15	5.56	
403	D18	16'	0.038	1.32	

* D12 not dug. + all holes not to bottom.

TABLE 6.
COMPOSITE BULK SAMPLES - FINE TAILINGS DUMP

Sample No.	%Sn	Grade lb/yd^3 70% cassiterite		Remarks
A0381	0.14	5.29		Crushed -60# D1-D18 composite
382	0.14	5.29	Av. 4.83	" " " "
383	0.12	4.50		" " " "
384	0.11	4.23		" " " "
385	11.30	0.48		5 litre panned conc. from -60# crushed composite

As can be seen from Table 6, the average grade for the composite bulk samples from the Fine Tailings Dump is 4.83 lb/yd^3 after crushing to -60 mesh. The average grade from the seventeen grab samples from the dump is slightly lower at 3.16 lb/yd^3. Comparing the preliminary Plan Sampling (Table 4), which shows an average grade of 0.02 lb/yd^3 free cassiterite, indicates the bulk of the cassiterite in the dump occurs as composite grains.

4. RESERVE ESTIMATE - YARDAGE AND GRADE

4.1 LOWER WARATAH RIVER VIRGIN WASH

Reserves of wash have been calculated (Table 7) on a line basis. Three lines have been completed across the valley at approximately 200m intervals. Pits were at 20m centres on each line. Depths and grades were recorded on a schematic cross-section shown in Figure 2.

TABLE 7.
RESERVES - LOWER WARATAH RIVER

Line	Cross-Sectional Area yd^2	Strike Length Yds	Volume yd^3	Grade lb/yd^3
54N	406	219	88,900	0.36
52N	237	219	51,900	0.44
50N	292	241	70,400	0.23
47.5N	203	224	45,500	0.17
		TOTAL:	256,700	0.31

A further two pits were excavated on line 47.5 north on a 50m wide strip of unworked ground beside the worked out area of RINGAROOMA MINING (see Plate 1). Indicated reserves are 256,700 yd^3 at an average grade of 0.31 lb/yd^3 70% free cassiterite. As indicated in Section 3.2, this grade is likely to be much higher if composite cassiterite is taken into consideration. The grade of 0.31 lb/yd^3 has been reduced by 80% allowing for oversize boulders present in the virgin wash.

4.2 FINE TAILINGS DUMP

Calculation of reserves in the fine tailings dump can only be approximate as none of the pits could be excavated to bottom.

The dump has a surface area of some 30,000 yd^2. From pitting information and surface observations an average thickness of 8 yds would be not unreasonable. From this an approximate volume of 240,000 yd^3 is indicated. (RINGAROOMA MINING estimated the dump to contain 200,000 tonnes of material.)

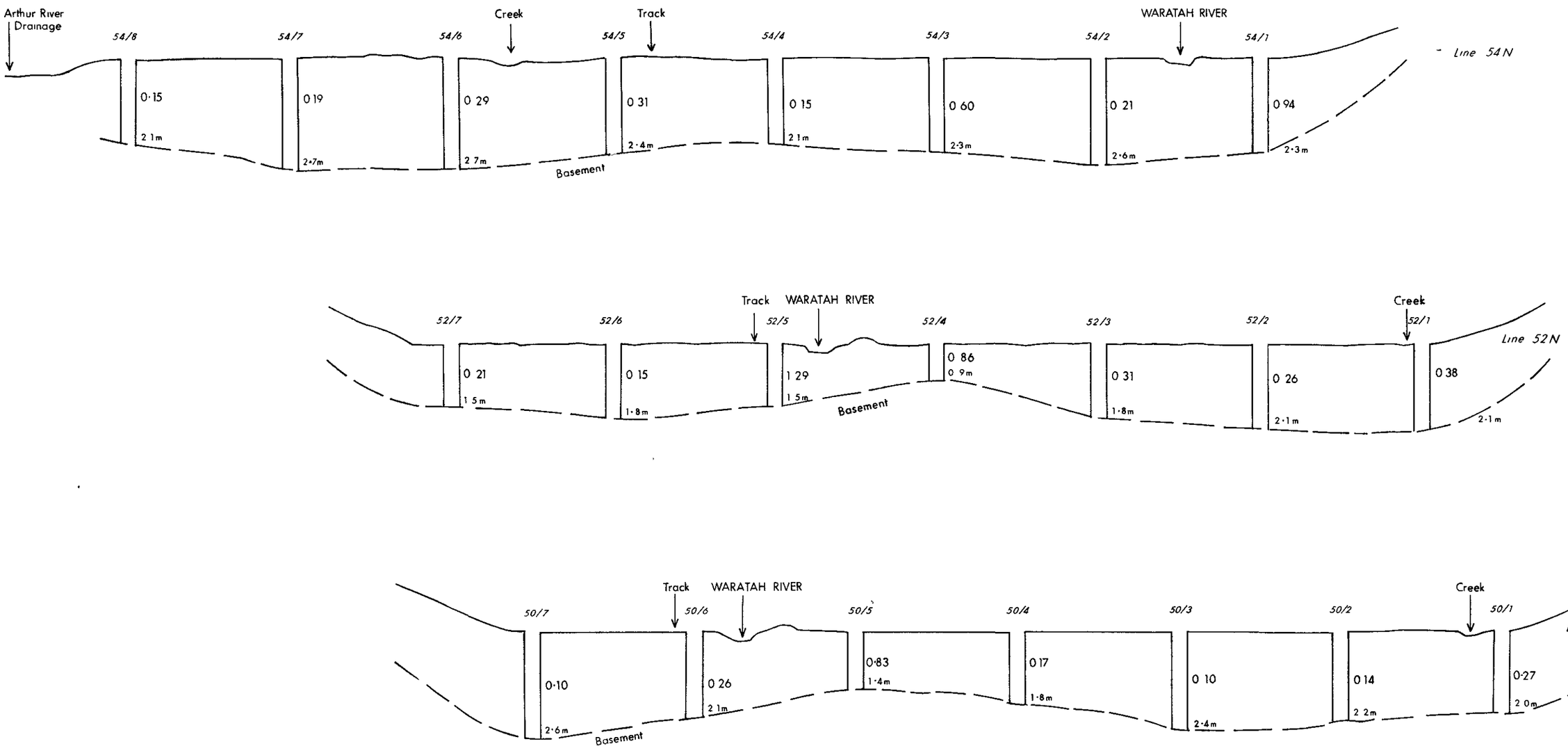
The grade obtained from bulk sampling the dump is 4.83 lb/yd^3 of 70% cassiterite, which occurs mostly as composite grains.

These figures indicate there are in the order of 500 tonnes of contained cassiterite, with an in ground value of around $A5 million (using a Sn. metal price of $A10,000 per tonne).

5. CONCLUSIONS

The North Valley Project - Waratah has been considered in two parts for the purpose of this study, the lower Waratah River virgin wash and the fine tailings dump left by RINGARCOMA MINING.

a. The lower Waratah River virgin wash contains approximately 256,700 yd^3 of wash at a grade of 0.31 lb/yd^3 70% free cassiterite. This grade could be appreciably higher (10.20 lb/yd) when composite cassiterite is taken into consideration.
b. The fine tailings dump contains approximately 240,000 yd^3 of material at a grade of 4.83 lb/yd^3 70% cassiterite.
c. Extraction of the lower Waratah River wash would be complicated by the presence of up to 80% boulders - 30 % boulders larger than 0.3 m, clayey nature of overburden, necessity to clear the land of thick forest, and an obligation to reafforestate the land after mining.
d. Treatment of the fine tailings dump could be a feasible proposition if an efficient milling process for the composite cassiterite could be established.
e. The present operating mill is considered not to be appropriate for the recovery of composite cassiterite.



NORTH VALLEY — WARATAH

Lower Waratah River Virgin Wash

Bulk Sample Pits

Basement Profiles

SCALE { HORIZONTAL 1 500 / VERTICAL 1 100

FIGURE 2

APPENDIX 1.

DESCRIPTION OF PLANT USED FOR TESTING PROGRAMME.

A front-end loader with a bucket capacity of 1.25 yds, feeds head-grade material directly onto a vibrating screen washed with high pressure jets of water. Each load is creeened and passed into the plant. The vibrating screen is set to reject material greater than 1/4" in size.

The -1/4" material is washed into a sump under the screen from where it is pumped into a three compartment jig. The jigs are fitted with 1/4" stainless steel mesh and heamatite pellets are used for ragging.

The tailings from the jig flow by gravity to waste and the hutch products are combined in a sump before being pumped to a 10" cyclone for desliming.

APPENDIX 2.

JIG PERFORMANCE DURING TESTING PROGRAMME.

During sampling of the lower Waratah River virgin wash, a three-cell jig was used to obtain a tin concentrate. Three streams were sampled; the jig feed, jig tailings, and jig concentrate. The jig performance can be calculated using the following formula:

$$\text{Jig recovery } \% = \frac{c\ (f-t)}{f\ (c-t)}$$

where c = conc. grade
f = feed grade
t = tailings grade

The average grade of free tin for the twenty-four bulk samples is:

Feed (f) - 0.78 lb/yd^3
Tailings (t) - 0.68 lb/yd^3
Conc. (c) - 2.71 lb/yd^3.

$$\text{Jig recovery } \% = \frac{c\ (f-t)}{f\ (c-t)} = \frac{2.71\ (1.78 - 0.68)}{1.78\ (2.71 - 0.68)} \times 100$$

$$= 82.50\%.$$

APPENDIX 3.

RAW ASSAY DATA

A. PRELIMINARY PAN SAMPLES

B. LOWER WARATAH RIVER BULK SAMPLING - JIG SAMPLES

C. FINE TAILINGS DUMP BULK SAMPLING.

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APPENDIX 3 - A

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LABORATORY REPORT

BATCH No.: 60B CLIENT: B.R.G.M. AUSTRALIA
ORDER No.: FJ 178 AREA: N.E. TASMANIA DATE RECEIVED: 23-2-78
SAMPLE TYPE: No. OF SAMPLES: 38 DATE COMPLETED: 9-3-78

SAMPLE No.	Location	Dry Wt. gms	Sn %	Grade lb/cyd	Sample Size (yd^3)	Remarks
A 0080	D1	8.86	1.00	0.04	0.01	
81	D2	19.27	0.49	0.06	0.01	
82	D3	21.43	0.12	0.01	0.01	
83	D4	21.33	0.19	0.02	0.01	
84	D5	21.98	0.17	0.02	0.01	
85	D6	25.79	0.18	0.02	0.01	
86	D7	25.95	0.35	0.04	0.01	
87	D8	14.81	0.38	0.03	0.01	
88	D10	7.82	0.12	0.005	0.01	
89	D11	4.03	0.17	0.003	0.01	
A 0090	D12	13.23	0.38	0.02	0.01	
91	D13	15.28	0.37	0.03	0.01	
92	D14	11.62	0.35	0.02	0.01	
93	D15	8.31	0.42	0.02	0.01	
94	D16	33.61	0.28	0.05	0.01	
95	D17	11.19	0.11	0.006	0.01	
96	D18	11.42	0.18	0.01	0.01	
97	54/2	2.49	24.40	0.29	.0065	River Crossing
98	54/3	21.51	0.34	0.04	.0065	Surface Sand
99	54/5	5.00	47.20	0.57	.013	Pit
A 0100	54/6	5.39	38.70	1.00	.0065	Pit
A 0289		30.10	0.29	0.02	.013	Old River Channel
A 0290		3.45	50.10	0.42	.013	River Bank
91	47.5/4	2.84	39.60	0.27	.013	Old Pit
92	46.5/1	42.42	26.60	2.71	.013	Old Trench
93	43.5/1	11.17	55.60	2.99	.0065	Bank of old Workings
94	43.5/2	22.32	17.00	1.82	.0065	Pit in bottom of Workings
95		43.77	38.00	3.99	.013	Opp. Websters Gully
96		3.76	0.92	0.02	.0065	Plant Sceen Oversize
A 0297		7.57	0.26	0.01		Jig feed + 30#

NATA

METHODS: Sn by method 105A

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(Cont)

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LABORATORY REPORT

BATCH No.: 60B CLIENT: B.R.G.M AUSTRALIA
ORDER No.: AREA: DATE RECEIVED:
SAMPLE TYPE: No. OF SAMPLES: DATE COMPLETED:

SAMPLE No.	Location	Dry Wt gms	Sn %	Grade lb/cyd	Sample Size(yd^3)	Remarks
A 0298		15.19	650ppm	0.01	Jig	Feed+60#-30#
99		21.00	0.32	0.03	Jig	Feed+120#-60#
A 0300		3.00	25.80	0.35	Jig	Feed+240#-120#
A 0601		3.47	24.70	0.39	Jig	Cons. + 60#
02		8.22	0.53	0.02	Jig	Cons+120#-60#
03		4.75	36.70	0.78	Jig	Cons+240#-120#
04		1.64	0.46	0.003	Jig	Tail +120#
A 0605		0.84	0.26	0.001	Jig	Tail+240#-120#

METHODS:

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APPENDIX 3 - B

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LABORATORY REPORT

BATCH No.: 96C CLIENT: B.R.G.M. AUSTRALIA
ORDER No.: AREA: N.E. TASMANIA DATE RECEIVED: 29-3-78
SAMPLE TYPE: No. OF SAMPLES: 76 DATE COMPLETED: 10-4-78

SAMPLE No.	Location/Type	Weight (g)	Sn %	Grade lb/cyn	Dilution %	Diluted Grade lb/cyd
A 0301	54/1 Feed(F)	51.76	18.8	4,68	20	0.94
02	Tail(T)	56.25	0.23	0.06		
03	Cons(C)	39.72	12.8	2.44		
04	54/2 F	38.37	5.8	1.07	20	0.21
05	T	25.08	5.8	0.70		
06	C	13.07	11.8	0.74		
07	54/3 F	41.31	15.0	2.98	20	0.60
08	T	68.67	5.5	1.82		
09	C	56.26	13.0	3.52		
A 0310	54/4 F	17.63	8.8	0.75	20	0.15
11	T	42.57	8.8	1.80		
12	C	55.27	10.5	2.79		
13	54/5 F	13.72	23.3	1.54	20	0.31
14	T	39.88	12.0	2.30		
15	C	16.53	15.8	1.26		
16	54/6 F	21.40	14.3	1.47	20	0.29
17	T	34.11	9.0	1.48		
18	C	35.71	13.5	2.32		
19	54/7 F	30.84	6.3	0.93	20	0.19
A 0320	T	37.73	10.5	1.90		
21	C	36.10	8.3	1.44		
22	54/8 F	20.50	7.5	0.79	20	0.15
23	T	05.72	10.0	0.28		
24	C	30.36	7.5	1.09		
25	52/1 F	49.25	8.0	1.89	20	0.38
26	T	81.27	7.0	6.73		
27	C	37.07	13.3	2.37		
28	52/2 F	22.56	12.0	1.30	20	0.26
29	T	30.74	16.3	2.91		
A 0330	C	24.44	16.8	1.97		

METHODS: Sn by method 7

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APPENDIX 3 - B (Cont.)

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Australian Laboratory Services PTY. LTD.

CONSULTING CHEMISTS & ANALYSTS

R. W. YERBURY
DIRECTOR

OFFICE & LABORATORY
44 BALACLAVA ST., WOOLLOONGABBA 4102
Phone (072) 391 6986 A/H 355 0776
TELEX ALSEV 42344

LABORATORY REPORT

BATCH No.: 96C CLIENT: B.R.G.M. AUSTRALIA
ORDER No.: AREA: DATE RECEIVED:
SAMPLE TYPE: No. OF SAMPLES: DATE COMPLETED:

SAMPLE No.	Location/Type		Weight (g)	Sn %	Grade lb/cyn	Dilution %	Diluted Grade lb/cyn
A 0331	52/3	F	25.59	12.8	1.57	20	0.31
32		T	05.99	0.93	0.03		
33		C	76.49	7.8	2.87		
34	52/4	F	23.00	38.8	4.29	20	0.86
35		T	06.69	2.9	0.09		
36		C	61.87	16.0	4.76		
37	52/5	F	77.34	17.3	6.43	20	1.29
38		T	10.95	1.3	0.07		
39		C	47.38	19.0	4.33		
A 0340	52/6	F	22.87	7.0	0.77	20	0.15
41		T	10.18	1.2	0.06		
42		C	31.92	15.3	2.35		
43	52/7	F	33.94	6.3	1.03	20	0.21
44		T	13.93	0.50	0.03		
45		C	74.07	6.8	2.42		
46	50/1	F	11.46	24.3	1.34	20	0.27
47		T	05.07	1.4	0.03		
48		C	44.23	16.8	3.57		
49	50/2	F	10.77	13.3	0.69	20	0.14
A 0350		T	12.77	0.40	0.03		
51		C	34.88	14.3	2.40		
52	50/3	F	07.77	13.8	0.52	20	0.10
53		T	07.65	0.88	0.03		
54		C	21.96	10.5	1.11		
55	50/4	F	21.30	8.3	0.85	20	0.17
56		T	12.91	1.3	0.08		
57		C	86.74	5.0	2.08		
58	50/5	F	47.38	18.3	4.17	20	0.83
59		T	44.90	0.85	0.18		
A 0360		C	145.04	9.3	6.48		

METHODS:

Signatory

APPENDIX 3 - B (Cont.)

830023

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LABORATORY REPORT

- 3 -

BATCH No.: 96C CLIENT: B.R.G.M. AUSTRALIA
ORDER No.: AREA: DATE RECEIVED:
SAMPLE TYPE: No. OF SAMPLES: DATE COMPLETED:

SAMPLE No.	Location/Type		Weight (g)	Sn %	Grade lb/cyd	Dilution %	Dilution Grade lb/cyd
A 0361	50/6	F	13.51	20.3	1.32	20	0.26
62		T	17.10	0.60	0.05		
63		C	81.33	16.3	6.37		
64	50/7	F	09.47	10.8	0.49	20	0.10
65		T	28.60	0.50	0.07		
66		C	48.80	8.8	2.06		
67	47/2	F	35.42	4.5	0.77	20	0.15
68		T	05.96	0.55	0.02		
69		C	113.37	3.3	1.80		
A 0370	47/3	F	33.18	6.0	0.96	20	0.19
71		T	08.54	0.20	0.01		
72		C	100.25	5.0	2.41		
73	Screen Oversize		265.40	42.0	53.57		
74	Composite Crushed Samples (Panned)	F	93.36	28.8	12.92	20	2.58
75		T	30.75	25.0	3.70		
A 0376		C	41.99	21.5	4.34		

METHODS:

Signatory

APPENDIX 3 - B (Cont.)

830024

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TELEX ALSEV 42344

LABORATORY REPORT

BATCH No.: 11D CLIENT: B.R.G.M. AUSTRALIA
ORDER No.: REF: FJ 178 AREA: N.E. TASMANIA DATE RECEIVED: 5-4-78
SAMPLE TYPE: CRUSHED GRAVEL No. OF SAMPLES: 4 DATE COMPLETED: 19-4-78

SAMPLE No.	Location/Type	Sample Wt. gms	Sn %	Grade lb/cyd	Dilution %	Diluted Grade lb/cyd
A0377	Composite Screen Oversize	3851	3.0	111.43	30	33.43
378	Crushed F	3675	1.35	50.13	20	10.03
379	Samples T	3621	0.37	13.77		
380	(Unpanned) C	3592	0.39	14.55		

CONFIRMATION OF PHONED RESULTS

METHODS: Sn by method 7

Signatory G. Lunn

APPENDIX 3 - C

830025

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CONSULTING CHEMISTS & ANALYSTS

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TELEX ALSEV 42344

LABORATORY REPORT

RESULTS TELEXED 24-5-78.

BATCH No.: 36 E CLIENT: B.R.G.M. AUSTRALIA.
ORDER No.: FJ178 AREA: N.W. TASMANIA. DATE RECEIVED: 11-5-78.
SAMPLE TYPE: S/SED's/CONC. No. OF SAMPLES: 23 DATE COMPLETED: 23-5-78.

SAMPLE No.	Location	Sn %	Dry Wt. gms.	Grade lb/cyd	Remarks
AO 387	D1	0.057		2.12	60' working face
88	D2	0.042		1.59	40' working face
89	D3	0.14		5.29	10' working face
AO 390	D4	0.17		6.35	
91	D5	0.18		6.88	
92	D6	0.11		4.23	
93	D7	0.13		5.03	
94	D8	0.060		2.38	
95	D9	0.082		3.18	
96	D10	0.036		1.32	
97	D11	0.056		2.12	10' working face
98	* D13	0.018		0.79	
99	D14	0.048		1.85	
AO 400	D15	0.034		1.32	
01	D16	0.066		2.38	
02	D17	0.15		5.56	
03	D18	0.038		1.32	
	* D12 not dug				
AO 381		0.14		5.29	
82		0.14		5.29	
83		0.12		4.50	
AO 384		0.11		4.23	
385		11.30	8.75	0.48	

METHODS: Sn by method 105 C (Classical)

Signatory

SEREM - NORTHERN DEVELOPMENT J V

WARATAH RIVER ALLUVIAL WORKINGS

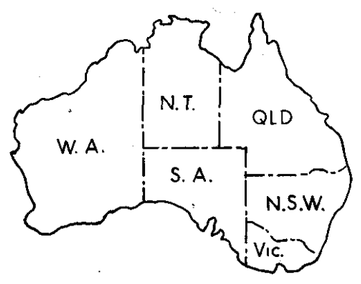
LEASE LOCATION & SAMPLING PITS

NORTH VALLEY ALLUVIAL TIN PROJECT

0 100 200 300 400 metres

SCALE 1:5000

5 cm



PREPARED BY B.R.G.M. AUSTRALIA

Date : March 1978
Project no : 78/SYD/07

830 01

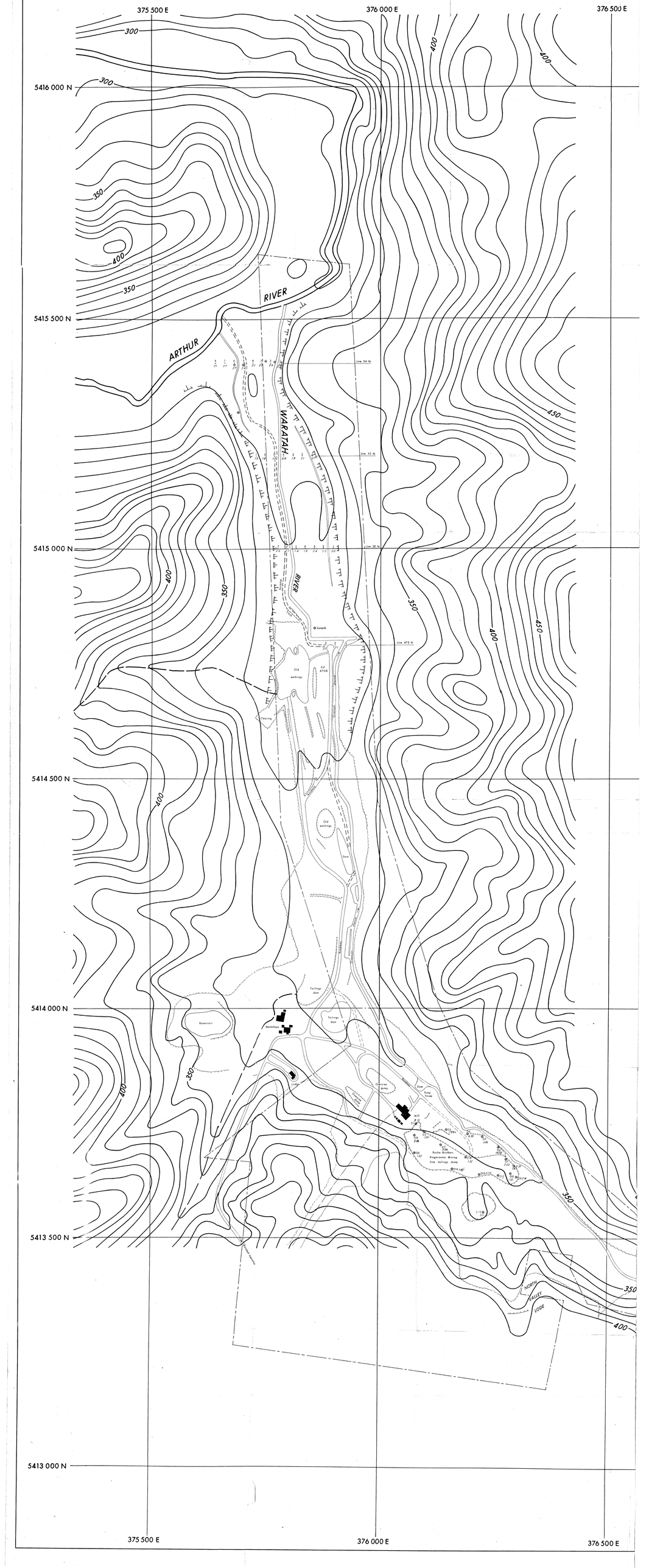
PLATE 1

375 500 E
376 000 E
376 500 E
377 000 N
5416 000 N
5415 500 N
5415 000 N
5414 500 N
5414 000 N
5413 500 N
5413 000 N

RIVER
Alluvium 2m. thick
ARTHUR
WARATAH
LINE 54
LINE 52
LINE 50
47·5 N
46 N
44·5 N
43 N
Edge of Clearing
old workings
ROAD
Channel
Diversion
dump
Reservoir
Workshops
Tailings dam
Lodge
Mill
Fine tailings dam

LEGEND

- Lease Boundary
- Roads & Tracks
- Mine Buildings
- River Creek
- Topographic Contours, 10m intervals
- Edge of Forest
- Limit of Wash
- LINE 54 — Sample Pit Location
- 48/1 — Preliminary Sample Location


375 500 E
376 000 E
376 500 E
5416 000 N
5415 500 N
5415 000 N
5414 500 N
5414 000 N
5413 500 N
5413 000 N
ARTHUR RIVER
WARATAH RIVER
Line 54 N
Line 52 N
Line 50 N
Line 473 N
Old workings
Old workings
Old workings
Clearing
Dam
Tailings dam
Tailings dam
Workshops
Reservoir
Lodge
Quarry
Quarry dump
Dam
Pump house
Mill
Roche Bonbars
Engineers Mining
fine tailings dump
NORTH VALLEY LODE
300
350
400
450


SEREM – NORTHERN DEVELOPMENT J/VENTURE
WARATAH RIVER
ALLUVIAL WORKINGS
SAMPLE LOCATION MAP
LOWER WARATAH RIVER
&
FINE TAILINGS DUMP
SCALE 1 : 2000
200 metres
5 cm
W. A.
N.T.
QLD
S. A.
N.S.W.
Vic.
Tas
PREPARED BY B.R.G.M. AUSTRALIA
830002
Date: June 1978
Project no: 78/SYD/07
PLATE 2
LEGEND
Lease Boundary
Roads & Tracks
Mine Buildings
Topographic Contours, 10m Intervals
Edge of Forest
River, Creek
Limit of Wash
Line 54 N
(depth in metres)
Sample Pit Location
Preliminary Sample Location
Sample Location Fine Tailings Dump
(Grade) 5·29 lb/yd3
376 500 E
377 000 E
5415 500 N
5415 000 N
5414 500 N
5414 000 N
5413 500 N
5413 000 N
400
450
350
NORTH
VALLEY
LODE