

**MICROFILMED**  
FICHE No.013363 -

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**EXPLORATION FOR  
ALLUVIAL TIN,  
RUTILE AND ZIRCON  
IN  
RINGAROOMA BAY  
OFF  
NORTH-EAST COAST  
OF  
TASMANIA**

**FEBRUARY 1966 TO MARCH 1967**

*EL 6/65*

**OCEAN MINING A.G.**

**SPECIAL NOTE : THE FOLLOWING REPORTS RELATE TO OCEAN  
MINING AG AT RINGAROOMA BAY DURING THE 1960S -  
TCR 81-1620 TCR 81-1621 TCR 94 - 3648**

**AUTHOR : ANON.**

**APRIL 1969**

**94 - 3648**

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TOE - JV SUMMARY,  
RINGAROOMA BAY, TASMANIA

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**Ocean Mining A.G.**

April 1969

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## 1. SUMMARY

About US\$500,000 has been spent by the TOE-JV partners on an exploration programme for tin and other minerals in Ringarooma Bay, north east Tasmania.

This exploration led to the discovery of a relatively large, low grade alluvial tin, zircon and rutile deposit in water depths of between 60 and 120 feet.

Assuming a cut-off grade of two ounces tin metal per cubic yard (US\$0.20) this deposit contains between 3,300 and 4,500 long tons tin metal, with a value of US\$10 to 14 million. Associated rutile and zircon contained in the area increase the gross value by between US\$1.5 and \$3 million dollars.

The drill hole spacing on which these estimates are based is relatively wide with some important holes being as much as 1,000 yards apart. It is possible that closer spaced deeper drilling to bedrock could about double the grade and the volume of the Ringarooma Bay deposit to perhaps 50 to 60 million yards averaging US\$0.90.

## 2. SUMMARY OF OPERATIONS

### GENERAL

Between February, 1966, and March, 1967, Ocean Mining A.G., conducted an intensive exploration programme for alluvial tin, rutile and zircon in Bass Strait, off the north coast of Tasmania.

The first phase of this exploration began in February, 1966. It was conducted with three small, locally chartered, fishing vessels equipped with seismic and sampling equipment. During the first five months 3,500 line miles of bathymetric and seismic profiling were run, mostly around the east and north coasts of Tasmania but also off Flinders Island and King Island to the east and west of Bass Strait respectively.

Detailed maps and profiles showing sediment thickness, bathymetry, and bedrock topography were compiled from these records. From this and other information targets were selected for reconnaissance drilling and 158 samples were obtained by jet air lift sampler, and assayed.

An evaluation of the results of the programme indicated several areas of potential interest and one in particular, Ringarooma Bay off the north-east coast of Tasmania, showed considerable promise.

Phase II operations were then immediately initiated to evaluate Ringarooma Bay and the several other targets indicated by the preliminary exploration. This evaluation was to be based on more precise, deeper, and closer spaced drilling.

The drilling vessel, Wando River, equipped with drilling capability to 100 feet in up to 200 ft of water, arrived in Tasmania in September, 1966. By late February, 1967, a total of 177 cores had been collected from selected target areas in Ringarooma Bay, Oyster Bay, King Island and Mussel Roe Bay. Over 1,300 samples were submitted to the Tasmanian Department of Mines Laboratories in Launceston for tin, titanium and zirconium assay and for preliminary mineral dressing studies.

A total of 138 holes were drilled in Ringarooma Bay in water depths ranging from 30 to 120 feet. Sediment thickness in this bay rarely exceeds 40 feet, so maximum drill penetration was of this order and averaged about 20 feet. Core recovery was about 95 percent if allowance is made for a few holes from which, for various reasons (e.g. jammed core catcher), no core was recovered. These holes were immediately redrilled.

The cost of this programme, to February, 1967, was approximately US\$500,000.

A summary of Phase I and Phase II operations is given in Table 1.

TABLE 1.

SUMMARY: TOEC OPERATIONS - TIN EXPLORATION 1st February 1966 - 28th February 1967

Exploration Licence	Area: Sq miles surveyed	PHASE I			PHASE II	
		Bathymetric line miles	Seismic line miles	Test Holes Jet Lift	Drill Holes	Samples
Oyster Bay	740	450	460	48	12	170
N.E. Coast <sup>(1)</sup>	1,000	610	329	41	149	1,041
E. King Island	600	310	267	28	16	94
Flinders Island	1,600	442	380	30		
Cox Bight	93	150		11		
Totals:	4,033	1,962	1,436	158	177	1,305

<sup>(1)</sup> Including Mussel Roe Bay

## RESULTS AND INTERPRETATION

### 3. Ringarooma Bay - Mineralisation

Although traces of tin were found in all areas sampled and richer pockets that were clearly too small to have economic potential were also located, the most promising tin mineralisation was discovered in an area of about five square miles in the centre of Ringarooma Bay.

Of the 138 holes drilled in Ringarooma Bay 27 yielded interesting tin concentrations, 16 of them having a minimum grade over their total depth, generally less than 40 feet, of better than two ounces (US\$0.20) metallic tin per cubic yard along with minor quantities of rutile zircon and gold. From these 27 holes, 192 samples were assayed of which 90 contained from one ounce of tin metal per cubic yard, to as much as 22 ounces (US\$2.20).

The accompanying map (Fig. 1) shows water depth, drill hole location and tin isograds in Ringarooma Bay. It shows clearly the linear nature of the mineralisation extending seawards from the mouth of the Ringarooma River, the main drainage feature from the tin-bearing Devonian granites of the area. Small pockets of mineralisation occur both to the east and west of the main-channel and indeed traces of tin were discovered in most drill holes in the Bay. This lower grade tin, however, which is not now associated with the main mineralisation, has almost certainly resulted from minor resorting and redistribution by marine agencies of material transported by the Ringarooma River.

Although it is quite possible that a concentration of heavy minerals could be present along a buried strand line in the bay no such concentration has so far been detected.

The sediment filled course of the Pleistocene Ringarooma River offshore from the present coastline was traced by seismic methods during Phase I and its position confirmed by drilling. The average gradient of the bed of the river offshore is only 9.5 ft per mile, and of the sea bed in the area only between five and seven feet per mile. A river having a thalweg of this order would be subject to frequent changes in course which in turn would lead to a very patchy distribution of any mineralisation. This certainly applies to the area in question where very little correlation of sediment type or cassiterite occurrence is possible between drill holes, even over short distances. A limited amount of close spaced drilling suggests that the deposit is patchy both areally and vertically, as is not uncommon in alluvial deposits

of this type. It is possible, however, that mineralisation within the gutter of the old Ringarooma River could be more persistent than that in the upper levels which have probably been resorted from time to time, but too few holes have been drilled into it for this to be determined. In this respect it is of interest to note that six drill holes bottomed in comparatively rich material (up to 10ozs/cu. yd).

The highest values are generally contained in samples of medium to coarse grained quartz sand and fine gravel which often includes well rounded granules and pebbles to three inches diameter. The association of high tin grade with coarse sediments is clearly marked, although exceptions have been noted. It is also evident that many of the richest samples in the upper levels of the sediment body overlie layers of very fine grained sticky silt or semi-compacted white clay and it is probable that these layers have acted as a "false bottom". No cassiterite has been recovered from any of the very fine sediments except where they form the matrix for coarser material as, for example, in a clay-conglomerate.

Although some of the cassiterite is very fine grained much of it occurs within the 150-250 microns range and ore dressing tests on a few small samples of approximately representative material indicates that tin recovery by tabling could possibly exceed 95 percent.

#### Water Depth

Fig. 1 shows that water depth increases towards the north along the line of mineralisation from 60 feet about one mile offshore to over 100 feet. It is apparent from the open ended nature of the tin isograds that the alluvial deposit trends even further offshore towards the north west. No drilling occurred in water deeper than 120 feet.

#### 4. RESERVES

Phase II exploration revealed the existence of a relatively extensive, low grade, alluvial tin deposit in Ringarooma Bay.

The overall grade, depth and lateral extent of the richer tin bearing ground is still uncertain because of the relatively wide spacing of the drill holes. However, an estimate based on the Phase II results has been made and this suggests that at least 30 million cubic yards of sediment with an average grade of about four ounces of tin metal exists within the main  $4\frac{1}{2}$  square mile area of interest.

This represents about 3,300 long tons of tin metal worth, at US\$3,000 per long ton, nearly US\$10,000,000.

The area also contains about three ounces of zirconium and 1.5 ounces of titanium ( $TiO_2$  as rutile) per cubic yard. The combined value of the titanium and zirconium is between \$0.05 - \$0.10 per cubic yard or about \$1.5 to 3 million dollars.

Significant amounts of ilmenite are also present but the chrom. content varies from 0.1 to 0.3 per cent, well above the acceptable chrome level (0.03%) for pigment manufacture. Traces of gold and minor amounts of monazite also occur.

#### 5. ECONOMIC POTENTIAL

TOE-JV drilling in Ringarooma Bay has outlined about 30 million cubic yards of tin, zircon and titanium bearing alluvium averaging about \$0.45.

The areal distribution of the mineralisation is known to be patchy and only 20 of the 138 holes drilled in Ringarooma Bay intersected areas of significant mineralisation. As a consequence the distance between most drill holes is relatively large (up to 1,000 yards.)

Because of the patchy nature of the mineralisation and the wide drill hole spacing it is thought possible that additional fill-in drilling could intersect more of the higher grade areas. The effect of this would be to reduce the volumes of influence of the existing lower grade holes and generally upgrade the deposit. In addition, more drilling around the periphery of the deposit, particularly to the east and further offshore, would probably increase the minable reserves, but some of this material would be in water depths greater than 120 feet.

It is difficult to estimate by how much the grade and volume of the deposit might be increased by these means but there is room for about a doubling of the volume to, say, 50 to 60 million yards. Then, if only four or five rich patches of mineralisation about equal in grade to the top few so far discovered were intersected in drilling, the overall grade would also be about doubled to US\$0.90 per cubic yard. On this basis the gross value of the deposit would be around US\$50 million.

## 6. MINING

Ocean Mining A. G., in collaboration with OSE and other experienced consultants, conducted a mining feasibility study on the basis of information about the area and the deposit available at the end of 1966.

The various systems considered applicable (taking into account reductions in operating capacity for floating equipment in offshore Tasmanian conditions) are summarised in Table 2. This table shows that operating costs and amortization in the vicinity of US\$0.30 per cu. yd. could be expected over the life of the deposit by mining with a large bucket dredge.

## 7. King Island

While evaluating the Phase I bathymetric, seismic and jet lift sampling data it became obvious that very good targets for tin and rutile existed within the King Island exploration licence, particularly along the east coast offshore from Naracoopa.

However, neither of the two targets selected, a major, deep sediment filled channel and Elephant Shoal, was adequately drilled by the Wando River in spite of two determined attempts to do so. In each case, even though the areas were off the sheltered eastern side of the island, drilling was continually hampered or prevented by high and continuous swell conditions.

As a consequence the potential of this area remains largely untested.

8. LICENCES

Of the five tin exploration licences covering an area of about 4,000 square miles originally held, only two areas, totalling 1,255 square miles, have been retained. The location of these licences is shown on the accompanying map and the relevant details are as follows:

Licence No.	Location	Renewal Date <sup>(1)</sup>	Area (sq. ml.)	Fees A\$
E.L. 6/65	N.E. Tasmania	18th May, 1969	900	168.75
E.L. 7/65	King Island	18th May, 1969	355	84.00

Although no field work has been undertaken within these for over 18 months, verbal discussion with the Tasmanian Department of Mines indicates that approval to renew them for six months beyond May, 1969 would probably be forthcoming but probably at a somewhat higher fee. It will be necessary to indicate that substantial efforts are being made to initiate further exploration.

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OCEAN MINING A. G.  
EXPLORATION LICENCES  
APRIL 1969

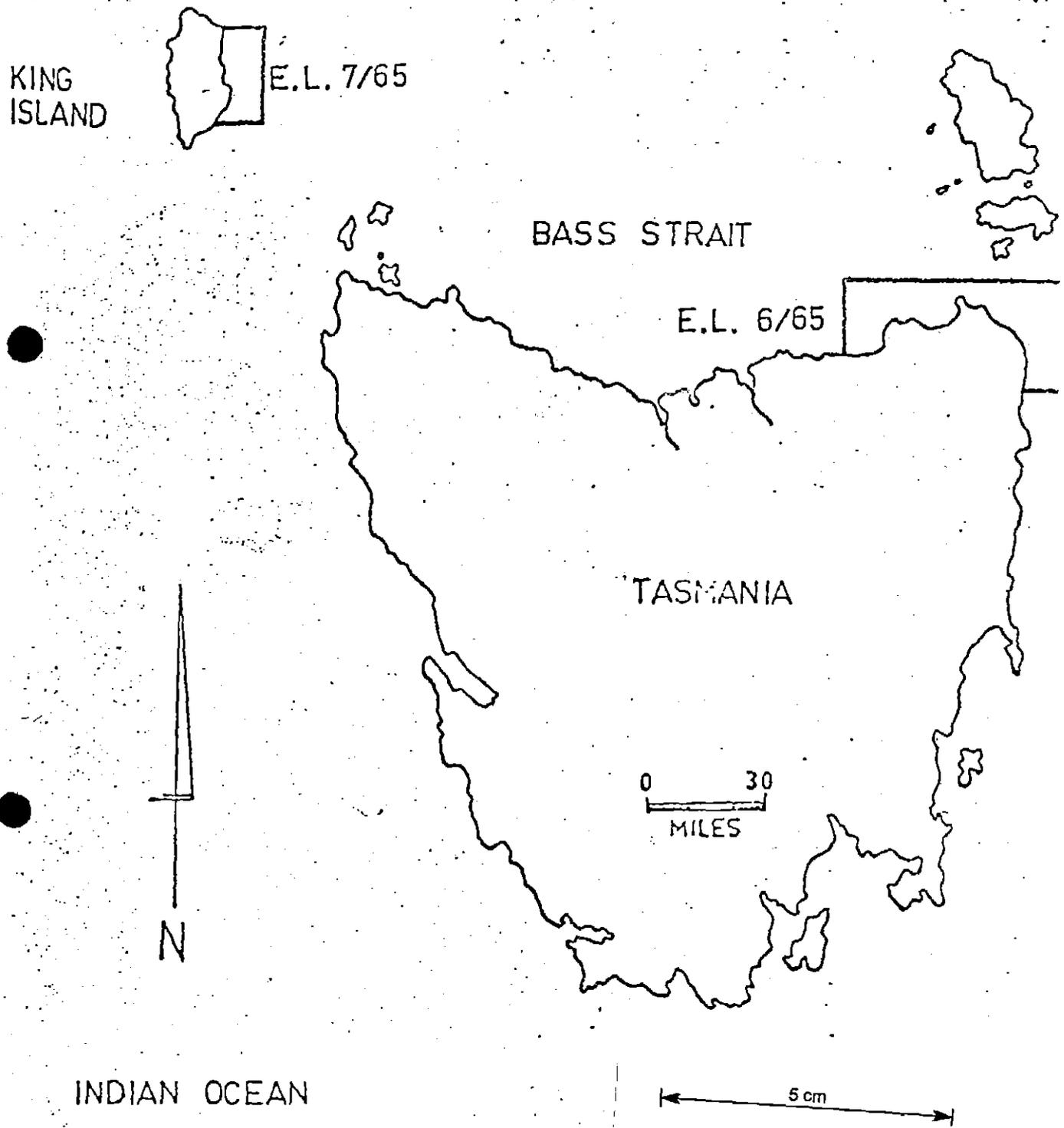
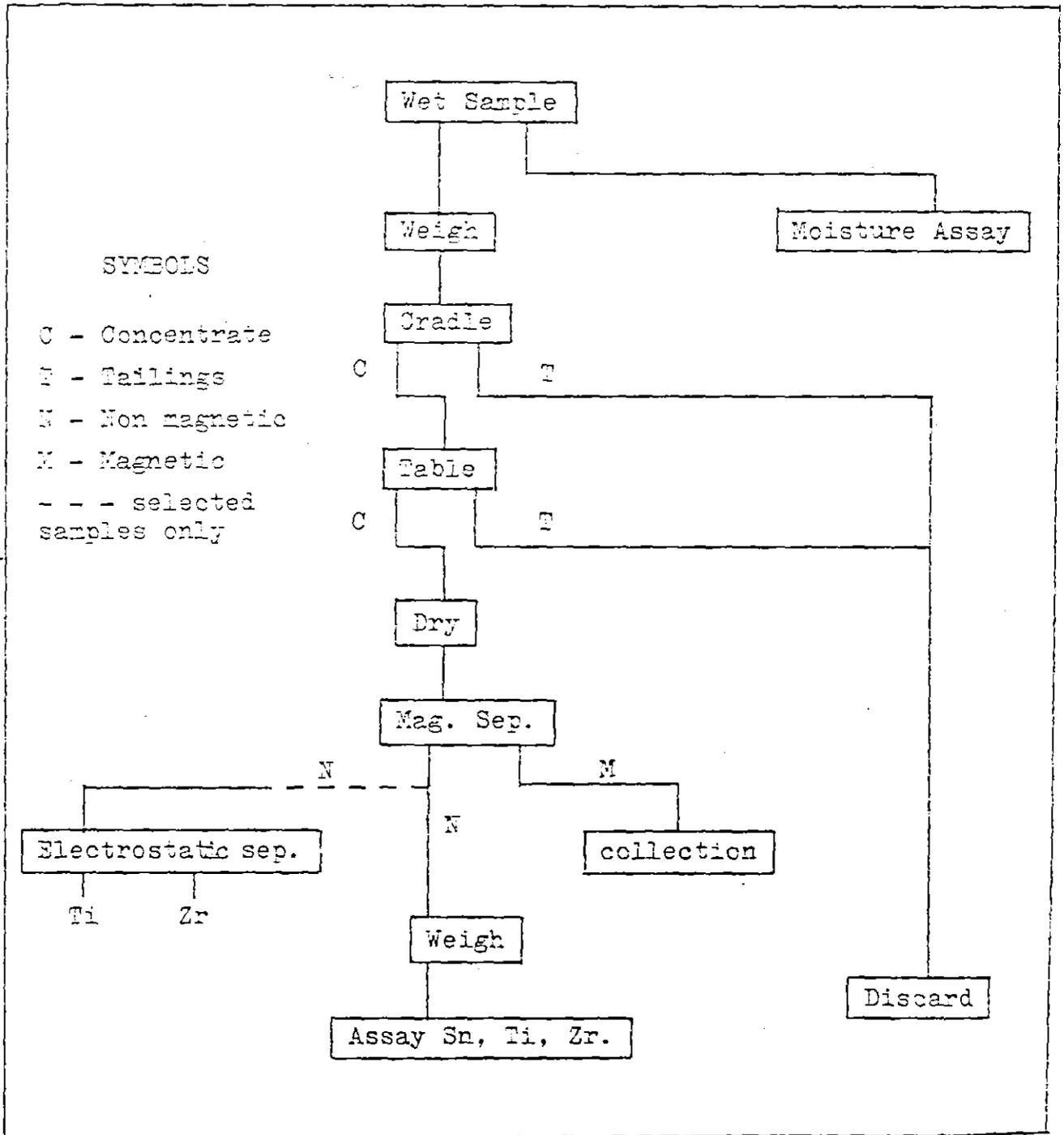


TABLE 2

SAMPLE TREATMENT FLOW SHEET



TOEC Oct '66

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TABLE 6

DRILL HOLE DATA  
NORTH EAST COAST TASMANIA

851015

Hole No.	Date October 1966	Water Depth ft.	Drill Penetration ft.	Core Recovered ft.	Bedrock Reached
1	27th	54	8.5	8.5	Yes
2	"	84	30.5	30.5	"
3	"	65	9.0	8.5	"
4	"	58	23.5	22.5	"
5	28th	83	11.5	11.5	"
6	"	74	21.0	18.5	"
7	"	74	38.0	37.5	"
8	29th	62	47.0	38.0	"
9	"	76	25.5	25.5	"
10	"	75	15.0	14.5	No
11	"	73	29.0	28.5	Yes
12	"	87	30.0	14.0	"
13	30th	88	11.0	5.0	"
14	"	82	8.0	7.5	"
15	"	86	28.0	25.0	"
16	"	98	8.0	8.0	"
17	"	82	10.5	10.5	No
18	31st	109	21.0	21.0	Yes
19	"	106	19.5	19.5	"
20	"	95	15.0	15.0	"
21	"	101	36.0	33.0	"
		Totals	445.5	403.5	

TABLE 5.

DRILL HOLE DATA

851016

NORTH EAST COAST TASMANIA

Hole No.	Date November 1966	Water Depth ft.	Drill Penetration ft.	Core Recovered ft.	Bedrock Reached
22	1st	87	13	13	Yes
23	14th	65	22.0	22.0	"
24	3rd	58	2	2	"
25	"	60	2	2	"
26	"	89	35	35	No
27	"	90	20	19.5	Yes
28	4th	105	19.5	19.5	"
29	"	89	8.5	8.5	"
30	"	95	28	25.5	"
31	"	102	10	9	No
32	"	109	10	9.5	Yes
33	"	106	28	24	"
34	5th	80	48	46	No
35	6th	109	15.5	15.5	Yes
36	"	112	24	20.5	"
37	"	103	41	37.5	"
38	"	113	30	25	"
39	"	75	28	19	"
40	7th	93	4	4	"
41	"	102	22.5	22.5	"
42	"	95	16	10	"
43	"	82	3	3	"
44	"	72	2.5	2.5	"
45	"	94	10	9.5	"
46	8th	104	7	7	"
47	"	110	12	10	"
48	"	113	12.5	12.5	"
49	"	53	10	3	No
50	10th	91	9	9	Yes

.../contd.

TABLE 5

DRILL HOLE DATA  
R.V. WANDO RIVER  
DECEMBER 1966

Hole	Area	Date	Water Depth ft.	Drill Penetration	Core Recovered	Bedrock Reached
KI 7	E. King Is	1st	95	0	0	No
8	"	"	62	22.0	16.0	Yes
NE 71	Ringarooma Bay	12th	115	23.5	21.5	"
72	"	"	118	32.5	31.5	"
73	"	"	120	39.0	33.0	"
74	"	"	118	28.0	28.0	"
75	"	16th	104	22.5	22.5	"
76	"	"	100	30.0	30.0	"
77	"	22nd	99	15.0	15.0	"
78	"	"	110	33.5	31.5	"
79	"	"	108	23.0	23.0	"
80	"	"	100	41.0	41.0	"
81	"	"	97	25.0	23.5	"
NE 02	Mussel Roe Bay	15th	47	22.5	22.5	"
03	"	17th	92	33.0	33.0	No
			Totals	390.5	372.0	% Recovered 95.3

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TABLE 5. (contd.)

DRILL HOLE DATA  
NORTH EAST COAST TASMANIA

Hole No.	Date November 1966	Water Depth ft.	Drill Penetration ft.	Core Recovered ft.	Bedrock Reached
51	10th	75	16	14.5	Yes
52	"	73	2.5	2.5	"
53	"	60	3.5	3.5	"
54	"	57	2	2	"
55	"	64	4.5	4.5	"
56	"	92	42	33	"
57	11th	112	20	19.5	"
58	"	120	21.5	16.5	"
59	"	111	32	32	"
60	"	103	30	28.5	"
61	"	100	25	22	"
62	12th	82	30	24	"
63	"	122	21	16	"
64	"	116	39	33	"
65	"	105	42.5	42.5	"
66	"	87	44.5	44.5	"
67	14th	94	35	33	"
68	"	71	39.5	37.5	"
69	"	67	12.5	12.5	"
70	"	60	12	11.5	"
Totals			970	954	
			Percent recovered	98.3	

TABLE 5.

DRILL HOLE DATA  
R.V. WANDO RIVER  
JANUARY, 1967

Hole No.	Area	Date	Water Depth (ft.)	Drill Penetration (ft.)	Core Recovered (ft.)	Bedrock Reached
82	Ringarooma Bay	7th	90	6.5	6.5	Yes
83			94	43.5	43.5	No
84			115	33.0	32.5	Yes
85		8th	120	39.5	39.5	
86			118	24.5	24.5	
87			110	27.5	27.5	
88			113	31.0	31.0	
89			114	34.0	34.0	
90		9th	118	31.0	29.0	
91			120	28.5	28.5	
92			125	6.0	6.0	
93			120	21.5	21.0	
94			115	32.0	29.5	
95		17th	110	27.0	26.5	
96			112	31.0	14.0	No
97			117	17.0	17.0	Yes
98			116	37.0	35.5	
99		18th	102	17.0	15.0	
100			100	9.0	9.0	
101			103	31.0	25.5	
102			111	13.5	13.5	
103			112	28.5	26.5	
104			100	19.5	19.5	
105		19th	95	13.0	12.5	
106		27th	102	17.0	16.5	
107			116	15.0	12.5	
108			115	10.0	10.0	
109			116	27.5	27.5	
110			111	16.0	16.0	
111		28th	123	37.0	30.5	
112			120	34.0	34.0	
113			112	30.0	25.0	
114			109	44.0	44.0	
115			101	34.5	33.5	
116		29th	115	28.0	28.0	
117			116	26.0	26.0	
118			112	28.0	28.0	
119		30th	90	25.0	22.0	No

.../contd.

TABLE 5 (contd.)

DRILL HOLE DATA  
R.V. WANDO RIVER  
JANUARY, 1967

Hole No.	Area	Date	Water Depth (ft.)	Drill Penetration (ft.)	Core Recovered (ft.)	Bedrock Reached
120	Ringarooma Bay	30th	90	31.5	31.5	Yes
121			100	48.5	40.5	
122			95	6.5	6.5	
123			110	9.0	9.0	
124		31st	116	23.5	23.5	
125			115	36.0	26.0	
126			107	40.0	39.5	
127			100	39.0	39.0	

Totals	1206	1136.5
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Core recovery		94.2%
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04	Mussel Roe Bay	5th	75	77.5	60.0	No
05		11th	90	27.0	21.5	Yes
06			105	21.0	21.0	
07			100	13.0	12.0	
08		16th	98	44.0	19.0	
09			108	34.0	30.0	
010			100	13.5	7.5	No

Totals	230.0	171.0
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Core recovery		74.3%
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TABLE 5.

DRILL HOLE DATA  
R.V. WANDO RIVER  
FEBRUARY 1967

Hole No.	Area	Date	Water Depth (ft.)	Drill Penetration (ft.)	Core Recovered (ft.)	Bedrock Reached
NE128	Ringarooma Bay	1st	85	7.0	7.0	Yes
129			112	12.0	12.0	
130			112	18.5	18.5	
131			113	11.0	11.0	
132			115	31.5	31.5	
133			118	27.5	27.5	
134		2nd	110	16.0	16.0	
135			120	2.8	2.8	
136			115	26.5	26.5	
137			100	23.0	23.0	
138			95	15.5	15.5	
Totals				191.3	191.3	
Core recovery					100%	
KI 8	East King Island	11th	80	10.0	4.5	Yes
9		20th	90	18.0	15.5	
10		78	20.0	15.0		
11		85	17.0	13.0		
Totals				65.0	48.0	
Core recovery					74%	

TABLE 9

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
NOVEMBER, 1966

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
1	NE 1	0.03	Trace	17	10
	2	0.06	Trace	44	22
	3	0.09	Trace	9	6
	4	0.02	Trace	3	2
2	5	0.05	57	7	9
	6	0.03	21	Nil	4
	7	0.02	3	4	4
	8	0.02	1	3	8
	9	0.10	1	8	10
	10	0.08	Trace	9	11
	11	0.06	Trace	4	4
	12	0.07	Trace	3	7
	13	0.12	Nil	14	8
	14	0.12	Nil	29	8
	15	0.12	Nil	14	8
	16	0.41	2	10	9
	17	0.06	Nil	18	14
	18	0.10	1	79	41
3	19	0.09	3	72	37
	20	0.16	6	32	26
	21	0.06	Trace	6	7
4	22	0.07	Trace	71	54
	23	0.14	Trace	28	43
	24	0.06	Trace	44	37
	25	0.11	Trace	33	68
	26	0.11	Nil	11	44
	27	0.10	Nil	7	28
	28	0.30	Nil	12	44
	29	1.02	Nil	12	15
	30	0.54	Nil	Nil	27
	31	0.08	Trace	29	27
	5	32	0.14	Trace	26
33		0.13	Trace	21	48
34		0.44	Nil	8	127
35		0.22	Nil	5	11
36		0.61	Nil	15	32

.../contd.

TABLE 9 (contd.)

## ASSAY RESULTS

NORTH EAST COAST LICENCE

NOVEMBER, 1966

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
6	NE37	0.12	Trace	38	48
	38	0.10	Trace	52	50
	39	0.28	Nil	72	68
	40	0.51	8	25	74
	41	0.26	3	6	6
	42	0.28	1	3	4
	43	0.83	Trace	10	Nil
	44	0.61	Nil	11	Nil
7	45	0.11	Trace	48	61
	46	0.09	Trace	8	8
	47	0.12	8	82	166
	48	0.08	4	48	52
	49	0.16	Trace	87	99
	50	0.18	Nil	104	89
	51	0.12	Nil	7	4
	52	0.18	Trace	13	12
	53	0.08	Trace	16	17
	54	0.09	1	19	24
	55	0.27	14	29	54
	56	0.55	6	17	29
	57	0.59	9	7	Nil
8	58	0.07	6	28	33
	59	0.06	9	33	41
	60	0.08	5	30	39
	61	0.08	9	31	60
	62	0.19	29	29	39
	63	0.72	19	31	32
	64	0.49	2	12	Nil
	65	0.12	5	13	12
	66	0.08	4	11	13
	67	0.13	38	11	20
	68	0.11	7	6	8
	69	0.19	5	9	10
	70	0.31	3	7	11
	71	0.36	Trace	9	13
72	0.32	Trace	6	7	

.../contd.

TABLE 9 (contd.)

## ASSAY RESULTS

NORTH EAST COAST LICENCE

NOVEMBER, 1966

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
9	NE74	0.36	Trace	68	94
	75	0.33	Trace	22	30
	76	0.25	Trace	20	13
	77	0.16	Trace	31	27
	78	0.47	Trace	14	21
	79	0.15	7	12	18
	80	0.10	4	24	4
	81	0.12	22	28	42
	82	0.06	8	4	4
	83	0.05	Trace	1	Nil
10	84	1.28	10	31	56
	85	0.57	9	36	82
	86	0.22	4	20	40
	87	0.09	8	12	23
	88	0.26	1	13	35
	89	0.44	2	19	39
	90	0.10	Trace	54	56
11	91	0.13	Trace	41	39
	92	0.07	Trace	14	13
	93	0.10	2	9	5
	94	0.10	12	12	17
	95	0.04	10	5	9
	96	0.03	2	4	7
	97	0.08	Trace	11	19
	98	0.05	Trace	11	18
	99	0.48	Nil	21	11
	100	0.27	Trace	15	12
12	101	0.08	10	8	21
	102	0.10	1	17	21
	103	0.17	Trace	18	14
	104	0.28	Trace	20	21
	105	0.45	Trace	33	34
	106	0.28	1	45	59
13	107	0.47	6	35	50
	108	0.32	5	32	44
14	109	0.91	4	Nil	Nil
	110	0.31	1	6	Nil
	111	0.49	Trace	9	Nil
	112	0.43	Nil	8	9

.../contd.

TABLE 9 (contd.)

## ASSAY RESULTS

NORTH EAST COAST LICENCE

NOVEMBER, 1966

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
15	NE114	0.09	Trace	11	6
	115	0.20	2	19	17
	116	0.15	3	8	10
	117	0.12	Trace	11	17
	118	0.10	1	9	18
	119	0.07	2	4	6
	120	0.31	6	47	58
	121	0.32	9	22	44
	122	0.22	7	68	99
	123	0.43	17	61	150
16	124	0.94	2	23	36
	125	0.07	Trace	19	35
	126	0.01	Trace	32	60
	127	0.20	1	15	21
17	128(		No concentrate obtained Entirely grey clay		
	129(				
	130(				
	131(				
	132(				
18	133 4'	0.12	4	23	33
	134 4'	0.15	49	10	21
	135 4'	0.20	196	16	44
	136	0.11	6	3	3
	137	0.19	2	Nil	Nil
	138	0.03	3	5	6
	139	0.03	1	6	12
	140	0.06	Trace	3	3
19	141 3'	0.82	45	15	48
	142	0.17	9	4	10
	143	0.12	Trace	7	5
	144	0.27	Trace	6	8
	145	0.06	Trace	3	3
	146	0.16	Nil	Nil	Nil
	147	0.08	Trace	1	Nil
	148	0.24	2	10	9

.../contd.

TABLE 9 (contd.)

## ASSAY RESULTS

NORTH EAST COAST LICENCE

NOVEMBER, 1966

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
20	NE149	0.09	2	37	51
	150	0.25	Trace	7	7
	151	0.07	2	2	3
	152	0.26	3	15	20
	153	0.13	2	3	6
	154	0.09	54	2	4
21	155	0.18	2	58	85
	156	0.11	Trace	23	27
28	215 2'	0.21	67	27	37
	216 3'	0.23	41	11	24
	217	0.15	Trace	6	8
	218	0.31	Trace	7	Nil
	219	0.03	Trace	2	4
	220	0.14	Nil	9	12
	221	0.12	Nil	4	Nil
	222	0.17	Nil	7	3
29	223	0.11	5	7	6
	224	0.12	Trace	3	2
	225	0.11	Trace	3	Nil
	226	0.15	Trace	5	3
40	315	0.11	17	28	62
41	316	0.16	1	24	33
	317	0.02	1	9	9
	318	0.04	3	9	7
	319	0.31	1	Nil	Nil
	320	0.01	Trace	Trace	1
	321	0.01	Trace	2	Trace
	322	0.07	Trace	Nil	26
	323	0.13	2	17	33
42	324 4'	0.06	51 42*	13	24
	325 3'	0.09	110	3	13
	326 3'	0.11	40	10	19
43	327	0.04	4	2	2
44	328	0.06	23	4	11
45	329	0.09	51	5	7
	330	0.05	24	2	4
	331	0.05	42	7	19
	332	0.11	30	3	7

TABLE 7

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
DECEMBER 1966

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
21	NE 155	0.18	2	58	85
	156	0.11	Trace	23	27
	157	0.08	Trace	18	25
	158	0.15	3	26	39
	159	0.18	50	18	47
	160	0.21	88	15	36
	161	0.20	151	20	56
	162	0.17	4	10	34
	163	0.09	2	7	32
	164	0.18	2	7	13
	165	0.13	Nil	10	Trace
	166	0.15	Nil	17	39
	167	0.05	2	13	22
	22	168	0.24	Trace	62
169		0.06	Trace	18	26
170 )					
171 )					
172 )					
	173 )				
			Clays-not treated		
24	190	0.32	3	25	24
25	191	0.31	1	21	16
26	192	0.30	Nil	34	32
	193	0.13	Nil	17	18
	194	0.15	Nil	23	15
	195	0.11	Trace	15	17
	196	0.16	1	62	91
	197	0.28	Nil	39	19
	198	1.12	2	225	414
	199	0.04	Trace	15	22
	200	0.27	2	5	4
	201	0.29	Trace	7	2
	202	0.06	1	3	1
203	0.08	5	3	4	
204	0.25	7	5	6	
205	0.10	5	6	4	

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
DECEMBER 1966

851028

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
27	NE 206	0.25	Nil	34	Nil
	207	0.23	Trace	32	31
	208	0.33	Trace	18	30
	209	0.26	Trace	6	11
	210	0.15	16	30	48
	211	0.19	5	8	16
	212	0.09	4	9	17
	213	0.08	6	11	16
	214	0.09	5	6	9
	30	227	0.25	2	28
228		0.41	Nil	15	31
229		0.22	Trace	20	22
230		0.06	Trace	26	24
231		0.02	Trace	5	6
232		0.10	Trace	12	13
233		0.14	Trace	10	11
234		0.09	1	9	14
235		0.08	Nil	3	4
236		0.04	2	5	8
237		0.25	5	8	19
31	238	0.79	Trace	9	23
	239	0.21	Trace	6	14
	240	0.28	Nil	3	2
	241	0.16	Nil	7	19
32	242	0.33	2	33	49
	243	0.15	Trace	63	53
	244	0.15	Trace	45	49
	245	0.17	43	83	114
33	246	0.12	6	61	77
	247	0.11	Trace	24	18
	248	0.07	Trace	14	11
	249	0.14	Trace	29	22

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
DECEMBER 1966

851029

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
33	NE 250	0.12	Trace	22	17
	251	0.07	Trace	14	9
	252	0.23	Trace	38	40
	253	0.32	Trace	107	102
	254	0.08	Trace	Nil	1
34	255	0.14	5	14	22
	256	0.11	7	32	42
	257	0.26	11	52	80
	258	0.09	5	9	16
	259	0.10	1	5	10
	260	0.06	2	3	84
	261	0.40	8	122	27
	262	0.37	4	113	25
	263	0.29	10	24	42
	264	0.13	2	40	8
	265	0.40	2	5	9
	266	0.08	Trace	3	5
	267	0.23	2	4	10
	268	0.71	Nil	Nil	Nil
	269	0.93	Nil	Nil	Nil
270	0.12	2	20	36	
271	0.42	5	13	34	
35	272	0.11	12	27	32
	273	0.23	16	6	10
	274	0.06	3	4	7
	275	0.12	2	4	5
	276	0.13	3	5	8
	277	0.08	6	3	9
36	278 3'	0.11	121	13	40
	279 3'	0.11	64	14	33
	280 3'	0.21	116	19	56
	281	0.09	2	11	26

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
DECEMBER 1966

851030

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
36	NE 282	0.03	Trace	5	7
	283	0.01	Trace	2	1
	284	0.27	10	8	12
37	285	0.16	1	40	53
	286	0.10	2	65	175
	287	0.09	1	37	53
	288	0.11	1	59	60
	289	0.12	1	65	74
	290	0.10	22	76	93
	291	0.11	50	33	67
	292	0.10	19	40	63
	293	0.15	5	15	22
	294	0.40	12	17	30
	295	0.09	8	6	10
	296	0.05	1	5	14
	297	0.22	6	7	8
298	No concentrate				
38	299	0.10	21	34	52
	300	0.06	4	10	12
	301	0.09	9	40	56
	302	0.19	14	46	74
	303	0.17	51	23	40
	304	0.25	45	22	39
	305	2.38	45	300	19
	306	0.85	14	10	6
	307	0.63	1	8	9
308	0.16	1	13	18	
39	309	0.12	1	11	10
	310	0.13	Trace	15	17
	311	) Analyses incomplete			
	312				
	313				
314					

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
DECEMBER 1966

851031

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
46	NE 333	0.25	13	11	17
	334	0.05	2	2	3
	335	0.13	Trace	Nil	2
	336	0.07	2	2	3
47	337 <sup>1s</sup>	0.19	47	17	40
	338 )	Clays - not treated			
	339 )				
	340	0.13	8	6	8
48	341 <sup>4'</sup>	0.21	116	17	38
	342	0.08	19	6	14
	343	0.48	1	9	13
	344	0.17	Trace		13
	345	0.22	1	9	10
58	377	0.07	2	25	36
	378	0.20	5	18	48
	379	0.18	Trace	11	27
	380	0.08	Trace	3	7
	381	0.08	Trace	2	5
	382	0.02	1	2	5
59	383	0.06	2	13	57
	384	0.08	4	5	11
	385	0.12	133	10	36
	386	0.11	17	33	60
	387	0.12	Trace	18	22
	388	0.02	1	4	9
	389	0.02	Trace	5	9
	390	0.30	Trace	15	18
	391	0.07	Trace	10	18
	392	0.25	Trace	10	15
	393	0.07	Trace	6	11
394	0.20	1	7	15	

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
DECEMBER 1966

851032

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
60	NE 395	0.04	3	10	32
	396	0.07	3	22	32
	397	0.13	2	37	28
	398	0.08	5	7	12
	399	0.08	2	18	22
	400	0.31	Nil	7	7
	401	0.35	Nil	8	10
	402	0.21	1	9	19
	403	0.10	2	7	16
	404	0.05	Trace	4	13
	405	0.05	Trace	2	5
	61	406	0.16	Trace	43
407		0.06	Trace	33	40
408		0.10	4	29	51
409		0.05	1	30	27
410		0.03	Trace	22	37
411		0.07	Trace	6	7
412		0.01	Trace	1	2
413	0.08	2	13	13	
63	422	0.15	8	24	31
	423	0.10	1	7	6
	424	0.13	5	Nil	4
	425	-	Trace	) not complete )	
	426	-	10		
	427	0.15	237	5	15

TABLE 7.

## ASSAY RESULTS

10.

NORTH EAST COAST LICENCE

RINGAROOMA BAY

FEBRUARY 1967

851033

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
106	NE 811	0.39	4	16	31
	812	1.18	25	Nil	47
	813	0.31	Trace	Nil	11
	814	0.5	1	Nil	20
	815	0.58	2	6	43
107	816 3'	0.69	75	Nil	45
	817	3.26	7	Nil	65
	818	1.13	2	Nil	40
	819	0.28	1	Nil	10
	820	0.32	Trace	Nil	11
108	821	0.97	21	Nil	48
	822	0.56	2	22	42
	823	0.19	2	Nil	39
109	824	0.58	23	15	55
	825	0.49	37	7	49
	826	1.76	88	Nil	35
	827	0.86	29	Nil	22
	828	1.55	5	Nil	31
	829	1.51	3	Nil	30
	830		Clay - not treated		
	831	0.48	1	Nil	12
110	832	1.71	36	Nil	77
	833	1.11	2	Nil	41
	834	1.45	3	Nil	36
	835	0.96	68	Nil	58
	836	0.43	6	Nil	30
113	856	1.82	4	82	255
	857	1.06	34	21	64
	858	0.71	4	Nil	64
	859	0.78	Nil	Nil	23
	860	1.18	2	Nil	53
	861	1.26	Nil	Nil	38
	862	1.17	6	Nil	53

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
FEBRUARY 1967

11.

851034

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
114	NE 863	3.25	16	Nil	65
	864	0.82	Nil	25	16
	865	1.20	Nil	Nil	24
	866	0.51	Nil	Nil	8
	867	0.26	Trace	12	35
	868	0.58	6	Nil	23
	869	0.44	3	Nil	13
	870	0.68	7	Nil	17
	871	0.83	10	Nil	17
	872	2.03	144	Nil	91
	873	1.50	24	Nil	42
	874	1.12	19	Nil	22
	875	0.77	6	Nil	19
	876	0.86	2	Nil	34
	115	877	1.84	4	Nil
879		0.22	5	33	52
880		0.14	12	21	41
881		0.88	2	18	53
882		0.59	1	15	38
883		0.25	Trace	Nil	11
884		0.41	Nil	Nil	16
885		0.31	2	3	22
886		0.72	1	Nil	14
887		0.97	2	Nil	29
888		0.28	22	Nil	17
116	889	3.85	3	Nil	154
	890	3.79	8	Nil	95
	891	1.37	3	14	34
	892	0.36	1	7	14
	893	0.34	1	Nil	7
	894	0.37	1	Nil	7
	895	0.70	3	Nil	18
	896	0.78	7	Nil	35
	897	1.61	6	Nil	32
117	898	1.38	6	Nil	35
	899	2.18	15	Nil	54
	900	4.73	28	Nil	118
	901	1.01	8	Nil	45
	902	0.63	3	9	44
	903	0.64	3	13	45
	904	1.34	5	Nil	57
	905	0.77	9	Nil	58

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
FEBRUARY 1967

851035

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
118	NE 906	0.50	10	Nil	33
	907	1.60	6	Nil	48
	908	0.74	8	Nil	19
	909	0.80	2	8	32
	910	1.25	4	Nil	25
	911	0.78	7	Nil	19
	912	0.45	5	9	31
	913	0.51	26	5	20
	914	0.48	3	5	31
119	915	0.39	5	14	88
	916	0.13	4	17	38
	917	0.24	1	6	29
	918	0.28	1	4	66
	919	0.53	1	Nil	37
	920	1.37	3	Nil	110
120	921	0.38	17	Nil	28
	922	0.62	4	Nil	22
	923	0.53	3	8	40
	924	0.24	1	Nil	6
	925	0.33	Nil	Nil	12
	926	0.36	1	5	27
	927	0.83	1	Nil	62
	928	0.38	9	Nil	11
	929	0.57	2	Nil	23
121	930	0.58	5	17	95
	931	0.52	2	16	36
	932	0.23	Trace	11	25
	933	0.20	Trace	7	12
	934	0.14	2	24	43
	935	0.23	14	Nil	17
	936	0.47	12	12	56
	937	0.39	8	Nil	23
	938	0.35	12	Nil	52
	939	0.18	8	Nil	14
	940	1.81	7	Nil	118
	941	0.74	1	11	70

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
FEBRUARY 1967

851036

Hole No.	Sample No.	Head Assay				
		Non Magnetic Percent	p.p.m. Metals			
			Sn	Ti	Zr	
122	NE 942	0.31	1	3	17	
	943	0.07	Trace	Nil	3	
123	944	1.60	13	Nil	40	
	945	0.05	4	Trace	3	
	946	0.04	Trace	Nil	2	
124	947	0.28	9	14	42	
	948	0.31	Trace	Nil	12	
	949	0.19	2	Nil	14	
	950	0.99	4	Nil	40	
	951	1.71	7	Nil	43	
	952			Clay - not treated		
125	953	0.28	2	8	20	
	954	0.26	1	9	27	
	955	0.83	11	8	21	
	956	0.57	5	14	48	
	957	1.01	28	10	56	
	958	0.74	42	Nil	33	
	959	2.18	78	Nil	65	
	960	0.53	13	Nil	19	
126	961	0.55	2	8	25	
	962	1.91	6	Nil	76	
	963	0.98	3	Nil	39	
	964	0.34	1	5	20	
	965	0.23	1	2	14	
	966(					
	967(			Clay - not treated		
	968(					
	969	0.30	22	12	42	
	970	0.56	20	Nil	36	
971	0.66	66	Nil	26		
127	972	0.43	8	8	41	
	973	0.47	7	12	38	
	974	0.51	10	20	66	
	975	0.75	15	11	30	
	976	0.65	20	6	49	

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGARCOMA BAY  
FEBRUARY 1967

851037

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
127 cont.	NE 977	0.77	15	Nil	27
	978(				
	979(				
	980	0.82	49	8	45
	981	0.27	8	7	40
	982	1.50	30	Nil	45
	983	1.19	30	Nil	36
984	1.60	51	Nil	48	
128	985	0.17	4	Nil	8
	986	0.09	4	1	4
129	987	0.93	3	Nil	46
	988	1.05	11	Nil	26
	989				
130	990	0.68	24	Nil	24
	991	2.82	23	Nil	70
	992	0.85	3	21	38
	993	0.76	2	15	27
	994	2.12	6	Nil	53
	995	2.31	9	23	58
131	996	0.75	10	15	41
	997	0.37	1	4	13
	998	0.53	2	5	19
132	999	0.63	4	16	34
	1000	0.76	17	46	65
	1001	0.68	12	27	54
	1002	1.27	3	19	44
	1003	1.16	14	Nil	29
	1004	1.15	3	Nil	17
	1005	0.81	3	8	32
	1006	1.68	3	Nil	34
	1007	1.00	3	20	55

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
FEBRUARY 1967

851038

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
133	NE 1008	0.39	5	27	47
	1009	1.46	18	44	117
	1010	2.93	35	Nil	88
	1011	1.40	10	56	105
	1012	0.89	4	18	44
	1013	0.53	2	16	32
	1014	0.77	3	31	50
	1015	0.29	1	Nil	9
134	1016	1.53	8	Nil	46
	1017	1.28	5	Nil	26
	1018	1.06	3	Nil	21
	1019	1.41	4	Nil	21
135	1020	1.23	4	Nil	31
	1021	0.93	4	Nil	37
	1022	0.72	2	14	25
136	1023	0.90	4	18	31
	1024	0.84	2	42	71
	1025	0.87	3	27	31
	1026	0.85	3	17	34
	1027	0.38	Trace	15	23
	1028	2.82	8	Nil	42
	1029	3.18	13	Nil	64
	137	1030 <sup>2'</sup>	0.84	3	59
1031 <sup>4'</sup>		2.12	59	Nil	64
1032		0.73	17	11	29
1033		0.88	11	18	35
1034		1.16	107	Nil	23
1035		0.79	4	24	40
1036		0.78	4	16	23
138		1037	1.22	4	Nil
	1038	0.75	2	15	30
	1039	0.52	5	31	26
	1040	1.73	7	Nil	52

TABLE 7.

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

851039

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
23	NE 498	0.10	Trace	27	69
	499	0.16	Trace	28	59
	500	0.13	1	34	101
	501	0.13	1	18	26
	502	0.08	Trace	7	17
	503(				
	504(				
505(					
			Clay - not treated		
39	311	0.06	1	16	22
	312	0.05	Trace	13	16
	313	0.07	Trace	44	42
	314	0.20	21	44	69
49	346	0.08	1	38	27
50	347	0.07	8	10	18
	348	0.18	1	5	1
	349	0.11	Trace	2	Nil
51	350	0.14	38	8	45
	351	0.06	11	10	36
	352	0.03	1	3	7
	353	0.07	9	8	22
	354	0.15	23	5	16
52	355	0.13	5	8	18
53	356	0.14	2	6	14
54	357	0.18	4	10	22
55	358	0.17	2	32	66

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

851040

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
56	NE 359	0.25	62	18	45
	360	0.05	28	4	12
	361	0.37	49	Nil	Nil
	362	0.46	13	Nil	Nil
	363	0.19	25	6	23
	364	0.24	30	Nil	Nil
	365	0.25	2	Nil	Nil
	366	0.08	3	3	Nil
	367	0.09	8	6	19
	368	0.10	4	26	11
	369	0.09	Trace	18	30
	370	0.06	2	19	30
	57	372	0.03	24	3
371		0.12	36	13	38
373		0.02	2	2	3
374		0.09	14	5	14
375(					
376(					
Clay - not treated					
62	414	0.06	42	13	41
	415	0.08	58	52	70
	416	0.09	10	11	29
	417	0.29	8	11	35
	418	0.12	Trace	3	4
	419	0.34	2	6	7
	420	0.02	6	4	7
	421	0.18	58	8	28
63	425	0.45	Trace	N.D.	N.D.
	426	0.72	10	N.D.	N.D.
64	428	0.32	20	30	47
	429	0.10	17	7	15
	430	0.06	4	3	7
	431	0.09	6	5	13
	432	0.40	13	9	17
	433	0.23	14	7	14
	434	0.14	3	13	14
	435	0.03	Trace	7	6
	436	0.04	1	10	15
	437	0.15	12	27	59
	438	0.25	9	22	48

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

851041

Hole No.	Sample No.	Head Assay				
		Non Magnetic Percent	p.p.m. Metals			
			Sn	Ti	Zr	
65	NE 439	0.24	16	28	60	
	440	0.21	1	16	29	
	441	0.19	Trace	33	51	
	442	0.18	Trace	31	47	
	443	0.14	Trace	26	19	
	444		Clay - not treated			
	445	0.14	18	34	19	
	446	0.23	57	48	138	
	447	0.18	75	30	106	
	448	0.18	13	7	20	
	449	0.08	4	5	11	
	450	0.02	3	2	4	
	451	0.07	4	9	14	
	66	452	0.22	Nil	32	101
		453	0.49	Nil	24	55
454		0.36	3	51	84	
455		0.30	2	63	101	
456		0.55	3	62	85	
457		0.64	Nil	80	75	
458		1.33	Nil	82	122	
459		0.52	Nil	9	23	
460		0.11	Trace	21	35	
461		0.11	Trace	31	39	
462		0.13	Trace	50	64	
463		0.28	9	21	45	
464			Clay - not treated			
465( 466(			No concentrates			
67	467	0.11	Trace	34	45	
	468	0.11	5	57	89	
	469	0.09	3	60	75	
	470	0.10	10	43	60	
	471	0.07	16	9	29	
	472	0.05	2	5	20	
	473	0.04	1	5	14	
	474	0.06	2	12	20	
	475	0.06	4	10	16	
	476	0.06	6	13	20	

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

851042

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
68	NE 477	0.23	Nil	17	30
	478	0.16	Nil	24	36
	479	0.07	Nil	11	15
	480	0.30	1	39	63
	481	0.05	10	11	19
	482	0.10	12	8	18
	483	0.13	2	Nil	8
	484	0.11	5	23	42
	485	0.09	14	19	30
	486	0.11	7	19	18
	487	0.06	1	11	25
488	0.13	1	7	22	
69	489	0.10	4	32	81
	490	0.14	2	6	24
	491	0.10	Trace	Nil	7
	492	0.08	Trace	4	9
	493	0.04	Trace	Trace	6
70	494	0.14	1	32	6
	495	0.08	4	12	28
	496	0.11	1	9	34
	497	0.15	Trace	14	55
71	506 4'	0.43	65.	19	490
	507	0.62	2	38	33
	508	0.79	2	19	17
	509	1.13	Nil	Nil	Nil
	510	1.02	2	24	15
	511	0.70	Nil	13	11
72	512	0.54	Nil	23	16
	513	0.48	Nil	41	26
	514	0.54	Nil	39	29
	515	0.42	Nil	31	18
	516(			Clay - not treated	
	517(				
	518	0.83	6	25	18
	519	0.60	23	14	18
	520	0.70	59	30	37
	521	1.24	5	Nil	Nil

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

851043

Hole No.	Sample No.	Head Assay				
		Non Magnetic Percent	p.p.m. Metals			
			Sn	Ti	Zr	
73	NE 522	0.46	Nil	36	28	
	523	0.44	Nil	41	37	
	524	0.52	Nil	29	23	
	525	0.46	Nil	34	4	
	526	0.99	8	Nil	22	
	527	0.25	9	14	19	
	528	0.50	12	18	22	
	529	2.95	27	Nil	44	
	530	0.49	27	Nil	18	
	531	1.40	Nil	Nil	21	
	532	1.76	132	42	65	
	74	533	4.07	Nil	Nil	Nil
		534	1.34	43	40	30
535		2.77	Nil	Nil	Nil	
536		1.45	6	Nil	Nil	
537		2.28	5	Nil	Nil	
538		3.08	Nil	Nil	Nil	
539		1.11	Nil	Nil	Nil	
540		0.97	6	35	43	
541		4.15	Nil	Nil	Nil	
75		542	0.21	4	34	53
	543	0.16	2	49	48	
	544	0.06	7	27	3	
	545	0.13	44	15	23	
	546	0.16	8	12	16	
	547(					
	548(		No concentrate			
	549(					
550	0.23	Trace	7	19		
76	551 3	0.51 3	40	58	176	
	552	0.14	8	11	17	
	553	0.09	Trace	4	10	
	554	0.12	Nil	8	8	
	555	0.44	Nil	11	13	
	556	0.08	Trace	7	11	
	557	0.44	Nil	11	13	
	558	0.25	Nil	8	10	
	559	0.10	Trace	12	15	
	560		No concentrate			
	561	0.19	Nil	6	4	

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

851044

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
77	NE 562 2'	0.33	111	25	35
	563	0.13	34	13	20
	564	0.54	18	16	16
	565	0.14	24	10	16
	566	0.20	12	10	12
	567	0.88	11	26	26
	568	0.48	9	30	37
	569	0.35	1	62	64
78	570	0.33	2	38	61
	571	0.26	17	66	91
	572	0.20	40	25	49
	573	0.52	11	39	785
	574	0.24	3	32	52
	575	0.20	3	14	20
	576	0.32	2	10	10
	577	0.19	Trace	6	3
	578	0.83	12	Nil	12
	579			No concentrate	
	580	0.35	1	21	24
	581	0.17	Trace	16	20
79	582 4'	0.68	156	158	55
	583 3'	0.35	32	16	37
	584 4'	0.68	122	Nil	15
	585	0.36	23	22	38
	586	0.31	2	37	45
	587	0.19	1	33	61
	588	0.27	Nil	18	24
	589	0.49	1	30	33
80	590	0.49	Nil	37	56
	591	0.26	23	24	34
	592	0.15	11	11	29
	593	0.21	16	Nil	30
	594	0.30	Trace	22	18
	595	0.18	1	13	10
	596	0.37	3	16	9
	597	0.25	5	26	43
	598	0.27	35	12	33
	599	0.40	110	10	30
	600	0.40	7	Nil	9

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

851045

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
80 (contd)	NE 601	0.76	2	18	11
	602	0.13	1	9	14
	603	0.36	Nil	20	19
81	604	0.64	Nil	63	54
	605	0.98	Nil	67	97
	606	0.66	Nil	37	30
	607	0.91	Nil	61	69
	608	0.90	Nil	129	224
	609	0.36	Nil	50	54
	610	0.19	3	40	60
	611	0.42	6	18	26
82	612	0.44	6	13	92
	613	1.75	Nil	26	40
83	614	1.97	10	39	207
	615	3.39	7	34	51
	616	1.92	13	96	38
	617	0.50	13	35	15
	618	3.65	11	91	37
	619	2.01	6	40	40
	620	1.87	8	37	19
	621	1.79	5	45	18
	622	1.01	3	25	10
	623	0.41	4	19	8
	624	2.18	22	196	55
	625	0.38	78	42	10
	626	0.34	18	22	9
	627	0.40	4	16	8
84	628	0.30	3	38	17
	629	1.12	3	39	22
	630	0.54	3	49	19
	631	0.84	160	42	17
	632	2.44	10	49	49
	633	0.27	4	14	10
	634	0.30	3	21	12
	635	3.56	7	71	36
	636	2.03	6	41	31
	637	0.31	50	70	30

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

851046

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
85	NE 638	0.67	3	47	24
	639	0.44	4	33	18
	640	0.61	64	76	34
	641	0.91	5	50	23
	642	2.56	13	128	51
	643	0.80	8	96	28
	644	0.71	7	75	25
	645	1.25	44	156	42
	646	1.17	134	70	228
	647	2.18	7	Nil	33
	648	0.43	2	Nil	13
	649	1.20	2	Nil	18
	650	0.43	1	Nil	9
	651	0.53	2	Nil	11
	86	652	2.26	7	34
653		1.54	6	54	139
654		1.05	7	95	110
655		0.98	4	20	44
656(					
657(					
658(					
659(					
660(					
			Clay - not treated		
87	661	1.96	12	39	157
	662	1.06	4	11	58
	663	0.78	3	8	43
	664	2.04	10	Nil	82
	665	1.67	12	Nil	92
	666	1.85	4	Nil	74
	667	2.29	5	Nil	69
	668	0.98	2	20	34
	669	2.56	5	Nil	64
	670	0.83	5	8	50
	671	1.90	6	Nil	38

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

851047

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
88	NE 672 3'	1.18	32	35	59
	673 2.5'	0.92	13	Nil	46
	674 4'	1.46	72	66	110
	675	1.78	5	Nil	18
	676	1.06	4	32	64
	677	2.67	11	27	53
	678	0.51	3	15	15
	679	0.74	3	11	19
	680	0.61	2	Nil	12
	681	1.76	88	18	35
	682	0.95	8	71	100
	89	683 3'	0.45	3	14
684 4'		2.06	515	391	453
685 2'		2.40	79	264	276
686 4'		1.93	116	309	415
687		0.42	21	67	48
688		0.13	2	35	40
689		0.14	1	19	25
690		0.37	2	28	28
691		0.09	1	17	16
692		0.22	1	24	17
693		0.59	2	44	47
694		0.13	1	31	23
90	695	0.70	4	32	39
	696	0.48	2	34	55
	697	0.24	1	38	37
	698	0.49	6	15	25
	699	0.59	2	30	35
	700	1.31	4	39	39
	701	0.90	3	27	41
	702	0.56	2	17	22
	703	0.77	6	23	23
	704	1.38	4	14	14
	705	2.34	7	Nil	23
706	0.94	2	Nil	24	

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

851048

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
91	NE 707	0.64	6	45	38
	708	0.50	2	18	23
	709	0.68	2	34	68
	710	1.08	8	16	54
	711	1.32	8	Nil	26
	712	3.96	16	Nil	Nil
	713	2.18	7	Nil	44
	714	1.17	4	Nil	23
	715	1.98	6	Nil	Nil
	716	2.01	10	Nil	30
	717	0.69	4	7	14
92	718	0.48 4.5	120	7	26
	719	2.22	31	22	89
93	720	3.35	13	Nil	67
	721	1.76	Nil	Nil	44
	722	1.02	Nil	10	20
	723	0.66	3	13	26
	724	0.96	41	19	86
	725	2.25	29	Nil	34
	726	1.18	7	Nil	18
94	727	0.62	2	19	47
	728	2.06	6	41	103
	729	1.21	2	24	48
	730	1.46	3	Nil	22
	731	1.47	3	Nil	22
	732	2.08	6	Nil	42
	733	0.65	4	7	20
	734	1.83	4	Nil	73
	735	1.81	4	Nil	72
	736	1.58	3	Nil	87
95	737	0.43	25	13	39
	738	0.29	24	22	46
	739	0.45	8	5	18
	740	0.70	5	7	18
	741	0.68	31	Nil	17
	742	2.25	43	Nil	45
	743	1.02	11	Nil	20
	744	0.91	14	Nil	18

.../contd.

TABLE 7 (contd)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

851049

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
95 (contd)	NE 745	1.77	14	Nil	18
	746	1.39	11	Nil	14
	747	1.70	12	Nil	17
96	748	2.68	27	27	67
	749	1.52	12	15	53
	750	2.07	10	21	124
	751	2.19	4	22	66
	752	1.20	4	12	36
	753	2.29	30	23	103
97	754	3.97	12	Nil	99
	755	2.14	4	21	64
	756	1.49	19	Nil	37
	757	2.20	4	Nil	22
	758	1.73	3	Nil	35
	759	0.94	3	Nil	19
98	760	2.66	5	Nil	67
	761	2.37	7	47	166
	762	1.54	5	15	39
	763	1.48	4	15	37
	764	0.97	5	15	34
	765	1.27	Nil	Nil	13
	766	2.13	11	21	64
	767	2.50	28	Nil	63
	768	2.57	10	26	77
	769	3.03	6	Nil	76
	770	1.99	Nil	Nil	50
99	771	1.39	8	Nil	70
	772	2.86	6	Nil	43
	773	0.70	2	Nil	11
	774	0.74	2	Nil	15
	775	1.44	4	Nil	29
100	776 & 5	2.64	58	Nil	66
	777	0.36	1	Nil	5
	778	0.26	2	Nil	7
	779	0.09	6	Nil	8

.../contd.

TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

851050

Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
101	NE 780	0.60	2	51	27.
	781	0.88	2	9	26
	782	0.36	1	43	43
	783	1.66	3	17	50
	784	0.44	1	Nil	11
	785	0.23	Trace	16	23
	786	0.42	1	29	50
	787	0.50	1	25	35
102	788	0.59	10	41	30
	789	0.27	2	5	11
	790	0.34	1	3	10
	791	0.2	Trace	Nil	6
	792		Not yet determined		
103	793 5'	0.26	13	31	56
	794 3'	0.31	98	11	47
	795 3'	0.89	8	9	40
	796 4.5	1.11	361	17	106
	797 4.0	2.26	111	Nil	57
	798	0.55	6	6	14
	799	0.29	1	Nil	7
	800	0.95	15	Nil	18
104	801	1.67	3	Nil	Nil
	802	1.47	3	Nil	29
	803	1.01	49	Nil	30
	804	1.31	35	Nil	26
	805	0.48	65	Nil	10
105	806	0.21	19	25	48
	807	1.37	5	Nil	34
	808	0.35	Trace	Nil	16
	809	1.19	2	Nil	29
	810	1.10	Nil	Nil	23
110	835	0.96	68	Nil	58
	836	0.43	6	Nil	30

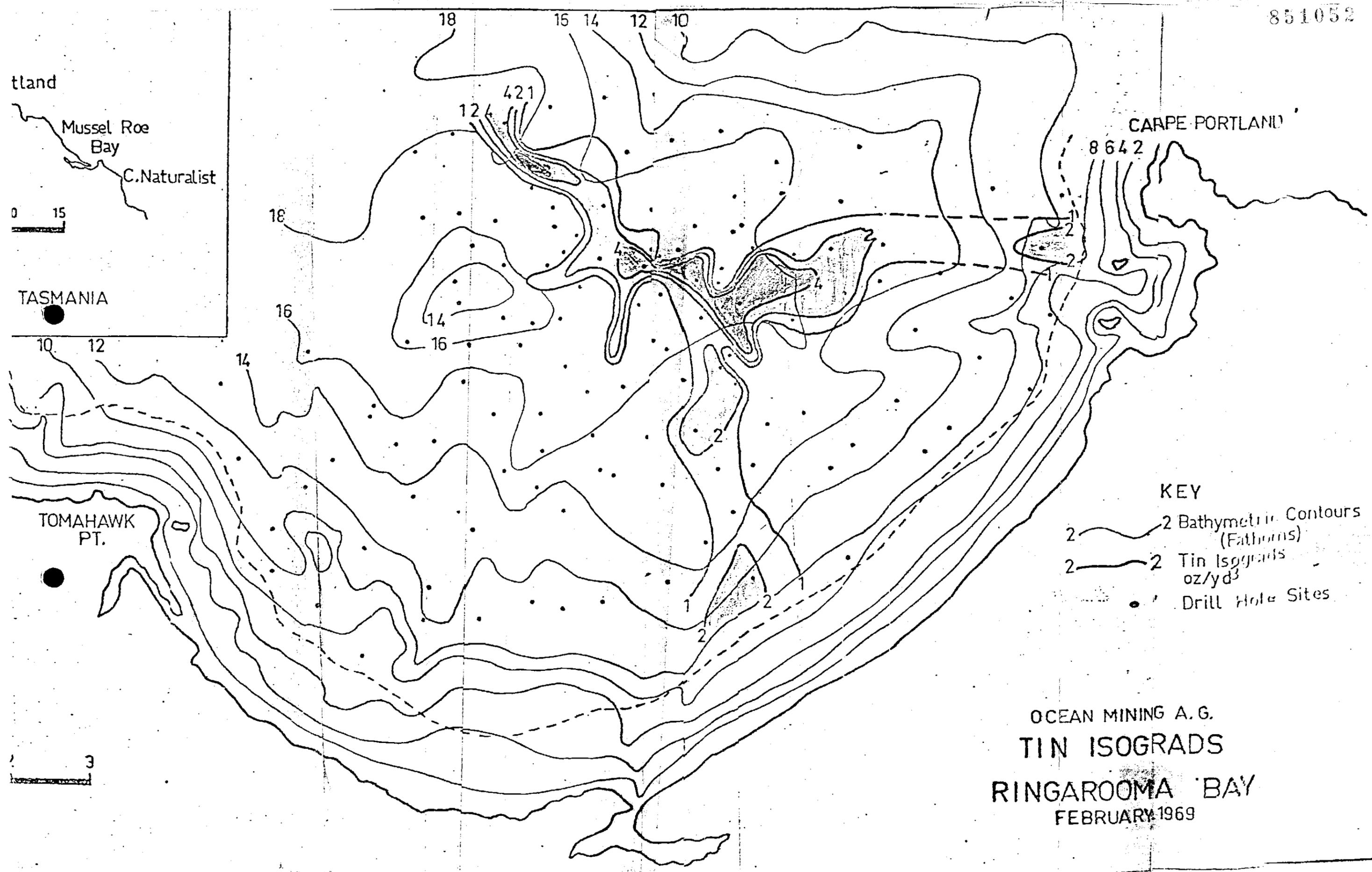
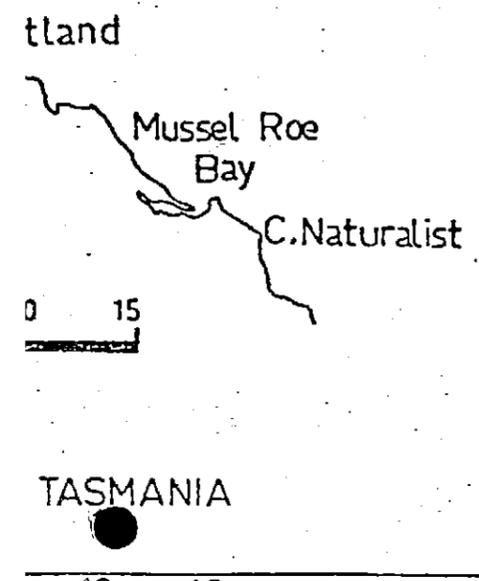
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TABLE 7 (contd.)

ASSAY RESULTS  
NORTH EAST COAST LICENCE  
RINGAROOMA BAY  
JANUARY, 1967

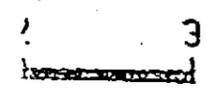
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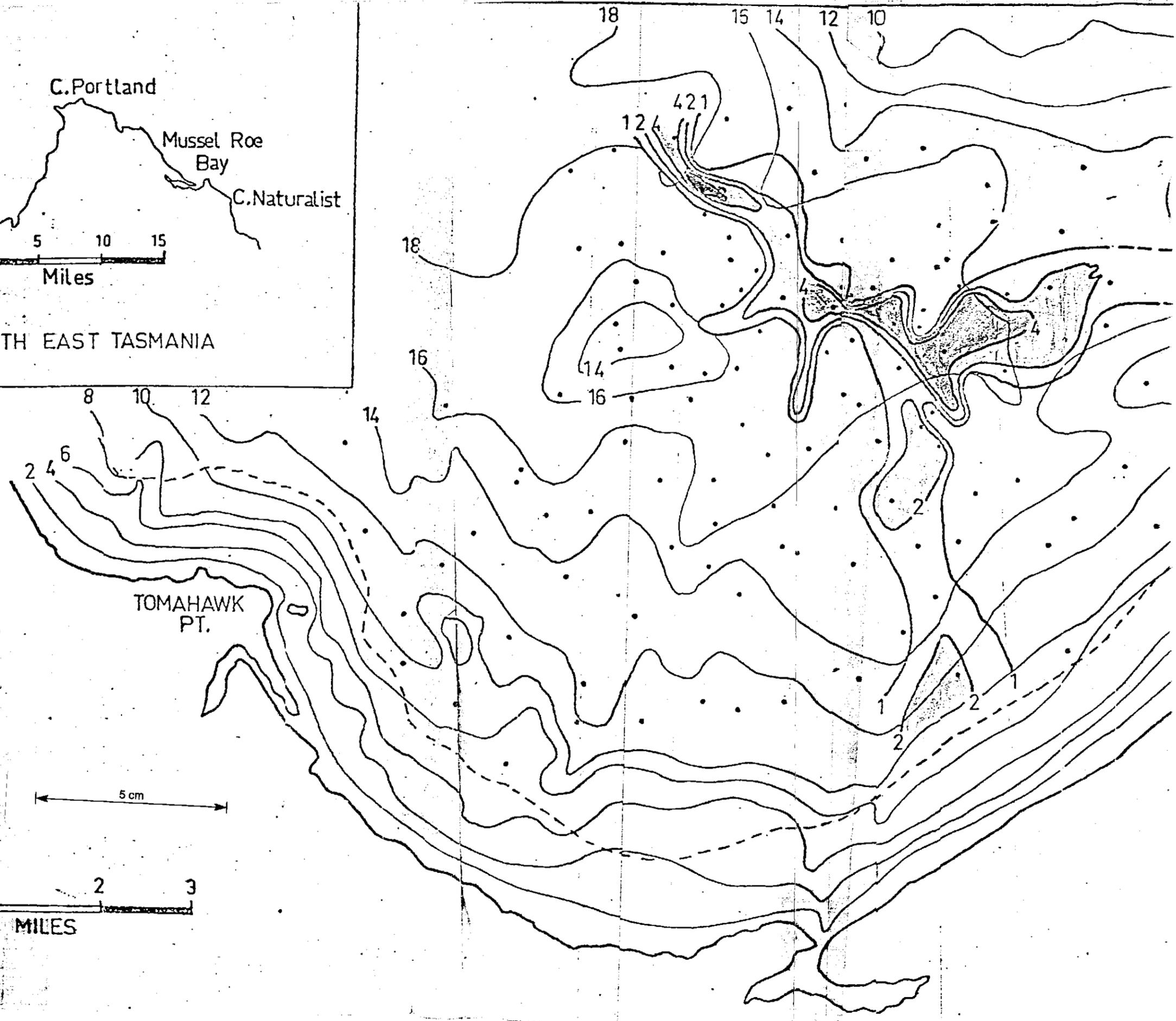
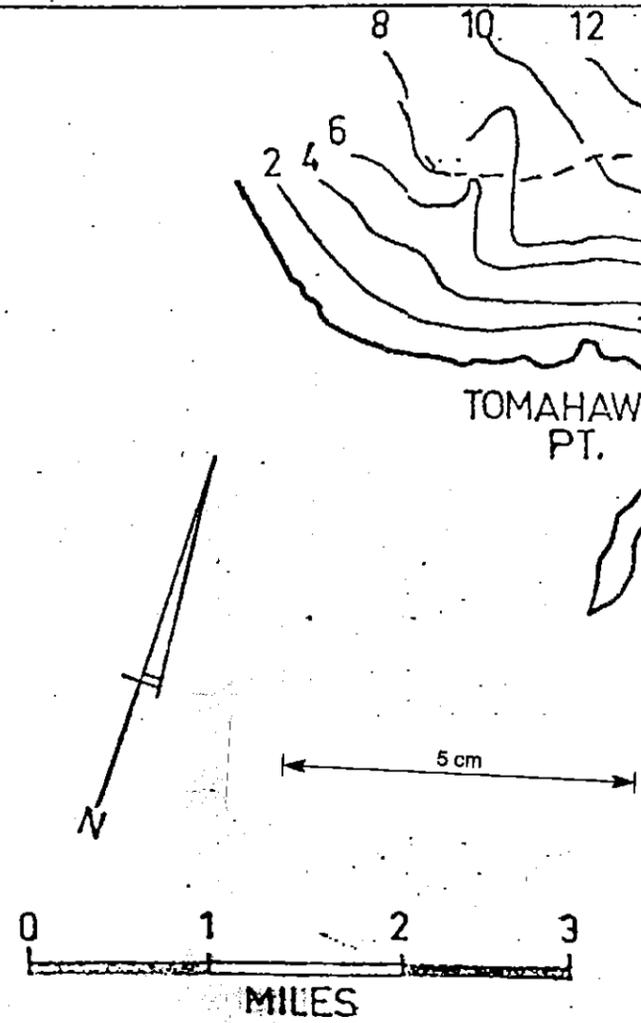
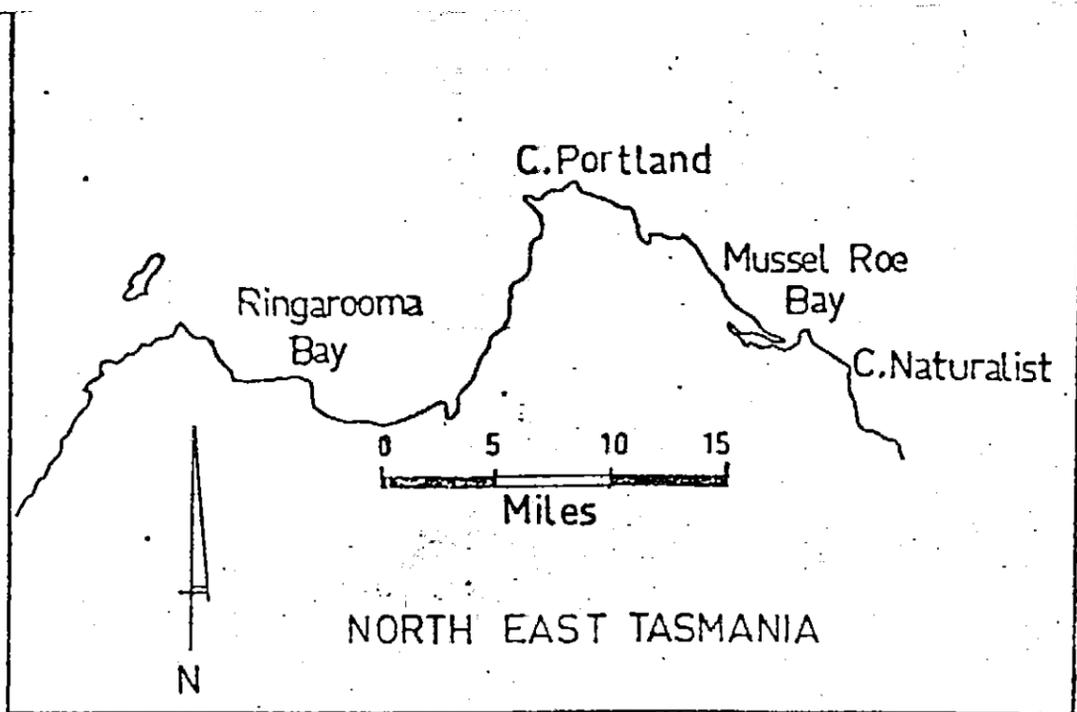
Hole No.	Sample No.	Head Assay			
		Non Magnetic Percent	p.p.m. Metals		
			Sn	Ti	Zr
111	NE 837	0.58	Nil	20	46
	838	0.46	Nil	16	37
	839	0.34	Nil	7	27
	840	1.05	2	Nil	63
	841	0.32	20	Nil	24
	842	0.76	8	Nil	34
	843	0.74	21	Nil	22
	844	2.32	23	Nil	58
	845	0.33	1	15	26
	112	846	0.46	1	14
847		0.76	2	15	57
848		0.73	Nil	Nil	33
849		1.01	2	Nil	61
850		1.88	Nil	Nil	47
851		1.01	Nil	Nil	35
852		0.31	Trace	Nil	11
853(			Clay - not treated		
854(					
855		0.47	1	Nil	16
113	856	1.82	4	82	255
	857	1.06	34	21	64

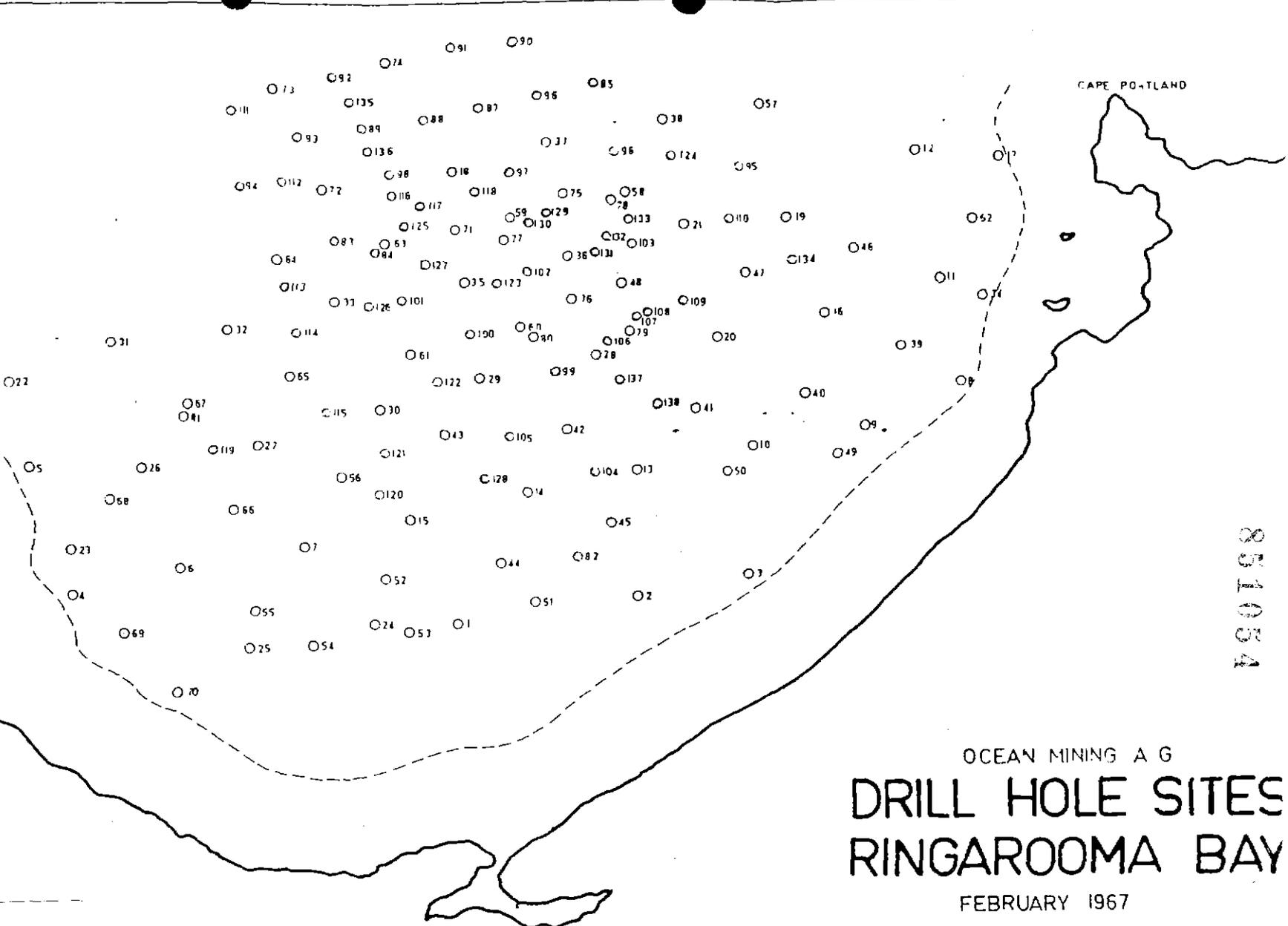
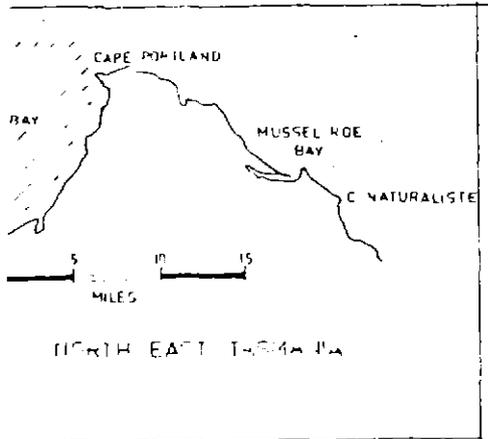


- KEY
-  2 Bathymetric Contours (Fathoms)
  -  2 Tin Isograds oz/yd<sup>3</sup>
  -  Drill Hole Sites

OCEAN MINING A.G.  
 TIN ISOGRADS  
 RINGAROOMA BAY  
 FEBRUARY 1969







851054

OCEAN MINING A G  
DRILL HOLE SITES  
RINGAROOMA BAY  
FEBRUARY 1967

Fig 2





**C R A EXPLORATION PTY. LIMITED**

ACN 000 057 125

UNIT 1, 23 BELL STREET, PRESTON, VICTORIA 3072, AUSTRALIA

851050

P.O. BOX 8093

NORTHLAND CENTRE 3072

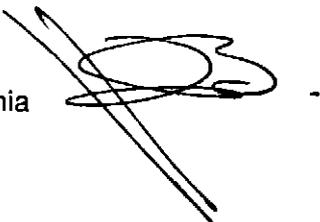
TELEPHONE: 480 1866

FAX: (03) 484 1375

14 October 1994



Dr A Brown  
Chief Geologist  
Mineral Resources Tasmania  
PO Box 56  
ROSNY PARK TAS 7018



Dear Tony

Vic Threader recently approached me to see if CRAE had a copy of the old TOC drilling in Ringarooma Bay. He indicated he could not find any record of the logs or assays in the Department.

We in fact have a copy of the drill results through a joint venture approach by Blaxland Sea Dredge many years ago and I was able to supply Vic with a copy.

I have attached a second copy so you can add it to your Department's files.

Best regards

**T W DICKSON**

Chief Geologist

Gil. — Please put this report on  
Open file.  
— Please send a thank you letter  
to Tom Dickson

**TASMANIA DEVELOPMENT AND RESOURCES**  
**MINERAL RESOURCES TASMANIA**

**FAX MESSAGE**

Date : 28 November, 1994  
To : Mr T W Dickson  
Chief Geologist  
Company : CRA Exploration Pty Limited  
Fax number : 03 484 1375

From Gilbert Oakes Mineral Tenements & Reports Section  
'phone (002) 338 362 Fax (002) 338 338  
number of pages including this cover : 1

**MESSAGE / SUBJECT :**

Thank you for your consideration in providing a copy of the report about the old TOC drilling by Ocean Mining N.G. in Ringarooma Bay during the 1960s. It has been accessioned into our library as TCR 94-3648.