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KEITH TURNER & ASSOCIATES
Mining Consultants

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100 COLLINS STREET, MELBOURNE, C.1

69-549.

090001

2/69

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24 MAR 1969				E & IL
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DEPT. OF MINES				
REF. NO.				

REPORT ON THE EXAMINATION OF BEACH SANDS

SOUTHPORT LAGOON

SOUTHERN TASMANIA

KEITH TURNER & ASSOCIATES,
100 COLLINS STREET,
MELBOURNE, VIC. 3000.

FEBRUARY, 1969.

AMG REFERENCE POINTS ADDED

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BEACH SANDS - SOUTHPORT LAGOON

INTRODUCTION

Exploration Licence No. 11/68 covers an area of 200 square miles along the south coast of Tasmania; the north-east corner peg being a few miles south of the township of South Port. The principal feature of the area is South Port lagoon which covers an area of around five square miles and is cut off from the Southern Ocean on the southern side by a long neck of sand dunes about two miles in length with an average width of half a mile.

The holder of this Exploration Licence is Mr. Anthony Edmund Bailey of 10 Victoria Street, Hobart and his associate Mr. Peter Yunghanns of 290 LaTrobe Street, Melbourne, arranged with Keith Turner & Associates to examine the dune system and the lagoon area for the presence of economic beach sands.

This report reviews the work done to date and recommends a continuation of the sampling programme.

LOCATION, HISTORY, ETC.

The lagoon area can be approached by land rover type vehicle from the western side, a bush track turning east about two miles from Leprena on the Lime River - Catamaran Road. A further bush track is said to exist approaching the lagoon from the north - this has not been found to date.

Entry from the sea through a narrow channel at the eastern end of the lagoon is possible, but presents hazards with small craft.

There is no history of mining of metallic minerals in the area of the Exploration Licence. Coal has been mined and evidence of this past activity is shown by a coal hulk anchored in Recherche Bay.

GENERAL GEOLOGY, ETC.

From the geological maps of the area, the principal exposures are Jurassic dolerites - they are prominent to the east and north of South Port lagoon.

Permian sediments covers a considerable belt of country to the west - while minor sections show other sediments pre-dating the Permian.

To the north west of South Port lagoon an area of unmetamorphosed precambrian is located but no acid igneous series are recorded. Since the granites and gniesses are the principal source rocks of beach sand minerals it is possible those minerals shown to be present in the lagoon and dunes are of off-shore origin. Reworked sediments may also have played a part in their source.

The results of assays show typical assemblage of detrital minerals (refer AMDL's report dated December 1968 attached) with the economic minerals, zircon, ilmenite and rutile being of particular interest. One sample carried a trace of monazite.

WORK PROGRAMME TO DATE

Four sampling exercises have been carried out along the dunes and beaches.

The first exercise indicated the presence of zircon, rutile and ilmenite but methods of determination were suspect, while the sampling was not representative.

The second exercise provided sound information that zircon could be of economic importance.

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The results of Exercise No. 3 is contained in AMDL report attached. These samples were of limited depth but zircon showed in six samples to contain an average of around 1.3% over depths of several feet. Rutile in the same six samples showed an average of .3% and is of interest.

Exercise No. 4 consisted of 29 samples taken in January 1969 from depths ranging between 2' and 19' and including some in shallow water of the lagoon, the attached plan shows location and depth. Assay results are awaited from these samples.

FUTURE PROGRAMME

The future programme will depend on results from Exercise 4, and off shore investigation in the lagoon, as well as a closed up pattern of drilling using standard beach sand practice as forecast in the light of results quoted above in the third sampling exercise.

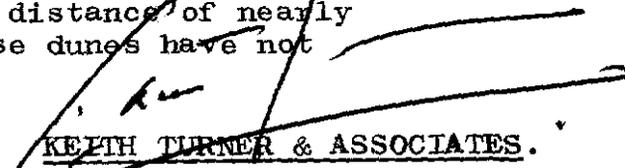
Indications of values are considered to be better in holes of greater depth.

COST OF PROGRAMME TO DATE

The cost of studies, sampling, assays, etc., to date is of the order of \$4,500 - the holder of the Exploration Licence is filing the necessary declaration.

RECOMMENDATION

1. It is recommended that an application for an Extension of the Exploration Licence for a further six months be lodged.
2. Recommended also that the application include an extension in the north-eastern corner to include the dune system prominent between the eastern side of the lagoon and extending east close to the shore line - a distance of nearly two miles. (Noted that these dunes have not been sampled).


KEITH TURNER & ASSOCIATES.

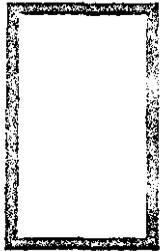
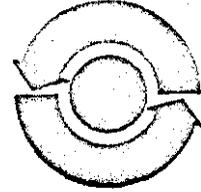
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CONYNGHAM ST. FREWVILLE SOUTH AUSTRALIA 5063 TELEPHONE 79 1662 TELEGRAMS 'AMDEL' ADELAIDE

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12/68

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES



PLEASE ADDRESS ALL CORRESPONDENCE TO THE DIRECTOR.

OUR REFERENCE: MP 3/0/0
YOUR REFERENCE:

19th December, 1968

Keith Turner & Associates,
2nd Floor,
100 Collins Street,
MELBOURNE, Vic., 3000.

Attention: J. Volker

REPORT MP2116-69

YOUR REFERENCE:	Letter dated 2/12/68
MATERIAL:	Beach sand samples (24)
IDENTIFICATION:	Nos 1 to 24
DATE RECEIVED:	4/12/68
WORK REQUIRED:	Heavy mineral separation, and grain counts for rutile, zircon and ilmenite.

Investigation and Report by: M.J.W. Larrett

X-Ray Diffraction by: J.F. Riley

Manager, Exploration Services: A.H. Spry

P. Dixon
Acting Director.

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HEAVY MINERAL ANALYSIS OF
TWENTY-FOUR BEACH SANDS

The twenty-four beach sand samples submitted for heavy mineral analysis were oven-dried, and riffled to obtain a representative portion of each for separation. Heavy mineral separations were then carried out using TBE (tetrabromoethane, S.G. 2.96), as the separating medium and the results are shown in Table 1.

Portions of each of the heavy fractions were examined in standard RI oil-mounts, and grain counts were carried out to determine the percentages of rutile and zircon present. A further portion of each was mounted as polished briquettes to facilitate the identification of the opaque minerals present to obtain percentages of ilmenite by grain count. Percentages of opaques, zircon, rutile and ilmenite are given in Table 2.

Two varieties of pyroxene were found to be the dominant constituents of these heavy fractions, together with minor amounts of andalusite, ?corundum, epidote, garnet, kyanite, ?sphene, staurolite and tourmaline. A trace of monazite was observed in sample No.8. The two pyroxene phases were examined by x-ray diffraction in order to confirm the optical identifications. One phase was identified as pigeonite, (a monoclinic pyroxene). The other phase was not positively identified, and would require some additional work in order to do this, but it was considered unnecessary at this stage.

In polished briquette, using reflected light and oil immersion techniques, hematite and goethite were generally found to be the dominant minerals present, together with minor amounts of ilmenite and lesser amounts of leucoxene. Traces of magnetite were observed in some fractions. The hematite and goethite occurs mainly as discrete, well-rounded, corroded grains, but composites are present also. The ilmenite occurs as discrete, subangular to subrounded grains, mostly free of inclusions and gangue minerals. A few ilmenite grains were observed which showed small areas of exsolved hematite. Much of the leucoxene contains small "residuals" of ilmenite.

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TABLE 1: PERCENTAGE HEAVY MINERALS

Sample	Wt taken g	Wt of LF g	Wt of HF g	H.F. %
1	20.0	19.59	0.41	2.05
2	20.0	19.74	0.26	1.80
3	20.0	19.89	0.11	0.55
4	20.0	19.71	0.29	1.45
5	20.0	19.50	0.50	2.50
6	20.0	19.25	0.75	3.75
7	20.0	18.44	1.56	7.80
8	20.0	16.75	3.25	16.25
9	20.0	19.18	0.82	4.10
10	20.0	19.12	0.88	4.40
11	20.0	19.40	0.60	3.00
12	20.0	19.89	0.11	0.55
13	20.0	19.85	0.15	0.75
14	20.0	19.53	0.47	2.35
15	20.0	19.24	0.76	3.80
16	20.0	18.25	1.75	8.75
17	20.0	16.87	3.13	16.65
18	20.0	17.19	2.81	14.05
19	20.0	19.26	0.74	3.70
20	20.0	17.18	2.82	14.10
21	20.0	19.51	0.49	2.45
22	20.0	19.85	0.15	0.75
23	20.0	18.94	1.06	5.30
24	20.0	2.89	17.11	85.55

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TABLE 2: CONSTITUENTS OF HEAVY FRACTIONS

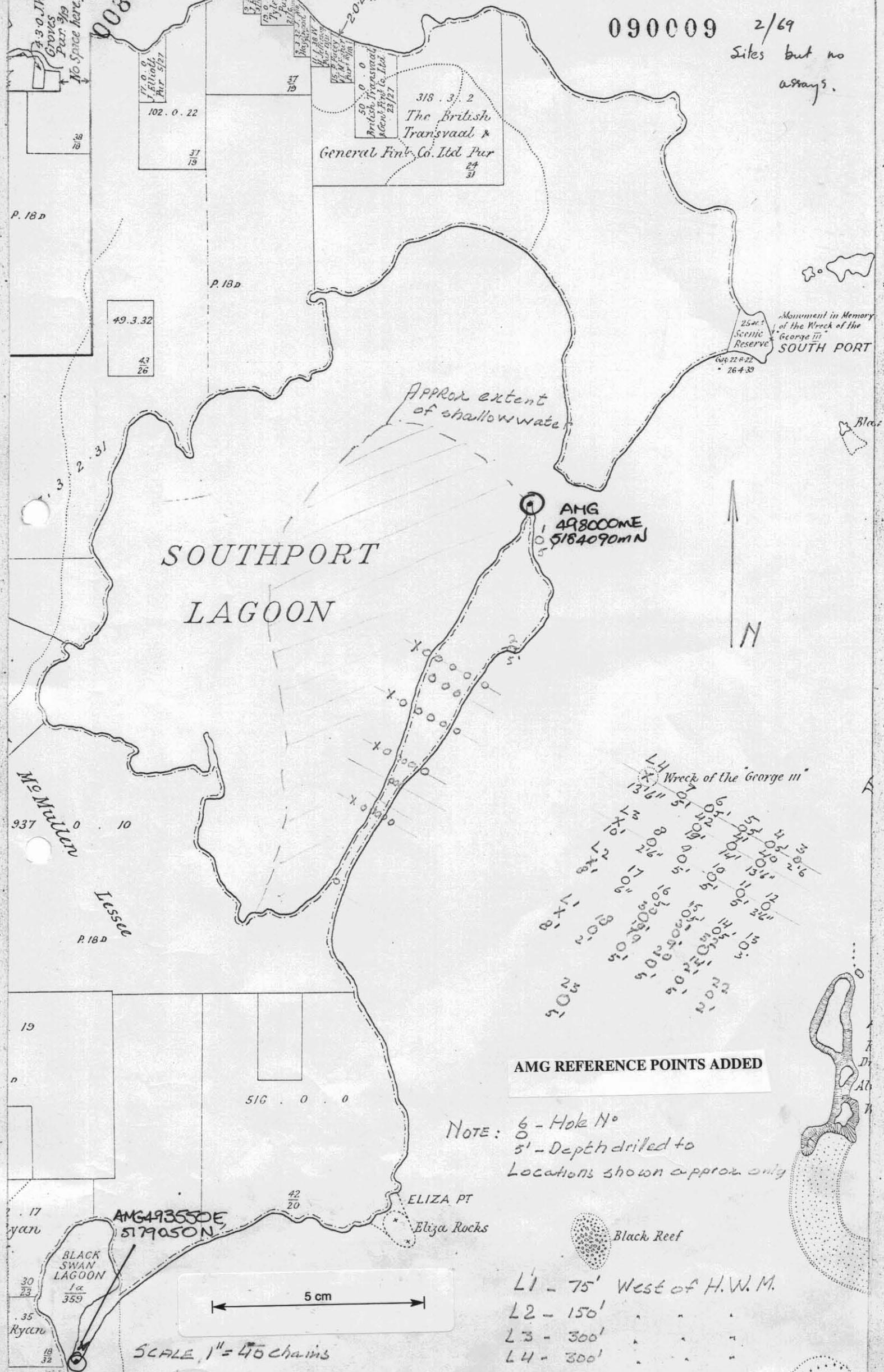
Sample	Polished Section No.	Opagues %	Individual Minerals in H.F.		
			Zircon %	Rutile %	Ilmenite %
1	12268	13.0	1.0	-	5.6
2	12269	9.0	2.0	0.7	2.0
3	12270	6.0	1.0	-	-
4	12271	6.9	0.6	0.5	Trace
5	12272	11.6	1.0	0.6	2.0
6	12273	8.7	1.9	0.9	4.0
7	12274	20.2	9.4	1.9	12.5 - .73x } 5'
8	12275	31.9	13.3	3.5	21.5 } 2.80x } 2'6"
9	12276	12.0	3.0	1.0	5.0 } .57x }
10	12277	11.6	6.5	2.5	6.0
11	12278	14.8	2.9	1.9	7.5
12	12279	10.7	0.8	0.8	3.0
13	12280	11.0	1.0	1.0	3.0
14	12281	8.1	0.6	0.9	7.0
15	12282	16.2	4.4	0.9	10.0
16	12283	11.5	6.2	1.6	5.0 } -.52x } 5'
17	12284	23.5	8.8	1.6	14.0 } -1.53x } 6"
18	12285	21.1	8.6	2.6	13.5 } -1.2x } 2'
19	12286	14.9	8.3	2.3	8.0
20	12287	23.7	12.2	4.2	15.0 } -1.73x } 6.7-5'
21	12288	6.9	1.5	0.9	3.8
22	12289	5.5	2.0	0.7	1.6
23	12290	10.5	2.5	1.6	6.2
24	12291	44.7	11.4	3.5	21.0
		ave: (15.17)	4.62	1.50	7.18

Note: Although percentages are quoted to one decimal place, it is doubtful if this accuracy was obtained on a count of 300 to 400 grains.

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Sites but no assays.



AMG REFERENCE POINTS ADDED

NOTE: 6 - Hole No
5' - Depth drilled to
Locations shown approx only

- L1 - 75' West of H.W.M.
- L2 - 150' " " " "
- L3 - 300' " " " "
- L4 - 300' " " " "

SCALE 1" = 40 chains

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June 23, 1969.

EDMUND
EXPLORATION PROGRAMME - E.L.11/68. MR. ANTHONY EDWARD BAILEY

1. The following exploration programme on the beach sands in the area of Southport Lagoon follows from -
 - (a) Evidence of values of both zircon and rutile in the dunes between the sea and Southport Lagoon (as shown on the attached plan).
 - (b) Possibility of the extensive dune system to the east and north of Southport Lagoon carrying enrichments of the same minerals.
2. The previous work completed shows within the dunes between the lagoon and the sea an area in excess of 50 acres (hatched red), an average depth of around 9' of sands carrying values of zircon and rutile of the order plus .50% and plus .20% respectively in holes down to water level only. The enrichments are highest in the section drilled immediately above water level. The area is inferred to carry around 1,000,000 tons with a zircon content of 5000 tons and a zircon content of 2000 tons. *rutile*
No evidence of heavy minerals was found in the Lagoon itself. A further pattern of holes below water line is proposed, extending outwards.
3. No drilling has been done on the higher dune systems to the east and north extending along the coast and it is proposed that this area should be tested. Substantial tonnage of beach sands exist in this section.
4. Some expenditure is also required to establish a road to the north-east corner of the area - entry from the sea being hazardous.
5. Programme
 - (a) A pattern of 30 holes closing up in the drilled area shown in red, extending to the north-east and south-west along the dunes.

5. (b) A pattern of 30 holes on a broad grid in the high dune systems to the
- (c) Establishment of tracks suitable for 4-wheel drive vehicles to enter areas (a) and (b) above.

6. Estimated cost of programme

(a) Drilling and sampling on the two areas, wages, etc.	\$1,500.00
(b) Bulldozing tracks, transport and general expenses	1,000.00
(c) Cost of analyses of heavy minerals	1,200.00
(d) Contingencies	500.00
	<u>\$4,200.00</u>

Programme to commence immediately after winter when tracks can be bulldozed and graded.

Number of men required - Field Supervisor and three assistants.

7. Exploration Licence Area.

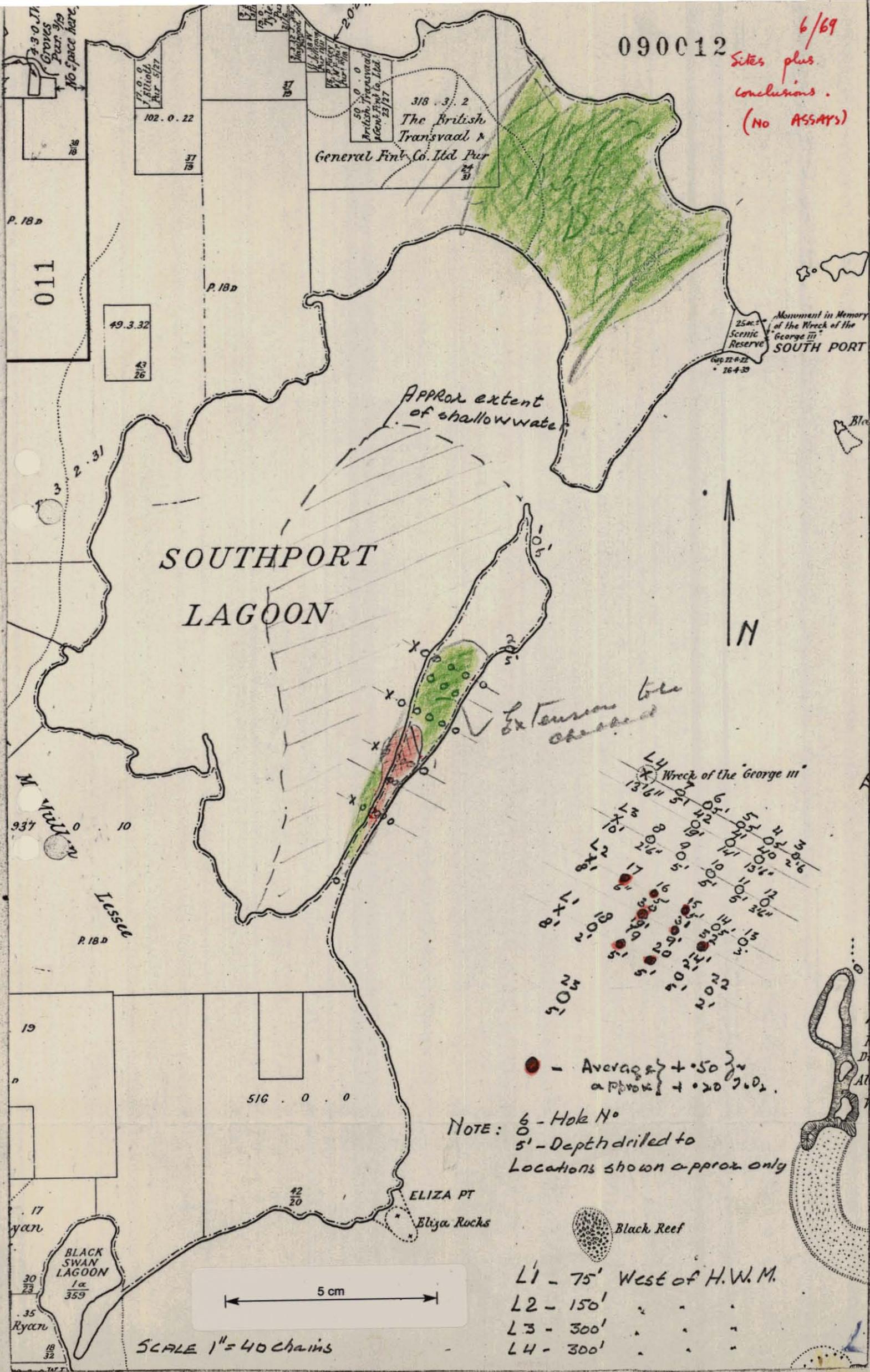
The present area of the Licence covers approximately 200 square miles - it is recommended that this area be limited by placing the western boundary at South Cape extending due north to the northern boundary line of EL11/68.

H. KEITH TURNER.

June 23, 1969.

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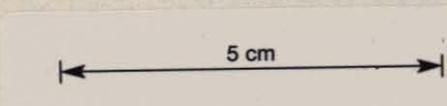
6/69
Sites plus
conclusions.
(NO ASSAYS)



NOTE: 6 - Hole No
5' - Depth drilled to
Locations shown approx only

● - Average } +.50 }
approx } +.20 }
 } } }

- L1 - 75' West of H.W.M.
- L2 - 150' " "
- L3 - 300' " "
- L4 - 300' " "



SCALE 1" = 40 chains

012

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Sites plus
Zr. figures
No. ASSAYS.

L4 13'6"	7.73 5'	6.07 5'	5.02 5'	4.31 5'	3 2'6"
-------------	------------	------------	------------	------------	-----------

42.17 19'	41.33 15'	41.2 12'
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L3 10'	8 26" 2.16	9.12 5'	10.28 5'	11.08 5'	12 3'6"
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L2 8'	17 1.46 6"	16 .54 5'	15 .16 5'	14 .01 5'	13 3'
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30 2.23 19'	31 1.67 9'	32 .34 14'
----------------	---------------	---------------

L1 8'	18 1.20 2'	19 .30 5'	20 1.72 5'	21 .02 5'	22 2'
----------	---------------	--------------	---------------	--------------	----------

18 2'	1.20
----------	------

18 - hole number

1.20 - % Zircon in total sample.

2' - depth of hole.

Results of drilling Southport Lagoon (Tas.)

Assays by Amdel Report MP2116-69

MP 2882-69

Calculation by J. Walker.

June 1969

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Copper to 27
8/68
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Specialists in Mineral and Metallurgical Analyses

Mr. P.N. Junghans
2nd Floor
290 Latrobe Street
MELBOURNE 3000

Job No. 68/371.

16th August 1968

Reference: Seven sand samples were submitted, by Mr. P.N. Junghans, on the 5th August 1968, for estimation of minerals present in the heavy mineral concentrates.

Method: Each sample was dried and weighed, and the fraction coarser than 1 mm particles size was removed by sieving (+60 mesh). The bulk of this oversize material consisted of either plant material or of shells: little sand was present in this fraction, and no heavy minerals would be expected in such a coarse fraction.

50.000 gm was sampled from the undersize fraction, and this sample was treated with bromoform of S.G. approximately 2.9. The sink fraction of "heavy minerals" was dried, weighed to determine the percentage of all such minerals in the sample.

The heavy mineral concentrates were examined in air using a stereoscopic microscope and a small subsample was examined from each, using immersion media (especially clove oil) and a petrographic microscope. A visual estimate of the abundances of the dominant and the economically important minerals was made.

<u>Results:</u>	<u>SAMPLE 1</u>	Dry weight	<u>651 gm</u>
		Weight - 1 mm fraction	<u>639 gm</u>
		Weight of heavy mineral	
		sample out of 50 gm	<u>4.543 gm</u>
		<u>Percentage</u>	<u>9.1%</u>

1-2-3-4
in Lagoon

85
9
7.65
501 7 1/2 %
32 S.D.V

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- 2 -

Mineral abundances:

Zircon	85%
Rutile	Trace
Ilmenite	Trace
Others: include Epidote, Quartz composite grains, etc.	15%

24% 2.8104

<u>SAMPLE 2</u> Dry weight	831 gm
Weight - 1 mm fraction	736 gm
Weight of heavy minerals from 50 gm	15.471 gm
<u>Percentage</u>	<u>30.9%</u>

Mineral abundances:

Zircon	80%
Ilmenite/leucoxene	Trace
Rutile	Trace
Monazite	Trace
Others: Quartz composites, hypersthene, <u>staurolite</u> etc.	20%

At W.L.
in bag

<u>SAMPLE 3</u> Dry weight	329 gm
Weight - 1 mm fraction	328 gm
Weight of heavy minerals from 50 gm	38.310 gm
<u>Percentage</u>	<u>76.6%</u>

Mineral abundances:

Zircon	80 %
Rutile	Trace
Monazite	Trace
Others: Quartz composites, garnet, tourmaline, <u>corundum</u> etc	20 %

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- 3 -

<u>SAMPLE 4</u>	Dry weight	308 gm
	Weight - 1 mm fraction	301 gm
	Weight of heavy minerals from - 1 mm fraction	6.656 gm
	<u>Percentage</u>	<u>13.3 %</u>

Mineral abundances:

Zircon	75 %
Ilmenite	Trace
Others: Quartz composites, andalusite, tourmaline, secondary limonite	25%

<u>SAMPLE 5</u>	Dry weight	377 gm
	Weight - 1 mm fraction	363 gm
	Weight of heavy minerals from 50 gm sample	2.718 gm
	<u>Percentage</u>	<u>5.4 %</u>

*Sandhill/
15-20' above,
HWM.*

Mineral abundances:

Zircon	60 %
Ilmenite	Trace
Others: Mainly ironstained Quartz, garnet, epidote, andalusite etc.	40%

<u>SAMPLE 6</u>	Dry weight	991 gm
	Weight - 1 mm fraction	991 gm
	Weight of heavy minerals from 50 gm sample	0.953 gm
	<u>Percentage</u>	<u>1.9 %</u>

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- 4 -

Mineral abundances:

Zircon	70 %
Rutile	Trace
Ilmenite	Trace
Others: Quartz composites, epidote etc.	30%

SAMPLE 7

*Ocean Beach
HWM*

Dry weight	754 gm
Weight - 1 mm fraction	754 gm
Weight of heavy minerals from 50 gm sample	3.296 gm
<u>Percentage</u>	<u>6.6 %</u>

Mineral abundance:

Zircon	70 %
Ilmenite	Trace
Others: Mainly limonite coated Quartz, tourmaline andalusite, epidote	30%

Comments: Most samples are ironstained, mainly by limonite, the worst being 7,5,4 and 1.

D. McL Ward
(Manager)

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*Due sum = 205.9, incl. 94.3920, for Rd, to Elms
to. mon, to and, same
coraid.*