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REPORT NO 3A/88

EL 44/86 TASMANIA

Relinquishment Report on Exploration Completed
in South-Western King Island Between 11/4/87 and 11/4/88

Prepared for National Mineral Sands Pty. Ltd.

A. Dove
G. Lee
April, 1988

LIST OF FIGURES

LIST OF TABLES

002

793003

CONTENTS

SYNOPSIS

SYNPOSIS

1. AIM

To investigate the potential for mineral sand occurrences in the southern and western areas of King Island.

2. REASON

During the past two years the demand for mineral sand products has outstripped the supply available from current production areas. As a consequence significant price rises have occurred in the mineral sand commodities - rutile, leucoxene, ilmenite (all TiO_2 raw materials), zircon and monazite.

King Island has a previous history of mineral sand production from the Naracoopa area on the east coast.

3. SUMMARY & CONCLUSIONS

3.1 EL 44/86 covered 103 km^2 in the south-western coastal areas of King Island.

3.2 A study of aerial photographs covering the licence area was completed and is shown as Figure 2 of this report.

3.3 Field investigation concentrated on surveying and drilling 36 hand auger and case sludged holes on 2 traverse lines.

3.4 Selected samples from each traverse line were subject to laboratory heavy mineral separation.

3.5 Heavy mineral contents are shown in Table 1.

3.6 Mineralogical study of the heavy minerals is recorded in Table 2.

3.7 The Badger Box drill hole tested showed mineral concentrations towards the bottom of the drill hole which may represent buried strandlines, however the mineral suite was still low in rutile and zircon.

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REPORT

4. INTRODUCTION

A preliminary exploration programme was carried out by Peter H. Stitt & Associates Pty. Ltd., on behalf of National Mineral Sands Pty. Ltd. (formerly Butlers No. 27 Pty. Ltd.) on their EL 44/86, in King Island, Tasmania. The object of the programme was to test prospective areas for economic deposits of mineral sand, particularly rutile, zircon, ilmenite and monazite.

The initial programme was based on the study of topographic maps and aerial photographs, and consisted of hand drilling a number of regular spaced holes along two traverse lines.

5. TENEMENT INFORMATION

Exploration Licence 44/86 was held by National Mineral Sands and covered an area of 103 square kilometres in the south-western corner of King Island, see Figure 1.

The area comprised 16 km² of Crown Land, 85 km² of private property and 2 km² of the Seal Rocks Conservation Area (proposed State Reserve). An area of 4 km² was excluded from the original application as it was public reserve.

6. PREVIOUS WORK

Exploration activities were carried out in the Seal Bay area EL 13/66 in September 1968 by Kenneth McMahon and Partners for Naracoopa Rutile Limited.

Fifty-five holes were drilled at various spacings north and south of Big Lake and across the neck of the Stokes Point Peninsula. A further nine holes were drilled to the east of Big Lake during December, 1968.

In October 1969 a further 168 holes were drilled along a series of lines heading north-west from Big Lake and Colliers Swamp, and south from Colliers Swamp. The assay results were not encouraging, although the north-west trending line from Big Lake had the most promise.

It was suggested that Big Lake was formerly part of Seal Bay and that concentrations of heavy mineral probably occur in old strandlines similar to those found inland from Cowper Point.

The orientation of many drill traverse lines in the Big Lake area was parallel to the old shore lines, and not ideally orientated to intercept mineralisation.

7. AERIAL PHOTOGRAPHY INTERPRETATION

Aerial photograph interpretation using the most recently available black and white photography from Tasmap was carried out over the EL. The photography was at a scale of 1:42,000 (approx) and dated as follows:

King Island	March/April, 1985

The maps prepared show sufficient geographic features to enable locating using the 1:100,000 topographic series. Distortion between photographs has created some problems in preparing these composites and is reflected by variation in the angle and length of some tenement boundaries.

The most prospective area for minerals are the strandlines developed around Seal Bay and Big Lake in the south-west of the island (see Figure 2).

The balance of the tenement covered aeolian dunes which for the most part overlie Precambrian granites and metamorphics which outcrop along the present-day shoreline. This is particularly noticeable along the western coast, south of Currie. The aeolian dunes may, however, overlie older beach deposits which may contain strandlines with heavy mineral concentrations.

8. FIELD INVESTIGATIONS

8.1 Survey

Drill holes where possible were located along straight traverse lines running nearly perpendicular to the strike of the strandlines or the coastline. Where possible the traverse lines were located along existing roads and tracks in order to minimise disturbance and allow ease of access during exploration.

Two traverse lines designated Seal Bay (SB) and Badger Box (BB) were drilled within the exploration licence (see Figure 2).

The survey of the drill holes was by tape, compass and abney hand level. Holes were spaced 40 metres apart along the traverse line at Seal Bay, and 100 metres apart along the Badger Box Traverse.

8.2 Drilling

All drilling in the programme was by hand augering and hand operated cased sludging. The drilling was carried out using a Tasmanian field crew, with a total of 36 holes and 309.2m. drilled for 310 samples.

Samples were collected at 1 metre intervals and bagged. The hand sludged samples were weighed in the field so that the drilling crew could maintain a check on weight variation per metre drilled and take steps to remain within acceptable limits.

Holes were drilled to a maximum depth of 10 metres, however most holes finished shallower, due to basement, calcrete or indurated layers, or difficult drilling.

8.3 Traverse Line Summaries

Seal Bay Traverse:

Traverse extended 465 metres, incorporating 12 drill holes. Heavy mineral

traces were detected over most of the line, with the greatest quantities found in holes SB 0 and SB 12, situated inland from the beach.

Badger Box Traverse:

Traverse extended 2300m. incorporating 24 drill holes. Most samples contained only calcareous sand. However encouraging heavy mineral concentrations were found in holes BB 120 and BB 160, which penetrated the underlying dune systems and may represent strandlines beneath aeolian dunes.

9. LABORATORY INVESTIGATION

Those samples that were assayed for heavy minerals during the period were treated by the Tasmanian Mines Department, Metallurgical Laboratories, Launceston, using the procedure outlined below.

1. Dry samples as received.
2. Weigh and record weight.
3. Screen on a coarse sieve (say 2 mm.) to break up agglomerated lumps.
4. Riffle split approximately 100 gm working sample.
5. Re-pack balance of sample.
6. Weigh working sample.
7. Screen on 600 micron sieve (or coarser sieve as directed) and weigh plus 600 micron fraction.
8. Using TBE, separate heavy minerals.
9. Dry and weigh heavy mienrals.
10. Calculate heavy minerals as a percentage of the sample weighed in Step 6 above.
11. Package heavies for despatch.

The heavy minerals for each interval were bulked together to form one composite sample for each drill hole. Mineralogical analysis was carried out on a number of these samples by Applied Petrographic Services, Sydney, N.S.W.

The method adopted for mineralogical study was:

1. Magnetically separate the heavy concentrate into:
   - . hand magnetics
   - . 0.5 amp Frantz magnetics
   - . 1.0 amp Frantz magnetics
   - . 1.6 amp Frantz magnetics
   - . 1.6 amp Frantz non-magnetics

using a Frantz magnetic separator with forward slope of 20^{o}. and side tilt of 12.5^{o}.

2. Weigh each magnetic fraction.

3. Optically identify mineral grains and point count a minimum 400 points for each magnetic fraction.

This is discussed in Chapter 11.

10. RESULTS AND DISCUSSION

Two drill holes selected because they contained visible heavy mineral and representing some of the higher grade material were analysed from the traverse lines; one each from Seal Bay and Badger Box. This was done to give an idea of the grades and details on the mineralogy in the areas.

The Seal Bay drill hole (SB12) had very little mineral present in the top six metres, but at the water table the grades increased to 0.5% (see Table 1). However the average grade for the drill hole was low at 0.16%.

The mineralogy of SB 12 was dominated by pyroxenes and rock fragments representing weathered bedrock material. Rutile, zircon and leucoxene only consitituted 3% of the total mineral (see Table 2).

The Badger Box drill hole (BB 160) showed consistent grades of about 0.3% for the top five metres, with an increase up to 0.9% for the remaining three metres (see Table 1). This possibly represents an older beach deposit containing strandlines with heavy mineral concentrations, underlying the more recent aeolian dunes. The average grade for the drill hole was 0.5%.

The mineralogy of BB 160 was dominated by a typical mature detrital suite of magnetite, ilmenite, garnet and tourmaline; with rutile, zircon and leucoxene only representing 11% of the total heavy mineral concentration (see Table 2). The concentration of such a detrital heavy mineral suite again points to the possibility of older beach concentrations of mineral. However the low content of the economically important minerals: rutile, zircon and leucoxene makes the area less attractive as an exploration target.

TABLE 1

Tabulation of Heavy Mineral Grades

Depth (metres)	Heavy Mineral Grades	
	SB 12	BB 160
0-1	0.1	0.3
1-2	0.1	0.2
2-3	0.1	0.4
3-4	0.1	0.3
4-5	0.1	0.4
5-6	0.1	0.6
6-7	0.2	0.9
7-8	0.5	0.9
8-9	-	-
9-10	-	-
Average Grade	0.16	0.5

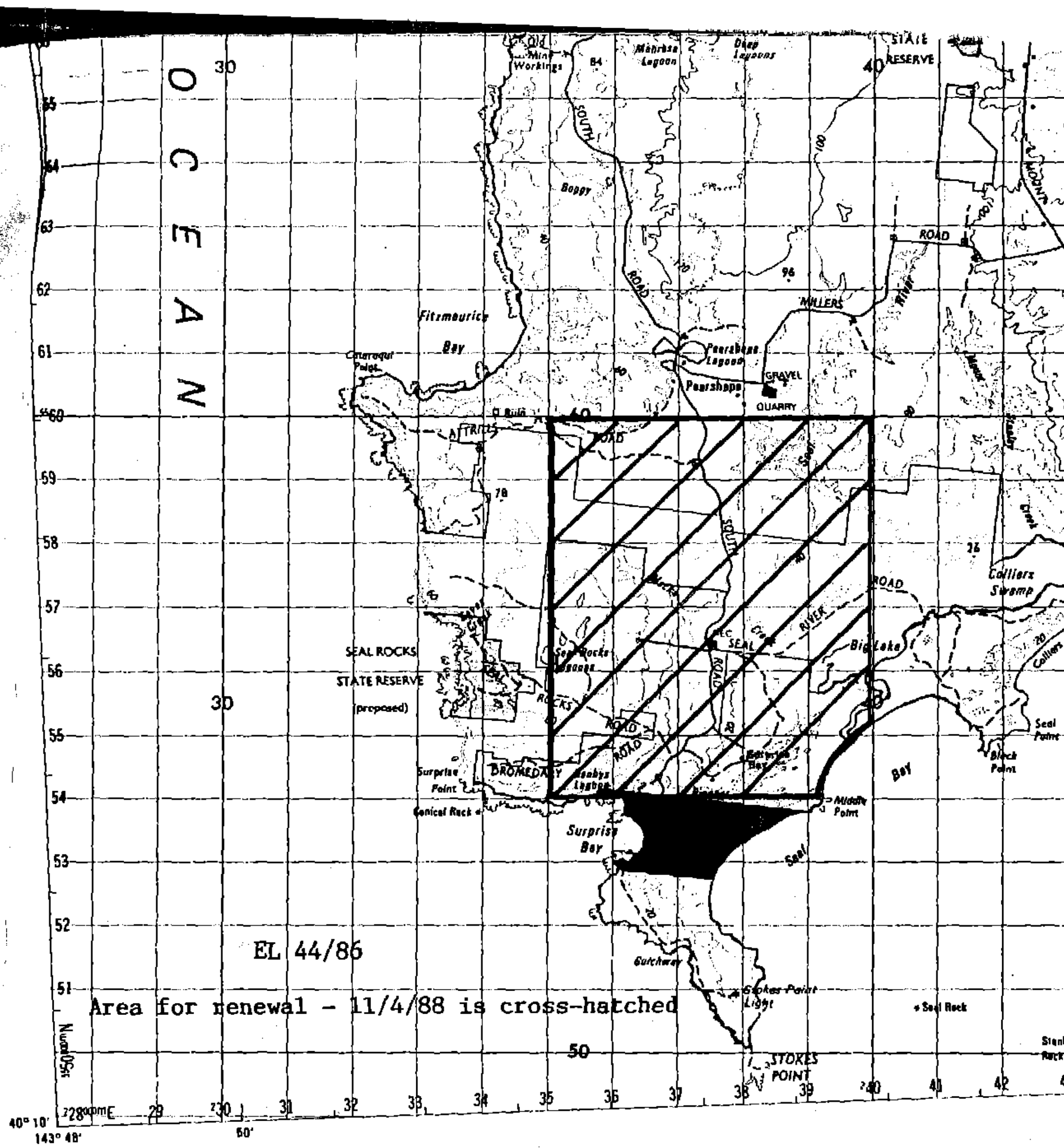
615

TABLE 2

Comparison of Mineralogy

MINERAL	SB 12	BB 160
MAGNETITE	5	18
ILMENITE	6	23
GARNET	11	10
TOURMALINE	10	21
RUTILE	1	4
ZIRCON	1	2
STAUROLITE	2	1
PYROXENE	35	1
AMPHIBOLE	1	1
OLIVINE	3	1
EPIDOTE/ZOISITE	1	2
ALUMINO-SILICATES	2	3
LEUCOXENE	1	7
QUARTZ	1	1
SHELL	7	1
ROCK FRAGS/COMPOSITES	13	7
MICA/CHLORITE	2	1
SULPHIDES	1	-
APATITE	-	-
CASSITERITE	-	1
MONAZITE	<1	<1
SCHEELITE	<1	-
AVERAGE GRADE H.M.	0.16	0.5

616



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Appendix 1

Drill Logs - Seal Bay and Badger Box Creek

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - SEAL BAY

LINE NO: 1 HOLE NO: SB 0

LOGGED BY: ANDREW DOVE

DATE DRILLED: 8.7.87

Interval (m)	Wet Wt. (kg)	Description	% Slime	%+1000 um	% H.M.
0 - 1		SAND, medium grained, greyish-orange, fine shell, grey colour due to organics.			
1 - 2		SAND, medium to coarse grained, amber. Abundant shell.			
		STARTED SLUDGING			
2 - 3	2.5	SAND, amber, medium grained, calcrete.			
3 - 4	4.5	SAND, fine grained, yellow H.M. visible (>1%)			
4 - 5	4.25	SAND, fine grained, pale yellow, H.M. visible.			
5 - 6	3.0	AS ABOVE. H.M. visible.			
6 - 7	3.5	SAND, coarse grained, pale yellow. H.M. visible, shell fragments abundant.			
7 - 8	4.25	AS ABOVE but coarser.			
8 - 9	4.25	AS ABOVE but paler colour (cream).			
9 - 10	3.75	SAND, fine, abundant shell, white, visible H.M.			
		END OF HOLE			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - SEAL BAY

LINE NO: 1 HOLE NO: SB 4

LOGGED BY: ANDREW DOVE

DATE DRILLED: 8.7.87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine-medium grained, dark grey. STARTED SLUDGING			
1 - 2	3.75	SAND, medium grained, light brown, shell fragments. Calcrete nodules.			
2 - 3	2.5	SAND, medium grained, cream, mostly shell fragments, H.M. visible			
3 - 4	4.0	AS ABOVE			
4 - 5	4.75	AS ABOVE			
5 - 6	4.25	AS ABOVE			
6 - 7	5.5	AS ABOVE, shell becoming coarser			
7 - 8	5.0	AS ABOVE			
8 - 9	5.5	SAND, fine, cream, fine and coarse shell and occasional pebbles.			
9 - 10	4.75	AS ABOVE but no pebbles.			
		END OF HOLE, coarse shell.			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - SEAL BAY

LINE NO: 1 HOLE NO: SB 8

LOGGED BY: ANDREW DOVE

DATE DRILLED: 9/7/87

033

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, medium grained, orange-brown, contains organics.			
1 - 2		SAND, medium grained, amber, abundant coarse shell fragments.			
2 - 3		AS ABOVE.			
3 - 4		AS ABOVE.			
4 - 5		AS ABOVE STARTED SLUDGING			
5 - 6	3.5	AS ABOVE. H.M. present.			
6 - 7	4.5	AS ABOVE - colour changing to grey at base. Organics present. H.M. visible.			
7 - 8	3.5	SAND, medium, grey with fine and coarse shell, old B horizon.			
8 - 9	4.5	SHELL fragment, mostly fine dominant, with light grey fine sand. END OF HOLE. Difficult drilling.			

28

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CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - SEAL BAY

LINE NO: 1 HOLE NO: SB 12

LOGGED BY: ANDREW DOVE

DATE DRILLED: 9/7/87

034

Interval (m)	Wet Wt. (kg)	Description	% Slime	%+1000 um	% H.M.
0 - 1		SAND, medium grained, greyish orange, abundant shell fragments.		1.1	0.1
1 - 2		SAND, medium grained, amber, abundant shell fragments.		1.1	0.1
2 - 3		AS ABOVE		0.5	0.1
3 - 4		AS ABOVE		0.5	0.1
4 - 5		AS ABOVE		0.9	0.1
5 - 6		AS ABOVE		1.1	0.1
6 - 7		AS ABOVE		0.8	0.2
		STARTED SLUDGING			
7 - 8	4.5	AS ABOVE, H.M. present (>1%)	9.4	1.7	0.5
		END OF HOLE, difficult drilling.			
		Average			0.16

29

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CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL

AREA: KING ISLAND - SEAL BAY

LINE NO: 1 HOLE NO: SB 16

LOGGED BY: ANDREW DOVE

DATE DRILLED: 9/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, coarse grained, greyish-orange, abundant shell.			
1 - 2		AS ABOVE but orange colour.			
2 - 3		AS ABOVE STARTED SLUDGING			
3 - 4	4.0	SAND, medium grained, light grey, abundant shell fragments.			
4 - 5	3.75	SAND, medium grained, no shell, some clay, greyish-yellow, H.M. trace.			
5 - 6	4.25	SAND, fine grained, cream, rich in fine shell. H.M. trace.			
6 - 7	4.25	AS ABOVE. H.M. trace.			
7 - 8	5.0	AS ABOVE, H.M. Trace			
8 - 9	4.25	AS ABOVE, H.M. Trace			
9 - 10	5.0	AS ABOVE, H.M. Trace			
		END OF HOLE 10m.			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - SEAL BAY

LINE NO: 1 HOLE NO: SB 20

LOGGED BY: ANDREW DOVE

DATE DRILLED: 9/7/87

036

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, medium grained, greyish-orange, abundant shell.			
1 - 2		SAND, medium grained, amber, abundant shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE with occasional pebbles and coarse shell. Organic layer - dark brown.			
6 - 7		SAND, medium to fine grained, pale brown, shell free; with clay matrix.			
7 - 7.7		SAND, medium grained, abundant shell. Clayey layer 7.0 - 7.20m. contained fine mineral Calcrete. STopped drilling at 7.7m.			
		END OF HOLE 7.7m.			

31

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CLIENT: NATIONAL MINERAL SANDS

AREA: KING ISLAND - SEAL BAY

LINE NO: 1 HOLE NO: SB 24

LOGGED BY: ANDREW DOVE

DATE DRILLED: 9/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, coarse grained, greyish-orange, abundant shell.			
1 - 2		SAND, medium grained, amber, abundant shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
% _ %.*		SAND, medium to coarser, amber, abundant fine and coarse shell, occasional pebbles. Traces of H.M., carbonate matrix.			
		END OF HOLE. Difficult drilling.			
		5.8m. hard base - probably calcrete layer			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - SEAL BAY

LINE NO: 1 HOLE NO: SB 28

LOGGED BY: ANDREW DOVE

DATE DRILLED: 9/7/87

038

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, medium grained, greyish-orange, abundant fine shell.			
1 - 2		SAND, medium grained, amber, abundant fine shell.			
2 - 3		AS ABOVE, contains some organics.			
3 - 4		SAND, medium grained, amber, abundant fine shell - some H.M.			
4 - 5		AS ABOVE, some H.M.			
5 - 6		SAND, medium grained, lgith grey-brown, contains organics, old B horizon			
6 - 7		SAND, medium grained, amber, abundant shell.			
7 - 8		AS ABOVE, becoming coarser. Occasional pebbles, H.M. traces.			
		STARTED SLUDGING			
8 - 9	4.25	SAND, medium to coarse grained, amber, H.M. traces. Occasional pebbles, abundant coarse shell.			
9 - 10	3.5	AS ABOVE - fine/coarse shell layers. Pebble base. Cream colour.			
		END OF HOLE 10m. Pebbles.			

33

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CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - SEAL BAY

LINE NO: 1 HOLE NO: SB 32

LOGGED BY: ANDREW DOVE

DATE DRILLED: 9/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, medium to coarse, light grey-amber. Abundant shell.			
1 - 2		AS ABOVE			
2 - 3		AS ABOVE, some H.M. becoming coarser at base.			
3 - 4		AS ABOVE, becoming finer			
4 - 5		AS ABOVE some H.M.			
5 - 6		AS ABOVE, has indurated layer - dark brown organic and hard.			
6 - 7		SAND, medium grained, slightly organic, amber, shell fragments.			
7 - 8		AS ABOVE - becoming coarser. H.M. trace.			
8 - 9		AS ABOVE, shell, becoming coarser. Some H.M.			
		END OF HOLE. Coarse sand 9.0m.			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

040

AREA: KING ISLAND - SEAL BAY

LINE NO: 1 HOLE NO: SB 36

LOGGED BY: ANDREW DOVE

DATE DRILLED: 9/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, medium to coarse, light grey, abundant shell fragments			
1 - 2		AS ABOVE - pale brown.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE. Traces H.M.			
4 - 5		AS ABOVE, occasional pebbles. Trace H.M.			
5 - 5.7		AS ABOVE, very coarse shell. Some H.M.			
		END OF HOLE 5.7m. Didn't bother to sludge.			

35

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CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - SEAL BAY

LINE NO: 1 HOLE NO: SB 40

LOGGED BY: ANDREW DOVE

DATE DRILLED: 9/7/87

041

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium, dark grey then amber. Fine shell fragments.			
1 - 2		SAND, medium grained, amber, organic material present, abundant shell.			
2 - 3		SAND, medium grained, light grey, abundant fine shell. Trace H.M.			
3 - 4		AS ABOVE - traces H.M.			
4 - 5		AS ABOVE, trace H.M.			
5 - 6		AS ABOVE. Trace H.M. shell becoming coarser.			
6 - 7		AS ABOVE, traces H.M. Some very coarse shell.			
		END OF HOLE 7.0m. Didn't sludge			

36

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CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - SEAL BAY

LINE NO: 1 HOLE NO: SB 44

LOGGED BY: ANDREW DOVE

DATE DRILLED: 9/7/87

042

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine-medium grained, light grey, abundant fine shell. Minor traces H.M.			
1 - 2		AS ABOVE			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE			
6 - 7		AS ABOVE			
		END OF HOLE 7.0m.			

37

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CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 0

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

043

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, grey, medium to coarse grained, abundant shell. END OF HOLE 1m. Basement			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

044

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 10

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine grained, grey, abundant fine shell.			
1 - 2		SAND, fine grained, grey then white, abundant fine shell.			
2 - 3		SAND, fine grained, white with occasional grey, abundant fine shell.			
3 - 4		SAND, fine to medium grained, white, abundant fine shell.			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE			
6 - 7		SAND, fine to medium grained, brown, slightly indurated, abundant fine shell.			
7 - 8		AS ABOVE			
8 - 9		AS ABOVE			
(_ LO		AS ABOVE, becoming more indurated.			
		END OF HOLE 10 metres			

39

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045

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 20

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine grained, dark grey then amber			
1 - 2		SAND, fine to medium grained, amber, abundant fine shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE, slightly organic.			
6 - 7		AS ABOVE			
7 - 8		AS ABOVE, BECOMING SLIGHTLY COARSER.			
8 - 9		AS ABOVE, SHELL BECOMING COARSE.			
(_ LO		AS ABOVE, grey.			
		END OF HOLE 10.00 m.			

40

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CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 30

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine grained, dark grey then slightly amber.			
1 - 2		SAND, fine to medium grained, amber, abundant fine shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
		STARTED SLUDGING			
5 - 6	3.5	SAND, coarse grained, amber to brown, coarse shell.			
6 - 7	3.5	AS ABOVE becoming grey.			
		END OF HOLE 7.0m. Gravel			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 40

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine grained, dark grey then amber. Abundant fine shell.			
1 - 2		SAND, fine to medium grained, amber. Abundant fine shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
% _ ¢		AS ABOVE			
		END OF HOLE 6.0m. Rock			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 50

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey, slightly amber.			
1 - 2		SAND, fine to medium grained, amber. Slightly organic, abundant fine shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE			
6 - 7		AS ABOVE, slightly coarser.			
7 - 8		AS ABOVE. H.M. traces STARTED SLUDGING			
8 - 9		SAND, fine tomedium grained, light grey, coarse shell fragments.			
9 - 10	3.0	AS ABOVE, shell not as coarse, went through dark grey indurated layer. END OF HOLE 10.0m.			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 60

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then light brown.			
1 - 2		SAND, fine grained, brown, fine shell fragments.			
2 - 3		SAND, fine to medium grained, amber, abundant fine shell			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE, slightly organic.			
6 - 7		AS ABOVE			
7 - 8		AS ABOVE			
8 - 9		AS ABOVE			
9 - 10		AS ABOVE			
		END OF HOLE 10.0m.			

CLIENT: NATIONAL MINERAL SANDS TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK LINE NO: 1 HOLE NO: BB 70

LOGGED BY: ANDREW DOVE DATE DRILLED: 19/7/87

050

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then amber. Abundant fine shell.			
1 - 2		SAND, fine to medium grained, amber. Abundant fine shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE			
6 - 7		AS ABOVE, slightly organic.			
7 - 8		AS ABOVE			
8 - 9		AS ABOVE			
9.00		AS ABOVE, no organics.			
		END OF HOLE 10.0 m.			

45

793038

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 80

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

051

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then amber			
1 - 2		SAND, fine to medium grained, amber. Abundant fine shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE, slightly organic.			
5 - 6		AS ABOVE			
6 - 7		AS ABOVE			
7 - 8		AS ABOVE			
8 - 9		AS ABOVE			
9 - 10		AS ABOVE			
		END OF HOLE 10.0m.			

46

2923039

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 90

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

052

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, amber, slightly organic, abundant fine shell.			
1 - 2		SAND, fine to medium, amber, abundant fine shell.			
2 - 3		AS ABOVE			
3 -4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE			
6 - 7		AS ABOVE			
7 - 8		AS ABOVE, slightly organic.			
8 - 9		AS ABOVE			
9 - 10		AS ABOVE			
		END OF HOLE 10.0m.			

47

793040

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 100

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

053

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium, dark grey			
1 - 2		SAND, fine to medium grained, dark grey then amber, abundant fine shell.			
2 - 3		SAND, fine to medium grained, amber. Abundant fine shell.			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE			
6 - 7		AS ABOVE			
7 - 8		AS ABOVE			
8 - 9		AS ABOVE			
9 - 10		AS ABOVE			
		END OF HOLE 10.0m.			

48

7930411

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 110 054

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then amber. Abundant fine shell.			
1 - 2		SAND, fine to medium grained, amber. Abundant fine shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE			
6 - 7		AS ABOVE			
7 - 8		SAND, fine to medium grained, amber. Abundant fine shell, then went through dark grey indurated layer, then back to white sand.			
8 - 9		SAND, fine to medium grained, amber, abundant fine shell.			
		END OF HOLE 9.0m. Didn't Sludge			

49

7930042

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 120

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, amber. Slightly organic. abundant fine shell.			
1 - 2		SAND, fine to medium grained, amber. Abundant fine shell.			
2 - 3		AS ABOVE, slight organic			
3 - 4		AS ABOVE, went through a calcrete layer.			
4 - 5		SAND, fine to medium grained, dark brown then amber, then white. ABundant fine shell.			
5 - 6		SAND, medium to coarse grained, light grey, some fine shell.			
		STARTED SLUDGING			
6 - 7	3.00	SAND, fine to coarse grained, H.M. present (>1%)			
7 - 8	AS ABOVE	H.M. present (>1%)			
		END OF HOLE Calcrete			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 130

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

056

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then amber. Abundant fine shell.			
1 - 2		SAND, fine to medium grained, amber. Abundant fine shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE			
6 - 7		AS ABOVE			
7 - 8		AS ABOVE then dark brown, indurated.			
8 - 9		SAND, medium to coarse grained, brown then amber, abundant shell.			
9 - 10		SAND, medium to coarse, dark brown, indurated. Abundant shell.			
		END OF HOLE 10.0m. Indurated			

51

793044

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 140 057

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then amber. Abundant shell.			
1 - 2		SAND, fine to medium grained, amber, abundant shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		SAND, fine to medium grained, amber then dark grey, slightly indurated. ABundant fine shell.			
6 - 7		AS ABOVE			
7 - 8		SAND, fine to medium grained. Amber then brown, abundant shell.			
8 - 9		SAND, fine to medium grained, brown, indurated. Abundant shell			
		END OF HOLE 9.0m.			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 150

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then amber, abundant shell.			
1 - 2		SAND, fine to medium grained, amber, slightly organic, abundant shell.			
2 - 3		SAND, fine to medium grained, amber, abundant fine shell.			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE, becoming slightly brown.			
5 - 6		SAND, fine tomedium grained, amber, then dark grey. Slightly indurated, abundant fine shell.			
6 - 7		SAND, fine to medium grained, amber, abundant fine shell.			
7 - 8		SAND, fine to medium grained, dark grey then brown.			
8 - 9		AS ABOVE. Indurated.			
9 - 10		AS ABOVE			
		END OF HOLE 10.0m.			

059

CLIENT: NATIONAL MINERAL SANDS TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK LINE NO: 1 HOLE NO: BB 160

LOGGED BY: ANDREW DOVE DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	%+1000 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then amber. Abundant fine shell.		1.2	0.3
1 - 2		SAND, fine to medium grained, amber, abundant fine shell.		0.6	0.2
2 - 3		AS ABOVE.		0.6	0.4
3 - 4		SAND, fine to medium grained, amber then dark grey, abundant fine shell.		6.7	0.3
4 - 5		SAND, fine to medium grained, amber with slight dark grey layers fine to coarse shell.		3.7	0.4
5 - 6		AS ABOVE		2.3	0.6
				%+ 600 um	
6 - 7		SAND, fine to medium grained, tan. Abundant fine shell. H.M. present (>1%).		4.9	0.9
		STARTED SLUDGING			
7 - 8	3.0	AS ABOVE, H.M. present (>1%).		3.0	0.9
		END OF HOLE 8.0m. .Clay.			
		Average			0.5

54

7930477

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 170 060

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then slightly amber. ABundant fine shell.			
1 - 2		SAND, fine to medium grained, amber, abundant fine shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE - becoming dark brown.			
6 - 7		SAND, fine to medium grained, brown to tan, abundant fine shell			
7 - 8		SAND, fine to medium grained, tan to brown, indurated. ABundant fine shell.			
8 - 9		AS ABOVE			
		END OF HOLE 9.0m. Clay			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 180

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then amber. ABundant fine shell			
1 - 2		SAND, fine to medium grained, amber. Abundant fine shell.			
2.3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE			
6 - 7		AS ABOVE			
& _ *		AS ABOVE			
8 - 9		AS ABOVE			
9 - 10		AS ABOVE			
		END OF HOLE 10.0m.			

[redacted] NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 190

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

062

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then amber, abundant fine shell.			
1 - 2		SAND, fine to medium grained, amber. Abundant fine shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE			
6 - 7		AS ABOVE, with occasional dark brown layers. Slightly indurated.			
7 - 8		SAND, fine to medium grained, amber. Abundant fine shell.			
8 - 9		AS ABOVE			
9 - 10		AS ABOVE. Slightly organic.			
		END OF HOLE 10.0.m.			

57

793050

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 200

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

063

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then amber. Abundant fine shell.			
1 - 2		SAND, fine to medium grained, amber. Abundant fine shell.			
2 - 3		AS ABOVE			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE, slightly organic.			
5 - 6		AS ABOVE			
6 - 7		SAND, fine to medium grained, amber. Abundant fine shell.			
7 - 8		AS ABOVE			
8 - 9		AS ABOVE			
9 - 10		AS ABOVE			
		END OF HOLE 10.0m.			

58

7933051

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 210

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey then amber. Abundant fine shell.			
1 - 2		SAND, fine to medium grained, amber. Abundant fine shell.			
2 - 3		SAND, fine to medium grained, amber then dark brown. Abundant fine shell.			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE, went through dark brown layer.			
6 - 7		SAND, fine to medium grained, dark brown to red, abundant fine shell, slightly indurated			
7 - 8		AS ABOVE then white sand.			
8 - 9		SAND, medium grained white, some fine shell fragments.			
		END OF HOLE 9.0m.			

064

59

7930052

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 44/86

AREA: KING ISLAND - BADGER BOX CREEK

LINE NO: 1 HOLE NO: BB 220

LOGGED BY: ANDREW DOVE

DATE DRILLED: 19/7/87

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, reddish grey. Slightly indurated. Some fine shell.			
1 - 2		SAND, medium to coarse grained, reddish brown. slightly indurated.			
2 - 3		SAND, fine to medium grained, light brown then white, abundant fine shell.			
3 - 4		SAND, fine to medium grained, white. Abundant fine shell.			
4 - 5		AS ABOVE			
5 - 6		AS ABOVE			
6 - 6.3		AS ABOVE			
		END OF HOLE 6.3m. rock			

065

60

7963053

CLIENT: NATIONAL MINERAL SANDS

AREA: KING ISLAND - BADGER BOX CREEK

LOGGED BY: ANDREW DOVE

TITLE NO: EL 44/86

LINE NO: 1 HOLE NO: BB 230

DATE DRILLED: 19/7/87

066

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained. Dark grey then amber. Abundant fine shell.			
1 - 2		SAND, fine to medium grained. Amber. Abundant fine shell.			
2 - 3		AS ABOVE - slightly organic.			
3 - 4		AS ABOVE			
4 - 5		SAND, fine to medium grained. Amber. ABundant fine shell.			
5 - 6		AS ABOVE			
6 - 7		AS ABOVE, slightly organic.			
		END OF HOLE 7.0m. Rock			

61

793054

075

CURRIE

EL 44/86

BADGER BOX
TRAVERSE

5575000m N

Pearshape
Lagoon

BIG LAKE
TRAVERSE

Big Lake

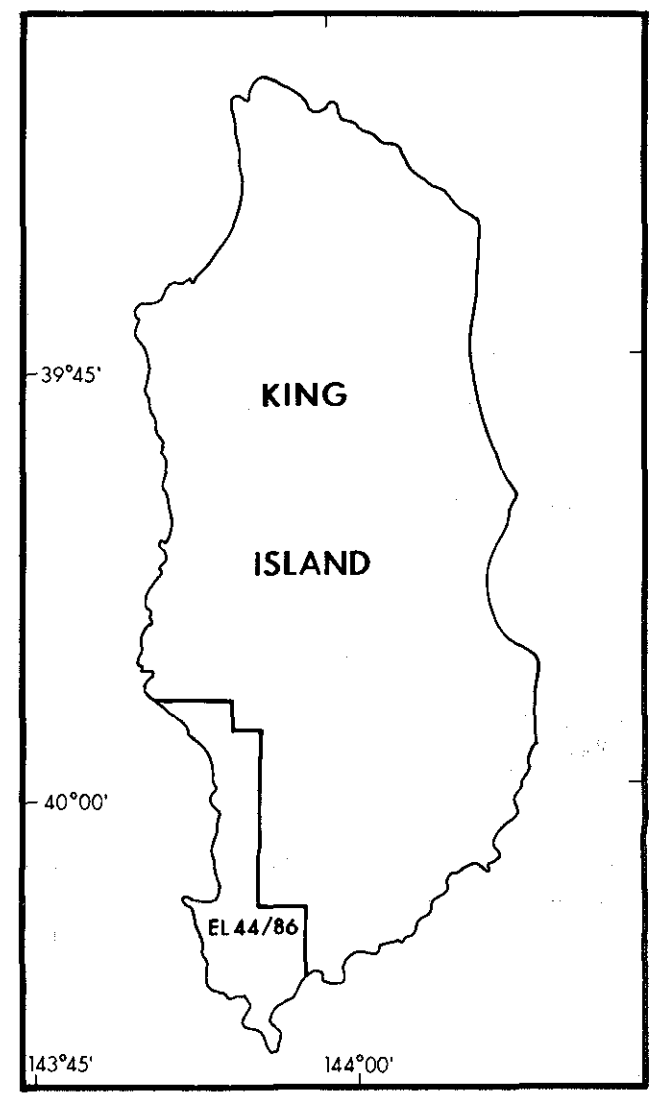
SEAL BAY
TRAVERSE

N

5 cm

SCALE 1:50 000

0 1 2 3 4 Km.



793055

NATIONAL MINERAL SANDS

EL 44/86 – TASMANIA

LOCATION MAP

88-2790

Fig. 1

750000m E

239000

CURRIE

5574000N.

Grassy

236000E

5572000N.

BB 230

BB0

BADGER BOX
TRAVERSE

Grassy

Grassy

Fitzmaurice
Bay

OCEAN

SOUTHERN

238000E

5560000N.

? Old Shoreline

Big Lake

241000E

SB0

SB 4.5

Seal Bay

SEAL BAY
TRAVERSE

Stokes
Point

NOTE :-

AEOLIAN DUNES ALONG THE WESTERN COASTLINE OVERLIE PRECAMBRIAN GRANITE AND METAMORPHICS, WHICH OUTCROP ALONG THE PRESENT DAY SHORELINE.

N

LEGEND

Photo Interpretation, Inland Margin of Sand. Aeolian Dunes.

Strandline Sand Deposits.

Track / Road

793056

5 cm

SCALE 1:42 000

0 800 1600 2400 3200 4000 m.

NATIONAL MINERAL SANDS

EL 44/86 TASMANIA

AIR PHOTO INTERPRETATION

KING ISLAND (SOUTH)

88-2797

Author : G. LEE	Date : FEB '88	Figure : 2