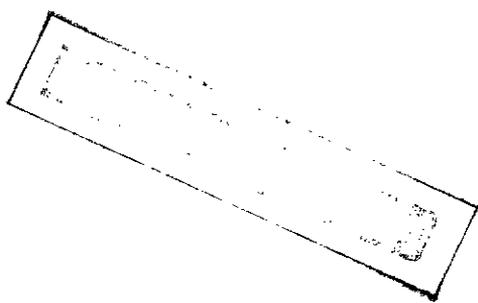


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Exploration Licence 28/85
King Island, Tasmania
Annual Report
Year Ended 30th January, 1988

Titleholder: Sanidine N.L.

Author: T. Owen

January 1988

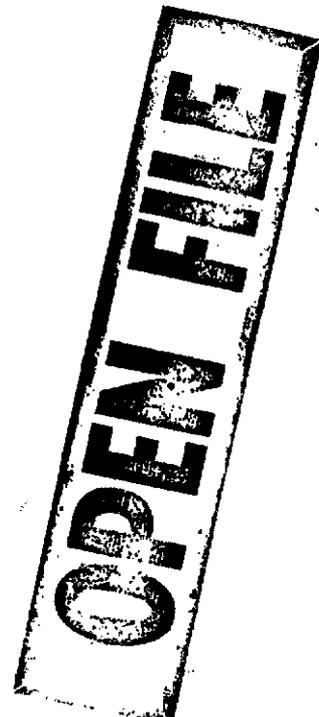
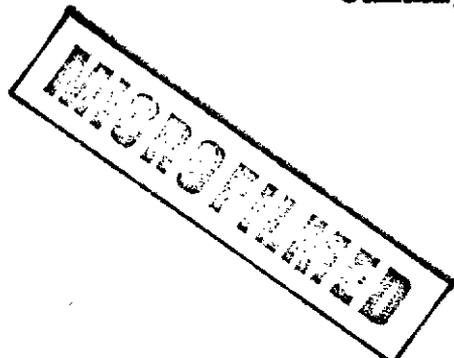


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- II. Review of King Island Heavy Mineral Sand Resources from Kibuka data made available through Sanidine N.L., by G. Lee, September 1987 (Peter H. Stitt & Associates Pty. Ltd., Technical Note No. 14/87)

Introduction

Exploration Licence 28/85 covers an area on the southeastern coast of King Island which has been mined in the recent past for heavy mineral sands (rutile and zircon) and also contains previously identified but unexploited heavy mineral sands deposits. The area was applied for by Sanidine N.L. to investigate the potential for exploitation of the known deposits and to explore for further mineralisation in the area.

Title

Exploration Licence 28/85 was applied for by Sanidine N.L. (a wholly owned subsidiary of Technomin Australia N.L.) in September 1985 over an area of 108 square kilometres along the coast and inland from Sea Elephant Bay, between Narracoopa and Cowper Point on the southeastern coast of King Island. Following objections lodged by parties involved with a proposed resort development (the Kings Paradise project) which lay within the area covered by the application, an area of 30 square kilometres was excised from the northeastern corner of the application area. Exploration licence 28/85 was subsequently granted for a term twelve months to 30th January, 1988 over the reduced area of 78 square kilometres.

Sanidine N.L. has entered into a joint venture with National Mineral Sands Pty.Ltd., who hold (through a subsidiary, Butlers No. 27 Pty. Ltd.) other mineral sands exploration interests on King Island and in other parts of Tasmania. National Mineral Sands will be operator of the joint venture.

Previous Mining and Exploration Activity

Heavy mineral sands mining was carried out at Narracoopa by Narracoopa Rutile Limited between 1968 and 1972, and then by Kibuka Mines Pty. Ltd. until the closure of the mine in the mid 1970's. Exploration was also carried out by Kibuka over the area between Narracoopa and Cowper Point to the North, resulting in the delineation of further deposits. Most of these lie within the area that was excised from EL 28/85.

Full details of the regional and detailed geology, mineralisation and past mining and exploration activities are contained within the two reviews by Peter Stitt and Associates Pty. Ltd. which comprise the appendices to this report.

Current Activity

Work carried out within the first year of term of EL 28/85 has been limited to reviews of available information on previous mining and exploration within the area. A number of reports, plans, and other records have been obtained from the parent company of Kibuka Mines, Triako Resources Limited. Unfortunately, a large amount of information held on site at King Island appears to have been lost when the last of Kibuka's facilities there were dismantled in 1980-1982.

The review work has been carried out by mining and geological consultants Peter Stitt and Associates Pty. Ltd. on behalf of Sanidine's co-venturer National Mineral

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Sands. This work is described in the two reports which comprise the appendices to this report.

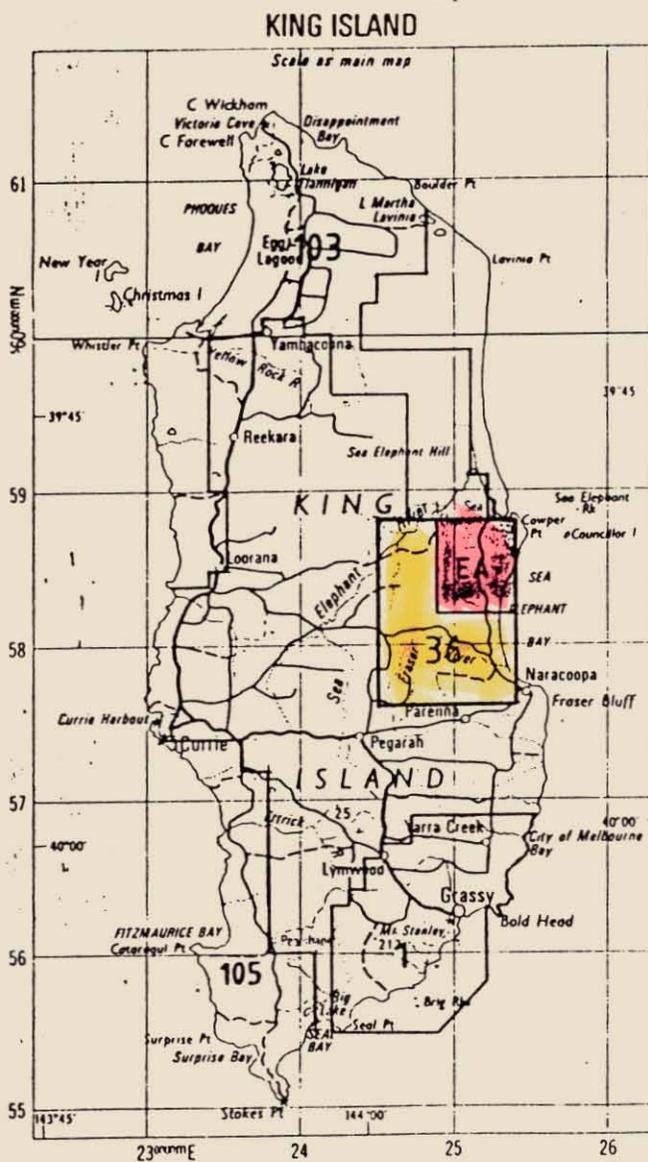
Conclusions

On the basis of the available information reviewed, and taking into consideration only the deposits already delineated within the area, it is apparent that exploitation of the known mineral sands resources within EL 28/85 would be marginally viable at best at today's relatively high prices for heavy mineral sands products. Inclusion of the known heavy mineral sand deposits within the area which was excised from EL 28/85 (and is currently exempt from the Mining Act) would be required to establish sufficient reserves for viable mining operations. It is considered, however, that there is good potential for the delineation of further heavy mineral sands deposits in the area between Narracoopa and Cowper Point and to the west of the known deposits, both within EL 28/85 and within the current Mining Act exempt area, should exploration/mining access to the latter become possible.

On the basis of these conclusions, drilling and feasibility study work is planned for 1988.

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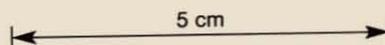
FIGURE 1



Location of EL 28/85 (yellow) in relation to other titles.

Exempt area (pink)

(Scale 1:500,000)



Appendix I

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TECHNICAL NOTE NO. 10/87

Summary of Information Available on Sanidine Holdings
EL 28/85
in the Naracoopa - Sea Elephant Bay Area of King Island

for
National Industrial Minerals

W. Lippiatt
G. Lee

August, 1987

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SUMMARY OF INFORMATION AVAILABLE ON SANIDINE HOLDINGS IN
THE NARACOOPA - SEA ELEPHANT BAY AREA OF KING ISLAND

1. INTRODUCTION

The area covered by Sanidine's E.L. 28/85 has a history of mining back to the early 1900's when the mineral of interest was tin. Initially, this interest was restricted to the high grade deposits of Milford Beach, adjacent and to the north of the Fraser River mouth. However the heavy mineral sands continue at least to the Sea Elephant River, north of Cowper Point.

The deposits at Naracoopa can be attributed to three different sea levels forming: Lanherne Beach (11m), Milford Beach (2m) and the present day Sea Beach (0m). The deposits appear to have been derived from the Precambrian metamorphics and igneous intrusives which are the basement rocks for most of the area drained by the Fraser and Sea Elephant Rivers, with a gabbro, south west of Naracoopa, the probable source of the chromite and ilmenite which are usually sparse in metamorphic rocks.

The resultant heavy minerals carried by the Fraser and Sea Elephant Rivers have been distributed and deposited by ocean tides and currents.

In 1972, remaining reserves were considered by Oliver, Haigh and Pullar to be uneconomic in combination with the rather inefficient mining and processing system then in use.

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However, in the current economic climate with rutile prices over A\$500/tonne, zircon over A\$300/tonne and leucoxene about A\$450/tonne, the resource has become attractive and certainly warrants a detailed assessment of the remaining reserves.

2. GEOLOGY & MINERALOGY

2.1 Regional Geology

Basement rocks of King Island consist of Precambrian Metamorphics and Palaeozoic sediments and volcanics. Granite rocks of two ages have intruded the above sequences:

- . Devonian potassic granites on the west coast, and
- . Carboniferous granodiorites and adamellite confined mainly to the east coast of the island.

2.2 Heavy Mineral Deposits

Previously mined heavy mineral deposits occur in three closely related but distinct strandline deposits. These deposits represent old beaches at higher sea level with the Lanherne deposit being approximately 11m. above present sea level and furthest inland.

Milford Beach is the intermediate deposit approximately 4m. above present sea level. Sea Beach is the present day beach which has shown considerable replenishment of heavy minerals in the years since mining ceased. In addition to the above deposits at Naracoopa, there is a large, somewhat lower grade deposit occurring in high dunes to the south-west of Cowper Point. This deposit, which has previously been evaluated, now lies within an exempt exploration area and so the resource, which is known to occur, is currently unavailable for further exploration and mining.

The Lanherne Beach deposit occurs as a loosely cemented, clay-bound sand with heavy mineral content diminishing to less than 1% 2,000m. north of the Fraser River mouth. It is within this deposit that the major currently delineated

resource occurs.

The deposit was formed by strong wave action, as evidenced by the cross-bedded and well stratified nature. It is notable for its iron-stain and contains compact indurated bands of iron and organic rich material. These bands predominate in the central and richest part of the deposit. Surface coatings of this nature may well be a cause for some of the poor metallurgical recoveries experienced previously during processing of heavy mineral concentrations.

Typical mineralogy for the deposits previously worked is listed below in order of abundance:

Quartz
Ilmenite*
Zircon
Tourmaline
Leucoxene
Hornblende*
Garnet*
Rutile
Staurolite*
Chromite
Kyanite
Monazite

Varying amounts of cassiterite also occur.

The magnetic minerals*, which make up about 60-70% of the heavy mineral, consist mainly of ilmenite and are mostly coarser than the non-magnetic minerals.

The ore minerals - rutile and zircon - vary in their size distribution in the heavy mineral.

The zircon is spread over a broad range of grain sizes whereas rutile has a more restricted distribution.

The majority of rutile is held on 120 mesh (125 micron) and 150 mesh (105 micron) screens with very little greater than 72 mesh (210 micron).

Most of the zircon is less than 100 mesh (150 micron) with significant amounts greater than 72 mesh (210 micron) screen.

(Neale & Salway, 1975)

Other published work by Billingham, 1967, summarised assay data for mineral distribution in the heavy mineral concentrate obtained from samples processed by the C.S.I.R.O. during the 1950's. This is set out below in Tables 1 and 2. The most significant aspect shown in these tables is that rutile and zircon concentrates are in the same order as appears to have been achieved in later products.

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TABLE 1MINERAL DISTRIBUTION IN HEAVY MINERAL CONCENTRATEFRASER RIVER, KING ISLAND (MT ISA MINES LTD).

Separated Fraction	Per Cent of Sample
Table Tailing and Middling	17.2
Magnetic Fraction (46.7% TiO_2)	49.5
Rutile Concentrate (94.9% TiO_2)	12.6
Zircon Concentrate	19.4
Other	1.3

Source: C.S.I.R.O. Ore Dressing Report No. 478, 1954

TABLE 2MINERAL ASSEMBLAGE IN HEAVY MINERAL CONCENTRATE,FRASER RIVER, KING ISLAND (KING ISLAND SCHEELITE 1947) LTD.

Separated Fraction	Per Cent of Sample
Quartz	17
Tourmaline, Garnet and other weakly Magnetics	20
Ilmenite, Leucoxene and magnetic rutile	38
Recoverable Zircon	12
Recoverable Rutile	13

Source: C.S.I.R.O. Ore Dressing Report No. 550 1957

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This suggests beach sands in the vicinity of Fraser River may contain rutile and zircon ratios in the range 1:1.1 to 1:1.5. Chromite has also been reported with Cr₂O₃ levels in ilmenite concentrates exceeding 1%. Unfortunately this report lacks details on percentage of heavy mineral in the ore.

However C.S.I.R.O. investigations indicated the presence of ferriferous rutile which would report to the magnetic fraction in a commercial separation and hence would be lost to the rutile concentrate. Mineragraphic work confirmed the presence of ferriferous rutile which possibly occurs as intimate mixtures of ilmenite and rutile. It was noted also that the zircon present was stained, and made an effective electrostatic separation of rutile and zircon difficult without cleaning. Washing with hydrochloric acid gave a substantially improved separation. Cassiterite was found to be present and the head sample assayed 0.04% Sn while monazite was present to the extent of 0.08% of the head sample.

Confirmation of the need for cleaning to give a satisfactory zircon concentrate was given from work on the King Island Scheelite sample and it was indicated that attrition cleaning in water would result in an adequate rutile/zircon separation.

Billinghurst (1967)

3. HISTORY

The important historical events of exploration and mining in the Naracoopa area are summarised below.

1905 - 1911

- . British Flag Prospecting & Mining Syndicate N.L. (Target tin).
- . Granted 125 acres adjacent and north of the Fraser River mouth.
- . 1584 cu yards excavated for 5 tons 11 cwt of tin and 1 oz. 11 dwt gold.
- . Lacked suitable concentrators and fund.

1939 - 46

- . Mr. Max Gatenby removed a few tonnes of tin.

1967-1970

- . McMahon. Test and check drilling at Naracoopa covered about 1220m. N-S by 610m. E-W in lines at right angles to the beach, spaced 120m. apart with drillholes at 30m. intervals. Lanherne Beach reserves were derived from the results of this.
- . Reconnaissance drilling between Naracoopa and Cowper Point showed no significant heavy mineral deposits.

1968

- . Mining commenced, Sea and Milford Beaches.

Late 1970

- . Mining commenced at Lanherne Beach (Sea and Milford Beaches almost exhausted).

February 1972

- . Naracoopa Rutile in receivership.

May 1972

- . Buka Minerals N.L. took over operations and a subsidiary, Kibuka Mines Pty. Ltd., was formed to manage operations at Naracoopa.

Mid 1973

- . Drilling at Lanherne Beach on a 50 x 25m. grid outlined the deposit for ore reserve calculation.

1975+

- . No information sighted except for an abstract of:

January 1979

- . Kibuka Mines Pty. Ltd. "Final Report on Exploration Licence 9/69" which mentions:
 - . ore reserve drilling and calculations to mid-1975.
 - . experimental geophysical surveys which located a small anomaly which was drilled and assayed at 2.5% HM.
 - . An MIP survey produced profiles which correlated well with drilling results but found no direct correlation with grade.

Drilling at Sea Beach was apparently aimed at proven ore calculation (May 1975).

4. ORE RESERVES

4.1 Introduction

The major known ore resources in the area of interest originally were the three beach deposits, of which Sea and Milford were said to be almost mined out towards the end of 1972 at 2.6 to 4.0% cut-off grade; and Lanherne Beach, where mining commenced in early 1972.

The Lanherne Beach area was first drilled by Mt. Costigan Mines, on a 120m. x 30m. grid at right angles to the beach line and later checked by McMahon (1967). Kibuka then drilled the deposit on a 100m. x 50m. grid which was later filled in to 50m. x 25m. between mid 1973 and April 1975 which allowed the calculated reserves to be classified as proven.

It is impossible to make a meaningful reassessment of the Kibuka reserves at present cut-off grades of 0.15% rutile (1.5% heavy mineral), without sections and plans of detailed drilling.

4.2 Pre Kibuka Pty. Ltd.

Reserves estimates made by McMahon (1970) for Naracoopa Rutile Ltd. & by Gresham et al (1972) for Peko Wallsend Ltd. are based on information available at the time of mining operations by Naracoopa Rutile Ltd. and are largely based on the same set of drilling results.

Summarising their results it appears that after mining to line 12:

Remaining reserves = 1.8 million Tonnes of raw sand
Cut-off grade = 4% heavy mineral

Average grade = 13% heavy mineral
Recoverable Rutile = 25,000 Tonnes
Recoverable Zircon = 11,000 Tonnes

The major part of the remaining reserve is from the Lanherne Beach deposit. Figure 3 shows the original Lanherne Beach deposit which was reasonably high grade from 4.2 to 42% heavy mineral.

Ironstaining of indurated horizons occurs mainly within the Lanherne deposit and the ratio of R/Z to heavy mineral content varies markedly from section to section. Gresham et al (1972) found the unavailability of assay records with a breakdown of heavy mineral content into rutile and zircon frustrated their attempts to recalculate ore reserves in terms of recoverable rutile and zircon. However, for a 2.5% cut-off, instead of 4%, it was inferred that the ore outline could be extended about 60m. to the east and an average of about 3m. in depth.

Since 1.5% cut-off is more appropriate in the current economic climate, even allowing for the isolation and more expensive freight and fuel etc. associated with King Island, this level of reserves may well be further extended.

However data on the area mined to date was not available and remains an uncertainty in any consideration of remaining reserves.

4.3 Kibuka Pty. Ltd.

Kibuka Pty. Ltd. carried out exploratory drilling from March 1972 to April 1975 using a Gemco 210 with auger samples at 1.8m. intervals. Some 33,000m. of drilling was completed.

Kibuka used two methods of ore reserve estimation:

Initially, Lanherne Beach ore body evaluation was by the influence area-depth method, but this was later recalculated using the cross section method, with a tonnage factor of 1.6 tonnes/cu.m. "Proven" reserves have been calculated from results of a closely spaced systematic drilling grid (50m. x 25m. or less). This data mostly supersedes that used by McMahon & Gresham and is shown in Table 3.

In comparing Kibuka results with McMahon's and Gresham's, the following points are relevant:

- . Drilling method, McMahon used hand boring while Kibuka used Gemco auger.
- . Cut-off grade, 4% for McMahon, 2.5% for Kibuka.
- . McMahon's reserves largely based on Lanherne Beach deposit, with only approx. 100,000t. due to the other deposits.

The significant increase of reserves following the Kibuka drilling would appear to be largely due to the lower cut-off grade of 2.5% heavy mineral.

TABLE 3
SUMMARY OF ORE RESERVES

PROVEN RESERVES

Deposit	Tonnes of Sand	Tonnes of H.M.	Average % H.M.	Tonnes Rutile	% R in Sand	Tonnes Zircon	% Z in Sand
Lanherne Beach	3,725,400	402,717	10.81	25,421	0.68	39,725	1.07
Sea Beach	392,029	50,894	12.98	3,097	0.79	6,145	1.57
Total:	4,117,429	453,611	11.02	28,518	0.69	45,870	1.11

4.4 Area North of Naracoopa

The most significant feature in the area north of Naracoopa is the large deposit known as the High Dune Deposit to the south west of Cowper Point. This area contains a probable reserve of 9 million tonnes of sand containing an estimated 29,000t of rutile and 26,000t of zircon. Unfortunately at the present time the area is set aside as being "exempt from exploration" since it is the site of a proposed tourist development.

Also within the area exempt from exploration is the Back Beach Deposit delineated by Kibuka. This area approximately 7 km. north of Naracoopa contains a proven 1.2 million tonnes of sand with 6500t rutile and 14,000t zircon.

The whole of the strandline development within E.L. 28/85 should be re-examined in view of the lower cut-off grades which could be applied today.

5. PRODUCTION PROBLEMS

Naracoopa Rutile experienced problems with mining and treatment methods to March, 1972, as detailed by Oliver, Haigh and Pullar (1972). In brief it appears that the unit price per tonne mined was satisfactory but the mining process was limited by operational problems.

Most of these issues appear to have been quickly resolved by Kibuka Mines Pty. Ltd. when it acquired Naracoopa's assets with the exception of an effective attritioning method to remove the iron coating typical of the Lanherne Beach deposit.

Production and grade problems resulted in poor performance over the years 1972-1973. This coincided with the commencement of mining at Lanherne Beach. Factors contributing to these problems include the following:

- . Ratio of R/Z to heavy mineral varies markedly from section to section. In one high grade area R/Z within the HM is 3.3. In the mined area it was 0.6, and in the residue 1.5 which is an abnormally high deviation. This R/Z ratio has an important bearing on the output of the separation plant and assay data from drilling should be available.
- . The presence of ironstaining and indurated horizons within the deposit. Even with the lightly stained mineral from Sea and Milford Beaches, separation difficulties were experienced. In 1975 Neale and Salway do not mention this as a problem.

In 1972 (pre Kibuka) Oliver, Haigh and Pullar considered that the depleted reserves of stained ore of 30,000 tonnes rutile adjacent and accessible to the separation plant were at the time insufficient to justify the capital required to correct plant deficiencies which had failed to successfully treat the clean ore.

- . It is estimated from the original drilling that the area mined contained 28,800 tons of rutile and 29,111 tons of zircon of which only 67.5% (19,460 tons) of rutile and 54.5% (15,945 tons) of zircon was recovered. Thus due to the high grade of the original material worked and inefficiencies in the treatment plant, those tailings would now be retreatable.

6. CONCLUSIONS

Proven reserves delineated by Gemco auger drilling carried out by Kibuka since mining ceased, appear to be about 29,000t of rutile and 46,000t of zircon. These figures are in the same order as those of McMahon and Oliver et al who made estimates based on earlier drilling. Generally operational performance in the three years 1969-1972 has confirmed the accuracy of the pre-mining drilling as to tonnage and grade.

Reserves figures will be influenced by:

- Leucoxene, tin and monazite are not included.
- A saleable ilmenite product may be achievable.
- Previously mined areas may be reworked to recover mineral previously discarded due to the high cut-off grades and plant inefficiency.

Limited exploration outside the mine area does not preclude the existence of other significant heavy mineral concentrations but the potential for further high grade deposits appears limited.

7. RECOMMENDATIONS

It is strongly recommended that all available drilling results and assay data, at least for the still unmined areas, be compiled on a reasonable scale plan (1:1000) to best determine the current status of the deposit. Much of the non Kibuka reserve estimation appears to be based on records no longer available and drill logs without plans. Kibuka's plans are not easily available at the Tasmanian Mines Department and are yet to be obtained from Sanidine.

Further it is recommended that some check redrilling be undertaken as a minimum to reassessment and if the Kibuka drilling results are not available the whole deposit should be redrilled.

8. REFERENCES

Gresham, J.J. & Danielson, M.J. - "Report on the Ore Resource & Exploration Areas of Naracoopa Rutile Limited". Geopeko Ltd. Feb, 1972.

Kenneth McMahon & Partners - "Naracoopa Rutile Limited. Report on EL 13/66, EL 14/66 and EL 9/69, King Island, Tasmania". 27 Feb. 1970 (Tas. Mines Report No. 70-613)

Neale, T. & Salway, I. - "An Evaluation of Kibuka Mines Pty. Ltd. Properties - King Island, Tasmania. EL 9/69. Apr. 1975.

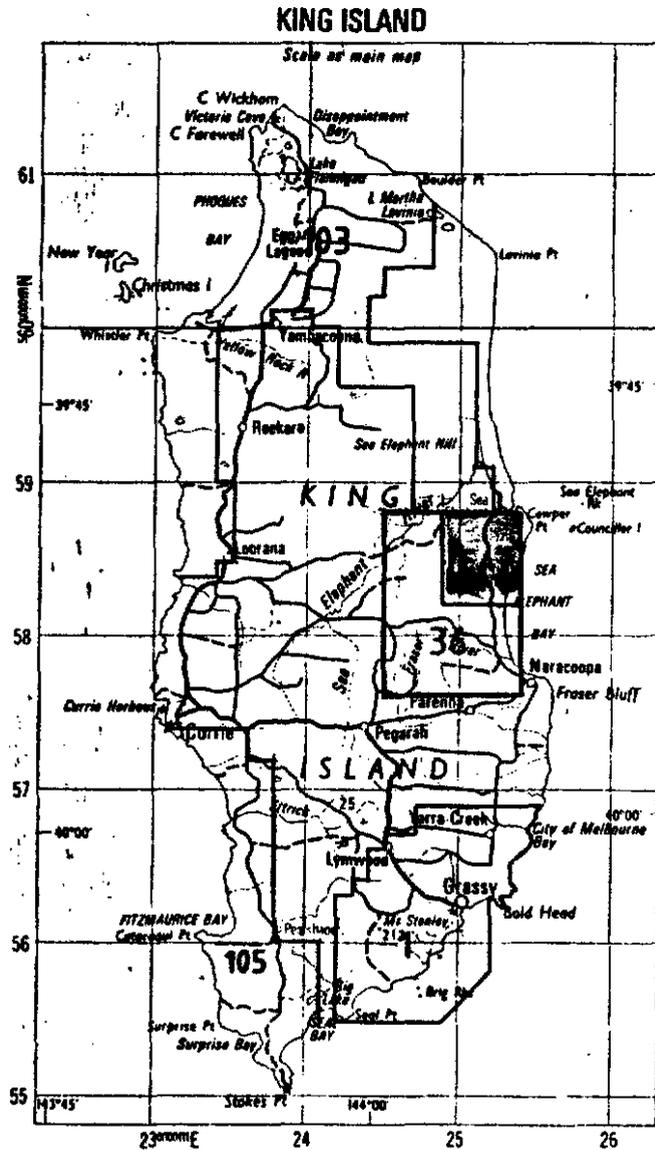
Oliver, P.K., Haigh, D.C. & Pullar, S.S. - "An Appraisal of Naracoopa Rutile Limited" (Receiver Appointed) March 1972.

Abstracts only sighted

Billinghurst, W.M. (1967). Investigation of Beach Sands from East Coast King Island. April 11, 1967. (Tas. Mines Report No. 61-462).

Davis, S. (1979) - Final Report Exploration Licence 9/69, King Island, Tasmania.

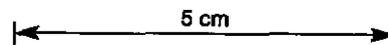
FIGURE 1



Location of EL 28/85 (yellow) in relation to other titles.

Exempt area (pink)

(Scale 1:500,000)



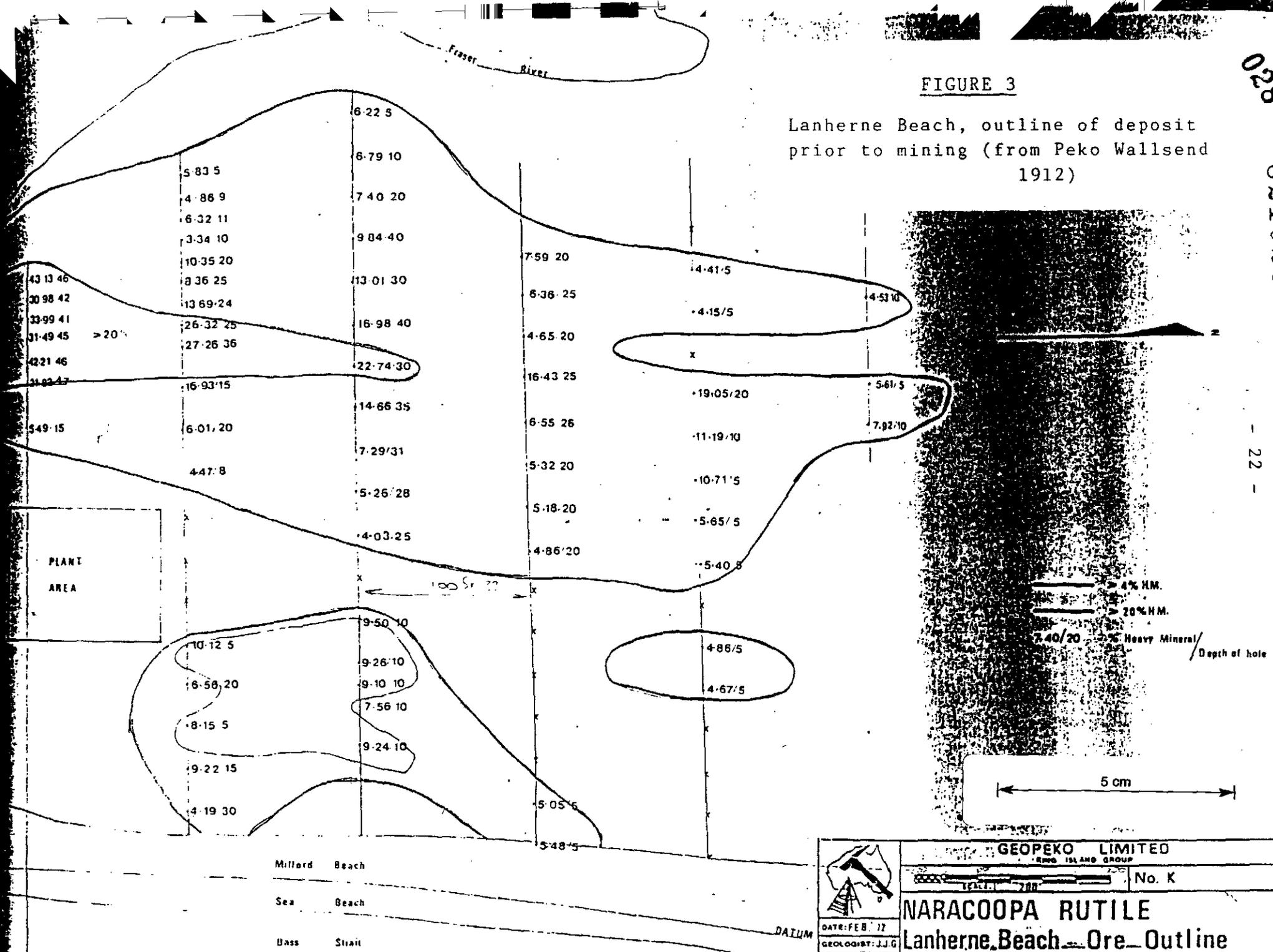
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FIGURE 3

Lanherne Beach, outline of deposit prior to mining (from Peko Wallsend 1912)



GEOPEKO LIMITED
 No. K
NARACOOPA RUTILE
 Lanherne Beach Ore Outline
 DATE: FEB '77
 GEOLOGIST: J.J.G.

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Appendix II

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TECHNICAL NOTE NO. 14/87

Review of King Island Heavy Mineral Sand Resources from
Kibuka data made available through Sanidine NL.

G. Lee
September 1987

- 1 -

1. INTRODUCTION

Mr Tim Owen has made available to the writer, fourteen reports and five map rolls of information stored in archives, which were initially obtained by Kibuka Mines Pty. Ltd. at the time they held tenements for mineral sand mining at Naracoopa on King Island. The reports date back to the period 1969 through to 1975 and include plans and sections, showing drill holes and grades, descriptions of the operations and results of exploration elsewhere on the island, for both mineral sands and other commodities.

In short, much of the information available is of limited value and the useful information is well summarised in two reports by Salway (1975) and Brown & Salway (1972).

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2. PAST OPERATION

It is not intended to give an exhaustive description of the previous operations but rather to briefly outline the activities undertaken during the period of extraction from 1969-72. Figure 1, taken from Salway 1975, shows the location of past operations.

Mining commenced on the Sea and Milford Beaches where very rich grades in excess of 50% heavy mineral were encountered, all clean, easily-mined sand. This material presented no processing problems and gave good clean products of rutile and zircon. Towards the end of extraction in these areas, mining moved to Lanherne Beach which is inland and at a higher level than Milford Beach. For the period up to closure of the operation, mining was undertaken on both Milford and Lanherne Beaches.

Lanherne Beach presented a number of difficulties. While the grades were very rich, much of the sand was indurated and most of the heavy mineral concentrates were down-graded, due to surface coatings which were not adequately removed by the processing plant then in existence. Test work was carried out, using attritioning to clean the grains which, while shown to be effective, was not implemented in plant practice. Therefore, concentrates produced from the Lanherne Beach raw feed were inferior quality and product rutile and zircon suffered from contamination, since effective separation could not be achieved. It is apparent also that the plant suffered a water supply problem, which was exacerbated when mining at Lanherne Beach with its higher clay content.

Descriptions of the mining operation also indicate significant problems. Mining was undertaken using drag lines, front-end loaders and trucks, with intermediate stockpiles as and when necessary.

In effect, this was an expensive means of feeding raw sand into the plant. The equipment used was not capable of handling the conditions and is described by Salway (1972) - "The haulage distance from mining point to stockpile was too great to keep the concentrator in continuous operation. The distance is approximately 1500'.". Material could not be moved over a distance of 450m. with the equipment available, so as to feed the plant at its design rate.

When mining commenced on the Lanherne Beach, the perched water table presented difficulty for a dry mining operation based on trucking. Therefore, the floor of the mining pit was established at or above the water table to achieve accessibility and not to recover the bottom of the mineralised zone. As a result, heavy mineral bearing sand below water table was left unmined.

It is also apparent, upon examining some of the plans and cross-sections, that the plant and amenities building associated with the operation, were actually built on part of the orebody and so reserves exist in this area which have not previously been extracted.

3. RESOURCES

3.1 Naracoopa Area

From the information available, it appears that the most reliable estimate of remaining reserves is contained in the work of Salway (1975). While it is possible from the plans and sections made available to recalculate reserves from the raw data, there is insufficient information as to the full extent to which mining was taken and so it is not possible to make a full and proper allowance for the depletion of reserves due to mining.

From the information, it appears that Mr. Salway was the Manager on King Island during the period 1972-75 and so it is most likely that any reserves estimate he has made would take full account fo depletion due to mining.

Table 3 of his report (1975) is a summary of the ore reserve. He has used a cut-off of 2.5% heavy mineral and has stated reserves to be in the proven category in the Naracoopa area as 28,000 tonnes of rutile and 46,000 tonnes of zircon, recovered from 4.1 million tonnes raw sand. These reserves are contained on both the Lanherne and Sea Beaches. A photocopy of the reserves summary is included as Table 1 of this report.

The reserves estimates of Salway (1975) are based on Gemco drilling undertaken by Kibuka. It is apparent that this drilling suffers from the normal problems associated with Gemco drilling and the reliability of

TABLE 37
SUMMARY OF ORE RESERVES

PROVEN RESERVES

Deposit	Tonnes of Sand	Tonnes of H. M.	Average % H. M.	Tonnes Rutile	% R in Sand	Tonnes Zircon	% Z in Sand
Lanherne Beach	3,725,400	402,717	10.81	25,421	0.68	39,725	1.07
Sea Beach	392,029	50,894	12.98	3,097	0.79	6,145	1.57
Back Beach	1,195,440	89,460	7.48	6,550	0.55	14,051	1.18
Total:	5,312,869	543,071	10.22	35,068	0.66	59,921	1.13

POSSIBLE RESERVES

Deposit	Tonnes of Sand	Tonnes of H. M.	Average % H. M.	Tonnes Rutile	% R in Sand	Tonnes Zircon	% Z in Sand
High Dunes	8,925,000	--	--	29,444	0.33	25,925	0.29
Total:	14,237,869			64,512	0.45	85,846	0.60

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the reserves below water table must be questioned. Notwithstanding, the estimates are likely to be attainable and, in fact, may be conservative when considered in the light of Sections 4.2 to 4.4 of this report.

3.2 Cowper Point Area

In the Cowper Point area, two areas of mineralisation have been outlined. Much of the data on which reserves estimates are based is due to original hand-boring carried out by Ken McMahon & Partners in 1969 with additional drilling, using Gemco auger, carried out more recently by Kibuka.

The two deposits outlined in the Cowper Point area are those within the High Dunes, which are the most easterly, and have been shown to contain in the order of 29,000 tonnes of rutile and 26,000 tonnes of zircon. Inland to the south-west of the High Dunes, is a strandline deposit known as the Back Beach, with 6,500 tonnes of rutile and 14,000 tonnes of zircon.

All of the deposits in the Cowper Point area are currently included in an area exempt from mineral exploration (see Figure 2) and until such time as this exemption is lifted, cannot be considered an available resource. They are, however, included in Table 1 to give an overall indication of the total resource currently known to exist in the Naracoopa/Cowper Point area of King Island.

4. COMMENTS ON RESOURCES

In considering the reserves estimates made by Salway (1975), a number of comments are worth making.

4.1 Drilling

In the Naracoopa area most of the drilling upon which reserves are based was carried out by Gemco auger. In the writer's experience, Gemco auger works reasonably well above water table provided care is taken during the drilling operation to avoid cross-contamination between samples from the hole, and to obtain samples relating specifically to a given depth interval. This can be achieved using the dead stick augering technique. However, once water table is reached, auger drilling tends to upgrade the heavy mineral content. This is possibly due to the auger acting as a spiral concentrator down the hole and so any samples obtained from beneath water table must be treated as highly suspect. Thus, a degree of uncertainty exists on the Naracoopa reserves, attributable to samples obtained by a Gemco auger beneath the water table.

4.2 Plant Site

The sections and plans of the mineralised area at Naracoopa indicate that good mineral grades existed in drill holes located nearby to plant, buildings, roads, etc. These areas were left unmined for obvious reasons.

4.3 Cut-off Grades

Salway (1975) applied a cut-off grade of 2.5% heavy mineral, and with rutile in the order of 6-8% of the total heavy mineral suite, this is equivalent to 0.15% - 0.2% rutile cut-off. At today's prices, the cut-off grade would probably be dropped to 1.5% total heavy mineral, which is equivalent to a rutile content of 0.10 - 0.12%. Obviously, average rutile values would be higher, as well the total resource available for mining would also increase, thereby extending the life of any mining operation.

With a cut-off grade of 1.5% in mind, some of the cross-sections available were examined. On the basis of the data presented, it is apparent that by reducing cut-off grade, total heavy mineral resource would increase by between 5 and 10%. Even this increase may not be fully realistic in that the area examined was largely the high-grade area from the Fraser River mouth to 1400m. north. Insufficient data exists to evaluate the area north of 1400m. at a reduced cut-off level and it is possible that a significant increase in available resource may exist in these lower grade northern areas.

It is very difficult to increase the resource by applying a reduced cut-off grade in the very high grade areas of a deposit, and it is over these high grade areas which most of the information available exists.

4.4 Additional Resources

During examination of data on the Lanherne and Sea Beach deposits, it became apparent that additional resources could exist as a result of:

- . Drilling holes to a greater depth - some holes were terminated while still in good heavy mineral grades without reaching the clay basement.
- . Extending some traverse lines - some traverse lines terminated for unknown reasons, short of evaluating the full deposit width, for example traverse line 1000N finished in good heavy mineral grades which may be of mineable grade near surface and low grade at depth.

4.5 Cowper Point Resources

In the Cowper Point area, currently exempt from exploration, drilling has been undertaken using both Gemco auger and hand boring with cased sludging, where necessary. At a number of points the holes drilled by the two techniques are sufficiently close to make comparisons. The results invariably do not compare, leading to the conclusion that one, or both of the techniques are unreliable from the viewpoint of determining reserves accurately.

Again, in the Cowper Point area, comments made above (4.1 - 4.3) relating to the Naracoopa deposits apply. Significant increases in available resource may well be found by reducing cut-off grade and by drilling to the vertical and horizontal extremities of mineralisation.

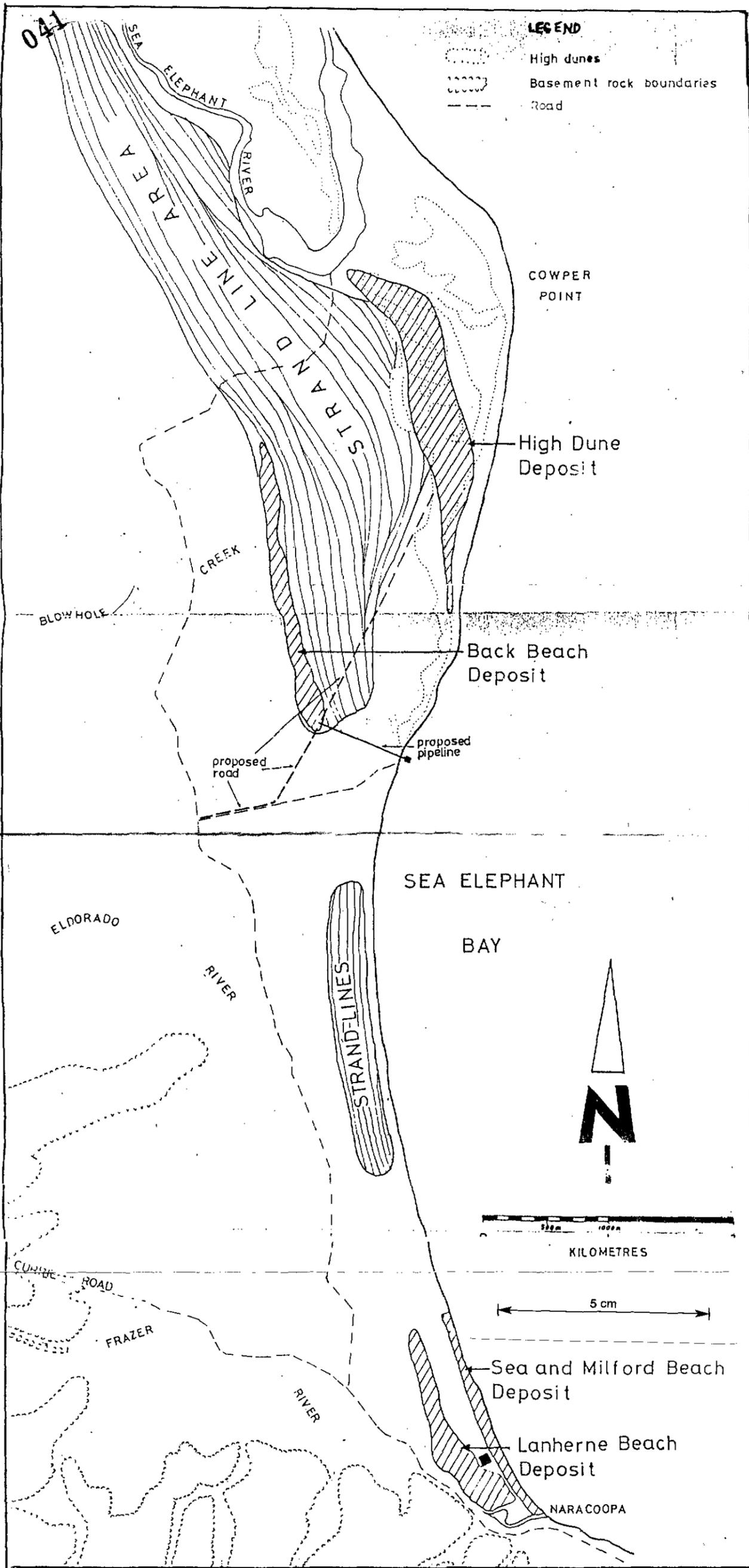
4.6 Naracoopa-Cowper Point Resources

It appears from examination of the maps and sections, that areas of potential mineralisation between Naracoopa and Cowper Point deposits and to the west of these deposits, have either not been previously examined or have not been examined in sufficient detail to outline any mineralisation which may be present.

In this respect, attention should be directed at seeking narrow stringers of mineralisation which may have considerable longitudinal extent as well as the larger bodies which may have both longitudinal and lateral extent.

4.7 Resource Increase

It is possible that a more detailed examination of the resources would lead to a fairly significant increase in the reserves available for mining. At this stage, it is impossible to say how much the increase would be.



LEGEND
 High dunes
 Basement rock boundaries
 Road

COWPER POINT

High Dune Deposit

Back Beach Deposit

proposed road
 proposed pipeline

SEA ELEPHANT BAY



0 500m 1000m
 KILOMETRES

5 cm

Sea and Milford Beach Deposit

Lanherne Beach Deposit

NARACOOPA

KIBUKA MINES PTY. LTD.

GENERAL PLAN OF SEA ELEPHANT BAY AREA

DATE - APRIL 1975

FIGURE 1

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