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EL 21/89 - MOUNT BOYES, FLINDERS ISLAND

YEAR 1 & FINAL REPORT

90-3167

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28 AUG 1990	
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K.C. MORRISON

August 1990

90-3167.

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**TENEMENT INFORMATION**

Exploration Licence 21/89 covers a 56 km<sup>2</sup> block of NE Flinders Island, to the east of Mt Tanner (Figure 1, Plan 1). The EL was granted on 23 June 1989 and is currently due for Year 2 renewal/relinquishment.

Two current Mineral Leases are wholly contained within the EL (Plan 1).

The tenement is owned 100% by Totteny Pty. Ltd., PO Box 326 South Melbourne, Victoria 3205.

**EXPLORATION PHILOSOPHY & OBJECTIVES**

The EL was acquired at time when tin prices were increasing and the company reasoned that a deposit of placer tin plus gem quality topaz may exist north of the old Mines Creek diggings. The primary objective was to test this target at depths where overburden thickness is no greater than the reach of an excavator. The possibility of a market for topaz sand developing in the near future was also considered as topaz is known to be the main gangue heavy mineral at Mines Creek.

A secondary aim was to explore for granite-hosted tin +/- topaz mineralisation if the tin price strengthened sufficiently.

**SUMMARY OF WORK COMPLETED IN YEAR 1**

- The Mines Creek/Killiecrankie Creek tin-topaz target was explored with 14 excavator pits.
- The target was not effectively tested due to a combination of shallow hard pans and excessive overburden depths preventing the machine sampling the basal mineralised gravels in all but three cases.
- Tin bearing basal gravels encountered in the southern part of the prospect range in thickness from 20-50cm and carry grades of recoverable tin ranging from 56 to 672 grams SnO<sub>2</sub> (70% Sn) per bank cubic metre. Topaz sands and granules are abundant but no gem stones were recovered during the sampling.

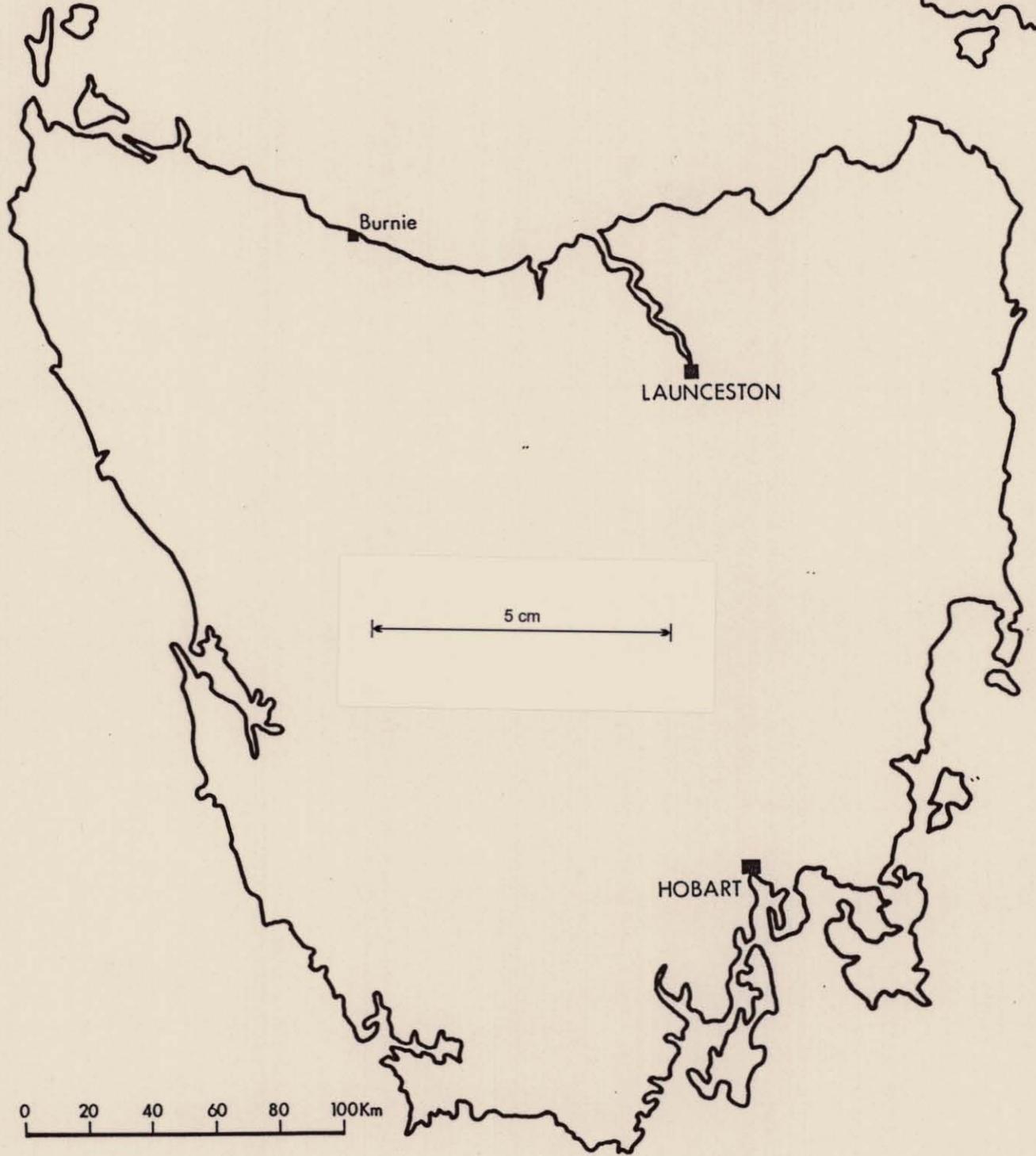
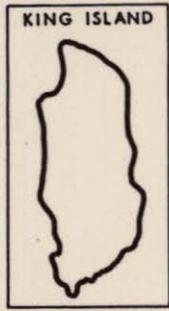


Figure 1. Location Map, EL 21/89 - Mount Boyes, Flinders Island.

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- A combination of tin grade and overburden thickness render the prospect sub-economic. There is insufficient hard rock prospectivity to justify exploration expenditure while the tin price outlook is so low.
- The EL is recommended for relinquishment.

#### SPECIFIC SURVEYS

The Mines Creek/Killiecrankie Creek alluvial tin-topaz target (Plate 1) was tested with a series of excavator pits (Plate 2). The aim was to determine whether sufficient reserves of recoverable cassiterite sand and gem quality topaz exist at a depth where the stripping ratio would allow a truck to gravity separation plant operation to be viable.

Sediments exposed in the old Mines Creek workings are typical of the Middle to Late Tertiary deep leads of NE Tasmania and therefore the two factors to be determined at Mines Creek were:

- the grade of the basal gravels
- the thickness of essentially barren overburden gravels, sands, clays and lignites

By analogy with known grades and mining costs of tin placers in NE Tasmania, it is likely that a viable operation would require a total sediment thickness overlying granite basement which could be dug by an excavator without benching in overburden.

A tracked excavator with a 6 metre reach was used and 14 pits were dug. Prior to the excavator arriving on site, the machine was thoroughly washed and sprayed with ABF-42 fungicide solution, supplied by the Division of Mines & Mineral Resources, Department of Resources & Energy.

Pit locations are shown on Plan 1 and their AMG co-ords are recorded in Appendix 1. Geological logs are presented in Appendix 2. Several of the pits are located inside ML 98M/77. Permission was granted by the lease holder to explore this ground.

The basal gravels were not effectively tested over the prospect as only 4 pits (MBP-3; MBP-4; MBP-13, MBP-14) reached granite basement. Of the others, 4 pits (MBP-5; MBP-6; MBP-11; MBP-12) were abandoned due to hard pans of diagenetic cement developed within the sediments being too hard for ripping by the teeth on the excavator bucket.



Plate 1. The Mines Creek/Killiecrankie Creek area, EL 21/89 - Mount Boyes, Flinders Island.



Plate 2. Excavation of pits, EL 21/89 - Mount Boyes, Flinders Island.

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Two of the pits which reached granite (MBP-3; MBP-4) demonstrated that no basal gravels and no mineralisation overly the northerly to northeasterly margin on the prospect area. This suggests that either only the deeper ground towards Killiecrankie Creek is prospective on the northern edge of the target, or, that the drainage divide separating Killiecrankie Creek from Mines Creek defines the northern boundary to the mineralised sediment.

Three pits (MBP-9; MBP-13; MBP-14) encountered gravels carrying significant tin mineralisation. Representative samples of this material were panned to produce sand concentrates which were assayed for Sn, Ta, Y by XRF (Appendix 3).

Only tin occurs in concentrations of economic interest. Tin grades for the mineralised gravels are presented in Table 1.

Table 1. Pan Concentrate Grades

Sample No.	Interval (mtrs)	Sample (kg)	Sample volume (ltrs)	Bulk Density (tonnes)
MBP-9 (A)	3.5-4.0	37.5	18	2.1
(B)	3.5-4.0	38.0	18	2.1
(C)	3.5-4.0	37.5	18	2.1
MBP-13	4.3-4.6	38.0	19	2.0
MBP-14	0.8-1.0	17.0	9	1.9

MOUNT BOYES ASSAY DATA

Sample No.	Sn gms	SnO <sub>2</sub> (70% Sn) gms	Sample Weight kgs	Grade (weight) g/t	Grade (volume) g/BCM* (approx)
MBP9 (A)	5.90	8.4	37.5	225	472
MBP9 (B)	6.70	9.6	38.0	252	529
MBP9 (C)	8.40	12.0	37.5	320	672
MBP13	0.75	1.1	38.0	28	56
MBP14	1.60	2.3	17.0	134	255

\* BCM = bank cubic metre

Grades range from approximately 56 to 672 grams  $\text{SnO}_2$  (70% Sn) per loose cubic metre. These grades are based on tin recoverable by panning and therefore approximately equate to expected recoverable grades from a full scale gravity separation plant.

Suprisingly, the sediments showed essentially no volume expansion when excavated, so the sample bulk densities shown in Table 1 can be taken as reasonable estimates of the in-situ bulk density, i.e. approximately 2 tonnes per cubic metre. This may reduce during dry periods.

Alluvial mining operations of the type and scale envisaged for the Killiecrankie area typically require a return of +\$6 per bank cubic metre to make reasonable profit. Assuming an average price of \$Aus500 per tonne for 70% Sn concentrate, average grade of  $1200\text{g/m}^3$  is required to return \$6. This is twice the best grade achieved during the sampling, without considering the penalty of barren overburdens which is +6 metres thick over most of the prospect.

Abundant topaz sand and common topaz granules were observed in the pan concentrates from MRP-9, MRP-13 and MRP-14. Most of the granule sized grains were fragments of clear, colourless, subhedral topaz crystals. Several fragments had a very pale blue tint. Although the clarity and general quality of the most of the topaz appears to be high (as far as field inspection can determine) no stones large enough to be considered commercially attractive semi precious gems were observed in the 168kg gravel panned. There appeared to be approximately 2-3 times as much topaz sand (by volume) as cassiterite in the pan concentrates. At present there is no market for topaz sand but attempts to develop a synthetic aluminium silicate refractory material made from topaz are underway.

In addition to the gravels described above, check samples were panned from the sands and granules recovered from all pits. They all showed only trace amounts of very fine, unidentified heavy minerals of no economic interest.

Large volumes of quartz sand and granules plus kaolinite clay occur in the prospect area, but it is unlikely that significant demand could be generated on Flinders Island or that the economics of export would be sufficient to warrant serious exploration of these materials.

All pits were backfilled immediately after sampling.

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A single composite rock chip sample (MBR-1) of soft, green coloured, white mica rich granite was taken from a council quarry, SE of the alluvials prospect (Plan 2) and checked for tin content (appendix 3). The rock assayed only 0.03% Sn.

#### CONCLUSIONS & RECOMMENDATIONS

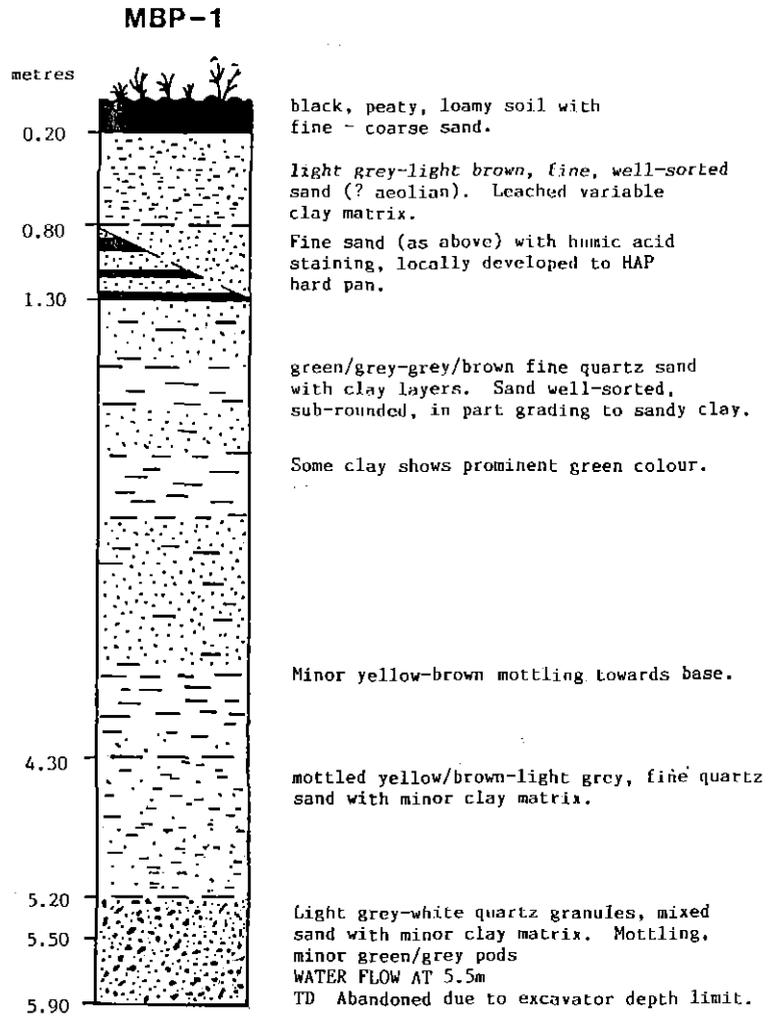
1. No further work is justified on the Mines Creek/Killiecrankie Creek placer tin-topaz target unless there is a dramatic increase in tin price and a market for industrial topaz develops.
2. The area has some prospectivity for granite-hosted vein and greissen sheet styles of tin mineralisation but, given the poor economic performance typical of these deposit types when tin prices are low, no further work is warranted at present.
3. It is recommended that the EL be relinquished,

## APPENDIX 1

EL 21/89 - MOUNT BOYES, FLINDERS ISLAND  
EXCAVATOR PIT LOCATIONS

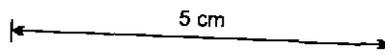
Pit	AMG Co-Ordinates	
MBP1	573 460E	5,587,860N
MBP2	574,080E	5,588,000N
MBP3	574,930E	5,587,950N
MBP4	575,740E	5,587,880N
MBP5	575,390E	5,586,710N
MBP6	575,320E	5,586,660N
MBP7	575,000E	5,586,450N
MBP8	574,910E	5,586,420N
MBP9	574,980E	5,585,570N
MBP10	574,980E	5,585,730N
MBP11	575,000E	5,586,000N
MBP12	575,250E	5,586,110N
MBP13	575,140E	5,585,230N
MBP14	575,130E	5,585,050N
MBR1	575,710E	5,584,320N

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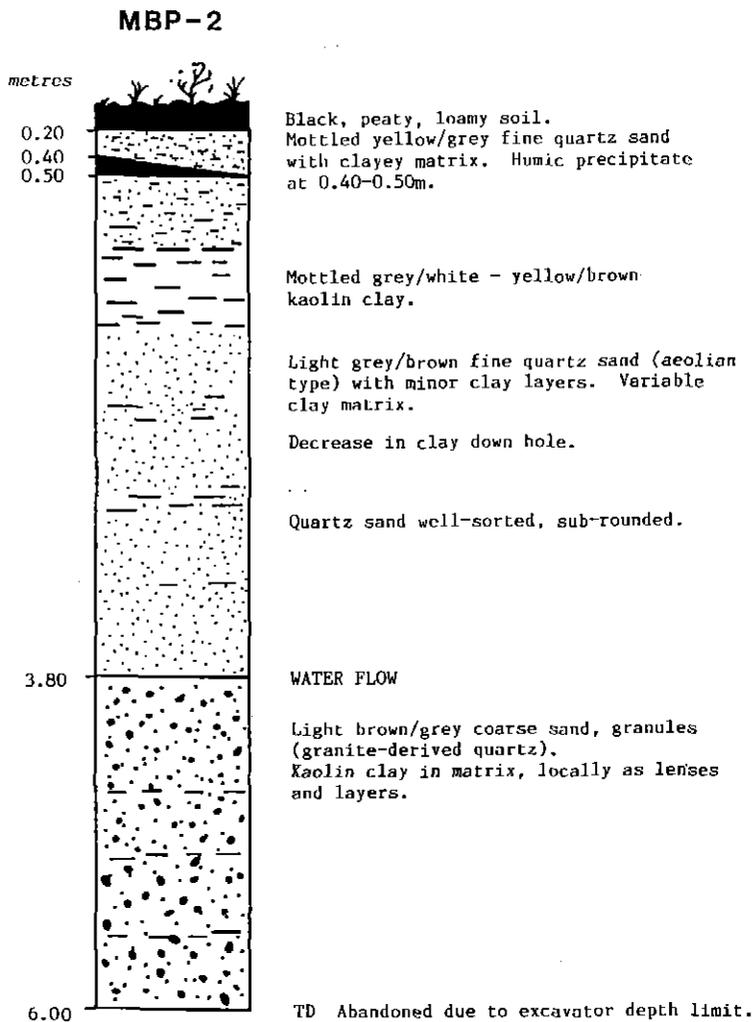


HAP - humic acid precipitate

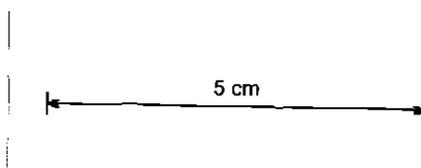
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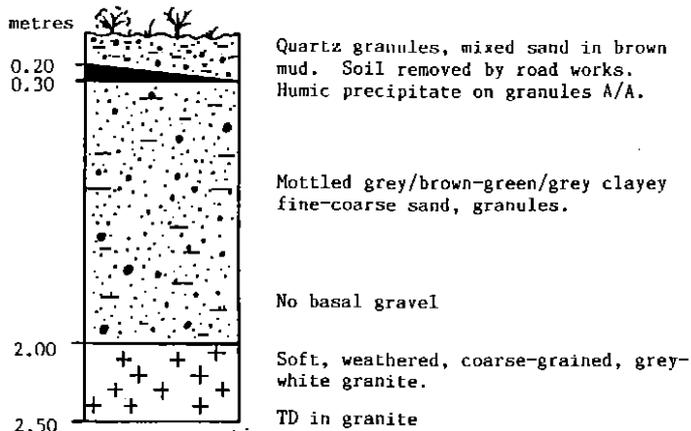


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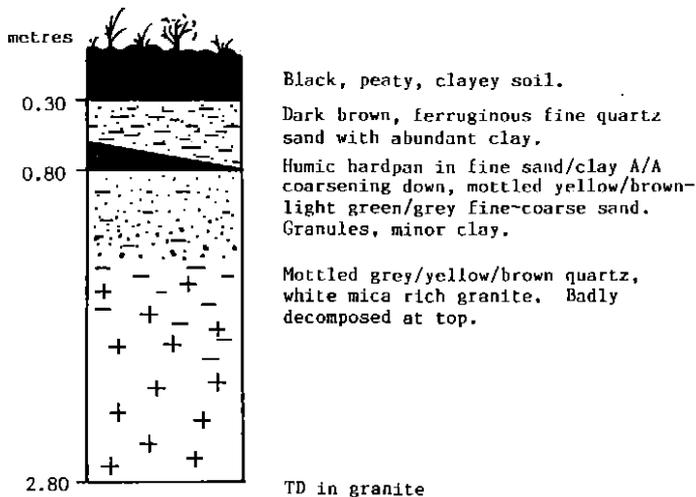
013

**MBP-3**



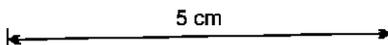
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**MBP-4**



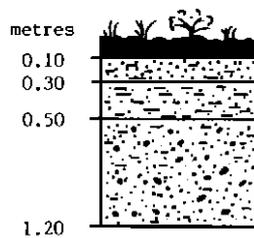
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Vertical Scale 1:500



014

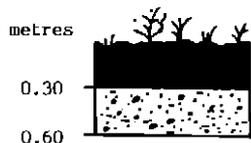
**MBP-5**



Black, loamy, peaty soil.  
 Light grey, well sorted sand with clayey matrix  
 Light brown clay with mixed fine-coarse sand.  
 Mottled yellow/brown-grey/white granules,  
 fine-coarse quartz sand with minor clayey  
 matrix. Increased hard silica/clay cement  
 down hole.  
 TD in silica/clay hardpan.

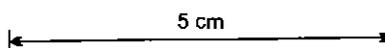
Vertical Scale 1:500

**MBP-6**



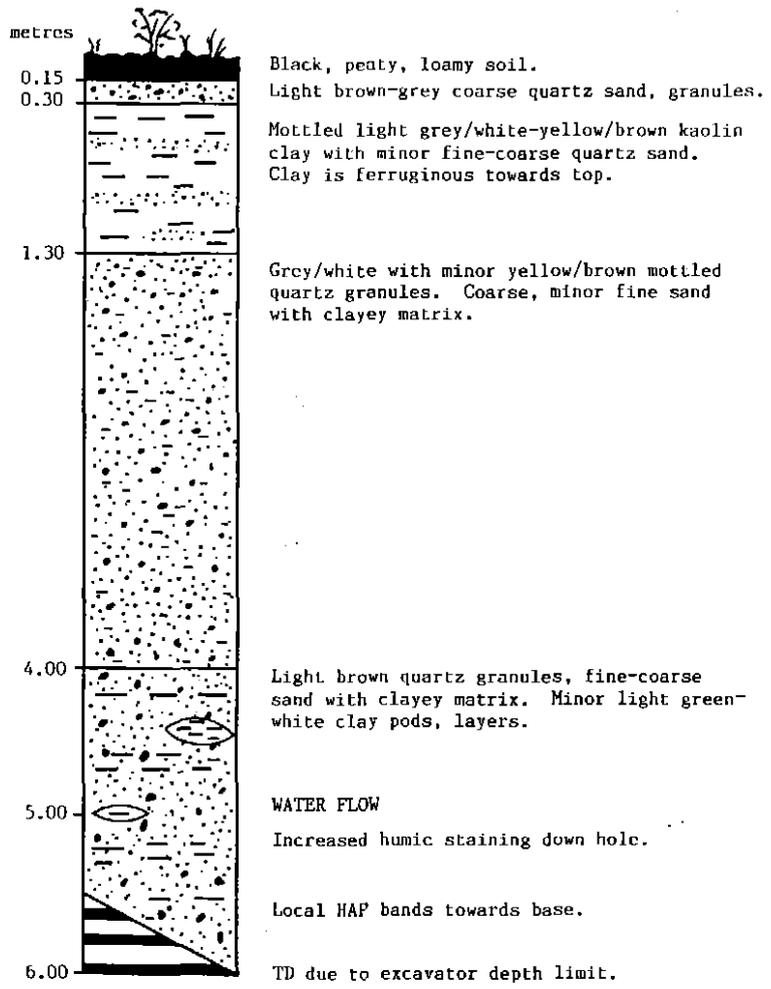
Black, loamy, peaty soil.  
 Light grey quartz granules, mixed sand  
 (granitic) with hard silica/clay cement.  
 TD in silica/clay hardpan.

Vertical Scale 1:500



013

MBP-7

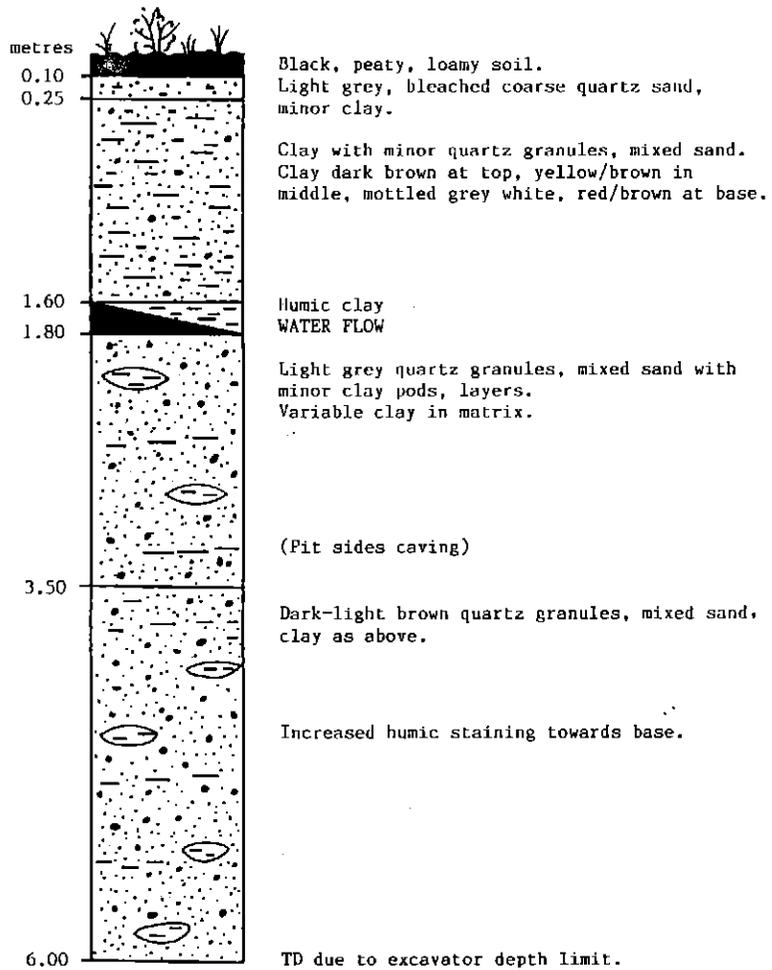


HAP - humic acid precipitate

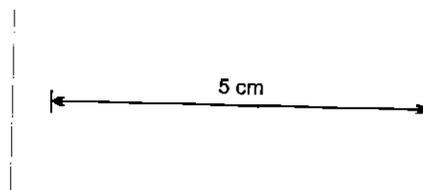
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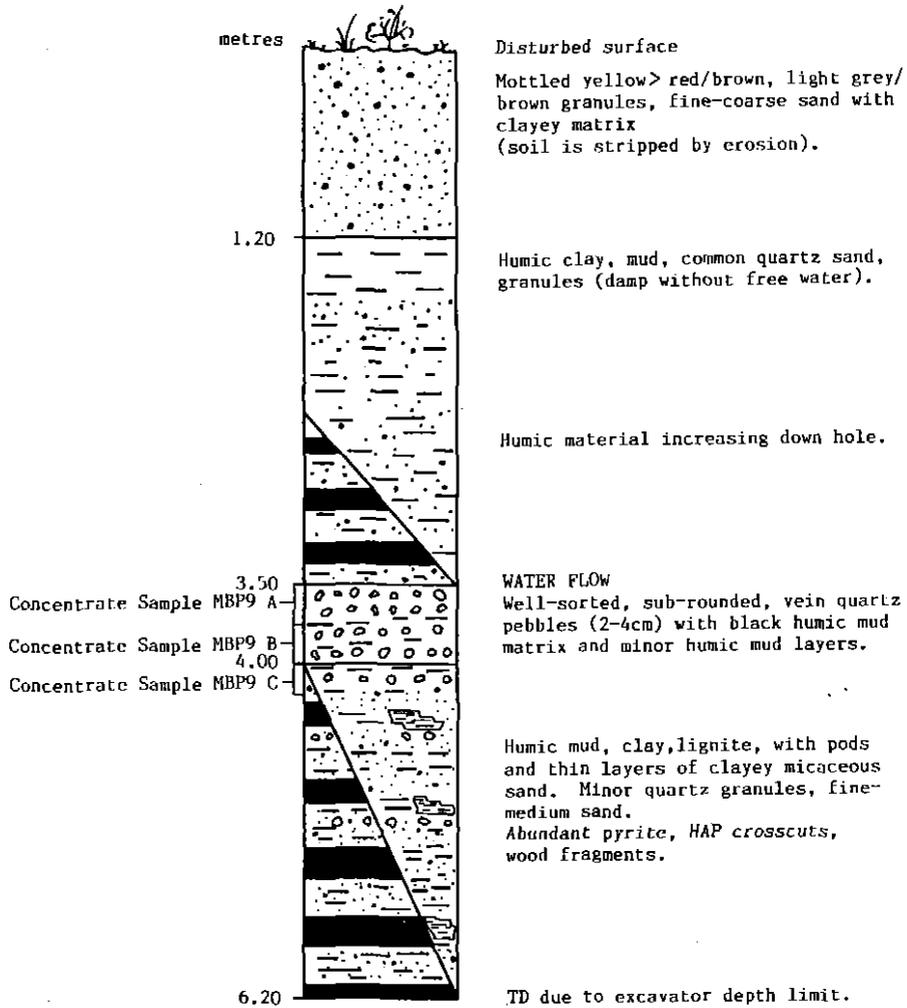
MBP-8



Vertical Scale 1:500

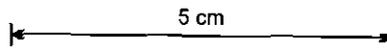


MBP-9

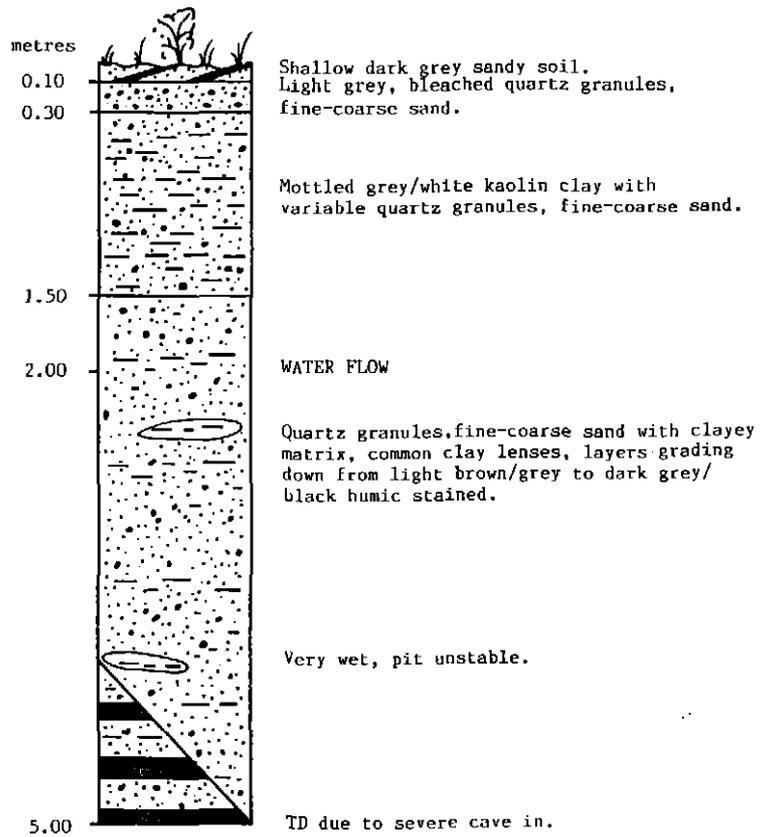


HAP - humic acid precipitate

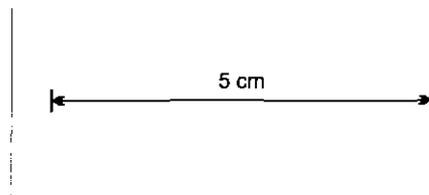
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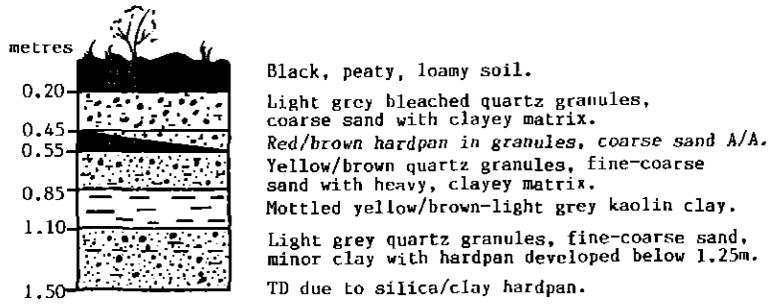
MBP-10



Vertical Scale 1:500

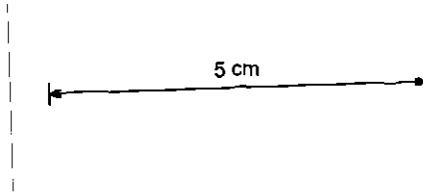


MBP-11

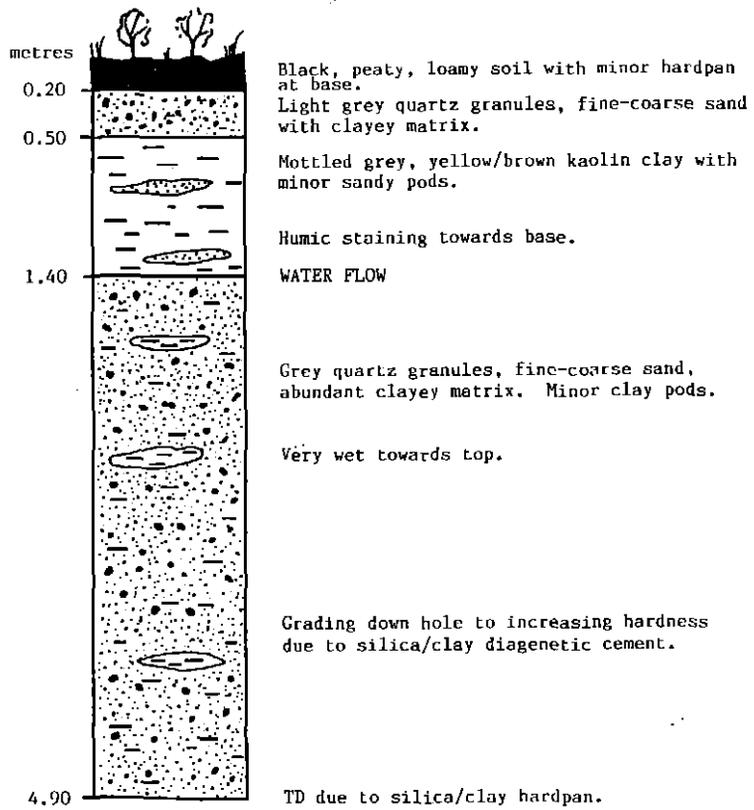


A/A - As above

Vertical Scale 1:500



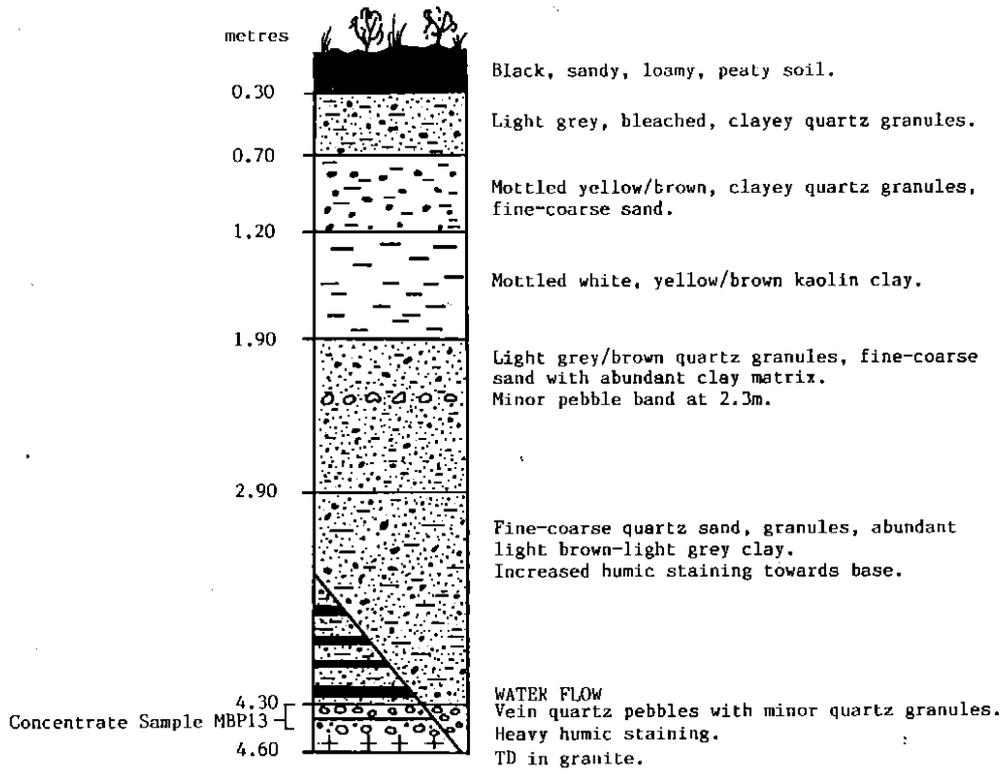
MBP-12



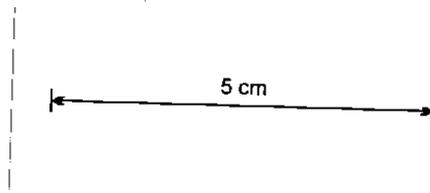
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5 cm

MBP-13

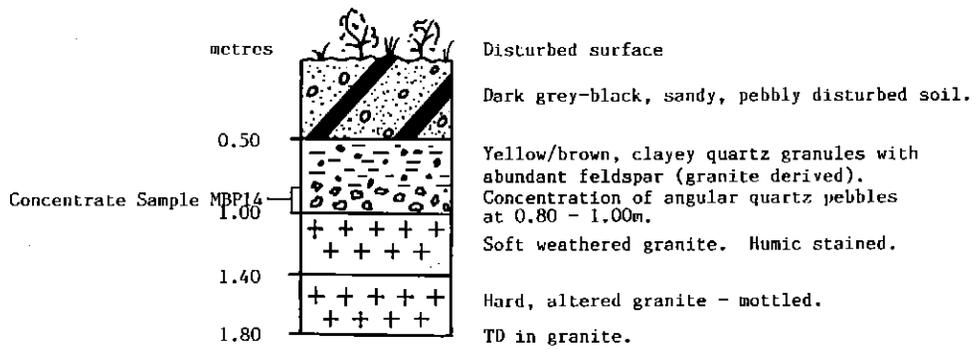


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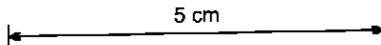


022

MBP-14



Vertical Scale 1:500





TASMANIA

# Department of Resources & Energy

## DIVISION OF MINES & MINERAL RESOURCES

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6th August 1990

Totteny Pty Ltd  
c/- K Morrison Pty Ltd  
340 Elizabeth Street  
HOBART 7000

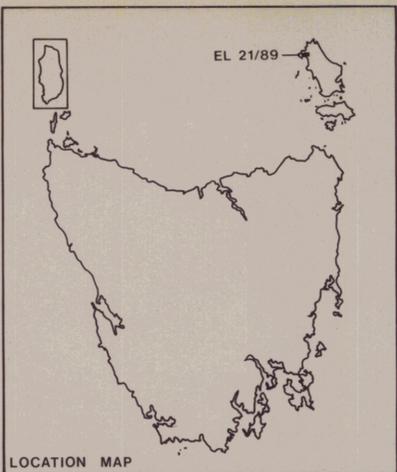
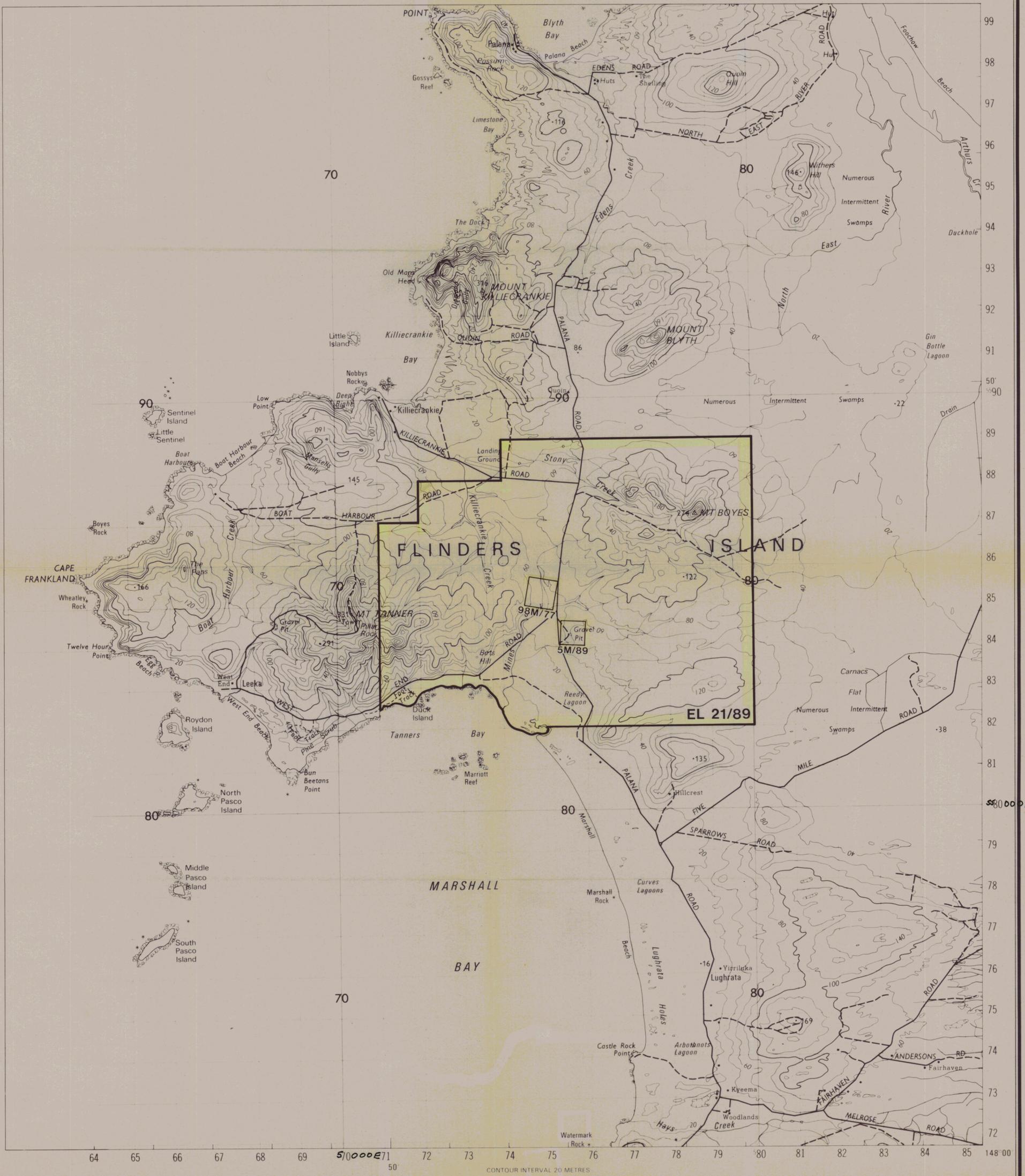
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The results of samples submitted by you on 26th July 1990 are as follows:

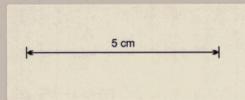
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903337	MB9 - B	216.4	3.1	11	110	6.7	2.4	24
903338	MB9 - C	178.5	4.7	16	150	8.4	2.9	27
903339	MB13	215.0	0.35	<10	66	0.75	<2.2	14
903340	MB14	182.1	0.90	<10	150	1.6	<1.8	27

Analyses by *M. J. Rhodes*

(D Zani)  
Chief Chemist & Metallurgist



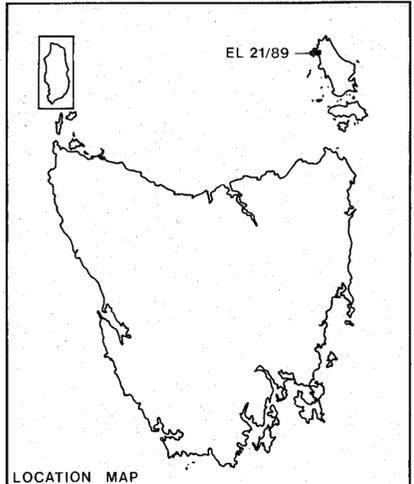
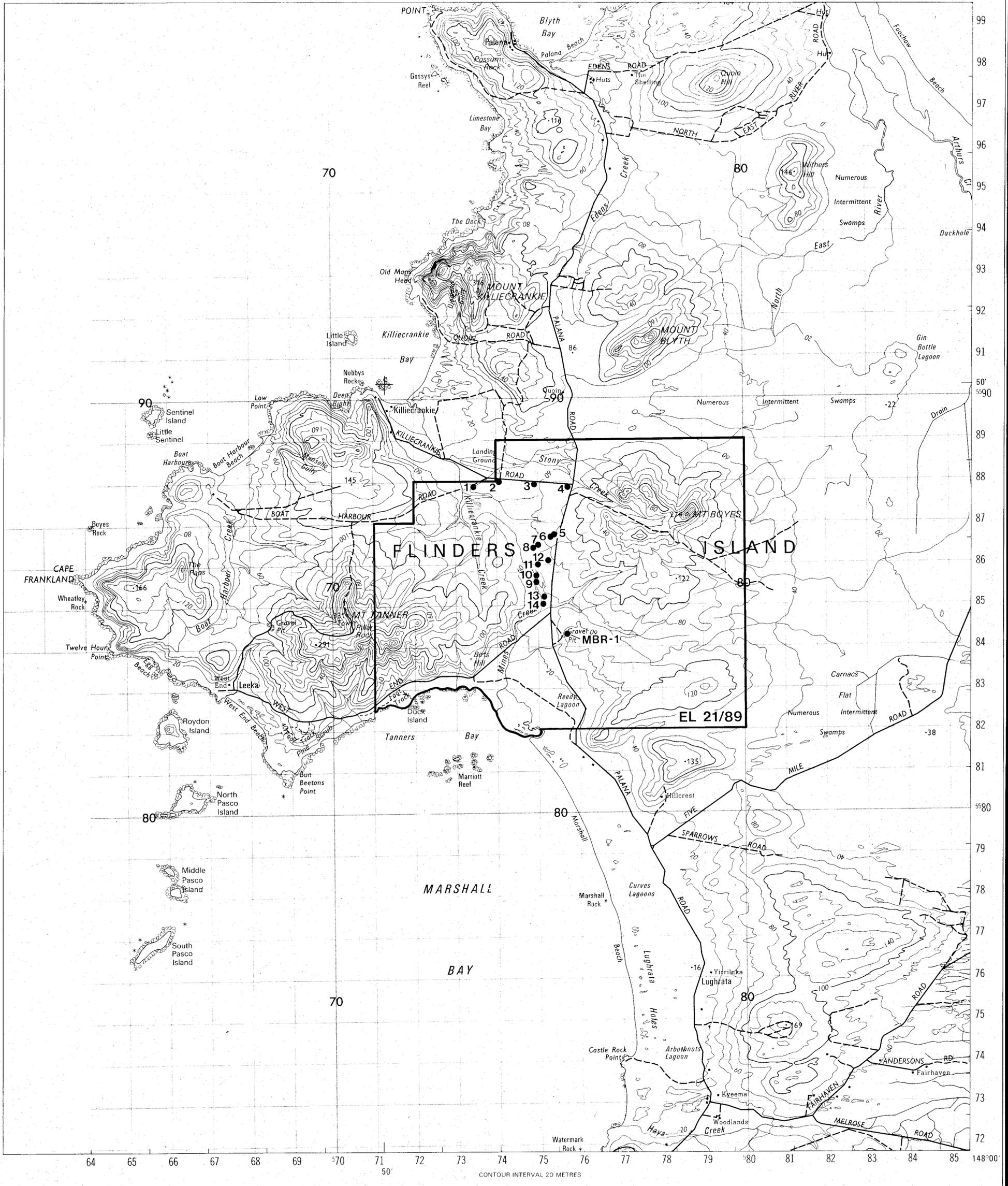
LEASE	HOLDER	AREA
98M/77	R.J. BREARLEY	49HA
5M/89	MUNICIPALITY OF FLINDERS	36HA



90-3167.

AMG REFERENCE POINTS ADDED

TOTTENY PTY. LTD.	
EL 21/89 - MOUNT BOYES LOCATION PLAN & ADJOINING MLs	
COMPILED	VH
DRAWN	VH
DATE	May 1990
SCALE	1:50,000
PLAN No.	1



4 • - MBP4

5 cm

453026

90-3167.

TOTTENY PTY. LTD.			
EL 21/89 - MOUNT BOYES		COMPILED	KCM
LOCATION OF EXCAVATOR PITS		DRAWN	VH
		DATE	July 1990
		SCALE	1:50,000
		PLAN No.	2