

UR1973-21

## Gravel deposits along the Eastern Outlet Road, Hobart.

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A survey was made of the gravel deposits remaining in the vicinity of the Eastern Outlet Road on the western flanks of Tunnel Hill (fig. 2). The land concerned is or was the property of C.T. and M.J. Martin ex A.G.H. Wright and, or R.P. Fitzgerald.

## OCCURRENCE

The only gravel in this area occurs as shoestring deposits in water-courses (fig. 1). They tend to widen downstream but not sufficiently to coalesce with neighbouring deposits. The interfluves are therefore barren and consist of sandstone or mudstone bedrock with a thin weathered layer of clay and sandstone boulders. Areas A to D (fig. 2) are worked-out pits and areas 1 to 4 are interfluves containing minor amounts of gravel.

## DESCRIPTION OF THE MATERIAL

The constituents of the gravel have a wide range of particle sizes. The coarser particles, usually up to 4 cm are sub-angular fragments of indurated Permian siltstone. The finer particles are a silt-clay mixture which constitutes at least 50% of the total. *In situ*, it is compact and extremely hard, requiring ripping for removal. It is stated to be difficult to work as it is very dusty when dry and very plastic when wet.

## ORIGIN OF THE MATERIAL

The distribution of the gravel and shape of the deposits indicates that they are of alluvial origin but the extremely poor sorting precludes the action of running water. They are therefore assumed to be solifluction deposits formed during the Pleistocene ice ages. During the frigid conditions then prevailing the mantle of rock waste which formed on the slopes due to weathering would have gravitated as semi-frozen rubble. Lava-like tongues of this material would have moved down the gullies and thin sheets would have remained on slopes. A return to warmer, pluvial conditions allowed the removal of the thin interfluvial deposits and all that remains are 'alluvial' fans and 'pockets' on slopes where surface irregularities have allowed local accumulations.

## EXTRACTABLE GRAVEL REMAINING

Areas 1 to 4 contain approximately 3300, 5400, 1250 and 2100 m<sup>2</sup> respectively. A thin layer of gravel is present over most of this area (12100 m<sup>2</sup>). The thickness of gravel is extremely variable, in places bedrock is visible at the surface while elsewhere 2 m of gravel is exposed in culverts. It is estimated that the average thickness is unlikely to exceed 0.6 m giving a total of about 8000 m<sup>3</sup> of gravel.

Prior to the formation of the new Eastern Outlet Road the railway embankment carried a water main and it is unlikely that any gravels in the vicinity would have been obtainable without damaging it. Any gravel in area 4 or the western part of area 3 should therefore be excluded from reserves calculations.

Due to the above consideration and the thinness and large areal extent of the remaining gravel and the uneven nature of the gravel bottom, the reserves are estimates to be 4000 m<sup>3</sup>.

It is understood that the Public Works Department removed approximately 4000 m<sup>3</sup> of gravel from the south side of the highway opposite bore holes 4 to 7 and also from a cutting opposite Mr Wright's house. This amount is not included in the estimate of reserves.

A seismic survey was conducted by W. Moore (1973) to test the depths of unconsolidated material in areas 1 to 4 and selected areas were tested by Gemco auger. The location of these holes is shown in Figure 2.

Area 4 contained the greatest thickness of unconsolidated ground above bedrock but it consisted of clay and mudstone boulders and the sizing analyses indicate its unsuitability for use as aggregate.

PRACTICAL CONSIDERATIONS

It seems likely that these old pits whose boundaries are now obscured by the new formation comprised the total amount of economically extractable gravel. The small amount remaining, thinly spread over several isolated areas, would not constitute a workable deposit.

The sizing analyses indicate the sub-standard quality both of Mornington strippings (Table 1) and Gemco auger (Table 2) samples.

The Gemco samples are not gravel but a clay/boulder mixture. The strip-pings were remnants from the old pits sampled by the P.W.D. The graph (fig. 3) shows how poor this material is in comparison with an acceptable road material.

It is understood that this material was to be bulldozed distances of up to 200 metres to pave areas between the old and new highways. The practicability of this operation is not within the scope of this report but it is pertinent to point out that 50% of the material is finer than 0.075 mm and would be unmanageable in wet or windy conditions.

CONCLUSIONS

The gravels remaining in the area studied are not considered by the writer to be an economic deposit because:

- (1) The total extractable quantity is too small (about 4000 m<sup>3</sup>).
- (2) The material is of poor quality.
- (3) It is spread too thinly over too great an area.
- (4) The uneven bottom of the deposits would make quarrying operations difficult.

Table 1. SIZING ANALYSES OF 3 SAMPLES OF MORNINGTON STRIPPINGS

B.S. Sieve	Cumulative weight % passing		
2 inch	100*	100*	100*
1½ inch	98	98	98
1 inch	95	97	93
¾ inch	89	94	91
⅝ inch	77	83	83
3/16 inch	70	70	74
7#	66	65	69
36#	63	59	64
200#	56	49	54

Table 1. (continued)

Property			
Liquid Limit	28	29	29
Plasticity Index	10	10	9
Linear Shrinkage	5	5	5

Table 2. SIZING ANALYSES OF GEMCO AUGER SAMPLES

B.S. Sieve	Cumulative weight % passing							
	B.H.1 0-2 m	B.H.2 1.2-1.5 m	B.H.3 0-2 m	B.H.3* 2-3 m	B.H.4* 0-0.5 m	B.H.5 0-1.3 m	B.H.6 0-2 m	B.H.7* 0-2 m
1 inch					100			
¾ inch	100		100	100	94	100	100	100
⅜ inch	98	100	98	85	83	99	98	93
3/16 inch	94	98	94	75	65	92	95	83
7#	92	95	88	68	55	85	91	73
36#	88	82	72	60	45	72	84	54
200#	72	67	59	44	34	59	65	40

B.H.1 and 2 were cored to 2.3 m and 5.5 m respectively in weathered sandstone and mudstone boulders and clay.

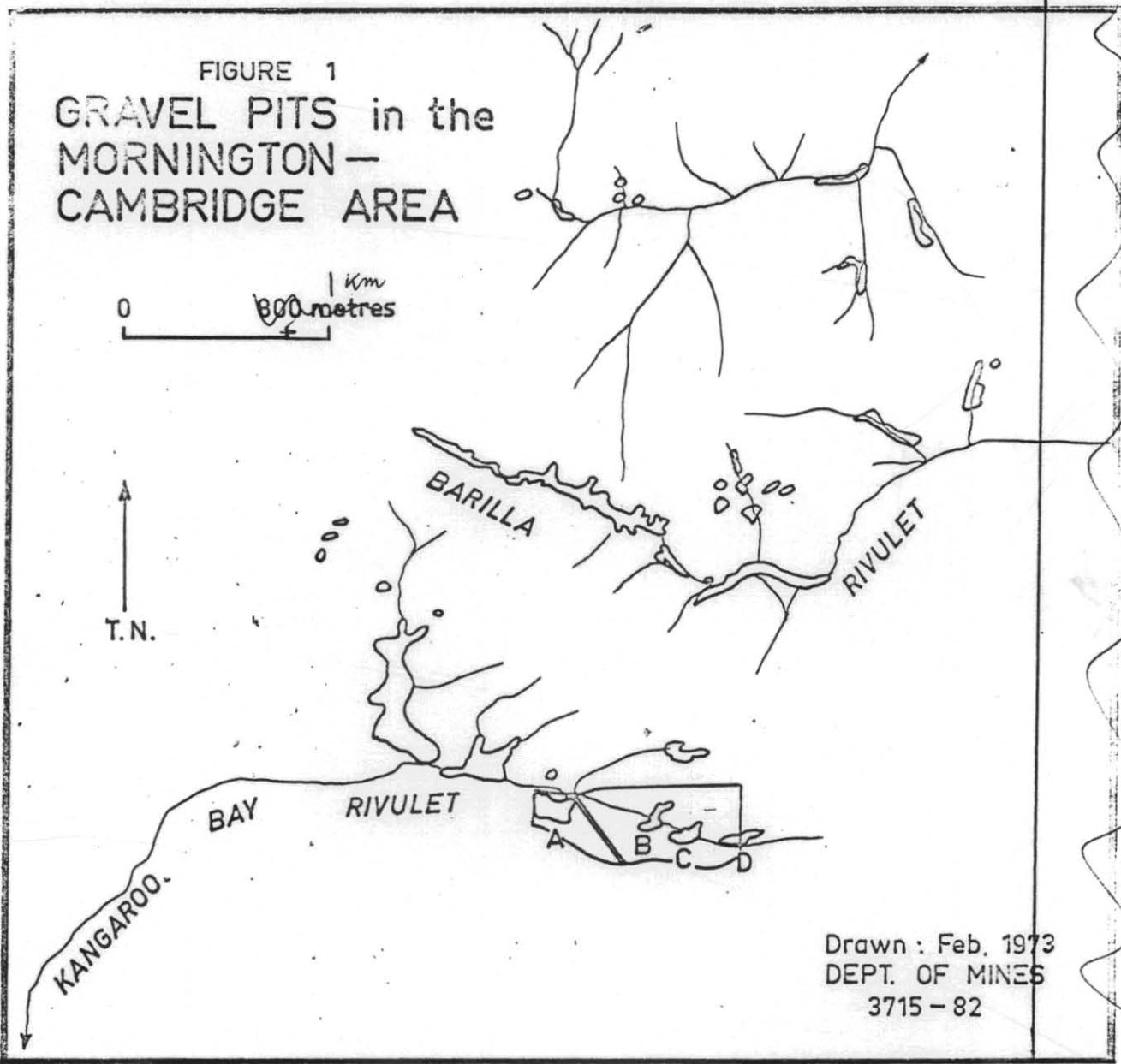
\*Analysis plotted (fig. 3). The remaining analyses are of material too deficient in coarser material to warrant plotting.

REFERENCE

MOORE, W.R. 1973. Seismic survey of gravel deposits along the Eastern Outlet Road, Hobart. *Unpubl.Rep.Dep.Mines Tasm.* 1973/7.

[12 February 1973]

FIGURE 1  
GRAVEL PITS in the  
MORNINGTON —  
CAMBRIDGE AREA

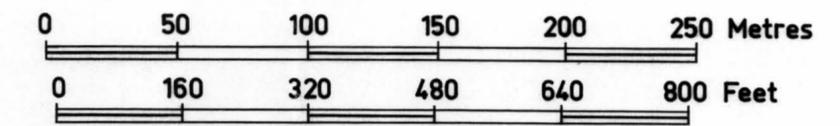


Drawn : Feb. 1973  
DEPT. OF MINES  
3715 - 82

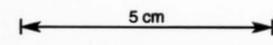
5 cm

# DISUSED GRAVEL PITS ON WEST FLANK, TUNNEL HILL

## Figure 2



GEOLOGIST : V.M.THREADER  
 Draughtsman : T.R.Bellis  
 Drawn : Jan. 1973



- A to D** Old pits
- ① to ④** Remnant gravel areas
- — —** Boundary of property examined
- - - - -** Old railway route
- 1** Gemco holes

