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Abstract

An area of 24 ha at Seven Mile Beach, purchased by the Royal Hobart Golf Club, is underlain by sand of marine and aeolian origin. The mean grain size is in the fine to very fine sand range, which limits the usefulness of the sand. Because of the low land surface, any mining should be restricted to a depth of 0.5 m to prevent groundwater entry.

INTRODUCTION

An area of about 24 ha has recently been purchased from the Lands Department by the Royal Hobart Golf Club. Two-thirds of this area contains a pine plantation which is owned by Australian Newsprint Mills and which will not become available to the Golf Club until the ANM timber lease expires in 1993.

The Golf Club secretary has requested information concerning the quality and quantity of sand on this property and the economic potential of the sand.

PREVIOUS INVESTIGATIONS

A groundwater study (Cromer, 1981) provides the geological basis for this report. Relevant portions of the study are given in the maps and sections accompanying this report (fig. 1 to 4). The sand occurring on the 24 ha block is of marine and aeolian origin and consists of 10 m of fine, very fine and medium sand with clayey portions and varying proportions of marine shell fragments. Below this is an unknown thickness of clay and sandy clay.

To the west of the block the sediments are of lagoonal origin and contain brackish groundwater in confined aquifers.

SAND QUALITY

The mineral composition of the sediments is quartz with minor amounts of clay and marine shell. On this basis, most of the material is suitable for use in construction industry aggregate.

The limiting factor in the economic usefulness of this sand is the fineness. The grading curves (fig. 3 to 5) illustrate this point. Figures 3 and 4 show the particle size distribution of sand collected from different levels in two of the auger holes in Cromer's (1981) groundwater study. Grading curves of surface samples from sand pits in and around the area are plotted on Figure 5, together with an idealised grading curve representing a desirable particle size distribution for fine aggregate for concrete making, road construction, concrete block and pipes.

The mean grain size of the auger samples lies in the fine to very fine sand range, and that of the surface samples lies in the fine sand range.

The gradients of the curves indicate the range of grain size present in the sample. The steeper the curve, the more highly sorted the sand and

- the less desirable it is for use in building or construction aggregate. The idealised curve has a mean grain size in the fine/medium sand range, i.e. it lies further to the left of the grading curves of the samples and has a much flatter slope, indicating good grading characteristics.

The four samples shown in Figure 5 are similar to dune sand from the South Arm area and are suitable for blending with coarser material to make specification fine aggregate, but have limited use if used alone.

SAND RESERVE

Twenty-four hectares contains 240 000 m³ of sand per metre depth, but the sections in Figure 2 indicate that the land surface averages only about one metre above sea level.

Cromer (1981) reported that the level of groundwater in the area during December 1980 was at sea level. Mining below this depth would probably create a semi-permanent water hole and may tap the confined aquifer to the west allowing brackish water to enter the area. It would not be considered desirable for workings over large areas to even reach sea level as the workings, when abandoned, would become swamps if not lakes.

For this reason mining should be restricted to a depth of 0.5 m and the reserve is reduced to 120 000 m³. Two-thirds of this reserve will not become available until 1993.

USES

The small quantity of sand available for marketing and the limited use to which it can be put would indicate that the most suitable course of action for the Golf Club is to retain the sand for Club purposes.

REFERENCE

CROMER, W.C. 1981. Groundwater investigations at Seven Mile Beach for the Royal Hobart Golf Club. *Unpubl.Rep.Dep.Mines Tasm.* 1981/3.

[28 May 1984]

Table 1. GRAIN SIZE ANALYSES OF SAND FROM SURFACE WORKINGS

RHGC 1 - Registered no. 840339

Sieve Size	Mass (%)	Cumulative mass retained (%)
+1.18 mm	0.06	0.06
+600 μ m	0.24	0.30
+300 μ m	2.74	3.05
+150 μ m	46.62	49.66
+75 μ m	42.04	91.71
+38 μ m	1.71	93.41
-38 μ m	6.59	100.00

RHGC 2 - Registered no. 840340

Sieve Size	Mass (%)	Cumulative mass retained (%)
+1.18 mm	0.74	0.74*
+600 μ m	1.32	2.06*
+300 μ m	8.46	10.52
+212 μ m	23.81	34.33
+150 μ m	41.02	75.35
+75 μ m	18.17	93.51
+38 μ m	2.50	96.02
-38 μ m	3.98	100.00

* mostly organic material

RHGC 3 - Registered no. 840341

Sieve Size	Mass (%)	Cumulative mass retained (%)
+2.36 mm	0.03	0.03
+1.18 mm	0.03	0.05
+600 μ m	0.11	0.16
+300 μ m	7.28	7.45
+212 μ m	27.82	35.27
+150 μ m	45.58	80.85
+75 μ m	18.69	99.54
+38 μ m	0.27	99.81
-38 μ m	0.19	100.00

RHGC 4 - Registered no. 840342

Sieve Size	Mass (%)	Cumulative mass retained (%)
+1.18 mm	0.04	0.04
+600 μ m	0.26	0.29
+300 μ m	15.41	15.71
+212 μ m	46.24	61.95
+150 μ m	30.24	92.18
+75 μ m	7.56	99.74
+38 μ m	0.15	99.89
-38 μ m	0.11	100.00

4/7

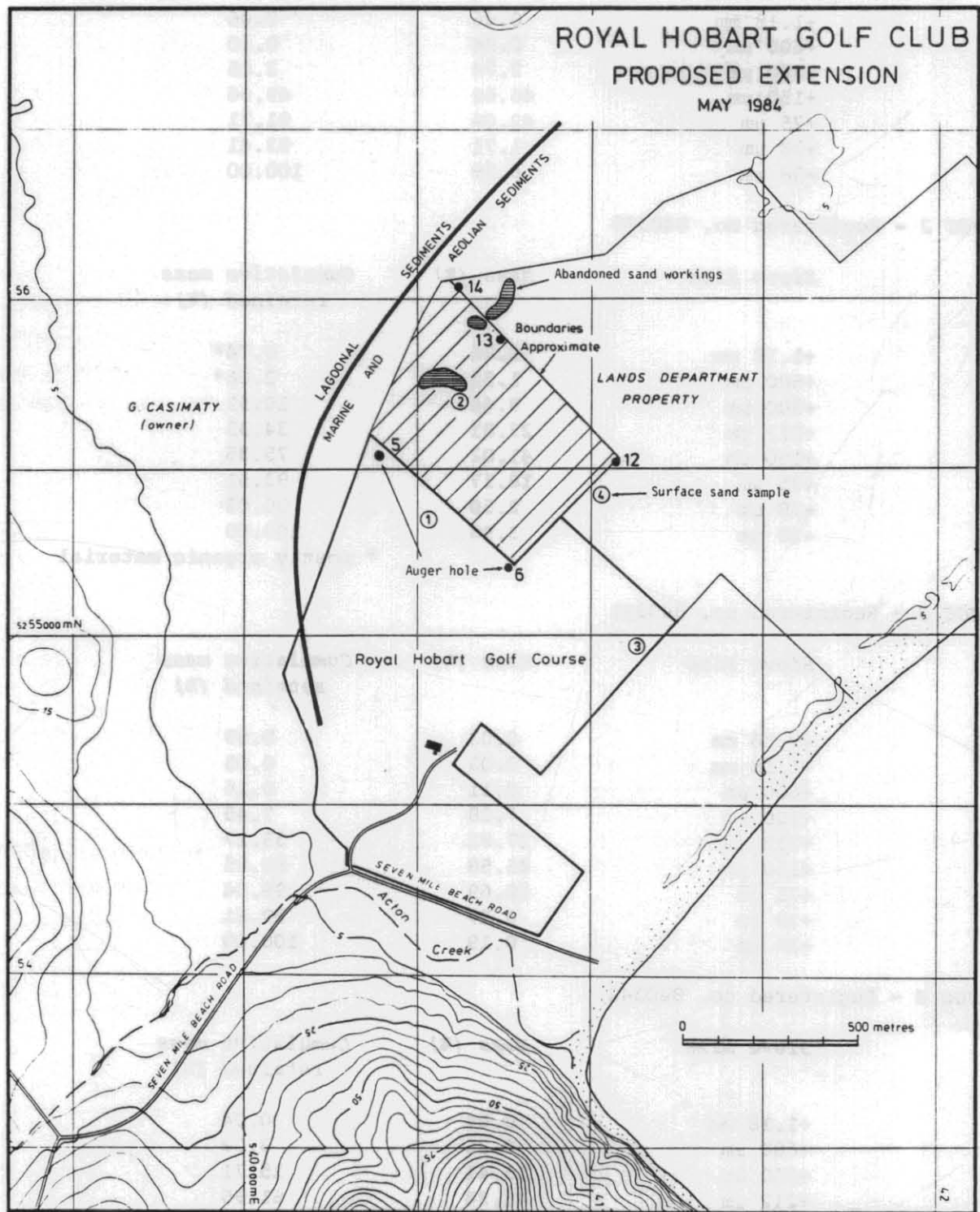
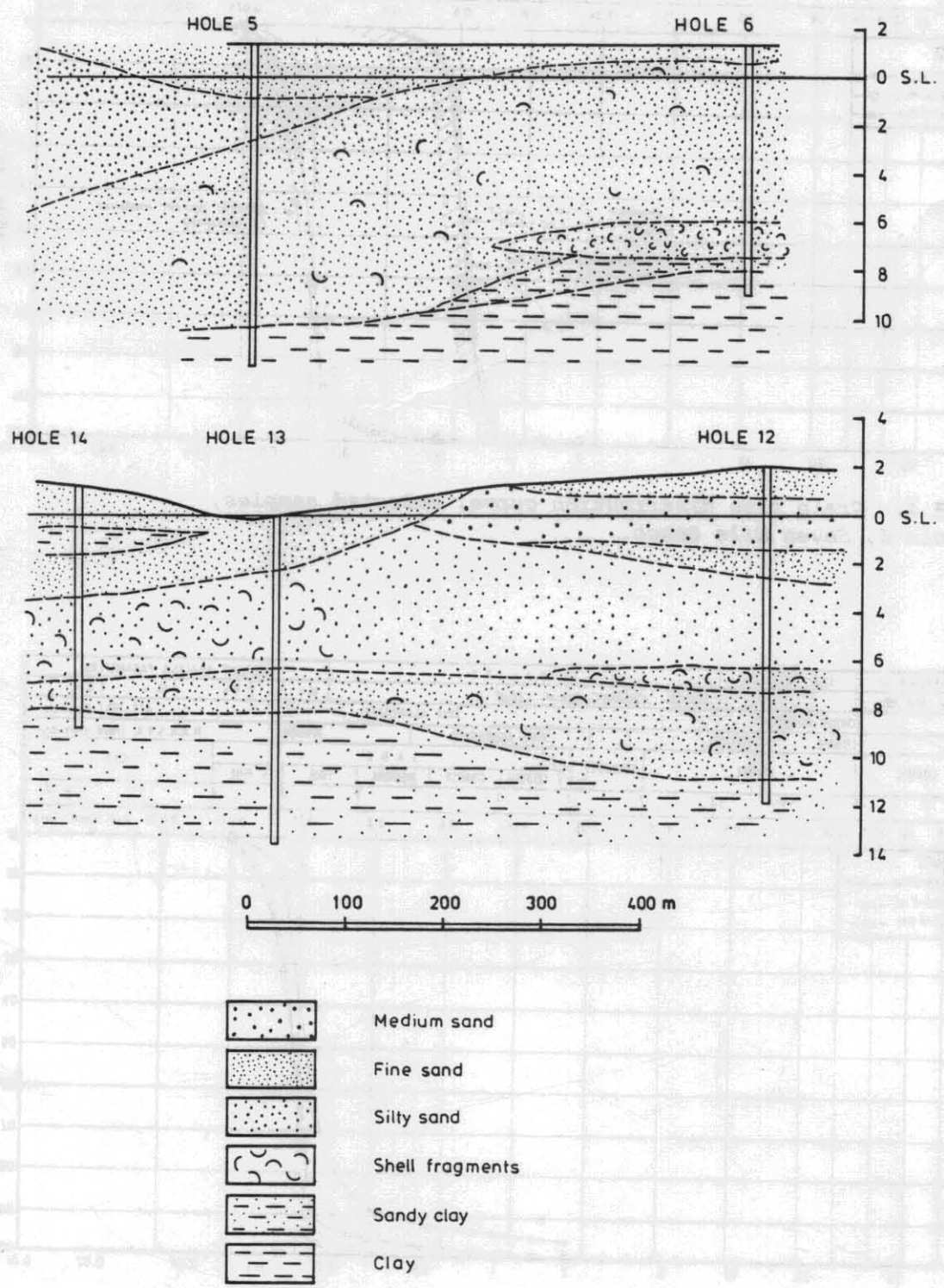


Figure 1.

5 cm

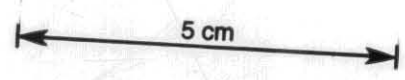
ROYAL HOBART GOLF CLUB SECTIONS THROUGH AUGER HOLES

MAY 1984



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Figure 2.



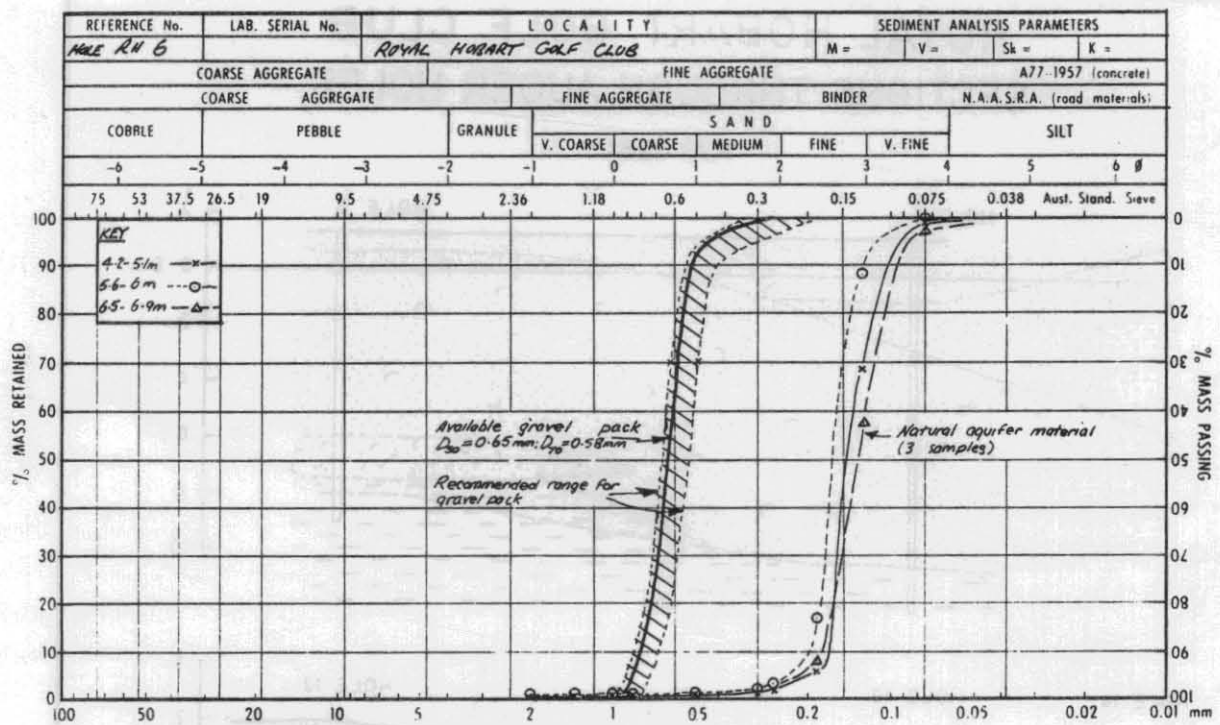


Figure 3. Grain size distribution curve, selected samples, Hole 6, Seven Mile Beach.

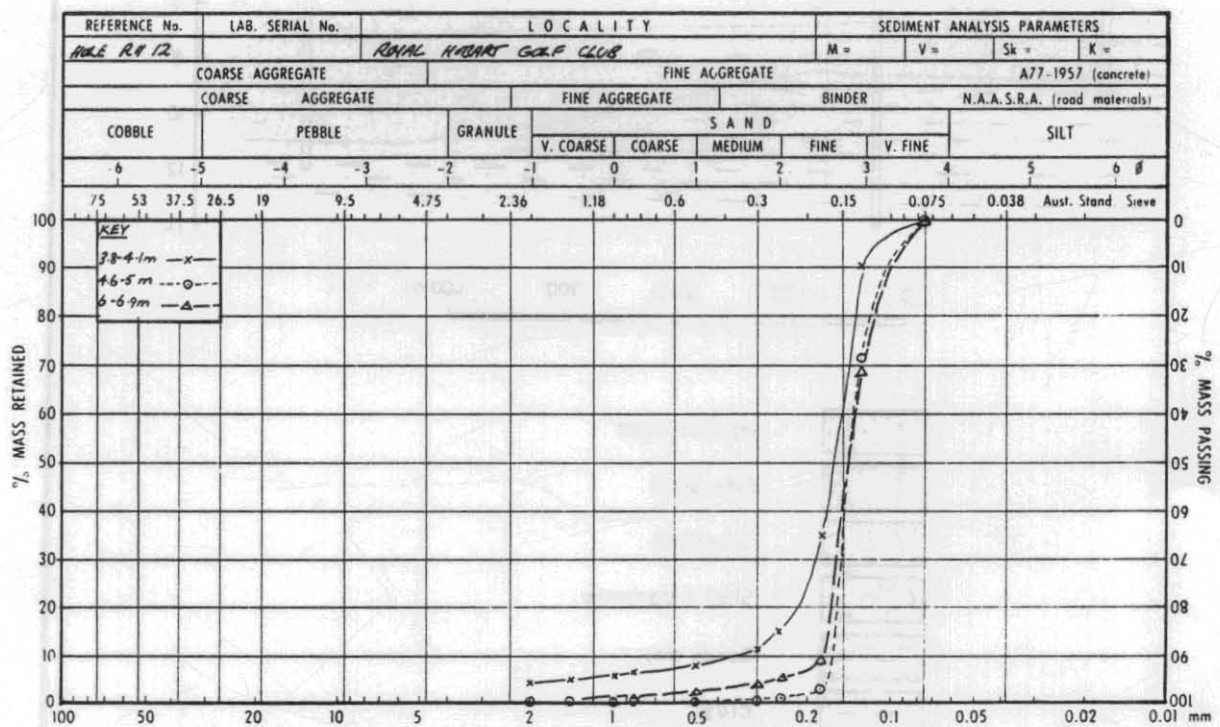


Figure 4. Grain size distribution curve, Hole 12, Seven Mile Beach.

