Rept. Bk. No. 57/86
G.S. No. 2739
D.M. 554/63

DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY

NON-METALLICS SECTION

REPORT ON

SCOUT BORING FOR SAND

SECTION 690, HUNDRED WILLUNGA

(THE FIELD NATURALISTS SOCIETY OF S.A.)

by

J. G. Olliver
Geologist

21st November, 1963

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S 3522	Location of Boreholes Section 690, Hd. Willunga (The Field Naturalists Society of S.A.)	1 inch = 20 chns.
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(THE FIELD NATURALISTS SOCIETY OF S.A.)

1. INTRODUCTION

Following a request from the Honorary Secretary (Mr. D.N. Kraehenbuehl) of The Field Naturalists' Society of S.A., three test holes were bored on the northern part of section 690, Hd. Willunga, Co. Adelaide, 1 mile north of the township of McLaren Flat (29 miles by road south of Adelaide).

Boring began on 25th and was completed on 26th September, 1963, using the Proline machine auger plant. The location of the boreholes is shown on the accompanying plan no. S 3522 and the geological logs appended.

Samples of sand were submitted to The Australian Mineral Development Laboratories for sieve analyses and the determination of clay contents, the results of which are included in the report and represented graphically on plan no. S 3524.

A sample of fine sand (from 0 to 6 feet in borehole no. 2) is being evaluated as a foundry sand.

2. REGIONAL GEOLOGY

The property is situated near the central northern edge of the Willunga Basin, a shallow valley in Precambrian bedrock, bounded on the south-east by the Willunga fault and filled with Permian and younger sediments. The bedrock, represented by Sturtian slates of the Adelaide System, outcrops 1 mile north-west of the property (see locality plan S 3522).

Building sand is won from the basal Tertiary North Maslin Sands in the Maslin Bay area, 7 miles west of McLaren Flat. This bed is exposed in two road cuttings west and south-west of section 690, as indicated on the locality plan.

Pliocene (upper Tertiary) lateritic sandstones and gravels are exposed in shallow pits on the top of the ridge within the property.

3. RESULTS OF BORING

The boreholes are located along a track which provides access diagonally across the property through natural scrub.

Borehole no. 1 - at road level approximately 600 feet west of the road.

Fine light coloured sand at the surface became coarser and reddish with depth. The sand, which is poorly sorted with ¼ inch grit and clayey lenses, and unfossiliferous, is regarded as North Maslin Sand.

The auger was stopped by tight sandy clay at 44 feet.

Borehole no. 2 - midway between boreholes nos. 1 and 3.

Fine sand, containing 1 inch quartz pebbles and fragments of laterite from 6 to 8 feet, became slightly clayey and coarser below 14 feet. The clay content increased with depth until the plant was jammed and a flight broken at 23 feet.

Borehole no. 3 - on the top of the ridge approximately 1800 feet along the track west of the road

Coarse lateritic sand and gravel at the surface covered pale coloured sands and silts.

Difficulty was encountered in boring boreholes nos. 2 and 3 as loose sands gave way to partially cemented sandstones and siltstones.

4. RESULTS OF SIEVE ANALYSES

The grading of the sand from borehole no. 1 (surface to 40 feet) falls outside the limit of British Standard Specification 882 (1954): Concrete fine aggregate as indicated on the accompanying plan no. S 3524. The results of the sieve analyses are as follows:-

B.S.S. Mesh		Weight percent Borehole no. 1 (0-40 ft.)	no. 2 (0-6 ft.)
	+ ⅜ inch	Nil	Nil
-⅜	+ 3/16 inch	0.1	Nil
-3/16	+ 7 mesh	0.3	Nil
- 7	+ 14 mesh	0.9	0.5
- 14	+ 25 "	1.7	0.6
- 25	+ 52 "	21.0	3.5
- 52	+ 100 "	44.9	57.7
-100	+ 200 "	11.2	32.9
-200		19.9	4.8
		100.0	100.0
Clay Content		12.0	2.1

In borehole no. 2 (0 to 6 feet), material coarser than 25 mesh consisted largely of organic matter.

The sample from borehole no. 1 contained 12.0% clay by weight compared with a specified maximum of 5% for building sand.

4. CONCLUSIONS

Borehole no. 1 penetrated probable North Maslin sands which are too fine and clayey for building purposes.

Boreholes nos. 2 and 3 intersected Pliocene gravels, sandstones and siltstones, which form the high ground on the property.

The fine surface sand is being tested for suitability as a foundry sand.

Coarse sand may exist at greater depth but thickness of overburden is considerable. Coarse sand may be nearer the surface in the lower lying south-eastern portion of the property which could only be confirmed by further boring.

J. G. Olliver
Geologist
NON METALLICS SECTION

21/11/63
JGO:AGK

APPENDIX

GEOLOGICAL LOGS OF BOREHOLES

LOG OF PROLINE BOREHOLE NO. 1

PROJECT: THE FIELD NATURALISTS SOCIETY OF S.A.

SECTION: 690 **HD.:** WILLUNGA **CO.:** ADELAIDE

R.L.: - **DEPTH:** 44 feet **DRILLER:** P. Cortolezzi

LOGGED BY: J.G. OLLIVER **DATE:** 25/9/63

DEPTH (Feet) From	To	Description
0	4	Fine wet grey sand.
4	6	Brown clayey fine sand.
6	12	Grey slightly clayey fine sand and pale brown sand with minor grit.
12	38	Light brown to light yellow sand, even-grained and slightly clayey to clayey in parts with occasional thin white clayey seams.
38	40	Red-brown coarse sand, slightly clayey with $\frac{1}{4}$ inch grit, and a thin seam of grey silty fine sand.
40	42	Red-brown clayey coarse sand.
42	44	Red-brown sandy clay

HOLE STOPPED AT 44 FEET.

LOG OF PROLINE BOREHOLE NO. 2

PROJECT: THE FIELD NATURALISTS SOCIETY OF S.A.

SECTION: 690 **HD.:** WILLUNGA **CO.:** ADELAIDE

R.L.: - **DEPTH:** 23 feet **DRILLER:** P. Cortolezzis

LOGGED BY: J.G. OLLIVER **DATE:** 25/9/63

DEPTH (feet) From	To	Description
0	4	Fine white sand over grey slightly clayey sand and fine pale yellow sand.
4	6	Fine cream sand.
6	8	Fine pale orange sand with quartz pebbles up to 1 inch diameter and laterite fragments.
8	12	Pale orange-brown sand.
12	14	Fine pale yellow sand.
14	16	Pale orange-brown fine clayey sand with some grit.
16	18	Fine yellow sand, slightly clayey.
18	20	Fine orange-brown sand, slightly more clayey than above.
20	23	Fine orange-brown clayey sand with thin white clayey seams.

HOLE STOPPED AT 23 FEET - FLIGHT BROKEN.

LOG OF PROLINE BORE HOLE NO. 3

PROJECT: THE FIELD NATURALISTS SOCIETY OF S.A.

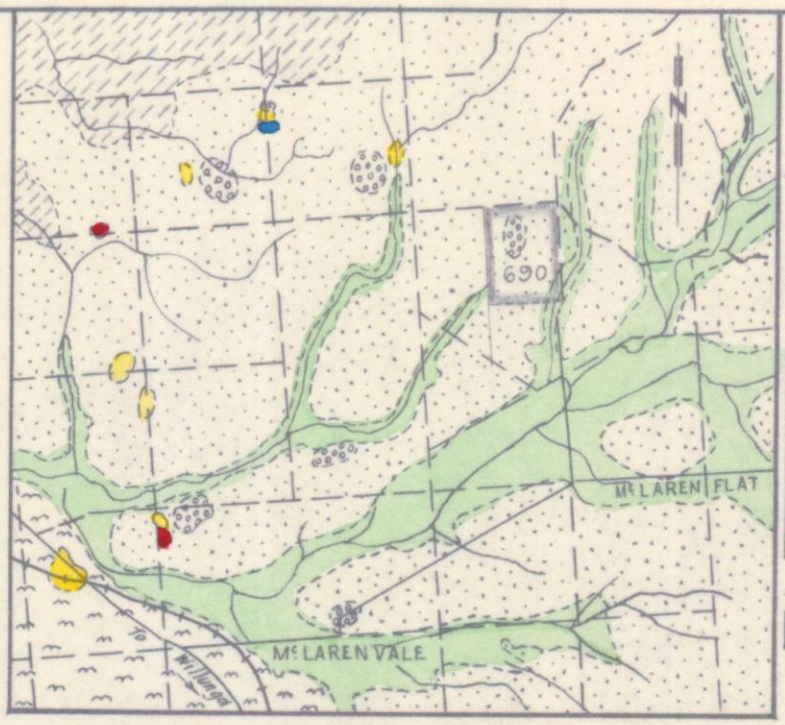
SECTION: 690 **HD.:** WILLUNGA **CO.:** ADELAIDE

R.L.: - **DEPTH:** 26 feet **DRILLER:** P. Cortolezzis

LOGGED BY: J.G. OLLIVER **DATE:** 26/9/63

DEPTH (feet) From	To	Description
0	2	Fine grey sand with rounded lateritic gravel over red-brown sand, clay and gravel. (lateritic).
2	4	Light pink silt, gravelly and sandy.
4	10	Fine white silty sand, brownish at base.
10	12	Cream sand, fine with coarser grains up to ½ inch rounded gravel.
12	22	Light yellow sand silty, fine to coarse with minor ¼ inch grit.
22	26	Pale orange brown fine sand with some coarser grains.

HOLE STOPPED AT 26 FEET - BECOMING TOO HARD TO BORE.



SCALE
1 inch to 1 mile.

RECENT
- Alluvial clays of the plains.
- Alluvial flood plains.

TERTIARY
- Pliocene fresh water gravels & sandstones, laterilised in part.
- Medium to fine grained sands.
- Blanche Point Marls.
- Tortachilla Formation.
- North Maslin Sands.

PROTEROZOIC
- Slates & quatzites.

Borehole ● 3 / 26' Number. Depth.

SCALE
1 inch to 20 chs.

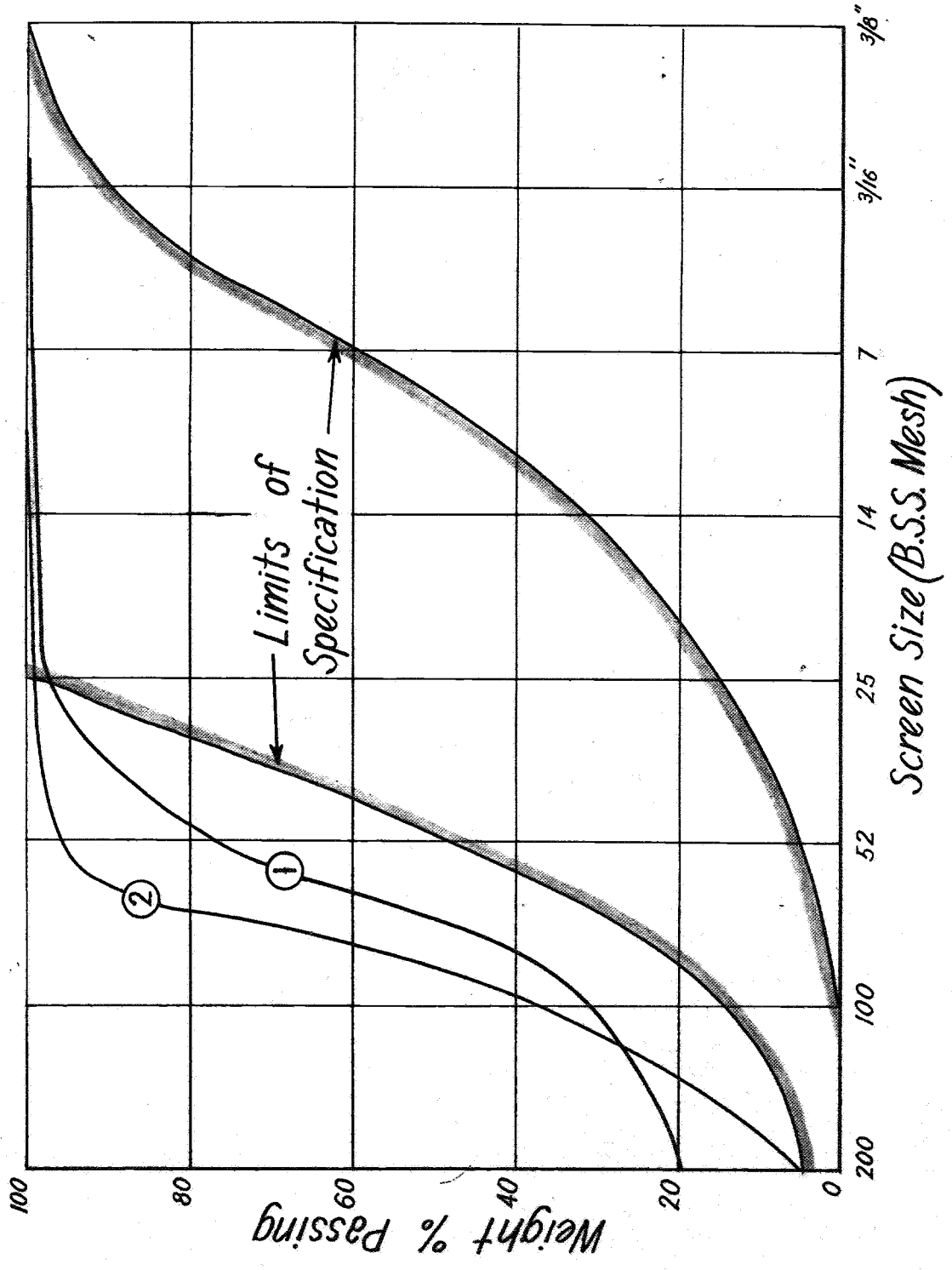
To accompany a report by J. G. Olliver.

S.A. DEPARTMENT OF MINES

Approved	Passed	Drn. J.G.O.	SEC. 690, Hd WILLUNGA The Field Naturalists Soc. of S.A. LOCATION OF BOREHOLES	D.M.	Scale 1" to 1m. & 20ch.
		Tcd. M.R.L.		Req.	S 3522
		Ckd.			Ha 11
Director		Exd.			Date 23·10·63

200—2-61 3805

BORE	DEPTH
1	0-40'
2	0-6'



To accompany report by J.G. Olliver

S.A. DEPARTMENT OF MINES

Approved	Passed	Drn.	B.S.S. 882 (1954)	D.M.	Scale
		Tcd. B.F.	CONCRETE FINE AGGREGATE	Req.	S3524
		Ckd.	Sec. 690 Hd. Willunga		Gc5
Director		Exd.	(THE FIELD NATURALISTS SOCIETY OF S.A.)		Date 29·10·63

220—2·61 5305