59/152.

DEPARTMENT OF MINES
SOUTH AUSTRALIA

Report on

FURTHER DIAMOND DRILLING
BALD HILL MARBLE DEPOSIT
Part Section 506, Hundred Moorooroo.
(S.A. Portland Cement Co. Ltd.)

by
J.G. Olliver.

To be published in Mining Review 121.

16th December, 1964

Rept. Bk. No. 59/152.
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D.M. 205/64.

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Geologist

NON METALLICS SECTION
GEOLOGICAL SURVEY

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(S.A. Portland Cement Co. Ltd.)

ABSTRACT

At Bald Hill, drilling has proved more than 6 million cubic yards of marble above the 780 feet level. The marble below the road estimated at 700,000 cubic yards is at present unavailable for exploitation. Overburden is estimated at 230,000 cubic yards with 125,000 cubic yards of waste rock within the marble. The marble persists with depth and working below 780 feet will depend on quarry layout and the water table.

The marble, white, grey and pink in colour, is adequate for the manufacture of cement, with more than 90% total carbonate content.

INTRODUCTION

A previous drilling programme for the S.A. Portland Cement Co. Ltd., in 1963, proved ¾ million cubic yards of high grade marble at the Bald Hill deposit, one mile south of Angaston. The Company plans to expand quarry operations in this area, and requested an appraisal of the marble in the alluviated valley immediately west of the existing quarry. This report incorporates the results of diamond drilling operations undertaken during the period 7th August to 16th October, 1964.

The locations of the drill holes are indicated on the accompanying plan No. L64-223 and complete geological logs are appended. The drill cores were retained at Angaston. Selected intervals were chemically assayed by the Company and the results are appended.

References and details of topography and geology of the deposit are described in the following reports:

Campbell, J.D. (1945) - The Geology of the Angaston Marble Beds I.C.I. Alkali (Aust.) Ltd. (unpub.)

Hiern, M.N. (1964) - Marble Deposit. Part sec. 506, Hd. Moorooroo. Mining Review no. 116, p. 90-92.

Olliver, J.G. (in press) - Marble Deposit
Part sec. 506, Hd. Moorooroo
Mining Review no. 118. p 78-80

Olliver, J.G. (in press) - Diamond Drilling Operations - Marble Deposit.
Part. sec. 506, Hd. Moorooroo
Mining Review no. 119. p 82-85.

Olliver, J.G. (in press) - Diamond Drilling Operations - Marble Deposit
Sections 333, 334, Hd. Moorooroo
Mining Review no. 120.

DRILLING PROGRAMME

Following discussions between R.K. Johns (Senior Geologist), the writer and Company representatives on 3rd December, 1963, 17 vertical holes were bored by the Company, using a Halco rock drill, to prove continuity of marble and the thickness of alluvium in the valley which bisects the Bald Hill (formerly Silbley's) marble deposit (See Plan No. L64-223 for location and summary details). To further investigate this area the following diamond drilling programme was devised and undertaken during August - October, 1964.

S-D.D.6 was depressed 30° in direction south 82° west to determine the attitude of the marble - mica schist contact on the western side of the structure because bore S-D.D.5 failed to reach its target.

S-D.D.7 - S-D.D.12 were depressed 40° in direction north 17° east to determine the depth of overburden and to prove the quality of the underlying marble.

S-D.D.13 was depressed 30° in direction east 72° south to prove the quality of the marble and to determine the attitude of the marble - country rock contact south-east of the quarry.

SUMMARY LOGS OF DIAMOND DRILL HOLES

The geological logs of the 8 diamond drill holes are summarized below. Full details are appended.

S-D.D.6

Surface	- 74'6"	Grey to white marble, rubbly to 11'. From 14'6" to 16'9" and from 21'0" to 23'1" light brown layers up to 4" thick.
74'6"	- 110'	Calc-silicate country rock.

S-D.D.7

Surface	- 37'	Alluvial sand and clay with pebbles of marble at base.
37'	- 106'6"	Calc-silicate country rock, weathered to green clay in parts.
106'6"	- 201'10"	White marble with pink, grey and minor brown patches.

S-D.D.8

Surface	- 18'4"	Alluvial sand over clay.
18'4"	- 65'4"	White marble with rubbly zones and occasional clay seams - poor core recovery.
65'4"	- 200'2"	White, grey and pink marble with a zone of heavy red and brown staining from 82' to 89'7".

S-D.D.9

Surface	- 22'7"	Alluvial sand and clay.
22'7"	- 66'9"	White, pink and grey marble with occasional seams of clay up to 2' thick.
66'9"	- 201'4"	White marble with grey streaks.
201'4"	- 203'	Green amphibolite with scattered pyrite.

S-D.D.10

Surface	- 14'5"	Alluvial sand over clay.
14'5"	- 149'1"	White to grey marble with rubbly zones and clay seams.
149'1"	- 205'5"	White marble with occasional brown patches.

S-D.D.11

Surface	- 24'	Alluvial sand over clay.
24'	- 78'	White to grey marble with occasional fissures, and seams of clay up to 1 foot thick.
78'	- 80'	Green weathered amphibolite.

S-D.D.11 (contd.)

80'	- 202'	White to pale grey marble with a sugary zone from 159'5" to 167'8".

S-D.D.12

Surface	- 59'	Alluvial sand and clay with pebbles and boulders of marble at base.
59'	- 151'3"	White marble with pink patches.

S-D.D.13

Surface	- 262'7"	White to pale grey marble with a zone rich in limonite cubes from 83'2" to 85'2".
262'7"	- 281'7"	Yellow stained marble jointed and sugary.

RESULTS OF DRILLING

On the western side of the structure, the marble - country rock contact dips at 40° to the east as indicated on cross-section K-K' (plan no. 64-1110)

Below the Recent alluvium in the central valley, the apparent dip of the contact is 60° to the south (See cross-section P-P'). The maximum depth of alluvium is approximately 40' at the northern boundary fence. The strata appear to steepen to the north. Bore S-D.D.9 bottomed in a calc-silicate band, probably 3 feet thick which was not intersected in bore S-D.D.10. A second calc-silicate band was cut in bore S-D.D.11 from 78 to 80 feet.

The major calc-silicate band which has been exposed in the Bald Hill quarry (See Plate No. 3) lenses out as indicated on the accompanying Plan No. L64-223. Bore S-D.D.12 penetrated high grade marble throughout.

Bore S-D.D.13 was abandoned at 281'7" while still in marble. Here the marble bed dips to the south-east at an angle shallower than 70°.

The marble recovered in the drill cores was generally white in colour with grey and pink streaks and patches.

Grain size of individual calcite crystals varied from 1/10 inch to ¼ inch. The marble contains seams of clay up to 2 feet thick and yellow stained joints and fissures which become

less abundant with depth.

Accessory minerals which are dispersed throughout the marble and occasionally concentrated in seams are -

biotite - black mica

haematite and magnetite - black iron oxides

quartz - colourless silica

pyrite - yellow iron sulphide, oxidized in parts to yellow - brown limonite (hydrated iron oxide)

actinolite - green complex silicate, up to ½ inch long needles often in aggregates. In S-D.D.6 above 14'6", the needles have been weathered and are soft and white.

RESULTS OF CHEMICAL ANALYSES

The total carbonate contents of random samples of apparent average grade marble are tabulated below; full assay data are appended.

Bore No.	Interval		Total Carbonate (%)
	From	To	
S-D.D.6	38'9"	44'0"	93.8
	63'3"	65'11"	96.3
S-D.D.7	135'6"	145'5"	93.7
	152'2"	162'2"	95.6
S-D.D.10	151'10"	161'10"	95.0
	195'5"	205'5"	96.3
S-D.D.12	92'0"	98'0"	97.3

The weighted mean of these samples is 95.2% total carbonate.

The other intervals assayed, represent seams of lower grade marble. The thickest impure zone encountered was from 78'3" to 89'7" in bore S-D.D.8.

In the previous drilling programme (Bores S-D.D.1 to S-D.D.5) the average grade of all marble assayed was 94.7% total carbonate. Therefore the marble of the Bald Hill deposit contains more than 90% total carbonate by weight.

In the samples tested magnesium carbonate ($MgCO_3$) varies from 0.5% in S-D.D.6 at 38'9" to 44' to 2.6% in S-D.D.7 at 152'2" to 162'2".

RESERVES

For reserve calculations the property has been subdivided into 3 areas as indicated on the accompanying Plan No. L64-223. The following volumes (in cubic yards) are based on the areas outlined on the cross-sections, Plan No. 64-1110.

Area A - Bald Hill Quarry - east of the road (cross-sections L-L' to O-O').

	Marble	Waste (Calc-silicate)
Above the 900 feet level	400,000	30,000
840	1,200,000	75,000
780	2,000,000	125,000

Area B - The central alluviated valley - west of the road. (cross-section K-K' to O-O')

Above the 900 feet level	100,000	120,000
840	1,200,000	230,000
780	2,200,000	230,000

Reserves of marble under the dividing road between areas A and B are -

60,000 cubic yards above the 900 feet level
300,000 " " " " 840 " "
700,000 " " " " 780 " "

Area C - The western strip of land (cross-section D-D' to J-J')

1,200,000 cubic yards of marble above the 840 feet level

This area is too narrow to allow quarrying to the 780 feet level.

Total reserves of marble in the area investigated are:

Above the 840 feet level - 3,600,000 cubic yards of marble with 305,000 cubic yards of overburden and waste.

Above the 780 feet level - 5,400,000 cubic yards of marble with 355,000 cubic yards of overburden and waste. A further 700,000 cubic yards of marble are available for exploitation below the road and above the 780 feet level.

The next 60 feet bench below the 780 feet level should yield approximately 2 million cubic yards of marble of which half a million cubic yards occur below the road. Progressively less marble will be obtained with depth unless the road can be closed and underlying marble exploited.

CONCLUSIONS

Drilling has proved coarsely crystalline, white or grey and pink Cambrian marble below Recent alluvium in the valley west of the present Bald Hill quarry.

If the calc-silicate bands are rejected the total carbonate content of the marble will exceed the quarry cut-off grade of 85%.

The south and west contacts of the marble and mica schist are sharply defined and dip 60° to the south and 40° to the east respectively.

The marble has been shown previously to grade into calc-silicate rocks in the east.

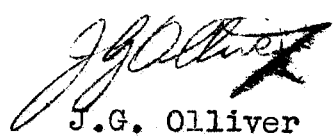
Drilling has proved 2,200,000 cubic yards of marble above the 780 feet level in the central valley below 230,000 cubic yards of overburden.

Maximum depth of alluvium is 40 feet. Waste calc-silicate rock within the marble occupies a volume of 125,000 cubic yards.

Total reserves of marble above the 780 feet level within the Company's property are estimated at 6 million cubic yards.

However, at present 700,000 cubic yards of marble below the road are unavailable for mining.

The volume of quarryable marble can be increased if the Company acquires the mineral rights to the road reserve, particularly if mining below the 780 feet level is practicable.



J.G. Olliver
Geologist
NON METALLIC MINERALS SECTION

JGO:EMD:AGK
16/12/64

APPENDIX I - GEOLOGICAL LOGS OF DIAMOND DRILL HOLES

DEPARTMENT OF MINES, ADELAIDE

DIAMOND DRILL LOG

PROJECT: S.A. Portland Cement Co. Ltd. D.M.: 205/64

BORE NO.: S-D.D.6

HUNDRED: Moorooroo SECTION: 506 DEPTH: 110 feet

BEARING S 82° W DEPRESSED: 30° DRILLER: K.Kalmar

DATE DRILLING COMMENCED: 7/8/1964 DATE DRILLING COMPLETED: 11/8/1964

LOG

Depth From Ft.	In.	To Ft.	In.	Core Recovered Ft.	In.	Description
Surface		4	6	2	0	Grey marble, fine to medium grained, with scattered black specks.
4	6	11	0	5	2	Grey to colourless marble, medium grained, with 8 joints yellow and brown stained.
11	0	11	10	0	10	Grey marble.
11	10	14	6	1	0	Grey marble, broken at top, with abundant ½" needles of white (weathered) amphibole.
14	6	16	9	1	9	Grey marble with brown bands up to 4" thick and abundant scattered black specks.
16	9	21	0	4	0	Grey to white marble (crystals 1/10") with scattered black specks, specks of pyrite and clusters of green actinolite needles.
21	0	23	1	1	4	Grey marble with brown layers up to 4 inches thick - jointed.
23	1	30	9	7	8	Grey marble with scattered black and green specks.
30	9	35	6	2	10	Grey marble with 3 jointed zones.
35	6	38	9	2	7	Fine white marble.
38	9	44	0	4	6	Yellow to orange marble, fine to medium grained, with scattered black specks.
44	0	48	4	3	9	White marble.
48	4	49	5	0	8	Yellow stained marble with black specks.
49	5	63	3	13	10	White marble.
63	3	65	11	1	0	Jointed brown marble with black specks.

Depth From Ft.	In.	To Ft.	In.	Core Recovered Ft.	In.	Description
65	11	74	6	8	7	Coarse white marble with several yellow stained joints.
74	6	110	0			Amphibolite schist.
						END OF HOLE 110 feet
						Total Core recovered in marble = 61 feet 6 inches.
						Core Recovery = 83%.

Bore logged by J.G. Olliver

Date 30/9/1964.

DEPARTMENT OF MINES, ADELAIDE

DIAMOND DRILL LOG

PROJECT: S.A. Portland Cement Co. Ltd. D.M.: 205/64

BORE NO.: S-D.D.7.

HUNDRED: Moorooroo SECTION: 506 DEPTH: 201 feet 10 inches

BEARING N 17° E DEPRESSED: 40° DRILLER: K. Kalmar

DATE DRILLING COMMENCED: 23/9/64 DATE DRILLING COMPLETED: 1/10/1964

LOG

Depth From Ft.	In.	To Ft.	In.	Core Recovered Ft.	In.	Description
Surface		18	6			Fine sand.
18	6	37	0			Mottled clay with 1 inch marble pebbles at base.
37	0	58	0			Green clay - weathered calc-silicate rock.
58	0	61	0			Black amphibolite.
61	0	106	6			Weathered green amphibolite with clay at the base.
106	6	111	3	4	7	Coarse white marble.
111	3	121	3	9	10	Coarse white marble, minor fissures in last 6 inches.
121	3	130	0	8	9	Coarse white marble with a fissure in top 2 inches and a brown stained seam in last 3 inches.
130	0	135	6	3	0	White marble with 6 yellow-stained joints.
135	6	145	5	8	11	White and pink marble with seams containing abundant specks of actinolite (green needles) biotite (black flakes) and minor pyrite (yellow).
145	5	152	2	6	4	Pink marble with several yellow-stained joints.
152	2	162	2	9	2	Pink marble with clusters of green actinolite needles (up to ½ inch long) and scattered black specks of biotite.
162	2	172	2	10	0	White marble with a few grey patches.
172	2	181	5	9	3	As above.
181	5	191	10	10	3	As above.
191	10	201	10	9	6	White marble with a few brown patches.
						END OF HOLE 201 feet 10 inches
						Total Core Recovered in Marble = 89 feet 7 inches.
						Core Recovery = 94%

Bore logged by J.G. Olliver Date 1/10/1964.

DEPARTMENT OF MINES, ADELAIDE

DIAMOND DRILL LOG

PROJECT: S.A. Portland Cement Co. Ltd. D.M.: 205/64

BORE NO.: S-D.D.8

HUNDRED: Moorooroo SECTION: 506 DEPTH: 200 feet 2 inches

BEARING: N 17° E DEPRESSED: 40° DRILLER: K. Kalmar

DATE DRILLING COMMENCED: 15/9/64 DATE DRILLING COMPLETED: 21/9/64

LOG

Depth From Ft.	In.	To Ft.	In.	Core Recovered Ft.	In.	Description
Surface		2	0			Fine sand.
2	0	18	4			Mottled clay.
18	4	20	0	1	8	White marble.
20	0	22	6	2	3	Coarse white marble with scattered green and black specks.
22	6	23	8	0	5	Rubbly marble.
23	8	27	10	4	2	Coarse white marble.
27	10	28	6	0	3	Rubbly marble.
28	6	29	10	1	4	Coarse white marble.
29	10	32	5	0	8	Rubbly marble.
32	5	32	9	0	4	Coarse whit marble.
32	9	33	5	0	8	Marble with a seam of red-brown clay.
33	5	43	0	9	7	Coarse white marble with grey streaks.
43	0	43	11	0	11	White marble.
43	11	45	4	0	10	Marble rubble with clay.
45	4	46	4	1	0	White marble.
46	4	47	10	1	0	Marble rubble with minor clay.
47	10	51	9	3	11	White marble.
51	9	53	0	0	9	Marble rubble and clay.
53	0	54	7	1	7	White marble.
54	7	55	3	0	4	Clay.
55	3	56	0	0	9	White marble.
56	0	60	0	4	0	White marble with grey streaks and scattered specks and clusters of mica and pyrite.
60	0	63	11	1	3	Clay with broken fissured marble.
63	11	64	10	0	11	White marble.
64	10	65	4	0	2	Fissured marble with a seam of clay.

Depth From Ft.	In.	To Ft.	In.	Core Recovered Ft.	In.	Description
65	4	73	0	7	5	White to grey marble with scattered specks of mica and pyrite. Several brown stained joints.
73	0	75	3	1	2	White marble - broken in places.
75	3	78	3	3	0	White marble.
78	3	82	0	2	2	Pink marble with some white patches and brown staining - broken in parts.
82	0	89	7	5	7	White marble, medium grain size with heavy red and brown staining which decreases with depth.
89	7	99	9	9	10	Coarse white marble with 3 yellow stained joints in upper portion.
99	9	110	0	9	5	Pale pink, grey and white marble.
110	0	121	2	11	2	White marble with pink and grey streaks.
121	2	123	10	1	8	Rubbly marble with brown staining.
123	10	133	10	9	7	White marble.
133	10	151	10	15	7	White to pale pink marble with a few yellow stained joints and a seam of clay from 141'6" to 141'10".
151	10	155	6	2	3	Brown stained marble, jointed in parts.
155	6	156	10	1	4	White marble.
156	10	176	10	17	10	Pale pink to white marble.
176	10	183	10	5	10	Pale pink marble with scattered green and black specks and clusters of green actinolite needles (up to ½" long).
183	10	200	2	16	4	Pink and white marble.
						END OF HOLE 200 feet 2 inches.
						Total Core Recovered in Marble = 158 feet 8 inches.
						Core Recovery = 87%.

Bore Logged by J.G. Olliver

Date 30/9/1964.

DEPARTMENT OF MINES, ADELAIDE

DIAMOND DRILL LOG

PROJECT: S.A. Portland Cement Co. Ltd. D.M.: 205/64

BORE NO.: S-D.D.9

HUNDRED: Moorooroo SECTION: 506 DEPTH: 203 feet

BEARING: N 17° E DEPRESSED: 40° DRILLER: K. Kalmar

DATE DRILLING COMMENCED: 7/9/1964 DATE DRILLING COMPLETED: 11/9/1964

LOG

Depth From Ft.	In.	To Ft.	In.	Core Recovered Ft.	In.	Description
Surface		8	0			Fine sand over clay.
8	0	14	0			Mottled clay.
14	0	22	7			Sand.
22	7	23	6	0	11	White marble.
23	6	28	3	4	9	Coarse white marble with several yellow stained joints.
28	3	28	9	0	5	Clay.
28	9	32	0	3	3	White marble.
32	0	42	0	10	0	White, pale pink and grey marble with scattered specks of black biotite and occasional pyrite.
42	0	46	0	3	9	
46	0	46	5	0	5	
46	5	48	4	1	11	Clay.
48	4	58	0	9	6	Pale pink and grey coarse marble with specks of mica and pyrite.
58	0	62	4	4	4	Pink and white marble.
62	4	66	9	1	2	Marble with 1 inch seams of clay.
66	9	73	6	6	9	Coarse white marble.
73	6	82	6	8	8	Coarse white marble with occasional specks of pyrite, mica and actinolite.
82	6	92	6	9	11	
92	6	102	6	9	9	Coarse white marble with greyish streaks.
102	6	112	0	9	3	
112	0	122	0	9	8	
122	0	128	8	6	2	As above with the last 3 inches of core - rubbly.
128	8	138	5	9	7	Coarse white marble with several yellow stained joints in the last 7 inches.
138	5	144	3	4	10	Coarse white marble with scattered specks and clusters of mica flakes. The last 1 foot of core is jointed with minor yellow staining.

Depth From Ft.	In.	To Ft.	In.	Core Recovered Ft.	In.	Description
144	3	154	4	9	8	Coarse white marble.
154	4	164	6	10	2	
164	6	174	7	10	1	
174	7	184	10	10	3	
184	10	195	1	10	3	
195	1	201	4	6	3	
201	4	203	0	0	3	Green micaceous amphibolite with specks of pyrite.

END OF HOLE 203 FEET

Total Core Recovered in Marble = 171 feet 11 inches.

Core Recovery = 95%.

Bore logged by J.G. Olliver

Date 30/9/1964.

DEPARTMENT OF MINES, ADELAIDE

DIAMOND DRILL LOG

PROJECT: S.A. Portland Cement Co. Ltd. D.M.: 205/64

BORE NO.: S-D.D.10

HUNDRED: Moorooroo SECTION: 506 DEPTH: 205 feet 5 inches

BEARING: N 17° E DEPRESSED: 40° DRILLER: K. Kalmar

DATE DRILLING COMMENCED: 28/8/1964 DATE DRILLING COMPLETED: 3/9/1964

LOG

Depth From Ft.	In.	Depth To Ft.	In.	Core Recovered Ft.	In.	Description
Surface		3	0			Fine sand.
3	0	14	5			Mottled clay.
14	5	15	2	0	9	Coarse white marble.
15	2	29	3	1	11	Marble rubble and seams of clay - less clay with depth.
29	3	30	0	0	9	Coarse white marble.
30	0	33	0	0	7	Marble with fissures.
33	0	35	0	2	0	Coarse white marble ($\frac{1}{4}$" crystals) with scattered black specks of iron oxide and minor yellow staining.
35	0	45	0	1	3	Broken fragments of marble.
45	0	50	3	4	11	White to pale grey marble with pink patches and scattered black specks.
50	3	52	3	1	2	Broken and sugary white marble with yellow staining.
52	3	53	2	0	1	Coarse white marble.
53	2	55	0	1	0	White marble rubble with brown clay.
55	0	55	8	0	8	Coarse white marble.
55	8	56	1	0	5	Marble rubble.
56	1	56	10	0	9	Coarse white marble.
56	10	57	1	0	3	Clay and marble rubble.
57	1	57	5	0	4	Marble with yellow stained fissures.
57	5	57	11	0	6	Clay with minor marble rubble.
57	11	59	8	1	9	White marble - sugary in parts.
59	8	60	6	0	10	Clay.
60	6	64	5	0	5	Marble rubble.
64	5	65	0	0	7	Coarse white marble.
65	0	66	1	1	1	Coarse light grey marble.

Depth From Ft.	In.	To Ft.	In.	Core Recovered Ft.	In.	Description
66	1	70	0	0	9	Clay.
70	0	71	5	0	7	Sugary marble.
71	5	71	9	0	4	Coarse light grey marble.
71	9	77	8	4	8	Coarse white marble with a few yellow stained joints and minor staining on crystal faces.
77	8	79	8	0	7	Rubbly and sugary white marble.
79	8	82	3	0	2	Clay.
82	3	93	6	7	11	Coarse white marble with several fissures and zones of yellow staining.
93	6	95	10	2	4	Coarse white marble.
95	10	104	7	2	1	Coarse white marble - broken, intensely jointed.
104	7	115	7	6	6	Coarse white to grey marble with zones containing scattered black and green specks.
115	7	123	8	0	8	Marble rubble.
123	8	125	4	1	8	Coarse white marble.
125	4	128	10	0	6	Marble rubble.
128	10	144	2	14	4	White marble with occasional green and black specks.
144	2	145	4	0	8	Marble rubble.
145	4	147	2	1	10	White marble.
147	2	149	1	0	4	Marble rubble.
149	1	151	10	2	9	White marble.
151	10	161	10	8	11	White marble with pale brown patches and yellow staining and scattered specks of mica and actinolite.
161	10	170	9	6	0	White marble with several jointed zones.
170	9	205	5	34	4	Coarse white marble with occasional specks of mica, iron oxide or actinolite.

END OF HOLE 205 feet 5 inches.

Total Core Recovered in Marble = 119 feet 11 inches.

Core Recovery = 63%

Bore logged by J.G. Olliver Date 30/9/1964.

DEPARTMENT OF MINES, ADELAIDE

DIAMOND DRILL LOG

PROJECT: S.A. Portland Cement Co. Ltd. D.M.: 205/64

BORE NO.: S-D.D.11

HUNDRED: Moorooroo SECTION: 506 DEPTH: 202 feet

BEARING: N 17° E DEPRESSED: 40° DRILLER: K. Kalmar

DATE DRILLING COMMENCED: 20/8/1964 DATE DRILLING COMPLETED: 26/8/1964

LOG

Depth From Ft.	In.	To Ft.	In.	Core Recovered Ft.	In.	Description
Surface		9	0			Fine sand.
9	0	24	0			Red clay.
24	0	28	8	4	6	Coarse white marble.
28	8	29	8	0	4	Brown clay.
29	8	36	8	7	0	Coarse white marble with occasional black specks and minor yellow staining.
36	8	37	6	0	8	Broken and fissured marble with clay.
37	6	74	6	34	10	Coarse white to grey marble with occasional yellow stained fissure.
74	6	76	1	0	3	Broken and fissured marble.
76	1	78	0	1	11	Coarse white marble.
78	0	80	0	1	5	Green weathered amphibolite.
80	0	91	11	11	11	Coarse white marble.
91	11	95	10	3	11	Jointed white marble.
95	10	96	11	1	1	Coarse white marble.
96	11	97	11	1	0	Jointed white marble.
97	11	157	10	59	11	White to pale grey marble with occasional black specks.
157	10	158	2	0	4	Jointed and yellow stained white marble
158	2	159	5	1	3	Coarse white marble.
159	5	167	8	7	0	White sugary marble - jointed in parts with some yellow staining. Fine to medium grain size.
167	8	202	0	33	9	Coarse white marble.

END OF HOLE 202 Feet

Total Core Recovered in Marble = 169 feet 11 inches.

Core Recovery = 96%

Bore logged by J.G. Olliver Date 30/9/1964.

DEPARTMENT OF MINES, ADELAIDE

DIAMOND DRILL LOG

PROJECT: S.A. Portland Cement Co. Ltd. D.M.: 205/64

BORE NO.: S-D.D.12

HUNDRED: Moorooroo SECTION: 506 DEPTH: 151 feet 3 inches

BEARING: N 17° E DEPRESSED: 40° DRILLER: K. Kalmar

DATE DRILLING COMMENCED: 12/8/1964 DATE DRILLING COMPLETED: 19/8/1964

LOG

Depth From Ft.	In.	To Ft.	In.	Core Recovered Ft.	In.	Description
Surface		14	0			Fine sand.
14	0	22	0			Red clay.
22	0	26	3			Red sand.
26	3	41	0			Mottled grey and red clay with rounded pebbles of marble and ironstone at base.
41	0	45	0			Clay with some marble core (probably marble boulder).
45	0	59	0			Grey clay with white soft marble rubble
59	0	99	2	40	2	White marble (crystals up to ¼ inch) with scattered brown specks occasionally concentrated into bands.
99	2	101	3	1	0	Jointed marble with yellow staining.
101	3	122	3	20	0	Coarse white marble with 4 joints near top with minor yellow staining.
122	3	128	0	5	5	Pink and white marble with 9 yellow stained joints.
128	0	129	3	1	0	White marble, sugary in parts with yellow staining on crystal faces and on 3 joints.
129	3	149	3	18	3	Coarse white marble with occasional specks, in places concentrated in bands.
149	3	151	3	1	7	Jointed yellow stained white marble.
						END OF HOLE 151 feet 3 inches.
						Total Core Recovered in Marble = 87 feet 3 inches
						∴ Core Recovery = 95%

Bore logged by J.G. Olliver

Date 30/9/1964.

DEPARTMENT OF MINES, ADELAIDE

DIAMOND DRILL LOG

PROJECT: S.A. Portland Cement Co. Ltd. D.M.: 205/64

BORE NO.: S-D.D.13

HUNDRED: Moorooroo SECTION: 506 DEPTH: 281 feet 7 inches.

BEARING: E 72° S DEPRESSED: 30° DRILLER: K. Kalmar.

DATE DRILLING COMMENCED: 7/10/1964 DATE DRILLING COMPLETED: 16/10/64

LOG

Depth From Ft.	In.	To Ft.	In.	Core Recovered Ft.	In.	Description
Surface		48	5	44	5	Coarse white to light grey marble with scattered specks of mica and iron oxide. Several yellow-stained joints with red clay in one at a depth of 5 feet.
48	5	50	5	0	8	White marble, rubbly with yellow staining.
50	5	83	2	32	9	Coarse white marble with occasional specks of mica and pyrite.
83	2	85	2	1	1	White marble with thin layers of red, yellow limonite cubes pseudomorphous after pyrite.
85	2	127	9	40	10	Coarse white to pale grey marble with scattered specks of mica, pyrite and iron oxide occasionally concentrated in patches.
127	9	128	6	0	5	Marble rubble with clay.
128	6	130	6	2	0	White marble.
130	6	135	1	4	2	Yellow stained sugary marble.
135	1	260	0	117	9	White to pale grey marble with occasional scattered specks of pyrite, mica and rare yellow-stained fissures.
260	0	260	7	0	4	White marble, yellow stained and slightly sugary.
260	7	262	7	2	0	White marble.
262	7	264	7	0	11	Sugary yellow stained marble.
264	7	280	9	5	4	White marble - broken and jointed.
280	9	281	7	0	6	Sugary marble minor yellow staining.
						Hole stopped at 281 feet 7 inches.
						Total Core Recovered 252 feet 3 inches
						∴ Core Recovery = 90%

Bore logged by J.G. Olliver

Date 17/11/1964.

APPENDIX II

RESULTS OF CHEMICAL ASSAYS

BORE S-D.D.6

Interval	11'10"-14'6"	14'6"-16'9"	21'0"-23'1"	38'9"-44'0"	63'3"-65'11"
Total Carbonate	87.9	88.4	92.0	93.8	96.3
Loss on Ignition	39.04	39.77		42.0	
SiO_2	7.48	4.94		3.42	
Fe_2O_3	0.65	5.08		0.71	
Al_2O_3	1.96	0.65		0.12	
P_2O_5	0.11	0.05		-	
TiO_2	0.06	0.02		0.04	
CaO	48.67	49.10		52.51	
MgO	0.98	0.83		0.22	

Y

BORE S-D.D.7 BORE S-D.D.8

Interval	135'6"-145'5"	152'2"-162'2"	78'3"-89'7"
Total Carbonate	93.7	95.6	90.7
Loss on Ignition	41.04	42.40	40.63
SiO_2	3.12	1.70	5.51
Fe_2O_3	1.12	0.55	1.01
Al_2O_3	1.00	0.47	1.67
P_2O_5	0.05	0.05	0.06
TiO_2	0.05	0.00	0.05
CaO	50.86	52.79	50.27
MgO	1.23	1.25	0.45

BORE S-D.D.10 S-D.D.12

Interval	47'0"-50'3"	65'0"-71'9"	151'10"-161'10"	195'5"-205'5"	92'0"-98'0"
Total Carbonate	not det.	not det.	95.0	96.3	97.3
Loss on ignition	13.40	29.5			
SiO_2	8.50	22.1			
Fe_2O_3	68.4	7.0			
Al_2O_3	8.4	6.9			
P_2O_5	not det.	not det.			
TiO_2	not det.	not det.			
CaO	0.6	29.2			
MgO	not det.	not det.			

APPENDIX III

PLATES

Plate 1: Diamond Drill rig, at bore S-D.D. 6.

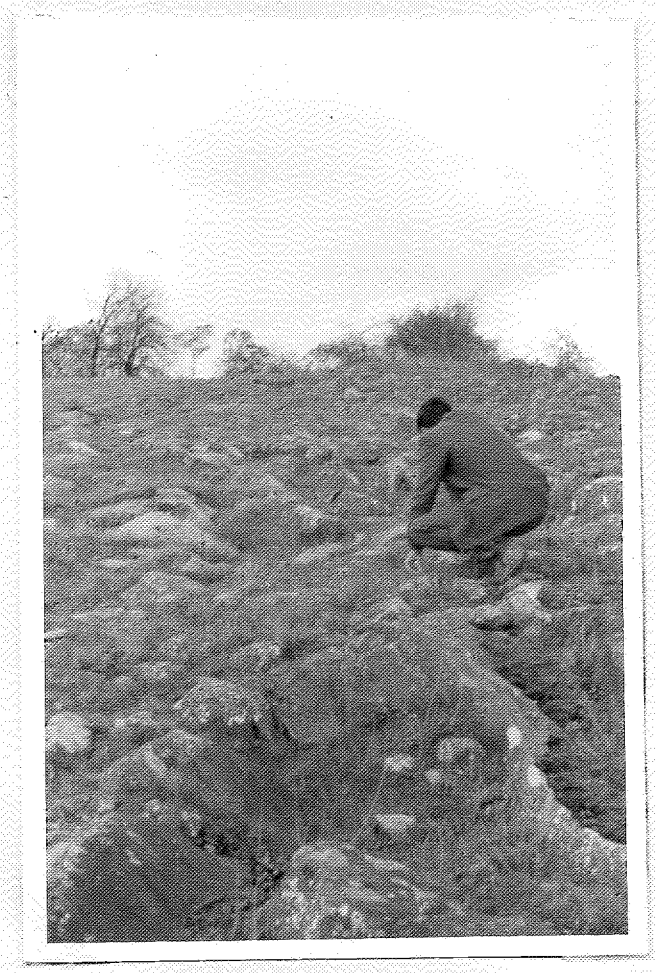


Plate 2: Typical marble outcrop, Bald Hill area.

Plate 3: Bald Hill Quarry - August 1964. The dark calc-silicate zone is exposed in the quarry face above the front-end loader (centre-left).


S.A. DEPT OF MINES
BALD HILL MARBLE DEPOSIT
HD. MOOROOROO PT. SEC. 506
S.A. PORTLAND CEMENT CO. LTD.
GEOLOGICAL PLAN & SECTIONS
To accompany report by J.G. Olliver & J.N. Cramsie
L64-22
Date 11-2-64
LEGEND
Recent
Alluvium
Cambrian
Marble
White, pale grey & pale cream with minor pink
Calc-silicate rock (Hornfels)
Mica Schist
Ironstone
Inferred boundary of Marble
Strike & dip of bedding
Vertical
Quarry
Fence
Halco drill hole
Diamond drill hole
Current drilling Program
Outcrop sample localities
Arbitrary datum, contour interval 10ft. Scadia Field Books 242 & 254
LOCALITY PLAN
Angaston
S.A. Portland Cement Co. Quarry
Area Mapped
Scale 1inch to 1 mile
Areas for which reserves are calculated
Scale 1 inch to 1000 feet
BALD HILL QUARRY
SEC. 506
Water bore
0-23' clay
23'-74' white marble
Vines
Orchard
Vines & Orchard
Mostly pink marble
Scattered
Outcrop
House
Shed
Fence
900' level
840' level
SCALE
Feet
Feet

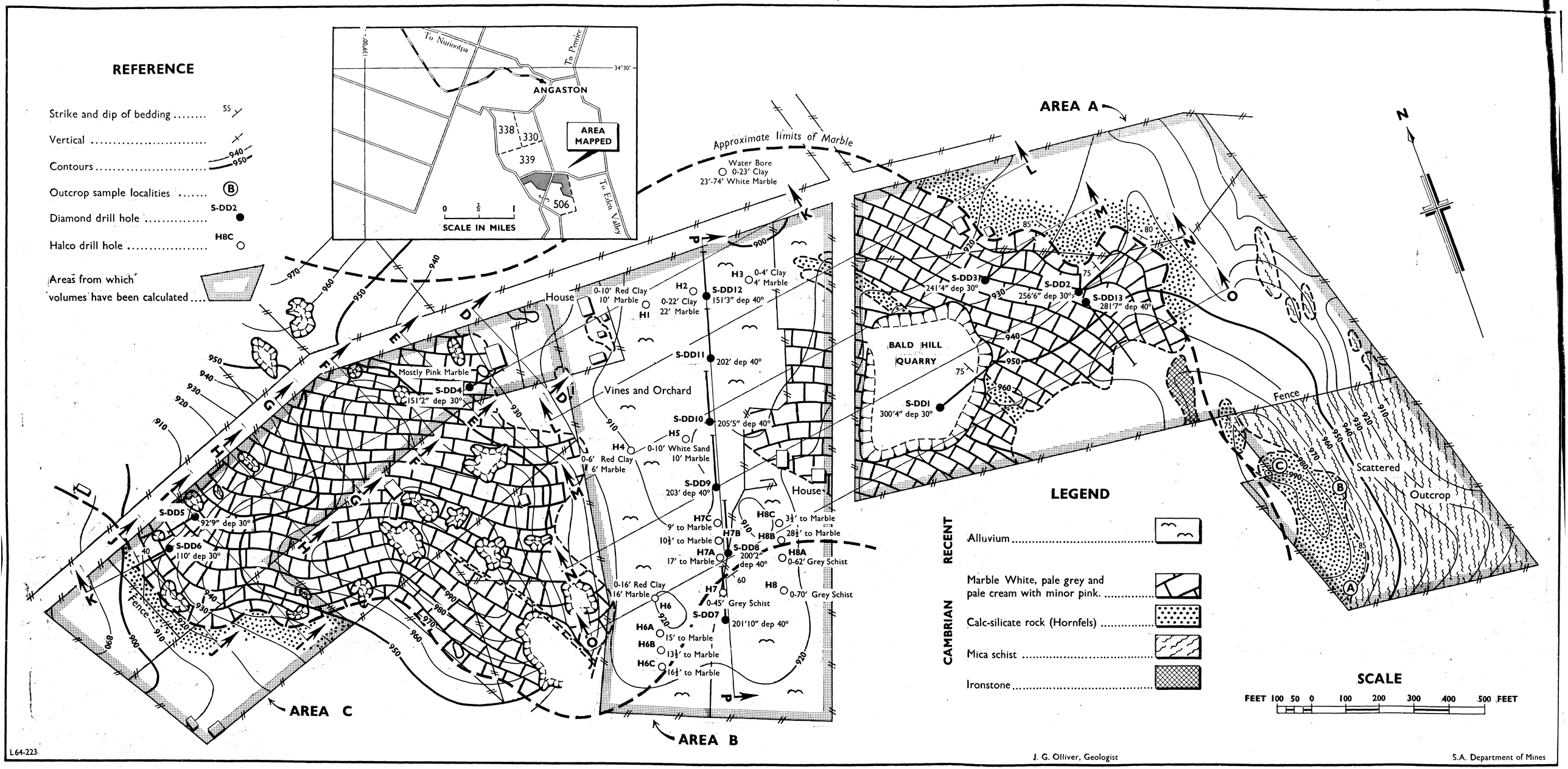
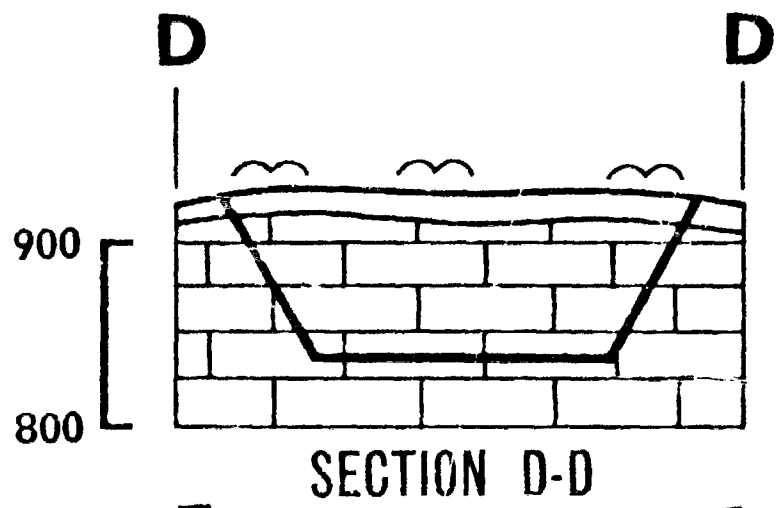
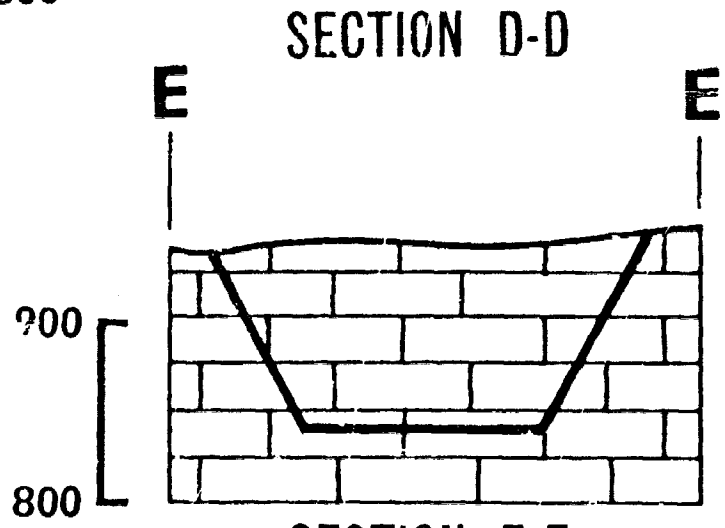


Fig. 1—GEOLOGICAL PLAN showing MARBLE DEPOSIT Hd. Moorooroo Part Sec. 506.



SECTION D-D



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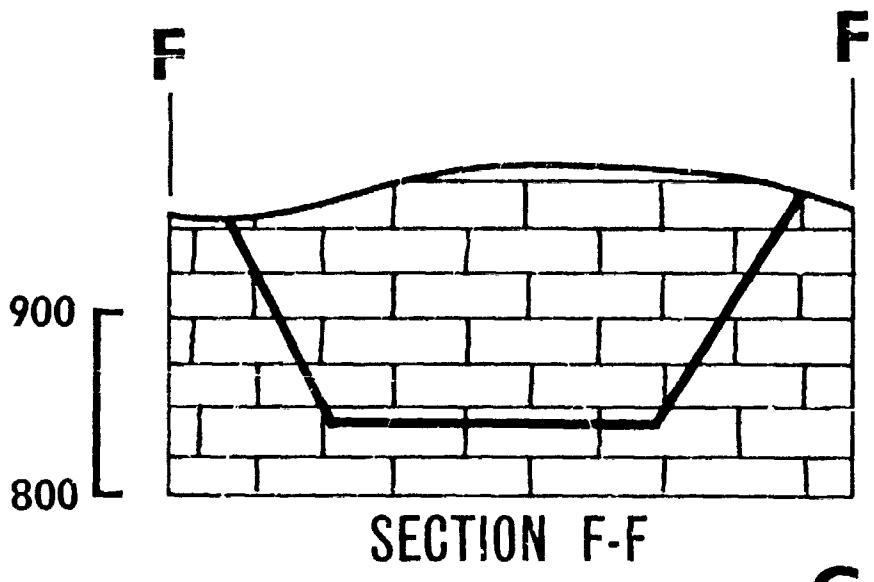
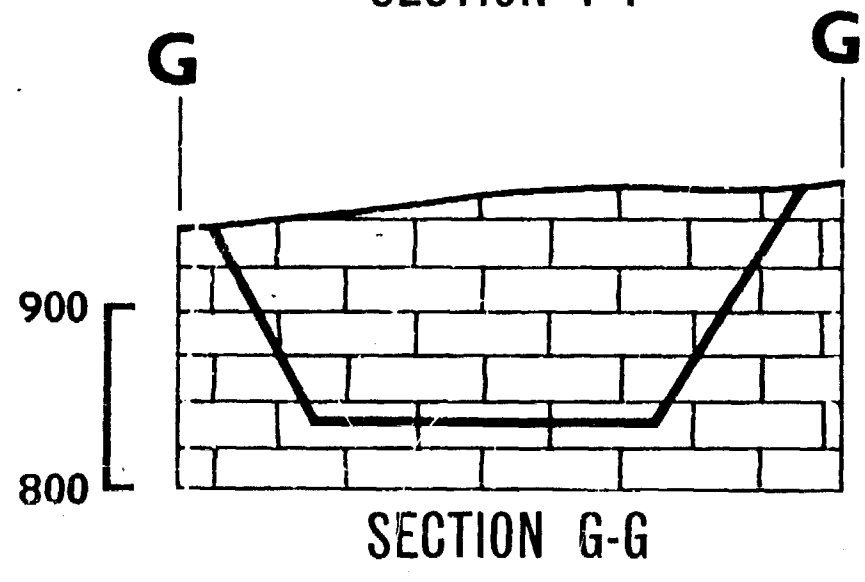
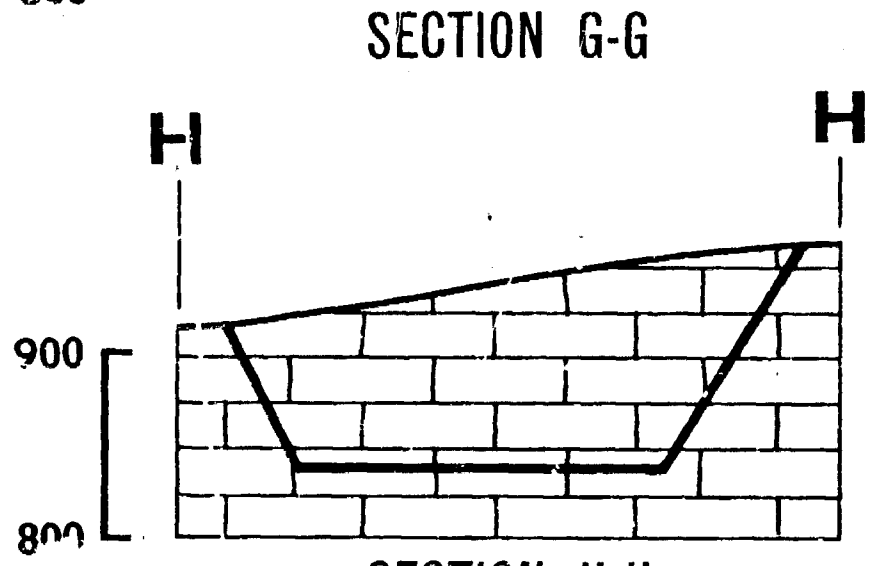


SECTION F-F



SECTION G-G



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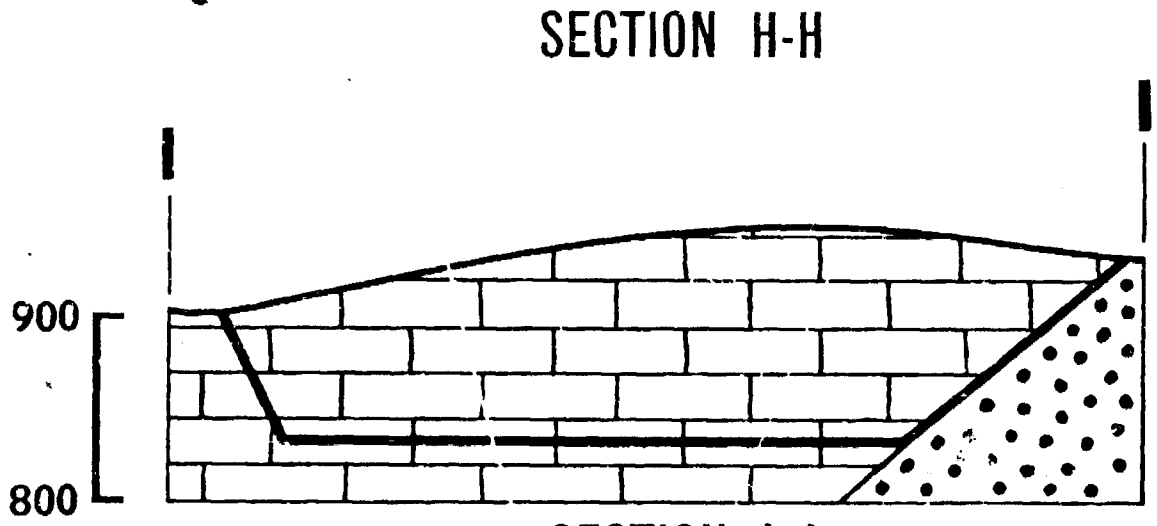
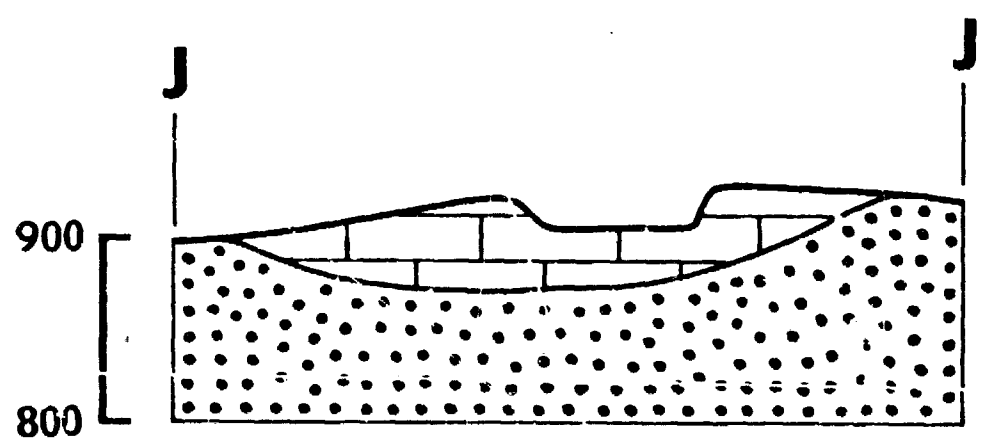
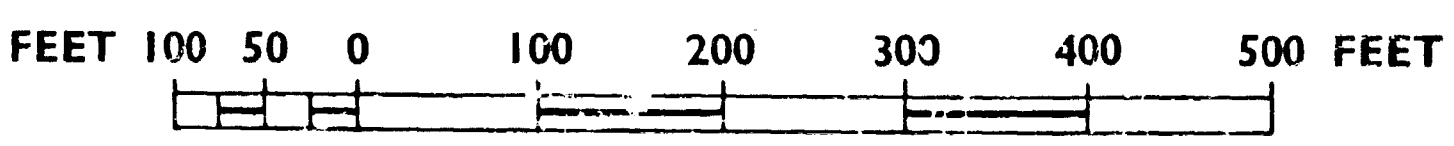


SECTION I-I



SECTION J-J

SCALE



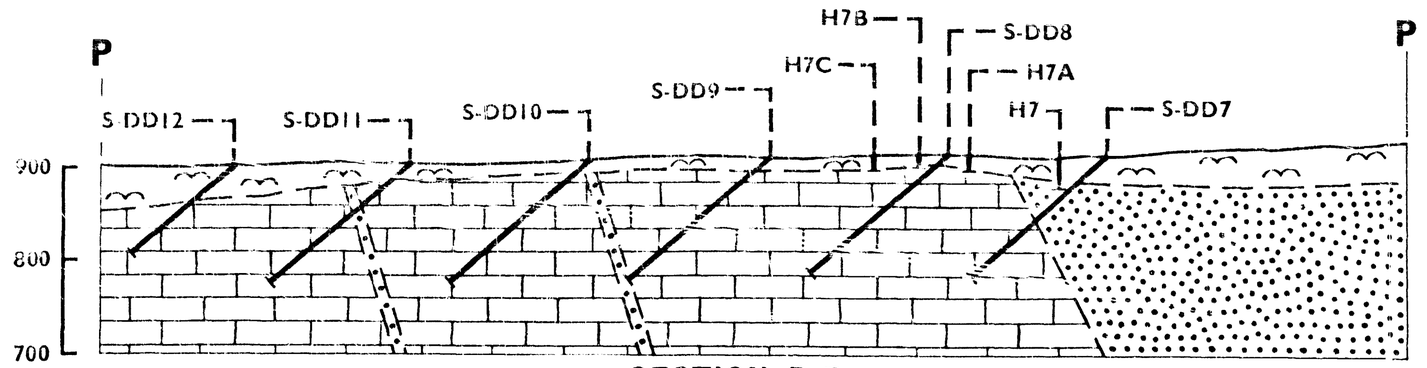
NOTE: VERTICAL SCALE IN FEET

For Legend see Fig. 1.

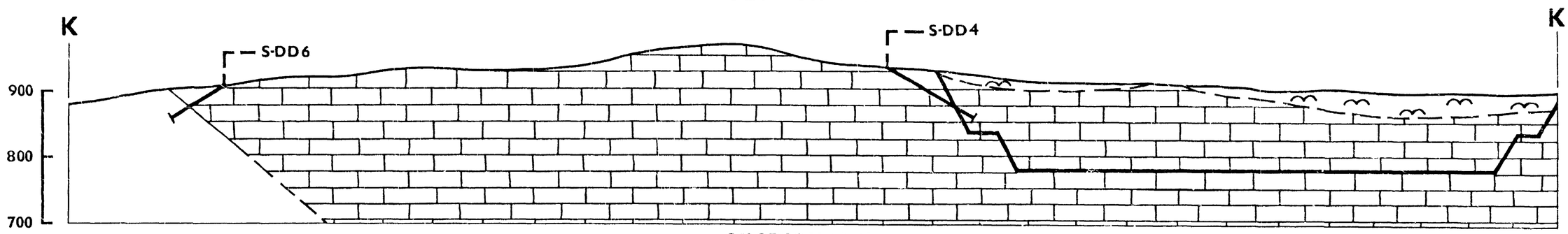
L64-223 A J. G. Olliver, Geologist S.A. Dept. of Mines

REDUCE to 7"

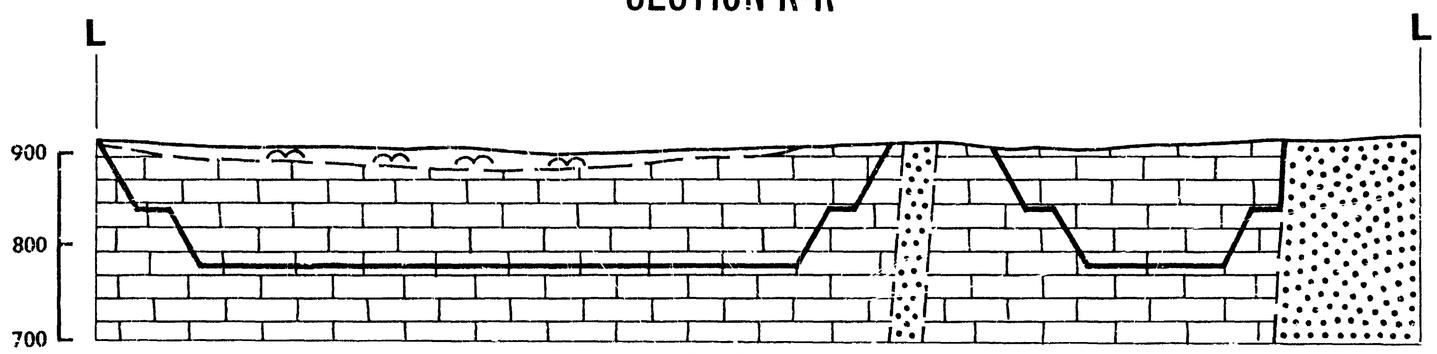
PLAN SHOWING
CROSS SECTIONS OF
BALD HILL MARBLE DEPOSIT R.121



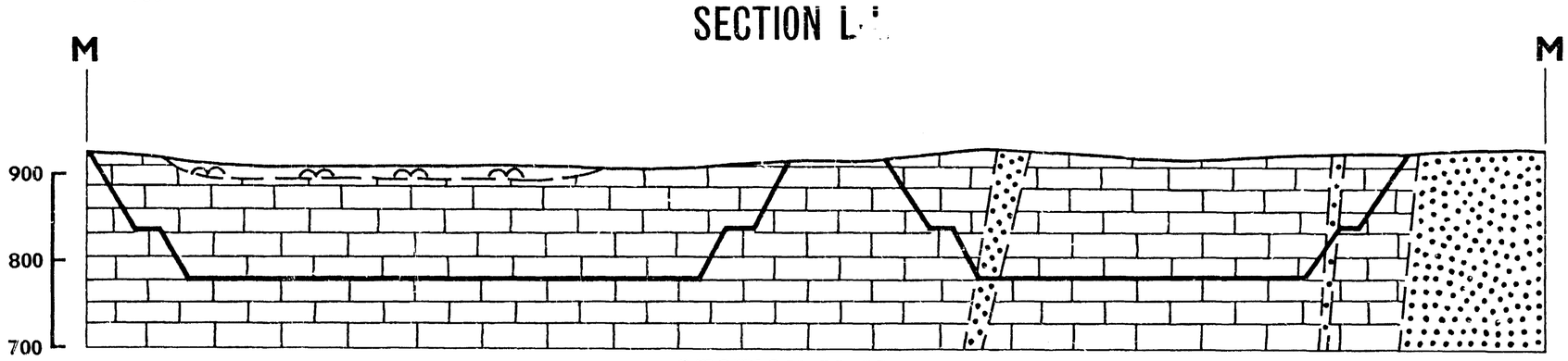
SECTION P-P



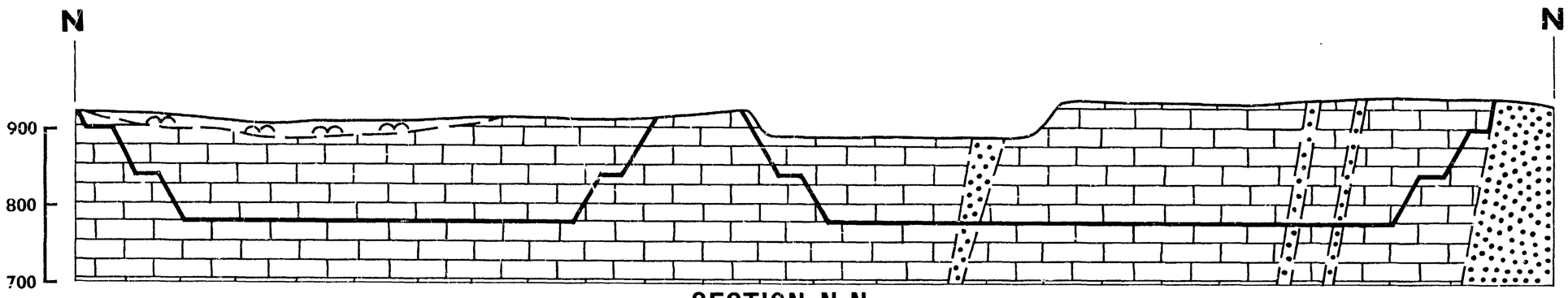
SECTION K-K



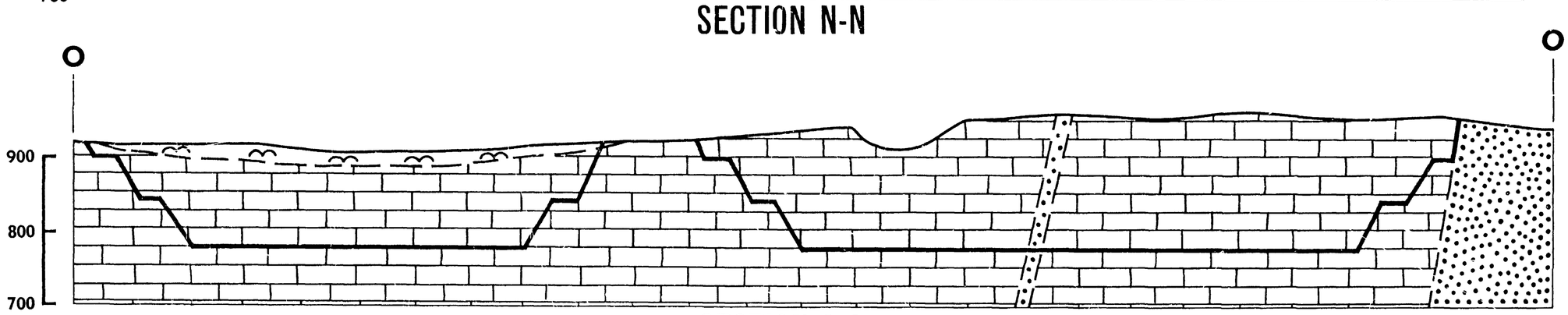
SECTION L-L



SECTION M-M



SECTION N-N



SECTION O-O

SCALE

FEET 100 50 0 100 200 300 400 500 600 700 FEET

NOTE: VERTICAL SCALE IN FEET

For Legend see Fig. 1.

J. G. Olliver, Geologist