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BRICK SHALE RESOURCES, PORTIONS 192 and 193, NEAR BUNGENDORE, PARISH OF MAJURA, COUNTY OF MURRAY, NEW SOUTH WALES.

by

D.E. Gardner

The information contained in this report has been obtained by the Department of National Development, as part of the policy of the Commonwealth Government, to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

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INTRODUCTION

In a brief report on the results of reconnaissance augering carried out in 1962 it was indicated that probably at least 300,000 cubic yards of brick shale could be won from an area, 900 feet square, that lies mainly within the north-eastern corner of Portion 192 (Gardner, 1965).

In response to a request from the Queanbeyan Brick and Tile Co., additional augering was planned and supervised, with the object of establishing reserves of at least 300,000 cubic yards within Portions 192 and 193. The augering was done on 29th June, 1965; the position of the auger holes are shown on Plate 2 which accompanies this report, and logs of auger holes are given in Appendix 1. Plate 1 is a locality map.

AUGERING

Augering was done along two lines set out on bearing 090 degrees magnetic, one 900 feet and the other 1500 feet south of a railway crossing at the north-eastern corner of Por. 192. Each line starts at the railway fence and runs westward from it, down sloping ground to the edge of flat country perhaps 50 feet lower in elevation.

The equipment used was a Gemco continuous spiral power auger with flights, or extensions, each 6 feet long. At the limit of augering, the top of the last flight is 2 feet above ground level, and hence the depth augered, assuming that the last flight has been drilled down to a maximum depth, is 4 feet plus multiples of 6 feet.

The augering was carried out in two stages. In the first stage, the holes designated by odd numbers were drilled to a depth of 10 feet (two flights); excepting hole N1 which went down to 16 feet (3 flights), and hole S1 which was stopped by hard siliceous shale at a depth of 4 feet. In the second stage of augering, holes were drilled to 22 feet (4 auger flights), excepting hole N8 which went down to 34 feet (six flights) and hole N10 on the flat, which penetrated to 10 feet (two flights).

It is considered that holes at 200-foot intervals along each sampling line are adequate to establish the average thickness of usable weathered shale. Consequently, when calculating reserves the average depth of the even-numbered holes only (less overburden thickness) has been taken as the average depth of brick-making shale. The 10-foot deep hole N10, on level ground, has also not been included. The shallower, odd-numbered, holes provide more information than the even-numbered holes alone would on the range of properties of the weathered sediments in the deposit.

In all holes, excepting hole S1, the auger was penetrating rapidly at the maximum depth, and presumably could have drilled deeper.

DISTRIBUTION OF BRICK SHALE

A band of feldspathic sandstone about 20 feet thick runs northward through the boundary between Portions 192 and 193 at a point 350 feet west of the railway fence.

East of the sandstone, shale suitable for brickmaking is interbedded with thin beds of sandstone and thin bands of silicified shale. Three of the seven holes drilled passed through satisfactory shale, one passed through shale interbedded with thin bands of sandstone and siltstone, two through hard silicified bands one eigth to one half an inch thick, and one hole terminated at 4 feet in hard silicified shale.

West of the sandstone, the strata consist almost entirely of thinly laminated shale, similar to that in the creek bed which has been made into very satisfactory trial bricks. Possibly a few interbeds of sandy and silty shale, which should be quite acceptable for brickmaking, are present. All auger holes were drilled in laminated shale; four of them intersected thin veinlets of quartz.

OVERBURDEN

Overburden, composed of soil, sand and detrital fragments, ranges in thickness from 2 to 4 feet. It could readily be stripped off by mechanical equipment.

QUANTITIES

The area east of the sandstone band probably could be worked selectively for brick shale, after costeaning to expose the bands of hard silicified shale. No estimate of quantities has been made for that area.

For the area west of the sandstone band estimates are given below, of dimensions for proved, probable, and indicated resources.

Proved Resources

Length. The auger lines are nearly at right angles to the strike of the beds, which is substantially uniform throughout the area; it is considered that the proved length of the shale locality is at least 900 feet, i.e. the distance from line N to the current working pit, about 300 feet south of Line S.

Width. The proved width is 500 feet at line N and 400 feet at line S.

Thickness. The limit in depth of the brick shale is the depth to which the shale is weathered. As explained under Augering, the deeper holes designated by even numbers were drilled to establish the thickness. The deepest hole, N8, was terminated at a depth of 34 feet, in completely weathered shale. The mean thickness is 21 feet.

Quantity. Using the dimensions given above, the proved resources amount to 315,000 cubic yards. Much of this is in sloping ground, in which a pit could be easily worked.

Probable Resources.

In estimating probable resources, the dimensions are increased as follows:-

Length. The probable length along the strike of the beds is extended 300 feet (half the distance between the auger lines) northward from line N; probable length is 1200 feet.

Width. Probable average width is assumed to be the width of shale proved along line N, viz. 500 feet.

Thickness. Probable average thickness of shale is obtained by assuming that the probable thickness at each of the deeper holes is the average of the proved thickness at that hole and the proved thickness at hole N8; the estimated probable thickness is 26 feet.

Quantity. Using these dimensions, probable resources amount to 570,000 cubic yards. As is the case with proved resources, a large proportion of the probable resources is in sloping ground where a pit can be readily worked.

Indicated Resources

Length. It is assumed that the shale west of the sandstone bed extends through Portions 192 and 193, viz. for a distance of 2400 feet.

Width. It is assumed that the average width of the shale is at least equal to the known width along auger line N, viz. from auger hole N5 westward to the shale outcropping in the creek bed; this is a little greater than 600 feet.

Thickness. The assumed thickness is that estimated under Probable Resources viz. 26 feet.

Quantity. Indicated resources estimated on the basis of these figures amount to 1,300,000 cubic yards. Much of this shale occurs in flat country; in working a pit, equipment would be needed to remove surface water that would enter the pit in wet weather.

Summary of Resources and Dimensions

Dimensions of Area that could be Worked for Brick Shale (feet)			Estimated Resources Cubic Yards.
Length	Width	Thickness	
Proved			
900	Average 450	Average 21	315,000
Probable			
1200	500	Average 26	570,000
Indicated			
2400	600	26	1,300,000

REFERENCE

GARDNER, D.E., 1965: Brick shale at railway crossing, 3.4 miles south-south-west of Bungendore, N.S.W. Bur.Min.Resour.Aust.Record 1965/121 (Unpubl.)

APPENDIX 1.

Shale Locality, Portion 192 and 193, Parish Majura, County of Murray, N.S.W.
Logs of Auger Holes

The locations of holes are shown in Plate 2.

Hole No.	Depth (ft.) From	To	Description
N1	0	1	Sandy soil and vein quartz
	1	4	Sand and clay, and fragments of sandstone, and vein quartz.
	4	5	Decomposed shale, occasional small fragments of vein quartz.
	5	9	Decomposed pale yellow shale, no vein quartz found.
	9	10	Pale cream decomposed shale.
	10	14	Pale brown decomposed shale; fragments of harder darker shale at about 13 feet.
	14	16	Pale cream decomposed shale.
N2	0	2	Sandy soil and hard fragments.
	2	4	Decomposed sandy shale.
	4	10	Decomposed yellow shale with hard silicified bands.
	10	22	Yellow weathered shale. Thin band of hard silicified shale at 17 feet.
N3	0	3	Fine sand and some decomposed shale.
	3	8	Purple shale, small fragments of sand.
	8	10	Purple decomposed shale, small fragments of very fine sand or silt.
N4	0	3	Sandy soil and hard fragments.
	3	10	Purple and salmon coloured decomposed shale.
	10	22	Creamy grey decomposed and weathered shale, smooth feel.

Silty.

Hole No.	Depth (ft.) From	To	Description
N5	0	1	Sandy soil and fragments of sandstone.
	1	3	Sandy and decomposed shale fragments.
	3	7	Pale yellow or cream-yellow decomposed shale, smooth feel.
	7	10	Pale purple shale (decomposed and weathered).
N6	0	2½	Sand and hard fragments.
	2½	6	Mustard yellow decomposed shale, smooth feel.
	6	16	Weathered shale. Pale purple at 7'.
	16	22	Creamy grey decomposed and weathered shale, smooth feel.
N7	0	½	Soil
	½	2½	Pale yellow sand.
	2½	10	Pale yellow-brown decomposed shale. Quartz vein at 8'
N8	0	1	Soil and hard fragments.
	1	2½	Sand and small fragments.
	2½	10	Pale yellow brown decomposed shale, slightly silty, changing to cream yellow at 4 feet. Vein of quartz at 7 feet.
	10	12	Cream white decomposed shale.
	12	20	Pale brown shale, weathered.
	20	34	Creamy yellow shale, weathered.
N9	0	1	Sandy soil and hard rock fragments.
	1	2½	Sand and small rock fragments.
	2½	10	Decomposed shale. Pale yellow. Smooth feel. Quartz stringer at 8 feet.
N10	0	1	Sandy soil.
	1	2	Sand and clay.
	2	3	Decomposed shale, pale yellow.
	3	4	Decomposed shale, light brown.
	4	10	Smooth decomposed shale, mustard yellow.

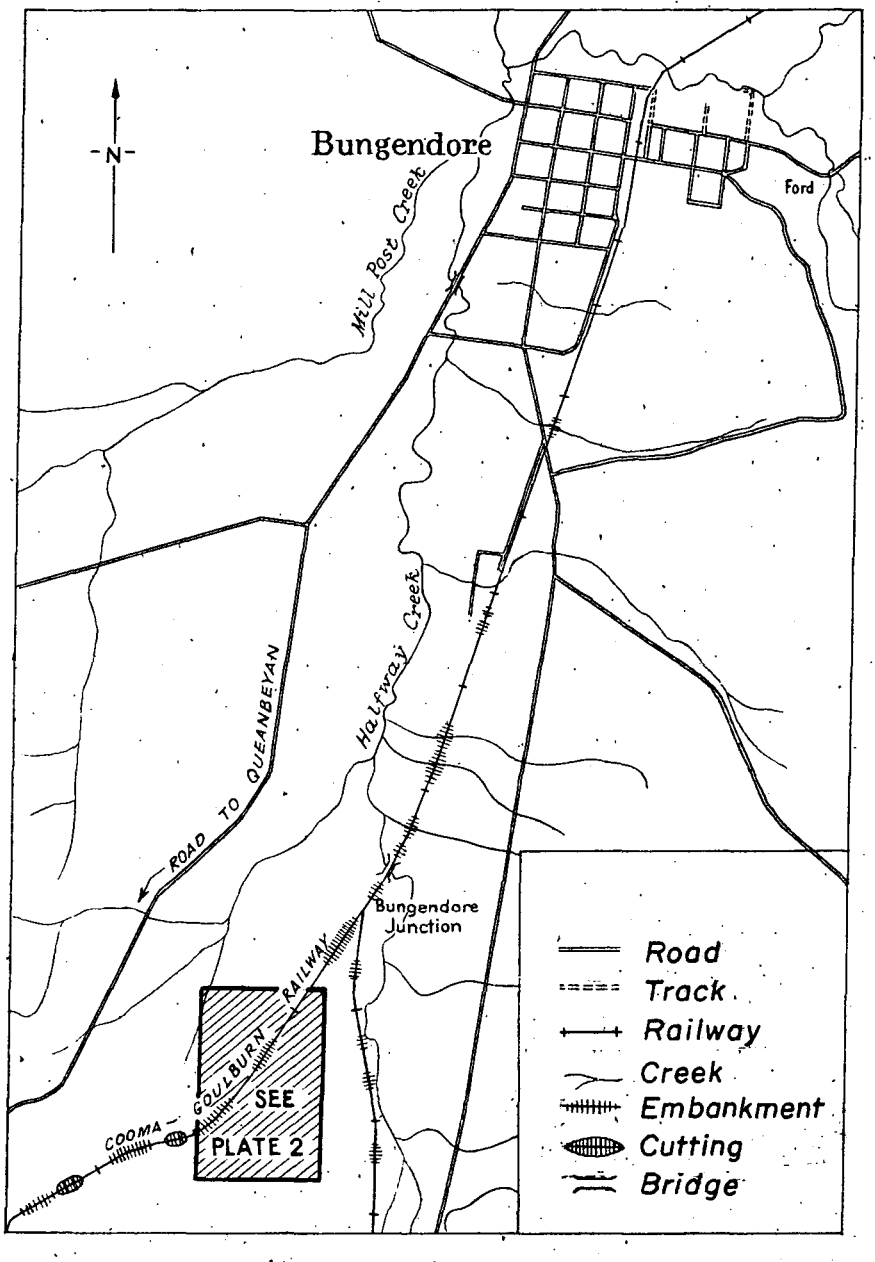
Hole No.	Depth (ft.) From	To	Description
S1	0	2	Sandy soil with hard fragments.
	2	4	Decomposed shale with hard silicified bands. Auger refused at 4 feet.
S2	0	2½	Sandy soil and hard fragments.
	2½	22	Creamy coloured decomposed shale, smooth feel. Changes to pale brown at 6 feet. Changes to creamy yellow at 10 feet. Changes to a creamy and salmon colour at 15', down to 21'6".
S3	0	2½	Sandy soil
	2½	4	Decomposed shale yellow brown.
	4	10	Mustard yellow decomposed shale. Quartz vein 5-8 feet.
S4	0	3	Soil and hard fragments.
	3	11	Decomposed shale, cream yellow. Salmon purple and smooth at 7 feet.
	11	22	Weathered cream yellow shale and salmon coloured shale.
S5	0	3	Sand and hard fragments.
	3	5	Decomposed shale, pale brown.
	5	7	Decomposed shale, purplish.
	7	10	Decomposed shale, salmon coloured.
S6	0	3½	Sandy soil and subsoil with hard fragments.
	3½	8	Decomposed shale, pale brown.
	8	14	Creamy yellow, smooth decomposed shale.
	14	22	Weathered shale, creamy yellow.
S7	0	3½	Sandy soil and subsoil.
	3½	5	Decomposed shale.
	5	10	Cream coloured, smooth decomposed shale.

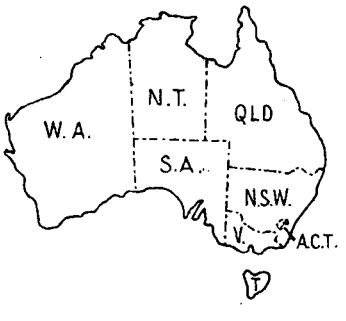
PLATE 1

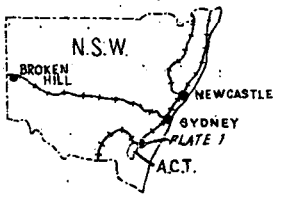
LOCALITY MAP

SCALE 1:50,000

1 0·5 0 1 MILE



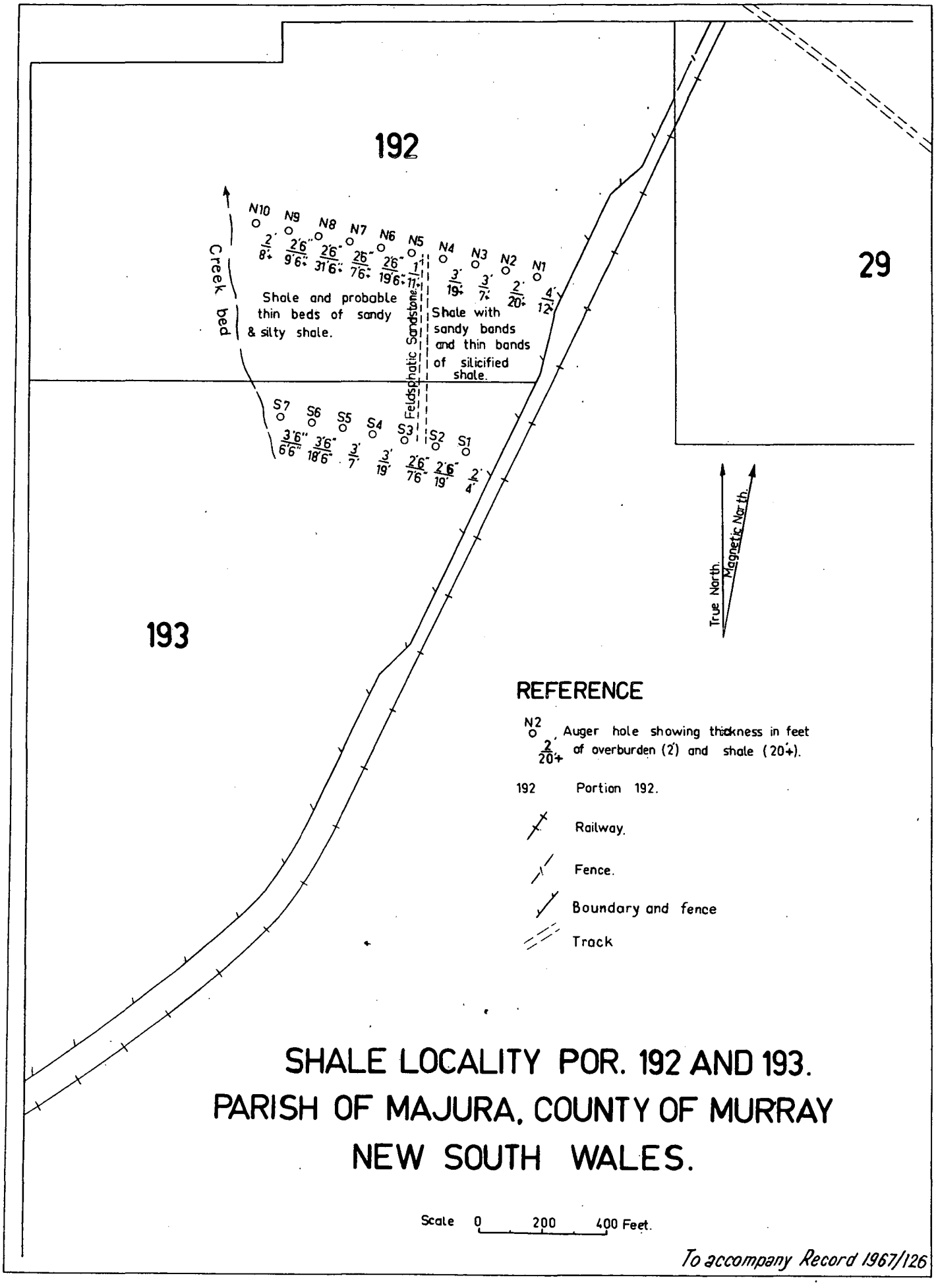




To accompany Record 1967/126

I55/A16/449

Plate 2



REFERENCE

N2 / 2' / 20'+ — Auger hole showing thickness in feet of overburden (2') and shale (20'+).

192 — Portion 192.

Railway.

Fence.

Boundary and fence

Track

SHALE LOCALITY POR. 192 AND 193. PARISH OF MAJURA, COUNTY OF MURRAY NEW SOUTH WALES.

Scale 0 200 400 Feet.

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