Report for Boss Energy on Saggers Hill (Area 1) Shallow Resource EL 20/2004

Mike Blake, August 2009

Executive Summary

The following review of shallow resources at the Saggers Hill (Area 1) locality of EL20/2004 shows that the potential for expansion of these resources may be 0.5 to 1 million tonnes of open-cuttable oil shale. The occurrence of shallow oil shale in the immediate area is tightly constrained by topography and geology and further increases of shallow resources beyond 1MT is unlikely. Further potential exists to the north. A suggested drilling program to test for the extension of shallow shale resources at Saggers Hill has preliminary costing of $36,000.

Introduction

Recently a review has begun of shallow resources across the Latrobe tenement. The intent is to bring Boss Energy's understanding of shale assets up to date, identify any areas of shale potential previously overlooked, and recommend ongoing work programs. The Saggers Hill area, shown in Figure 1, is examined here and has been termed Area 1 in previous work and resource estimations. This document is focused on shallow resources with open cut potential, and does not consider deep resources in this area. It could be assumed therefore, that deep resources would remain unchanged unless some of those resources are shown to be shallow.

Previous resource estimate

Previous resource estimates for this area of 0.57 million tonnes (<20mdepth) shale were presented by CRA Exploration LTD in 1992.
The corresponding area is referred to as West Saggers Hill, Area 1, shown in figures 1 and 5. Calculations were presented as 'order of magnitude' geologically indicated resource potential. Within the framework of The Australian Standard for Coal Resource Assessment, this calculation would fall into the category of inferred inventory coal. Resources quoted by CRAE for all of Area 1 are shown in Table 1 below.

Table 1. CRAE resource figures for Area 1.

Locality	**Av Thickness(m)**	**Indicated open cuttable (MT)**	**Indicated Deep (MT)**	**Possible Deep (MT)**
West Saggers H	1.43	0.57	4.96	Nil
Beneath Saggers H	?1.2	Nil	Nil	?1.25
E of Saggers H	1.0	Nil	1.0	?4.0
Cherry Hill	1.3	Not tested	0.78	?4.0+

Boss Energy calculations

Boss Energy Calculations for shallow resources at Saggers Hill are essentially the same as the CRAE figures, exept that the specific gravity figure used is 2.1 g/cc, instead of 2.0 g/cc, accounting for an increase of 30,000T. The CRAE figures are thus conservative. For interest, a calculation of theoretical oil content and in ground value is shown below in tables 2.1 and 2.2.

Table 2.1

Variables		
Horizon thickness	1.43	metres
Horizon Density	2.1	Tonnes per cubic metre (Clementson 1981)
Yield	146	Litres/Tonne (Clementson 1981)
Barrel volume	159	Litres/Tonne
Barrel price	$80	Australian Dollars

Table 2.2

Location	**Category**	**Area Km^2**	**Shale Tonnes**	**Barrels**	**In Ground Value**
Saggers Hill	<20m depth	0.1999	600300	551000	**$44,097,000**

Geological constraints

The Tasmanite oil shale is known to occur in a sequence of Permian sedimentary rocks which are fairly flat lying, dipping 5-8 degrees towards the north east in the Saggers Hill area (Clementson, 1982). Because of the flat lying nature of the sediments, the depth below surface of the shale horizon can be affected by rise and fall of local topography. Other factors affecting the position and distribution of the shale are local faulting, which is known to shift the shale position up, or down, geological boundaries with rocks which do not contain Tasmanite, and characteristics of the host rock, such as old topographic highs, where Tasmanite was not originally deposited.

The Saggers Hill shallow resource area is constrained by a geological boundary to the west with Pre Cambrian rocks which are much older than the Tasmanite bearing Permian rocks, and have no potential for containing Tasmanite. To the east lies Saggers Hill which is Tertiary Basalt which overlies the Permian Tasmanite bearing rocks. Tasmanite may be present beneath the basalt cover rocks, which accounts for the CRAE ‘beneath Saggers Hill’ category presented in Table 1. To the north, shallow resources are bounded by a dolerite intrusion. To the south, shallow resource potential is constrained by previous drilling which indicates that the Tasmanite postion has been eroded away, or is not present. The Saggers area is also tightly constrained by topography, contained in a hill bounded North-West to South-East depression. Topography and geology are indicated in figures 5 and 6 respectively.

Potential for resource expansion.

There is some potential for identifying further shallow resources in the north, and south of the currently defined area. The northern area has recently been 'opened up' by forestry operations and is crossed by numerous new tracks which would provide drilling access. Areas where there is possibility of further expansion of shallow resources are shown in pink outline and labeled A-D in Figure 7. Photographs taken in recent months in the resource area are shown in Figures 2-4.
Potential tonnages shown below were calculated using a shale horizon thickness of 1.43 metres, and a specific gravity of 2.1 grammes/cc. The resulting tonnages are speculative but not unreasonable, and can only be tested by drilling.

Location	Category	Area Km^2	Shale Tonnes
Saggers Hill	A	0.09857	296,006
Saggers Hill	B	0.09986	299,880
Saggers Hill	C	0.1333	400,300
Saggers Hill	D	0.06862	206,066
		Total	1,202,251

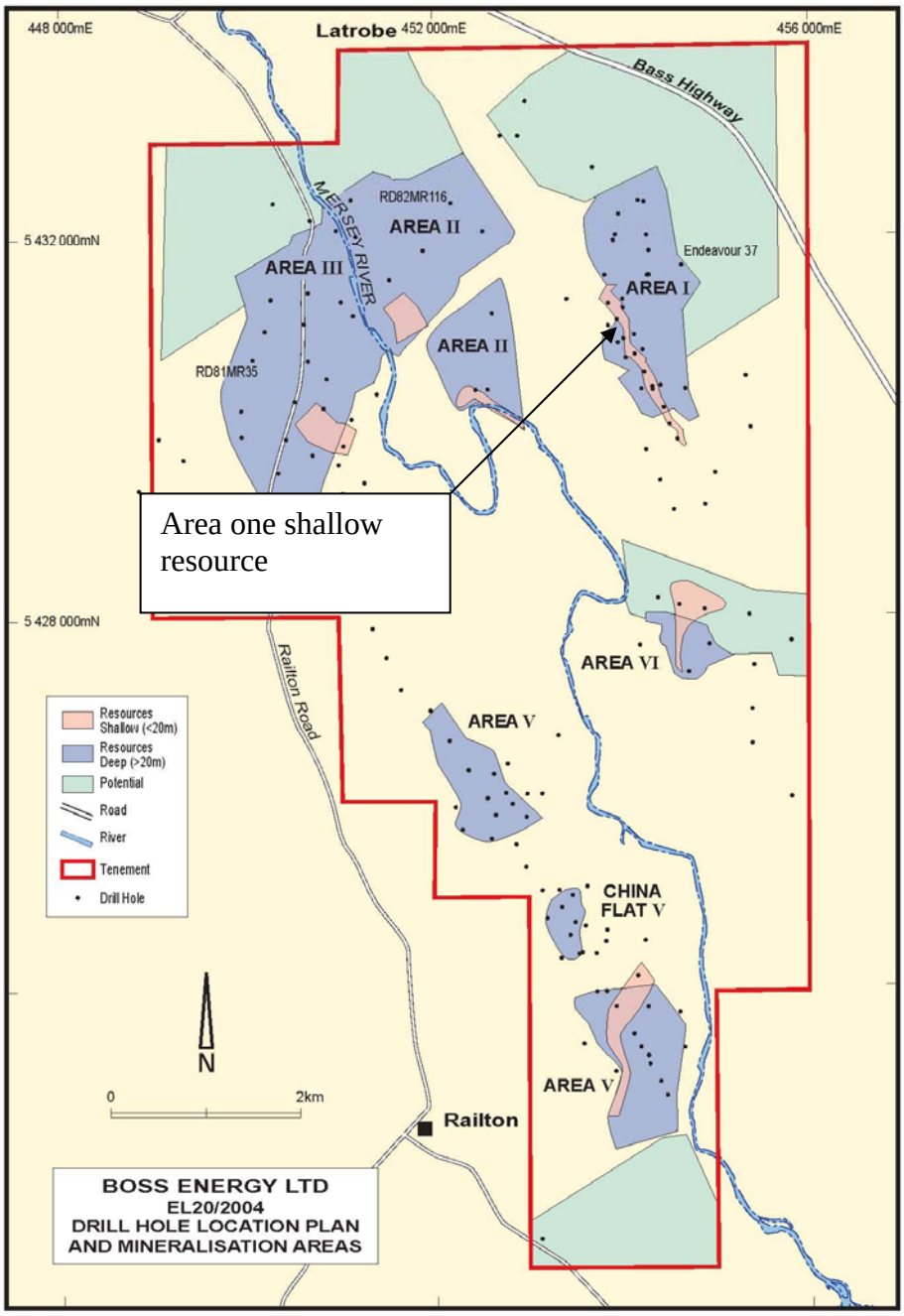


Figure 1. Area one locality map

Fig.2 Centre of resource area looking north. Shale Depth 4m.

Fig.3 Northern end of resource area. Shale depth locally 2m

Fig.4 Southern resource area looking north. Shale Depth uncertain.

Fig 5

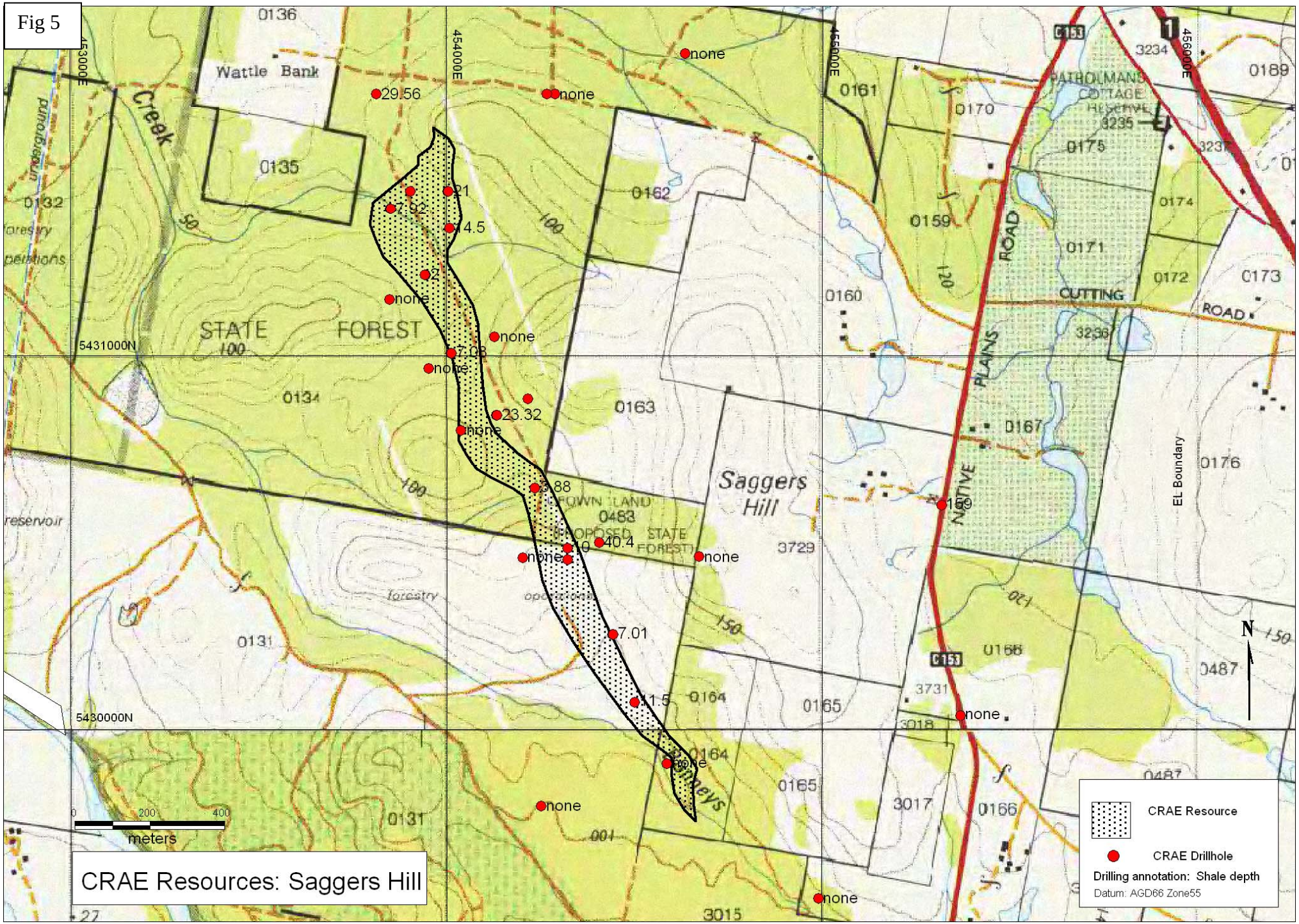
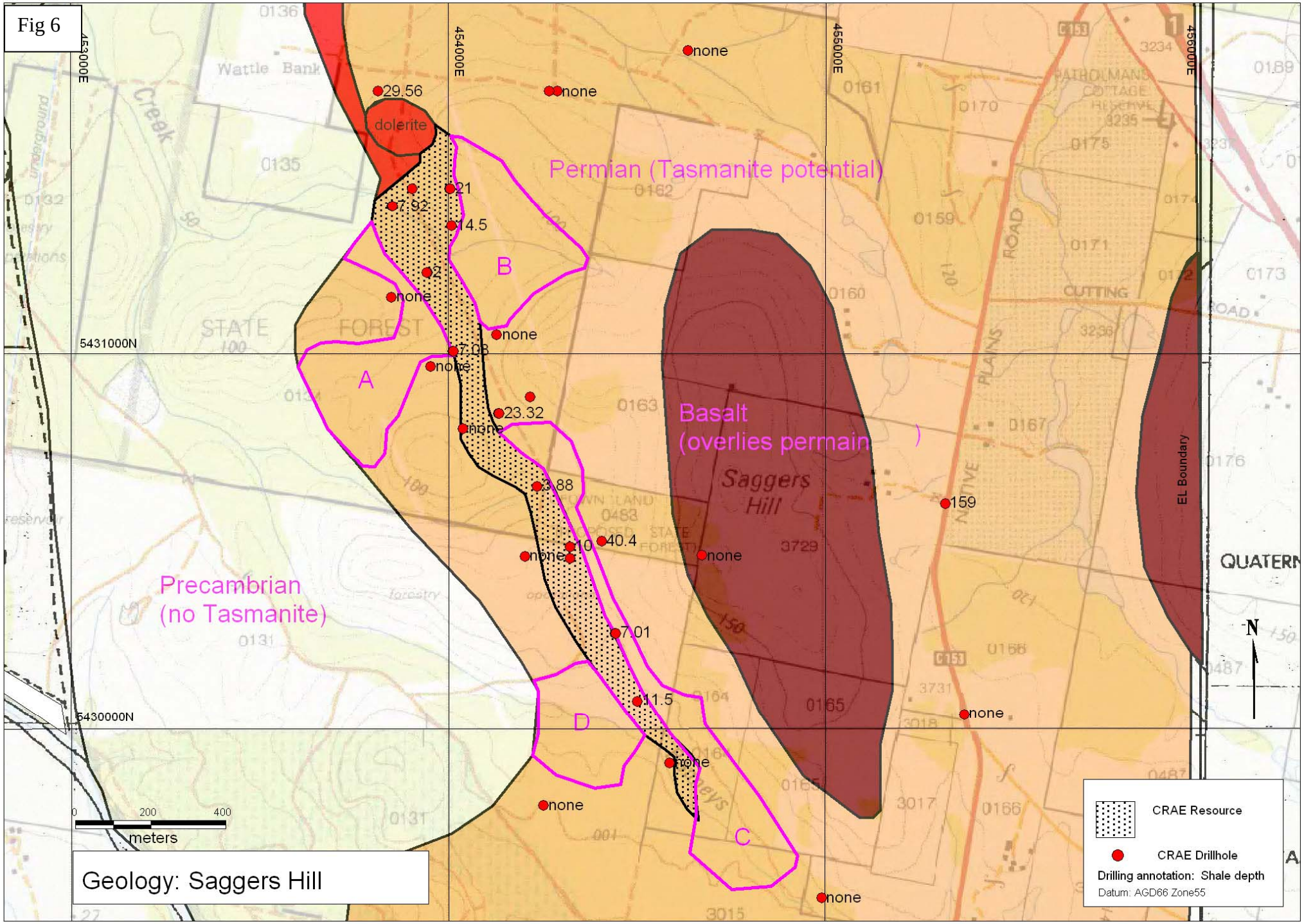

Wattle Bank
Creek
STATE FOREST
Saggers Hill
29.56
none
7.92
4.5
2
7.08
23.32
3.88
40.4
7.01
11.5
15
PATROLMANS COTTAGE RESERVE
CUTTING
ROAD
PLAINS
NATIVE
EL Boundary
C153
5431000N
5430000N
454000E
453000E
455000E
456000E
0 200 400
meters
CRAE Resources: Saggers Hill
CRAE Resource
CRAE Drillhole
Drilling annotation: Shale depth
Datum: AGD66 Zone55
N

Fig 6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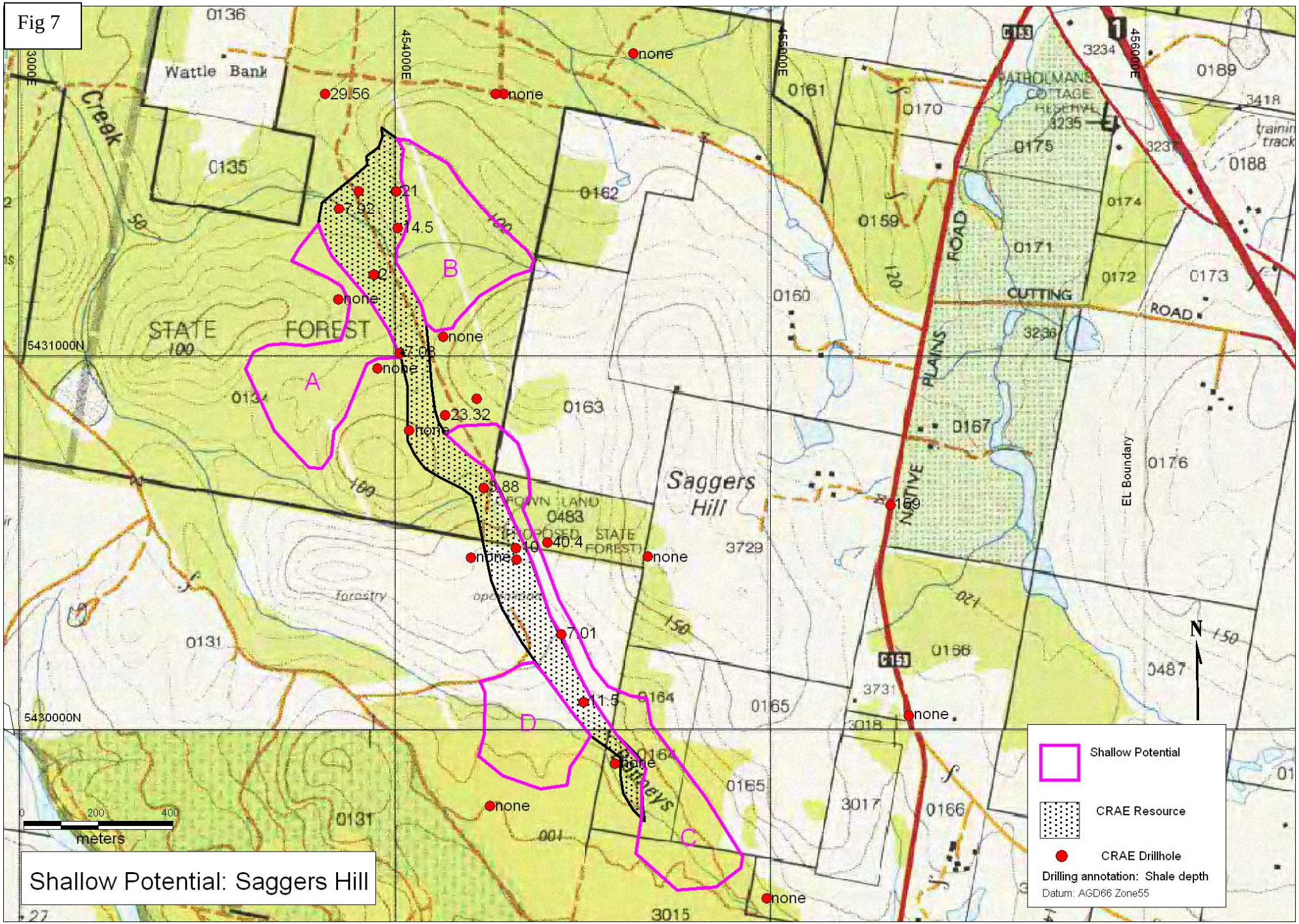
454000E
455000E
5431000N
5430000N
Wattle Bank
Creek
STATE FOREST
dolerite
29.56
none
21
7.92
14.5
2
7.08
23.32
3.88
10
40.4
7.01
11.5
Permian (Tasmanite potential)
Precambrian
(no Tasmanite)
Basalt
(overlies permain
Saggers
Hill
A
B
C
D
159
EL Boundary
QUATERN
N
0 200 400
meters
Geology: Saggers Hill
CRAE Resource
CRAE Drillhole
Drilling annotation: Shale depth
Datum: AGD66 Zone55

Fig 7



Shallow Potential: Saggers Hill

Suggested work program

A drilling program to potentially increase the known resources in this area would probably consist of at least 4 holes in each potential zone, and would be most easily executed in areas that have been recently accessed by new logging tracks. Mapping the new tracks with GPS would be a logical first step.

Preliminary Cost Estimate

Calculations shown in Table 4 are based on a drilling rate of $48 per metre, and average drilling depth of 30 metres. Mobilization, consumables,estimated supervision costs and 15% contingency are also included.

Table 4. Drill program cost estimate

zone	Drillholes	Cost estimate
A	4	$9,000
B	4	$9,000
C	4	$9,000
D	4	$9,000
Grand Total		**$36,000**

References

Australian guidelines for estimating and reporting of Inventory Coal, Coal Resources and Coal Reserves, prepared by The Coalfields Geology Council of New South Wales and the Queensland Mining Council.

Clementson, I.M., 1982, *Railton EL 4/74 Final report on 1982 drilling*, CRA Exploration PTY. LTD., MRT report 82_1789