

APPENDIX 16

Coal Exploration in the Galilee Basin, Central Queensland Internal GSQ Memorandum by A.F.Carr

COAL EXPLORATION IN THE GALILEE BASIN,
CENTRAL QUEENSLAND

by

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INTRODUCTION

It has been known for well over 50 years that coal exists in the northern part of the Galilee Basin, and deposits were examined at Porcupine and Oxley Creeks in the early part of this century. Water bores near the eastern margin of the basin have intersected coal. In the deeper parts of the basin to the west, coal seams of Late Permian age have also been penetrated in a number of oil wells. However, very little information has been available regarding quantity or quality of coal in the Galilee Basin. A Department of Mines drilling programme was therefore devised to investigate the extent and quality of coal, and the possibilities for mining. Drilling commenced in July, 1971.

PROGRESS OF INVESTIGATION

Since it was suspected that coal deposits could extend over a very large area, drilling has necessarily been very sparse and widespread, and is essentially only a preliminary investigation. However, the programme, which is not yet completed, has been very successful in revealing very large quantities of coal over a large part of the area drilled.

Lines of three or more holes have been drilled across the strike of strata close to the eastern margin of the basin. The holes are up to 5 kilometres apart, and the lines are approximately 50 kilometres apart. The areas drilled are shown on the accompanying plan.

Eight seams have been tentatively identified and at least the upper four, and possibly five, of these can be correlated from Wendouree in the

south to Mirtna, a distance of approximately 200 kilometres. North of Mirtna, as far as Longton, which is about 55 kilometres, and possibly even further north to Pentland, the upper seams thin, and the lower three seams only contain workable quality coal and even these seams may be too thin in places to be economically workable. South of Wendouree also the seams thin, and are not an attractive economic proposition in the Lambton Meadows area.

The area as far north as Moray Downs is structurally simple. The seams dip gently to the west, at about $\frac{1}{2}^{\circ}$ in the Wendouree area, and the dip increases gradually northwards to 5° at Moray Downs. No major faulting has been found, and it is not anticipated that faulting would be a serious problem to mining. At Mirtna the dip of strata is greater than 12° , and some faulting does occur. North of Mirtna the strata assume a more gentle dip, and at Longton it is less than 5° .

Superficial deposits of Tertiary and Quaternary age cover the area to depths ranging from 30 to 135 metres, and it seems unlikely that coal seams will crop out anywhere within the area so far examined. The greatest thickness of these deposits is in the Degulla and Laglan areas.

COAL RESOURCES

At Wendouree five seams containing workable quality coal were drilled. These range in thickness from 1.5 to 4.5 metres, and total thicknesses are 14 metres. At Degulla, Laglan, Moray Downs, and View Hill the upper two seams coalesce, and are 15.5, 7.5, 8.5, and 6.5 metres respectively of workable quality coal. Two lower seams are also workable at Degulla and Laglan, three at Moray Downs, and four at View Hill. At Mirtna four seams contain a total of 15 metres of workable quality coal.

The coal is mainly dull, particularly that in the lower seams in the north, with some bright beds. Workable sections contain relatively few stone beds. It is sub-bituminous in rank, and there is no coal of coking quality. It is generally sub-hydrous, and has a low sulphur content.

Coal Reserves

Since drillholes are so far apart reserves are classified as inferred, and it is not possible to calculate an accurate quantitative value. However, if it is assumed that the coal is continuous between the lines of boreholes, and there is no apparent reason to suspect that this should not be so, and if it is further assumed, again a not unreasonable assumption, that the coal is continuous from sub-crop to a depth of 400 metres, then it can be expected that there is not less than 40 000 000 000 tonnes of workable quality coal in situ. However, coal available for opencut mining would be very much less than this amount.

Opencut Mining

The amount of coal available for opencut mining will depend almost entirely upon the feasibility of removing the overburden of Tertiary sediments. At Wendouree and Moray Downs this overburden is not more than about 45 metres, and should not present an insuperable problem. At View Hill it is about 70 - 75 metres thick, which may not be too excessive for its economic removal. However, at Degulla and Laglan, where there appears to be no likelihood of seams cropping out, the overburden is up to 120 metres thick, and at the present level of stripping technology in Australia this would appear to be an exceedingly difficult, if not impossible, proposition. Large quantities of water which occur in the lower part of the Tertiary sediments at Laglan could compound the difficulties. However, further technical advances in stripping operations, and a rapidly changing economic climate, could well make these areas economically viable in the future.

In the Wendouree and Moray Downs areas there is probably not less than 900 000 000 and 450 000 000 tonnes respectively of opencut coal. In between these two areas there would probably be at least 1 000 000 000 tonnes of coal available if, in the future, it could be worked by opencut methods. Similarly, at View Hill large tonnages would be available if the problem of removal of overburden can be resolved. North of View Hill the composite, thick top seam is not present in the sequence, and the prospects for opencut mining are very poor. With insufficient information available, it must be borne in mind that the tonnages quoted are no more than a very preliminary estimation.

Underground Mining

From the figures quoted above it can be seen that more than 90 per cent of coal available would have to be worked by underground methods, at the present level of mining technology. Since the upper two seams coalesce over a large area north of Wendouree and would be too thick for normal extraction, and assuming a normal extraction rate of 50 per cent, considerably less than 50 per cent of coal available for underground mining could in fact be extracted.

EXPLOITATION AND UTILIZATION

The coal is not of coking quality. It may be used for electricity generation, but its future hopefully lies in the production of synthetic oil and gas, and the associated petro-chemical industry.

Average proximate analysis (air dried basis) for a washed coal product is:

Moisture	9.0 per cent
Ash	15.2 per cent
Volatile matter	30.0 per cent
Fixed carbon	45.8 per cent

Its relatively low rank, with an average specific energy of 23.26 MJ/kg, and the geographical isolation of the Galilee Basin may diminish its steam-raising potential. However, with the very large tonnages involved, some coal would undoubtedly be available for power station use. In addition, residual char products from some processes of synthetic fuel manufacture may become available for this purpose.

Since the economic production of synthetic hydrocarbon requires very large tonnages of easily and cheaply obtained coal, opencut mining is desirable. Apart from the paramount problem of removal of overburden, other difficulties will involve water supply, and perhaps paradoxically drainage. Geographic isolation poses problems in transport.

CONCLUSIONS

Coal exploration undertaken by the Department of Mines in the Galilee Basin has been so far very fruitful, and it is hoped that the continuing investigation will prove more workable coal north of the Longton area.

Although opencut mining appears attractive at both Wendouree and Moray Downs, the area between these two presents considerable difficulties. At View Hill overburden thickness is somewhat thicker than desirable, but the area may still prove a workable proposition.

Closer drilling and more detailed geological examination are necessary throughout the area.

17th April, 1975.