

29th May, 1941.

MEMORANDUM:PREOLENNA COAL AND OIL SHALE

The Preolenna coalfield, situated on the northern slopes of the Campbell Range, occupies a small, roughly rectangular area, approximately two miles in length, with a width of nearly one mile, the long axis of which is practically north-east. The western limit is marked by the dyke-like mass of dolerite, while the outcrops mark the eastern and southern limits. North of the seven mile peg, the series is covered with a thin capping of Tertiary basalt.

The coal seams outcrop mainly in two gorges developed by the Flowerdale and Inglis Rivers namely, the Upper Flowerdale and the Jessie Rivers.

The coal measures are confined absolutely to the Permo-Carboniferous system, with the coal occurring at two horizons, namely, the Greta coal measures and the Tomago coal measures. The seams in the former, number four, while in the latter, although a number of outcrops have been located, it has not been definitely established whether there are a number of seams or only one, faulted into various positions; by analogy with the Pelion occurrences, the indications are that there is only one seam developed.

The coal seams vary in thickness from about 9 inches to 24 inches, the greater number of the outcrops showing a thickness about 15 inches to 24 inches. The coal seams are characterised by the fact that without exception they belong to the kerogenites or humic kerogenites. Several of the coal seams show at various places, the occurrence of high-grade kerosene shale and it is specially noteworthy that this shale is not confined to any one seam but makes and disappears in a manner totally characteristic of this class of coal.

The shale is a black "kerosene shale" of the nature of the cannel, or torbanite rather than a true shale; it does not occur in independent seams but as lenticular bodies in the coal seams.

Regarding the quality of the coal, it is generally conceded that the Preolenna coals, consisting as they do of many varieties of the kerogenites and humic-kerogenites, are the highest grade coals found in Tasmania. They are especially suitable for gas-making and steam-raising, as well as for household purposes. A test run made by the Tasmanian Government Railways indicates that the Preolenna coal can replace the imported New South Wales coal with very satisfactory results.

It must be remembered, however, that the sulphur content is rather high, but could undoubtedly be reduced to the average sulphur content by adopting modern washing practice.

In a series of exhaustive tests conducted by the Purified Coal and Coke Company coal washing plant at Jesmond, New South Wales, much valuable information was obtained respecting the efficacy of washing to reduce sulphur and ash contents of Preolenna Coal.

In the matter of sulphur elimination it was reduced from 5.87% to 3.38% equal to a reduction of 42.4%. The ash content was reduced from 13.72%, 9.68% or 29.5% reduction.

The proportionate reduction of the sulphur was much greater than in the case of the ash, but the amount of the latter is considerably lower than any other Tasmanian coal.

In making these tests, the coal was crushed to pass through a  $1\frac{1}{2}$  inch ring. This indicates that a relatively high percentage is left even after washing when reduced to a size that precludes its use for steam boilers and general domestic purposes.

It is quite apparent that, apart from tracing the outcrops some distance, the driving of three adits and the drilling of two holes, one not completed, no serious attempt has been made to prove the extent and thickness of the coal seams for the purpose of providing reliable data useful in calculating available reserves.

Faulting, due to the doleritic intrusion, must also be a further complication.

It must be remembered also, that the thick mantle of horizontal scrub, bauera etc., combined with the great depth of surface-soil renders the task of conducting a systematic geological investigation extremely difficult and has proved a formidable barrier to extensive prospecting operations in the past.

No authentic statement of possible yield of oil is available. The proximate analyses made by the Department of Mines, however, indicate that the Preolenna cannel is very rich. The volatile content of the richest sample reported is quite consistent with an assay yield of 130 gallons of tar per ton. Other analyses suggest considerably reduced yields and the average recovery of a commercial plant over a number of years possibly would be much less than 100 gallons per ton.

It appears, that the little information available, applies only to the seam as exposed in the nine mile tunnel and elsewhere on the old field, rather than to the new extension, so that the quantity and quality of cannel available in the new area should be closely and accurately determined before undertaking any programme of development.

The possibility of exploiting the cannel coal for the production of oil has been investigated in a preliminary manner by L.I. Rodgers, Commonwealth Fuel Technologist.

The only work, apart from proximate analyses by the Department of Mines, was an examination by Mr. Watson, Chief Chemist, Victorian Mines Department, of a sample of oil reported to be derived from this source.

The proximate analyses indicated that the material was a rich cannel not an oil shale, while Watson's work indicated that the tar was highly aromatic and that the heavy end contained pitch. In these circumstances, the product must be regarded as a tar and not as an oil.

The possibility of refining by cracking does not arise, partly because the tar would be a poor cracking stock, and partly because of the limited scale of operations; therefore, it is assumed that the tar would be refined by distillation and chemical treatment only.

7 Many factors contribute to the dormant condition of the Preolenna coalfield; a field that is so favourably situated within short distances of thriving towns and shipping ports.

Although the coal is of a very good grade, the unusually high sulphur content precludes its use under ordinary conditions as a fuel for steam raising purposes.

Probably, the chief factor against the active development of the field is the comparatively small size of the seams, which must add considerably to the cost of hewing.

For utilization of the coal for oil production, large reserves would be necessary which would require a heavy capital outlay both in developmental operations and drilling, to secure continuity of supply.

The Preolenna coalfield is undoubtedly of high potential value, but it remains for complete research investigations to determine the avenues in which to effect its utilization.

FIELD GEOLOGIST.

The Director of Mines,  
HOBART.