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88-2801 (R)

SUMMARY REPORT
ON
RL 4/74

(SPECIFICALLY RL'S 8805 & 8806)

OPEN FILE

88-2801 (R)

AMG REFERENCE POINTS ADDED

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SUMMARY REPORT ON EL 4/74LATROBE/RAILTON SHALE OIL PROJECT - TASMANIAINTRODUCTION

Most of the known significant oil shale occurrences in Tasmania are found in the Latrobe/Railton area, flanking and outcropping along the banks of the Mersey River, some 12 to 20 kilometres SSE of Devonport, between Latrobe to the north and Railton in the south. The oil shale, first identified in this area during the 1850's, was subsequently exploited commercially between 1910 and 1934 where a total of 1.6 million litres of shale oil (kerogen concentrate) was extracted.

Exploration Licence EL 4/74 covering the known occurrences is held by Endeavour Resources Limited. The resource was extensively drilled in 1981 and 1982 by CRA Exploration Pty Limited, following an agreement made with the titleholders. The results of the drilling programs and consequent estimates made of the potential shale resource form the basis of Table 1. given below.

SUMMARY OF INVESTIGATIONS

CRA Exploration Pty Limited completed a total of 5,051 metres of open hole and diamond drilling to test the resource. Representative drill core samples were collected and submitted for proximate analysis and Fischer assay of oil content. From the results obtained from these investigations, CRAE concluded that the indicated reserves totalled 42 million tonnes were found in five separate locations and that there was potential for a further 20 to 30 million tonnes of shale at depth, but little potential to increase the open-cut portion of the reserves beyond 6 million tonnes.

The five separate localities referred to above are indicated in Figure A1-2 together with the separate resource details.

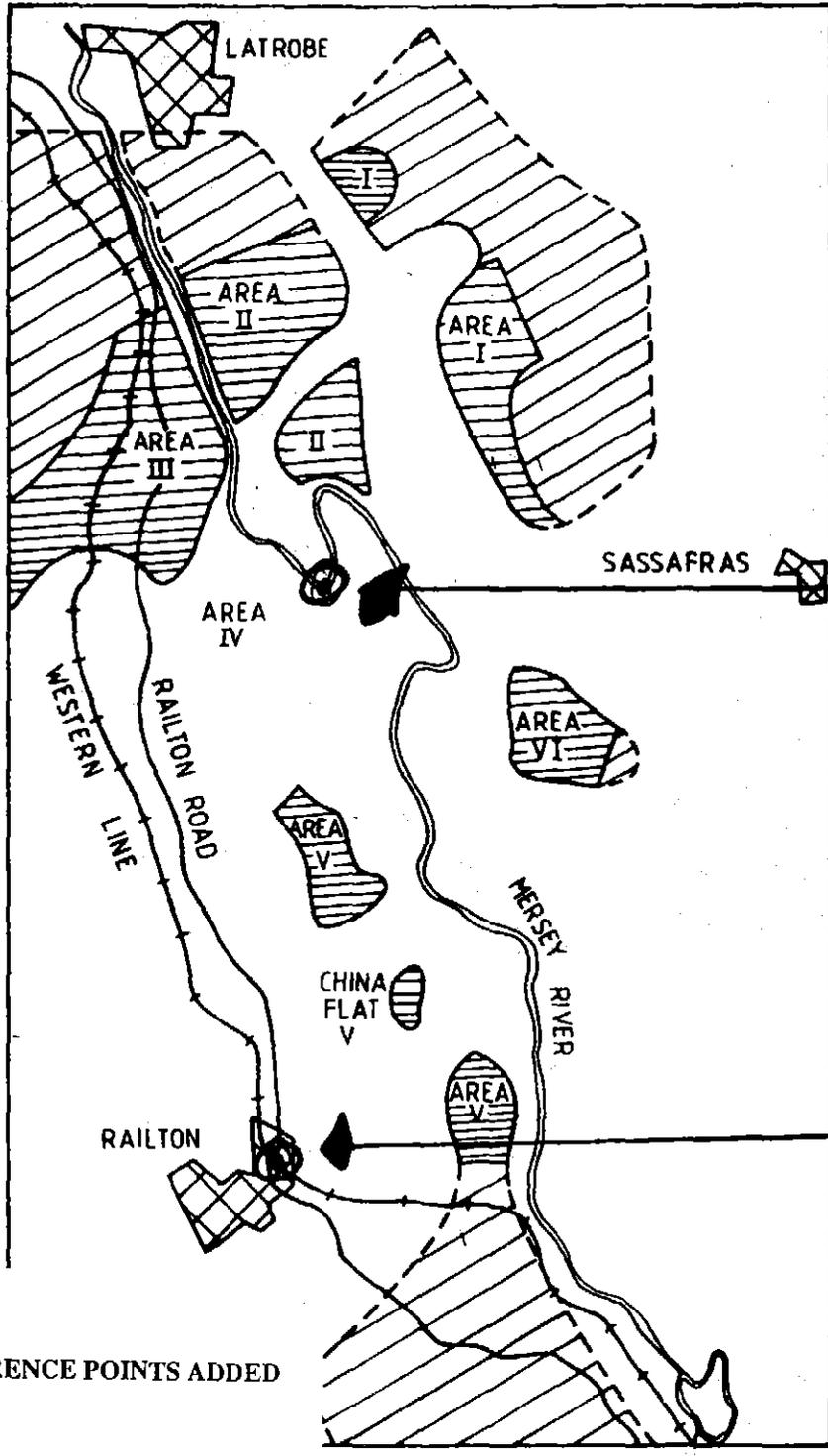
The reserves and potential of the oil shale resources are also summarised in Table 1. taken from the Hydro-Electric Commission of Tasmania's recent publication of "Liquid Fuels from Oil Shale in Tasmania." Here reserves are defined as quantities of oil shale estimated from the results of programs of systematic drilling and testing, whereas resource encompasses reserves, but also include quantities of oil shale based partly or wholly on isolated borehole results, surface indications and the extrapolation of data for other areas.

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OIL SHALE OCCURRENCE LATROBE - RAILTON
FIGURE A1.2

SOURCE: CRAE REPORT No 11212 (1982)



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| LOCALITY | AV. THICKNESS (METRES) | INDICATED RESOURCE (MILLION TONNES) | | POTENTIAL RESOURCE (MILLION TONNES) |
|----------|---------------------------|--|-----------|--|
| | | OPEN CUT <20m | DEEP >20m | DEEP >20m |
| AREA I | 1.4 | 0.6 | 6.7 | 9.3+ |
| AREA II | 1.8 | 0.7 | 11.6 | 7.0 |
| AREA III | 1.8 | 0.7 | 13.8 | 10.0+ |
| AREA IV | NOT ADEQUATELY TESTED | RESOURCE BELIEVED TO BE MINIMAL | | |
| AREA V | 1.2 | 3.5 | 2.0 | ? |
| AREA VI | 1.25 | 0.6 | 1.9 | 0.9 |
| TOTAL | 1.62 | 6.0 | 36.0 | 27.2 |

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TABLE 1 - TASMANIA'S OIL SHALE RESOURCES

| | |
|-------------------------------------|---|
| <u>Oil Shale Resources</u> | <u>Million Tonnes</u> |
| Latrobe/Railton Area | |
| - Indicated Reserves | 42 |
| - Potential resources at depth | 30 |
| | — |
| Total Assumed | 72 |
| <u>Oil Content by Fischer Assay</u> | <u>litres/tonne</u> |
| From drill core samples : | |
| - Minimum | 5 |
| - Maximum | 300 |
| - Average | 130 |
| Average Density of Oil | 0.934 t/m ³ |
| <u>In-Situ Oil Content</u> | |
| - Indicated Reserves | 5460 megalitres (5.1 million tonnes) |
| - Assumed resources | 9360 megalitres (8.7 million tonnes) |

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LIQUID FUEL PRODUCTION FROM OIL SHALE

From the in-depth study of the Planning and Public Affairs Group given in the above Hydro Commission of Tasmania publication, the Summary and Conclusions reached with respect to the production of liquid fuels from oil shale in Tasmania are reproduced in their entirety below.

Summary and Conclusions

1. The indicated reserves and additional potential resources of oil shale in Tasmania are of sufficient magnitude to allow shale to be extracted at the rate of 2 million tonnes each year for a period of 20 years.
2. Processes exist which would allow Tasmanian oil shale to be mined then restored to yield shale oil, the shale oil to be hydrotreated to yield a petroleum equivalent, and the hydrotreated oil to be refined to yield the full range of transport fuels required by the State. The transport fuel yield from 2 million tonnes of oil shale would be about 286 megalitres, or more than 1/3 of Tasmania's current annual requirements.
3. The project devised and described in this paper would involve an initial capital outlay of \$805 million and employ in excess of 900 men. The project works would be located in the general proximity of Devonport, Latrobe, Railton and Spreyton, and it has been assumed employees would be housed in these towns. The indirect employment likely to be generated in the area has not been quantified, but employment multipliers provided by the Centre for Regional Economic Analysis suggest that the total of direct and indirect employment provided would be about 2,500 people.
4. The cost of product from the project described has been estimated to range from 66 cents/litre if produced by a statutory authority with access to Government secured capital funds, rising to 95 cents/litre if produced by a company using 100% equity capital and subject to company taxation. These figures are at 1 January, 1986 cost levels.

By comparison, the current maximum wholesale price of motor spirit in this State is 51.24 cents/litre.

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5. The component of the price of motor spirit which represents the cost of petroleum is currently about 19 cents/litre. A major increase in the price of petroleum would be required to make the production of transport fuels from oil shale economic.

Department of Resources and Energy projections of the price of petroleum to the end of this century show price increases which fall well short of levels which would justify construction of the project described.

6. Because of the high capital cost of the transport fuels from oil shale project, construction would be warranted only if petroleum prices are expected to remain at a high level during the life of the plant. The development does not provide an effective means of partly insulating the State from the effects on price of occasional petroleum shortages.

In summary, therefore, while the production of transport fuels from oil shale in Tasmania is technically feasible, it appears unlikely to be economic until well into the twenty-first century.

OTHER USES

Endeavour Resources Limited have recently concentrated their efforts in sponsoring or commissioning research into the possible utilisation of the oil shale (Tasmanite) or its kerogen products. This research was conducted both in Australia and America and the findings were reported in Quarterly Reports submitted to the Tasmanian Mines Department during the past few years.

Some of the other possible uses are commented upon in a paper prepared for the Company by R.F. Cane, entitled "The Utilisation of Tasmanian Oil Shale" (see Commissioned Reports under "Bibliography"). Conclusions reached are reproduced below:-

Conclusions

As a result of discussions in the U.S. and Australia during the period June-November 1984, the writer has made a preliminary appraisal of the commercial possibilities of Tasmanian oil shale (tasmanite) for the following uses:

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1. Production of shale oil for refinery and other use.
2. Production of oil shale for fuel use, as mined and crushed.
3. Production of oil shale for chemical use.
4. Production of a tasmanite concentrate for fuel use.
5. Production of a tasmanite concentrate for miscellaneous uses.

It is concluded that:

- (a) Within the foreseeable future there is no commercial justification for the production of shale oil.
- (b) Mined and crushed tasmanite is not an attractive saleable product.
- (c) There is no encouragement for the production of marketable chemicals or intermediates from tasmanite. This is not to say that chemicals cannot be produced but existing knowledge does not lend hope to such a venture. Whether tasmanite can be made to yield useful chemical intermediates is a matter for extensive research, but the prospect does not look promising.
- (d) Tasmanite concentrate has a good potential market for fuel use provided the cost is competitive. The concentrate has use mixed with either coal or oil. The sale of such a concentrate depends on price and chemical analysis.
- (e) Tasmanite concentrate has possibilities for miscellaneous uses such as a soil conditioner or as an organic diluent.

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Principal references relating to this project are listed below. Commissioned Reports to the company are available on request.

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