

## **‘The Politics of Oil Shale’ The Tasmanian Oil Shale Industry from 1910 to 1935**

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Oil shale deposits were discovered and exploited in the Mersey Valley, some 10 to 15 kilometres upstream from Devonport in northern Tasmania, from the 1860s.<sup>1</sup> For the next fifty years, various companies and individuals attempted with little success to develop the deposits.<sup>2</sup> During the period from 1910 to 1935, a series of operators attempted to establish the oil shale industry in the Mersey Valley, producing crude oil and/or refined derivatives. A notable feature of this period was the role that politics played in the sequence of events. Changing Federal Government policy toward oil in Australia impacted on the economic environment in which the various enterprises operated, while the Tasmanian State Government’s direct involvement had a significant influence on the direction of the industry’s development during this period. This paper explores these political influences through an examination of the major steps in the evolution of Federal Government oil policy, and through a chronological account of the experiences of the most important Mersey Valley operators.

### **Federal Government policy on oil shales, 1910 – 1935**

The period from 1910 to 1935 saw a number of Federal Government initiatives with regard to oil in Australia. In 1910, the Federal Government introduced a bounty on the production of kerosene and paraffin wax from shales, products that had been the traditional mainstay of the early oil shale industry in NSW.<sup>3</sup> This measure had no significant impact on the activities occurring in Tasmania over the three years of the life of the scheme (1910 to 1913). In 1917, *The Shale Oil Bounty Bill, 1917*, was introduced into Federal Parliament. Unlike the previous scheme, the scheme anticipated by this Bill was to focus on the production of crude oil from shale, prompted, at least in part, by a growing awareness of the strategic need for a local supply of fuel oil for the fledgling Australian Navy.<sup>4</sup> Vigorous debate on the Bill ensued in both houses of parliament, particularly around the intrusion of such a measure into the arena of private enterprise. An alternative scheme for the Federal Government to invest directly in the industry was ruled out on the grounds that it would be unconstitutional once emergency war powers were discontinued. The question of whether or not the bounty scheme should be

extended to cover 'well oil' was also discussed, with the underlying feeling being that if 'well oil' were to be discovered in Australia, the rewards to the discoverer would be great enough without the need for an extra bonus on production. The Bill was finally assented to in September 1917 in its original form, providing for a sliding scale of bounty payments based on production.

The bounty scheme was initially intended to be in force for four years.<sup>5</sup> The scheme was extended for another year in 1921, in essentially the same form, and again for a further year in 1922, three years in 1923 and three years in 1926. During debate on these extensions, a case was made that there had been no evidence the scheme had encouraged higher production rates from the industry, despite substantial payments being made to the primary producer in NSW.<sup>6</sup> It was claimed that the producer in question had profited by selling its production of fuel oil to various gas companies and pocketing the bounty, without re-investing in further development of the industry. An alternative scheme based on paying a bounty on refined products being sold into the community rather than on crude oil was canvassed as being fairer to the taxpayer, but was never instigated.

The bounty scheme involved a provision that payments would only be made once annual production exceeded a threshold. This made it very difficult for the Tasmanian industry, with its generally low level of production compared to NSW.<sup>7</sup> The threshold level was initially set around production rates achieved by the NSW industry. Attempts at various times to reduce the threshold were met with little enthusiasm in Federal Parliament. Very little in the way of bonus payments ever went to the Tasmanian industry, despite the fact that the scheme was in force throughout much of the period from 1910 to 1935 while attempts were being made to establish the Tasmanian industry, and while the NSW industry was generally in decline.

The introduction of the *Oil Agreement Bill*, 1920 into Parliament marked a shift in Federal Government policy away from preferential support for the oil shale industry. The intention of this Bill was to ratify an agreement that the Government had made with the Anglo Persian Oil Company to establish a jointly funded monopoly refining operation in Australia (to become the Commonwealth Oil Refineries Ltd [COR]). When conceived, the intention of this scheme appears to have been to provide a counter point to the major international oil interests then controlling Australia's liquid fuel supplies. The scheme was structured with the intention that when 'indigenous' crude oil was available, this would be supplied to COR, but that in the interim, imported crude supplied by the Anglo Persian Company would be used. During the protracted

parliamentary debates surrounding this contentious Bill, it became obvious that the definition of 'indigenous' in this context was a grey area. Crude oil from shale was not expressly referred to in the wording of the agreement. New South Wales shale oil interests made a strong plea that the Bill be looked at closely by a Parliamentary Committee, fearing that passage of the Bill without change would 'automatically close the shale-oil industry of the Commonwealth' and leave the country vulnerable in time of war.<sup>8</sup> In his final speech in support of the Bill, the Prime Minister, William Hughes, had this to say:

It is said that this Bill will mean the death knell of the shale oil industry. It exposes the shale industry to no greater competition than at present, though it changes the nature of the competition. The shale industry will not be exposed to the American competition only; it will be asked to face competition, partly in our midst and partly from overseas, but the volume of competition will remain the same. Since we have established, by bonus and otherwise, the shale industry in this country, we shall not desert it merely because we pass this agreement. We shall encourage the shale industry; we never know but the day may come when we shall have to fall back on shale oil, and we will not desert those men who have put their money and given their time to the establishment of the industry. Above all, we shall do everything we can to make ourselves independent of the Anglo-Persian crude oil by finding oil on the continent of Australia or in our territories.<sup>9</sup>

The Bill in its original form was assented to in May 1920.<sup>10</sup> Commonwealth Oil Refineries Ltd. was incorporated in Victoria in 1920 and by 1921 had acquired a site for its first refinery at Laverton near Melbourne. The first shipment of crude oil arrived in 1924 and refining began shortly thereafter.<sup>11</sup> The ambiguity around the exact role that COR should play with regard to the refining of 'indigenous crude', including crude from shale oil, was to be a recurring distraction for some of the Mersey Valley operators. The potential conflict of interests between the desire to turn a profit on its refining activities and the fulfilling of a strategic role to process 'indigenous crude' may have been a concern for some with interest in the oil shale industry, but did not ever seem to overly concern COR.

During the debates around the *Oil Agreement Bill*, the need for Government support of exploration activities for 'well oil' within Australia was repeatedly raised. The Federal Government had already invested directly in the exploration for oil in Papua, with little success. In the early 1920s a reward of £50,000 was offered for the discovery of commercial 'well oil' within Australia. This reward was never claimed and was withdrawn in 1925.<sup>12</sup> In 1926, the *Petroleum Prospecting Act* was passed by parliament. This Act provided for direct financial support of oil exploration activities

within Australia, in the form of help for companies to evaluate their prospects, and assistance to persons, companies and state governments conducting geological surveys.<sup>13</sup> The introduction of the *Petroleum Prospecting Act* marked a further shift in Federal Government emphasis with regard to the oil resources of Australia, and, temporarily at least, a move to disengage from the oil shale industry.

### **The Mersey Valley, circa 1910.**

When the Tasmanian Government Geologist reported on the area in 1911, activity was concentrated on the east bank of the Mersey River, some three miles south of the town of Latrobe.<sup>14</sup> Only one company, The Tasmanian Shale and Oil Company NL, was actively mining and treating the shale at that time, although several mining leases in the hands of individuals were current, and another company, The Latrobe Shale Oil Company, was conducting exploration and treatment trials.<sup>15</sup> The shale was being mined from a number of adits, transported via a rope haulage tramway to the treatment works, crushed, and retorted in a bank of four vertical retorts of a type pioneered by the Company's manager in NSW.<sup>16</sup> A later report suggests that The Tasmanian Shale and Oil Company eventually produced a total of 4,800 gallons of crude oil up to 1911.<sup>17</sup>

The general style of operation evident at this time was emulated by later operators, albeit with variations in detail. Mining activities were largely underground, generally involving simple manual methods based on the Bord and Pillar technique developed for coal mining.<sup>18</sup> This approach was found appropriate for the average seam thickness of about five feet and the relatively faulted terrain, and was capable of producing sufficient shale to feed the various processing plants erected by the successive operators. Plans were developed to increase the level of shale production, utilising a mechanised Longwall technique, if and when the scale of the industry warranted, but these plans were never actuated. Throughout the period, a wide range of different styles of retorts were employed to process the shale, with respective advantages and disadvantages pitted against each other. In many ways, this 'war of the retorts' came to symbolise the development of the oil shale industry in the Mersey Valley.

### **1912 – 1919, The Railton-Latrobe Company**

The Railton-Latrobe Shale Oil Company NL was formed in Tasmania in July 1912.<sup>19</sup> By late 1912 it had taken over the operations of the Tasmanian Shale and Oil Co. and instigated an expansion program (Fig. 1).<sup>20</sup> By 1914, the plant was capable of producing

250-300 gallons of crude oil per day.<sup>21</sup> In 1915, the Company produced a total of 24,000 gallons of crude oil.<sup>22</sup>

**Figure 1:** *Shale works on the east bank of the Mersey River, circa 1912*



Source: National Trust of Tasmania Picture Collection

During 1915, a previous proposal for the Tasmanian State Government to take-over the property and interests of the Railton-Latrobe Company, and operate the works to supply fuel oil to the Australian Navy, was revived.<sup>23</sup> To what extent this proposal was driven by the emerging economics of the enterprise, or by the strategic need to secure an oil supply during war time, is not clear. The Tasmanian Government was already indirectly investing in the operation through a number of loans.<sup>24</sup> In 1910, a visit had been made to the area by a deputation from the Australian Navy looking at the prospects for obtaining a local fuel supply for its ships. During this visit, fuel oil produced from the Mersey Valley shale had been successfully demonstrated and claims made that fuel oil from this source was as good as any available elsewhere.<sup>25</sup> Whatever the motivation, the proposal was taken seriously and was referred to the Parliamentary Standing Committee on Public Works for detailed evaluation of the economics of a Government acquisition. Two separate experts provided their opinions on the proposal from a number of perspectives covering the size of the resource, potential products, the cost of production at various levels of output, the capital cost of necessary expansions,

possible markets (including the Navy), and potential threats to such markets from within Australia and overseas. In each case, the end point was a financial analysis of the proposed acquisition.<sup>26</sup>

A progress report was tabled in February 1916, and final report in July 1916.<sup>27</sup> The reports came to the view that the asking price of £125,000 for the Company's assets was unreasonable, but that a price of about £60,000 might potentially provide a return on invested capital commensurate with commercial expectations. In the report, the Committee pointed out that the final decision as to whether to proceed was a matter of State policy that would have to be decided by Parliament. Meanwhile, the Tasmanian Government had been negotiating with its Federal counterpart to supply the Navy's fuel oil requirements for a period, thereby guaranteeing a market.<sup>28</sup>

Following the tabling of the Standing Committee's report, three agreements were drafted to provide the basis on which to proceed:

- an agreement between the State Government and the Railton-Latrobe Company for the Government to purchase the assets of the Company for £65,000 (less the value of any outstanding loans) before February 1917.
- an agreement between the State Government and the Federal Government for the latter to purchase 8,000 tons of fuel oil annually, from the start of 1918, for a period of eight years. This agreement required the Federal Government to construct storage facilities at Devonport, and for the State Government to construct a pipeline to the port and ensure that the port would be able to cope with the Navy's ships.
- an agreement between the State Government and the Marine Board of Mersey to ensure that the port would comply with the above requirement.<sup>29</sup>

In each case, the draft contained a clause that the agreement needed to be ratified by both houses of parliament before coming into effect.

Vigorous debate on the proposal took place in both houses of the Tasmanian Parliament from December 1916.<sup>30</sup> Much of the debate revolved around the reliability of the estimates of commercial viability provided by the experts and on how the State was to finance the purchase. While the potential strategic importance of supplying the Navy with fuel oil was recognised, the critical issue appeared to be whether or not the acquisition was a 'good deal' for the State. When all the 'dust had settled', the Assembly voted in favour of the proposal. In The Council, however, no amount of pro deal rhetoric seemed able to sway the members: 'The speech was a capable one, but the character of the interjections indicated that hon. members were not being convinced'.<sup>31</sup> In January 1917, the Council, by a margin of two votes, rejected the proposal.

During the debate, members of the Standing Committee were criticised for their failure to provide a public recommendation regarding the acquisition, but allegedly conspiring privately to support the acquisition. Strong words were exchanged, both in parliament and through the agency of the press, concerning the Committee's response to the opinion of the Chief Mining Inspector contrary to the value of the acquisition to the State. The editorial policy of the *Hobart Mercury* was drawn into question by those supporting the scheme. The paper defended its policy and raised the spectre of vested interests within the Parliament influencing the progress of the debate. The Premier went as far as to suggest that the hand of outside interest groups such as Standard Oil might be seen in the opposition to the proposal. In the end, all this heated interaction counted for nothing, the underlying essence of the issue being encapsulated in an editorial article in the *Hobart Mercury* which looked back on the debate to comment on what might have been had the proposal been adopted:

And readers will not forget that a majority of the House of Assembly had actually passed this Bill, which would have saddled our impoverished little State with the fresh burden of a costly speculation, probably ending in heavy loss.<sup>32</sup>

Following defeat of the proposal, the prospect was raised that the Federal Government take over the operation and produce fuel oil for its own needs. The Premier indicated that he had made contact with the Federal Government to this end.<sup>33</sup> This prospect had, however, been previously looked at and dismissed, it being felt constitutionally difficult for the Federal Government to deal with the inevitable surplus production of some products over and above its own requirements.<sup>34</sup>

After a period of quiescence during 1917 and 1918 while the Australian Fleet was away on service, the Railton-Latrobe Company made another attempt to interest the Federal Government in purchasing fuel oil for the Navy for a fixed period. The contract between Governments of 1916 was reworked as a contract directly between the Company and the Navy, and forwarded to the Federal Government in September 1919.<sup>35</sup> The contract was adjusted to take account of the fact that the Federal Government had introduced its bounty scheme in the intervening period, but otherwise was essentially identical to the earlier version. On 30<sup>th</sup> September, a deputation from the Company visited the Minister for the Navy to press its proposal.<sup>36</sup> During these discussions it became clear that the Company was prepared to be flexible on the asking price for the oil, and on the period of the contract, but was looking for an expression of support from the Government. The Minister promised to pursue the matter in Cabinet.

Minutes of Naval Board meetings at the time reveal their advice to the Minister that any purchase by the Navy of fuel oil should be strictly a market transaction and that any encouragement that the Government might offer be funded from outside of the Navy budget.<sup>37</sup> Records of debates in Federal Parliament highlighted the ‘Catch 22’ that had emerged.<sup>38</sup> While the Company was looking for a firm sales contract as a basis from which to lever investment funds from private sources and/or the Tasmanian Government for the £150,000 that it estimated it required to expand its operations to meet the contract, the Federal Government was looking for concrete evidence that the Company could supply the oil before it would enter into such a contract, being of the belief that its recently introduced bonus scheme would supply all the incentive necessary. No way was found out of this impasse.

### **1925 – 1930, The Australian Shale Oil Corporation.**

Between 1920 and 1925, a series of companies attempted to keep activities alive in the Mersey Valley, most notably Southern Cross Motor Fuels Pty Ltd and the Tasmanian Cement Company.<sup>39</sup> The former set up a small processing plant on the east bank of the Mersey River, utilising a retort of its own design (Fig. 2). The Company had already established a refinery at Yarraville, Victoria, at which it was planned to treat the crude produced. The second group attempted to distil liquid products from the gases produced during its cement manufacturing activities, employing an original plant design developed locally by the works manager. Both Companies appear to have had limited success, an explosion in the plant forcing a premature curtailment of activities in the latter case.<sup>40</sup> In 1925, the level of activity accelerated with the arrival of the Australian Shale Oil Corporation.

The Australian Shale Oil Corporation Ltd. was formed in Melbourne in August 1924, with the initial intention of re-visiting the shale deposits at Murrurundi in NSW originally developed by the British Australian Oil Company and acquired by Australian Shale Oil Pty Ltd (a predecessor company) in 1923.<sup>41</sup> Australian Shale Oil Pty Ltd had also managed to acquire the exclusive rights to use the American invented Bronder retorting process in Australia. Both the concession to the shale deposit and the rights to the use of the Bronder process were assumed by the Australian Shale Oil Corporation and used extensively in their promotion of the Company float.<sup>42</sup> Prior to the formation of the Australian Shale Oil Corporation, Australian Shale Oil Pty Ltd had set up small scale demonstration plants of the Bronder process in Melbourne and Sydney. Based on the results from these trial plants, claims were made in the prospectus for the Australian



Shale Oil Corporation of recoveries between 90 and 100 percent, and cost efficiencies compared to previous types of retorts that would put the industry in Australia on a new commercial footing independent of the Federal Government bonus scheme.

**Figure 2:** *Shale works on the east bank of the Mersey River, circa 1924*



Source: National Trust of Tasmania Picture Collection

Before any significant activities were initiated at Murrurundi, representations were made on behalf of the Tasmanian Government in an attempt to convince the Company to establish their works at Latrobe rather than in NSW.<sup>43</sup> In October 1924, trials were conducted on shale samples from the Latrobe area in the small scale Bronder plant previously established in Melbourne.<sup>44</sup> Although not convincing, the results of these trials were apparently sufficiently encouraging to stimulate negotiations between the Company and the Tasmanian Government. An agreement between the parties was drafted by November 1924.<sup>45</sup> The draft agreement was a convoluted document, exceedingly favourable to the Company. It emerged later that the draft had been prepared by the Company's lawyers, with little opportunity for scrutiny by State legal officers.<sup>46</sup> When the Bill to enact the agreement was presented to the Tasmanian Parliament in December 1924, it was referred to a Select Committee by the Legislative Council. The Committee's report was presented on 22 January 1925, and reported in the

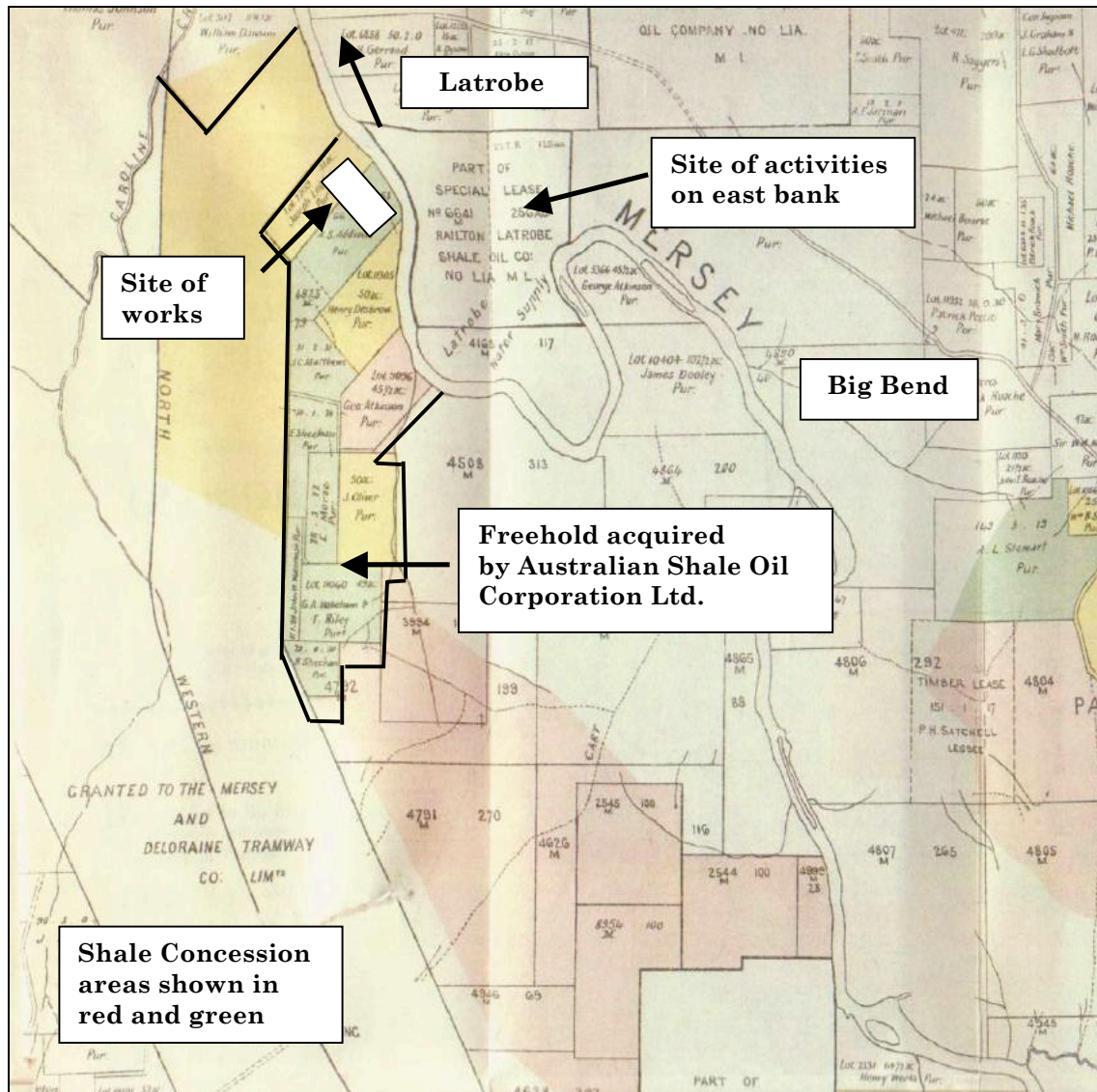
*Hobart Mercury* the following day.<sup>47</sup> The Committee was critical of the draft agreement in many respects, and condemned the process by which the Government had made its representations to the Company in the first instance. Suggestions of improper share ownership in the Company by interested parties were, however, dismissed. The Committee provided an alternate form of agreement for the Legislative Council to consider. After debate, the Legislative Council indicated its willingness to support an agreement essentially in line with the Committee's recommendations, hoping that there would be sufficient encouragement in this for the Company.<sup>48</sup>

*The Australian Shale Oil Corporation Act, 1925*, was assented to in February 1925.<sup>49</sup> The schedule to this Act was based on the recommendations made by the Select Committee. In essence, the Act required the Company to complete construction of a single retort plant by 30 June 1926, capable of treating 180 tons of shale per day, and upon certification by the Mines Department of satisfactory performance, expand this plant to be able to treat 1,000 tons of shale per day by 30 June 1930. In return, the Company would be granted rent free access to shale bearing areas for three years from commissioning of the expanded plant to the satisfaction of the Mines Department. In addition, the Company would be able to access shale free of rental costs while developing its initial plant. Any fears that the Government may have had about the attractiveness of this arrangement to the Company were soon allayed. In its supplementary prospectus to shareholders, the Company described the arrangement as 'a valuable shale concession'.<sup>50</sup> In effect, the Company would be placed in a strong position to potentially dominate the oil shale industry in Tasmania as a result of this concession (Fig.3). In addition to the concession over areas that it could work on its own behalf, the intention was that the Company would process shale sourced from other producers, effectively ensuring a monopoly.

With its preferential position secured, the Company set about activities. By October 1925, the Company was able to report that satisfactory progress was being made in proving the quantity of shale available on the freehold land acquired by the Company on the western side of the Mersey River, developing its mine, and establishing the initial retorting plant on this land (Fig. 3).<sup>51</sup> At the time of its 1925 report, the Company felt that it was on target to meet its contractual obligations to the State Government. By the time it reported the following year, however, problems had emerged.<sup>52</sup> Late delivery of equipment by suppliers had delayed installation of the retort, and initial trials of the retort, when it was finally completed, were well below expectations in terms of throughput, requiring significant modifications and operation at

higher temperature than originally planned to approach the necessary throughput capacity.

**Figure 3:** Location of major areas of activity, with part of concession areas shown



Source: Schedule to *The Australian Shale Oil Corporation Act*, 1925.

A report prepared by the Council for Scientific and Industrial Research in October 1926 summarised the status of the Company's plant at the time of a visit to the site by one of its officers (Fig. 4):

At the present time some £90,000 has been expended and a retort which has actually put through 70 tons of shale per 24 hours and which is estimated to have a throughput of 100 tons per day has been erected. The works are also provided with extensive crude oil condensing plant, with a crude naptha condensing plant and with a naptha refining plant. Some 30,000 gallons of crude oil have been accumulated.<sup>53</sup>

**Figure 4:** *Australian ShaleOil Corporation Ltd. works on the west bank of the Mersey River, circa 1927*



Source: National Trust of Tasmania Picture Collection

The performance figures quoted in this report were based entirely on information supplied by the Company. An independent trial of the modified plant conducted during December 1926, indicated a potential throughput of approximately 50 tons of shale per day and a total yield of approximately 41.5 gallons per ton.<sup>54</sup> Despite falling well below the required throughput capacity, these results were apparently sufficient for the Tasmanian Government to continue to support the Company, and for the Company to seek to raise additional capital.

In its supplementary prospectus and accompanying information booklet produced in 1927, the Company set out a case for an additional £85,000 of capital, based on what it claimed was a successful demonstration of the potential of the Bronder retort.<sup>55</sup> The capital was required to install extra retorts to bring the throughput capacity up to 150 tons per day, and to erect a refining and cracking plant. The required capital was not, however, able to be fully realised following the default of the major potential investor.<sup>56</sup> Operations at Latrobe were subsequently put onto a caretaker basis after a total production of 65,000 gallons.<sup>57</sup> Owing to the low level of output achieved, no significant Federal bonus payments were made with respect to this production, even though the scheme had been operative during this period.<sup>58</sup> In 1928, a merger arrangement was negotiated with L & N Brown Coal Ltd. of England, by means of

which operations at Latrobe could be continued using a patented retort design used by the English company to process coal.<sup>59</sup> In 1929, it was reported that the new retort had arrived on site, but by 1930 it had become obvious that the merged entity was not going to succeed.<sup>60</sup> The seductive 'shale concession' offered by the Tasmanian Government was never exercised.

### **1930 - 1934, The Tasmanite Shale Oil Company.**

While the Australian Shale Oil Corporation was pursuing its path to dominate the industry with the Bronder retort, other groups were experimenting with alternate retorts.<sup>61</sup> The Tasmanite Shale Oil Company Ltd. was formed in 1928 and took over the interests of Southern Cross Motor Fuels Pty Ltd. Up to 1930, activities were conducted with two different types of retorts, the 'Long' and the 'MacPherson', producing a total of about 35,000 gallons of oil.<sup>62</sup> In 1928, The Goliath Cement Company emerged out of the Tasmanian Cement Company and began activities using a Crozier retort established on the east bank of the Mersey River near Latrobe. This retort was financed and operated by The Mineral Oils Extraction Company of the UK, the holders of the patent. In operations up to 1931, about 36,000 gallons of oil was produced using this retort.<sup>63</sup> The shale for both activities was sourced from the mining leases still held by the Railton-Latrobe Company, or from adjacent freehold land on the east side of the Mersey River north of the Big Bend (Fig. 3).

In August 1930, the Tasmanite Shale Oil Company Ltd. approached the Federal Government in an attempt to obtain the latter's help in marketing its crude oil production. At this time the Company's storage capacity at Latrobe was being pressed and it anticipated an increase in the rate of production once additional retorts came on line. The request made of the Government was, to say the least, ambitious:

- that the [COR.] be instructed ... to accept the responsibility for the marketing of Tasmanian crude oil ...
- that under the authority of the [COR] a refining plant be erected at Devonport East (Tasmania) to treat the crude oil produced by the Tasmanite Shale Oil Co. and other kindred Companies in the vicinity ...
- [that] authority be given to construct immediately a pipe line from Latrobe ... to the suggested refining plant at Devonport.
- that a thorough investigation and research be made by a special Department under the authority of the Bureau of Science and Industry and the [COR] to ascertain the actual contents of the crude oil produced in Tasmania and the commercial value of the various contents.<sup>64</sup>

This request, in effect, represented a direct challenge to the views expressed in Federal Parliament when the *Oil Agreement Bill* was being debated and to the stated aim for COR to treat 'indigenous oils' contained in the wording of the *Act*. The Federal Government turned to COR for advice. In early September 1930, COR responded to the Government<sup>65</sup> claiming that it had been approached on several occasions by various interested parties with a view to taking an active role in the Mersey Valley, but had declined on the grounds that in its assessment crude oil of a satisfactory quality for refining/ cracking could not be produced profitably from the area. The response went as far as to suggest that the quality of the crude was inferior and that the current operators in the area had been misguided in ignoring well-founded advice. A somewhat abridged response was passed back to the Tasmanite Shale Oil Company by the Government, suggesting, in part, that the Mersey Valley crude could not be treated by the current COR refinery, and that anyway it would be too expensive to transport the crude from Tasmania to the mainland for refining even if it were technically possible; that the crude could not be mixed with the products being manufactured by COR for marketing; and that the natural mix of products produced by refining imported crude already resulted in an over supply of the heavy fractions and that this would be exacerbated by additional crude from Tasmania, necessitating periodical closure of the refinery.<sup>66</sup> Not un-naturally, the Tasmanite Shale Oil Company was unhappy with this response, suggesting in a reply to the Prime Minister that if the current refinery could not handle the Mersey Valley crude, a new refinery be erected (presumably by COR) at Devonport, expressly for this purpose.<sup>67</sup> No further response appears to have been forthcoming from the Government. In October 1930, the Tasmanite Shale Oil Company advised the Government that it had ceased operations due to a lack of storage capacity at its plant.<sup>68</sup> The discontent embodied in this exchange around the role of COR had parallels in other organisations.<sup>69</sup> This discontent was to eventually emerge at a Royal Commission held into the petroleum industry, but without any resolution useful to the Mersey Valley industry.<sup>70</sup>

By the end of 1930, it had become obvious to those interested in the Tasmanian oil shale industry that some form of a co-ordinated approach was going to be necessary if the industry was to ultimately succeed. In December 1930, the Federal Government convened a meeting in Melbourne between representatives of Federal and State Governments, public servants from various departments, representatives from the Companies operating at the time, and the relevant Unions.<sup>71</sup> It was resolved at this meeting to form the 'Tasmanian Shale Oil Investigation Committee', under the auspices

of the Federal Government, along the lines of a committee previously formed in NSW. The Committee was to be made up of two representatives nominated by the Federal Government, four representatives nominated by the State Government (both of these sets of nominees to include representatives of the industry) and two representatives of the relevant Unions. The terms of reference would be to determine the obstacles in the way of commercial development of the industry in Tasmania, and to suggest steps to be taken to overcome these. A number of sub-committees were set up to examine various aspects of the industry, including mining, processing, and marketing. The sub-committees set about their tasks immediately. In April 1931, a meeting of the full Committee was held in Launceston to discuss progress.<sup>72</sup> At this meeting it was agreed to pursue the prospects for amalgamation of the various interests in the Mersey Valley.

Progress toward amalgamation was surprisingly rapid. By early May 1931, agreement in principle had been obtained from the Railton-Latrobe Co., Goliath Portland Cement Co., Mineral Oils Extraction Ltd., and the Tasmanite Shale Oil Company Ltd.<sup>73</sup> This expeditious outcome may have been prompted by reports in the press around this time of the possibility of substantial direct funding for the industry from the Federal Government.<sup>74</sup> Rightly or wrongly, the prospects for achieving such funding were linked to the amalgamation of the various interests in the Mersey Valley.<sup>75</sup> By August 1931, the formal basis for execution of an amalgamation had been worked out, involving merging of the various groups into the Tasmanite Shale Oil Company Ltd. by a share arrangement, to form a consolidated entity to be called by the same name. The proposed scheme was put to the shareholders of the Tasmanite Company in September 1931 and accepted.<sup>76</sup>

By the time of the amalgamation, most parties were of the view that the focus should be on use of the Crozier retorting process. The Federal Government had made it clear in January 1931 that it was development of this process that they saw as being critical to the future of the Tasmanian industry.<sup>77</sup> The effectiveness of the Crozier retort for processing the Mersey Valley shale had been demonstrated as early as 1924 by means of tests conducted on samples sent by the Tasmanian Government to a prototype plant at the Wembley Exhibition in London.<sup>78</sup> A representative of the Tasmanian Government had witnessed the trials and reported back enthusiastically. The full size plant that had operated at Latrobe in conjunction with the Cement Company had further convinced most people of the potential of this process.

After making some modifications to the Crozier retort already installed at Latrobe, the Company embarked on a series of trials throughout the first half of 1932.<sup>79</sup>

By the end of June 1932, it had been established that the Crozier process could effectively treat the Tasmanite shales for prolonged periods. The average daily throughput was found to be around 12 tons during sustained operation, producing around 24 to 25 gallons of crude per ton. On the basis of these trials, the Company decided to continue operation of the existing treatment plant indefinitely, whilst preparing detailed plans to install additional retorts to increase throughput to around 50 tons per day. By May 1933, the plans for expansion of the plant were completed and detailed costing arrived at.<sup>80</sup>

Perhaps anticipating that the Company, having complied with the Federal Government's wishes in bringing about amalgamation and pursuing the Crozier retort, would receive Government support, the Company wrote to the Minister for Development in June 1933. It proposed a three way cost sharing arrangement between the Company, State Government and Federal Government to finance the expansion as a way of demonstrating the commercial potential of the Mersey Valley industry based on use of the Crozier process.<sup>81</sup> The Government turned down this proposition, citing the need for the anticipated final report of the Tasmanian Shale Oil Investigation Committee to be tabled before any definitive position was ratified.

Meanwhile, a co-operative group entered into an arrangement with the Tasmanite Company to continue work using the initial retort, with the aid of operating subsidies financed by the Federal Government through the Investigation Committee, amounting to a total of £3,920 by the end of 1934.<sup>82</sup> By that time, a total of about 240,000 gallons of crude oil had been produced from the Crozier retort.

### **1930 - 1932, The Shale Oil (Demonstrating) Company.**

At the time that amalgamation was being pursued in May 1931, a letter was sent to the Tasmanian Shale Oil Investigation Committee by a group of 'business men' who had acquired the residual assets of the Australian Shale Oil Corporation/L&N (Tas) at Latrobe.<sup>83</sup> In this letter the group explained their wish to pursue a trial of a retort design of the type employed widely in the Scottish oil shale industry. A claim was made that the group had endeavoured to negotiate a position with the other participants in the amalgamation that would ensure that a trial of this type of retort would be included in the on-going programme, but that no accord could be reached. As a result of this, the group signalled their intention to proceed independently.

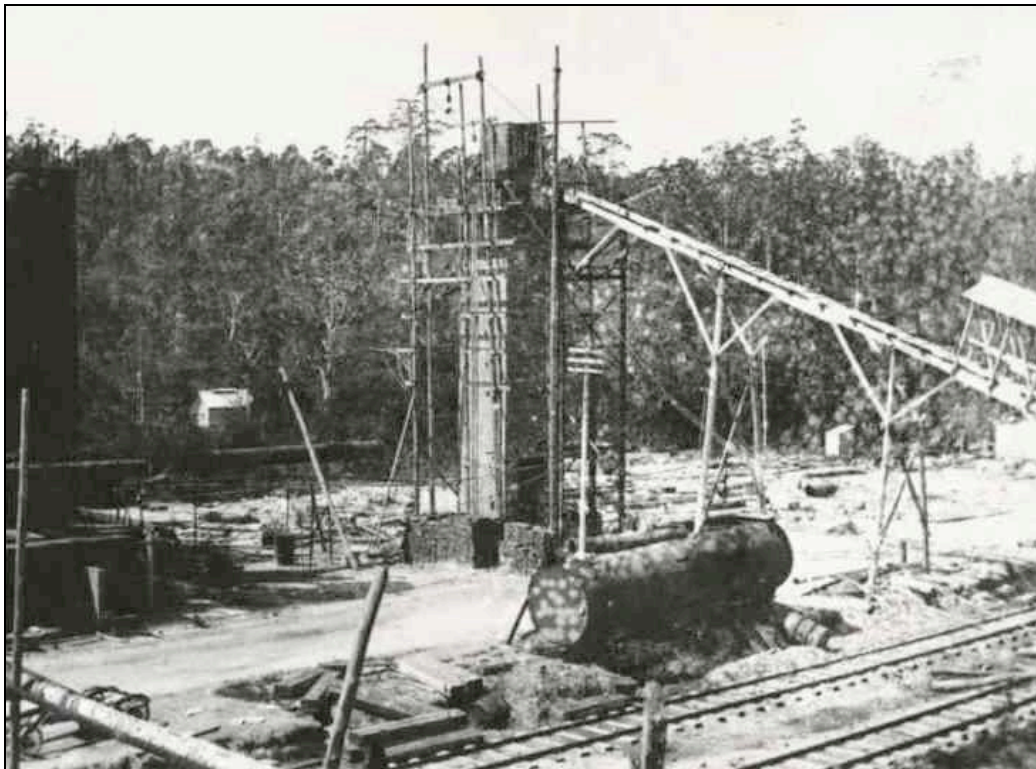
In June 1931, the Shale Oil (Demonstrating) Company Ltd. was floated to take over where the Australian Shale Oil Corporation/L&N (Tas.) Ltd venture had left off.<sup>84</sup>



The stated aim of the new entity was to import and demonstrate a 'full size modern Pumpherstons retort', of the type developed by and used in the well-established Scottish oil shale industry. The intention was to link this 'proven' style of retort to the ancillary plant still left at Latrobe, and to add a cracking plant to maximise production of benzine. In the event that a successful demonstration could be achieved, the next stage would be to set up a working company to exploit the inherited reserves of shale on the freehold land owned by the earlier Company, and to hopefully re-secure the shale concession offered by the Tasmanian Government.

In November 1931, the Company wrote to the Federal Government setting out its position and requesting that in the event of any funding being provided to Tasmania, equal consideration be given to the Shale Oil (Demonstrating) Company as to the Tasmanite Shale Oil Company.<sup>85</sup> There is no evidence that any funding was ever provided. Despite the lack of support, the Demonstrating Company proceeded with its plans. By May 1932, the new retort had been installed and a trial run commenced (Fig. 5).<sup>86</sup> The trial was run from 29 May to 19 July 1932, during which time 200 tons of shale was treated at an average throughput of 5 tons per day, producing 'an excellent quality crude' with no particular problems. On completion of the trial run the plant was shut down pending further developments, never to be fired up again.

**Figure 5:** *Pumpherstons retort demonstration plant, circa 1932*



Source: National Trust of Tasmania Picture Collection

### **1931 - 1935, the Federal Government position**

If the Federal Government policy with respect to the Tasmanian industry had been confounding up to 1930 as a result of the impacts of the *Shale Oil Bounty Act* and the *Oil Agreement Act*, after 1930 it became confused as the Government's ambivalence toward the oil shale industry emerged.

In January 1931, the Minister for Home Affairs in the Federal Government made a public statement, reported in the Hobart press, to the effect that '... the £100,000 voted for the repatriation of coal miners might be used for the development of the shale industry'.<sup>87</sup> The context of this statement suggested to the Tasmanian shale oil industry that they might benefit from this possibility. Minutes of Federal Government Cabinet meetings as early as March 1931, however, make it clear that the Government, whilst not legally bound regarding the disbursement of this fund, had a verbal agreement with the Miners Federation by this time to the effect that the vast bulk of this fund would be expended in NSW where out of work coal miners were concentrated.<sup>88</sup> Despite this, the activities of the various oil shale interests in the Mersey Valley continued to be spurred by the prospect of securing some of this funding.

After completion of the trials conducted by both the Tasmanite Shale Oil Company and the Oil Shale (Demonstrating) Company in the first half of 1932, the Federal Government commissioned a report by L.J. Rogers, a fuel research officer in the Government service, on the results of these trials and other aspects of the Mersey Valley industry. This report was presented in September 1932. Foremost in the report's conclusions was that:

From the information at present available, there seems little prospect of the Crozier plant being able to produce revenue in excess of working expenses, even on a large scale. The Pumpherstons plant offers distinctly better prospects of commercial development'.<sup>89</sup>

In his report, Rogers suggested that further work was required to better establish the operating performance of the latter type of retort at larger scale. Contrary to this advice, the Federal Government continued to support the operation of the Crozier retort for a further two years, but offered no support to the Demonstration Company. The ongoing support for the Crozier retort appears to have been motivated by the creation of employment opportunities as much as anything else.

About the same time as the report was presented by Rogers, the Shale Oil Investigation Committee tabled its first report.<sup>90</sup> Among the recommendations emerging from this report were that a sum of £25,000 be provided from the fund set up for

repatriation of out of work coal miners to support further drilling by the Tasmanian Mines Department to prove the extent of the shale resource, and to contribute toward larger scale trials of the existing retorts. An amount of £1,500 was provided to support the drilling program, but the retorting trials were not supported. Minutes of Federal Government Cabinet meetings reveal that the decision not to fund the retort trials was based partly on the preference to support the NSW industry, and partly on the diminished balance (£53,000) then existing in the repatriation of miners fund trust account.<sup>91</sup> The consistency of this decision is open to question.

At the end of 1934, the long awaited final report of the Tasmanian Shale Oil Investigation Committee was tabled. This report looked in detail into the economics of establishing the oil shale industry in the Mersey Valley. A meeting was convened in Melbourne in December 1934 between The Minister for Development in the Federal Government, The Minister for Mines and Secretary for Mines in the Tasmanian Government, and representatives of the Tasmanite Shale Oil Company, to discuss the implications of the report.<sup>92</sup> In essence, the report concluded that;

- no further understanding was going to be gained by continuing to operate the 12 ton per day Crozier plant,
- the construction and operation of either a 60 ton per day or 250 ton per day plant was going to incur a substantial on-going loss for the Federal Government, and was therefore not justifiable,
- the best hope for the industry in Tasmania was to concentrate on the production of by-products, particularly bitumen.

Despite an eleventh hour attempt to re-visit the prospect of supplying fuel oil to the Navy through Devonport, this time at the rate of 10,000 tons per year, the tabling of the final report of the Investigation Committee effectively brought to an end endeavours to produce crude oil and/or its derivatives from Mersey Valley shale, a position that the Federal Government appears to have been happy to accept at the time. The Crozier plant was finally shut down in January 1935.

### **Epilogue.**

Trials of various processes to manufacture bitumen from the Mersey Valley shales were continued for a number of years, ultimately leading to the production of substantial quantities of this product.<sup>93</sup> Numerous investigations have been conducted into utilisation of the shales over the years since 1935, and interest shown from time to time in resuming commercial activities.

By 1934, the Federal Government had committed itself, in principle, to an arrangement with the NSW Government to part finance the start up of a new major oil shale enterprise in the Blue Mountains.<sup>94</sup> It is interesting that as part of this arrangement, COR were to be induced to take on the marketing role, a commitment was to be made for the Navy to source all its fuel requirements from this enterprise, an undertaking was to be pursued that all government and public bodies in the Sydney area would also source their fuel requirements from the enterprise, and production from the enterprise would be free of Federal excise. The Tasmanian industry may well have had cause to bemoan the absence of a 'level playing field' and a consistent government policy framework.

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## Endnotes

<sup>1</sup> C.A. Bacon, 'A summary of the oil shale resources of Tasmania', *Tasmanian Department of Development and Resources Unpublished Report 1986/61*, 1986, p. 4.

<sup>2</sup> *Ibid.*, pp. 4-5.

<sup>3</sup> *Shale Oil Bounties Act*, 1910, Acts of Federal Parliament, no. 23 of 1910, Commonwealth Government Printer, Melbourne, 1910.

<sup>4</sup> See for example, *Hansard*, 19 September 1917, p. 2239.

<sup>5</sup> *Shale Oil Bounty Act* 1917, Acts of Federal Parliament, no 29 of 1917, Commonwealth Government Printer, Melbourne, 1917.

<sup>6</sup> See for example, *Hansard*, 24 August 1923, p. 3477.

<sup>7</sup> See for example, *ibid.*, 16 August 1923, p. 2927.

<sup>8</sup> *Ibid.*, 14 May 1920, p. 2124.

<sup>9</sup> *Ibid.*, p. 2142.

<sup>10</sup> *Oil Agreement Act* 1920, Acts of Federal Parliament, no. 13 of 1920, Commonwealth Government Printer, Melbourne, 1920.

<sup>11</sup> Annual Reports of the Commonwealth Oil Refineries Ltd, 1921-1924, Published by the Company, Melbourne.

<sup>12</sup> *Australian Year Book*, Commonwealth Government Printer, Melbourne, 1926, p. 762.

<sup>13</sup> *Petroleum Prospecting Act* 1926, Acts of Federal Parliament, no. 5 of 1926, Commonwealth Government Printer, Melbourne, 1926.

<sup>14</sup> W.H. Twelvetrees, 'The Tasmanite Shale Fields of the Mersey District', *Geological Survey of Tasmania, Bulletin*, no. 11, 1911, p. 62.

<sup>15</sup> *Ibid.*, pp. 64-83.

<sup>16</sup> *Ibid.*, p. 63.

<sup>17</sup> C.E. James, 'Report of Tasmanian Shale Oil Investigation Committee', *Geological Survey of Tasmania, Mineral Resources*, no. 8, vol. 11, 1932, p. 21.

<sup>18</sup> The Bord and Pillar technique involves removing material from a network of tunnels (bords), leaving behind a regular grid of pillars to support the overlying strata.

<sup>19</sup> Application for Registration of Railton-Latrobe Shale Oil Company Ltd., Item MIN66/1/1724, 1912, Archives Office of Tasmania.

<sup>20</sup> Bacon, 'A summary of the oil shale resources of Tasmania', p. 5.

<sup>21</sup> *Ibid.*

<sup>22</sup> James, 'Report of Tasmanian Shale Oil Investigation Committee', p. 21.

<sup>23</sup> *Ibid.*, p. 19.

<sup>24</sup> *Hobart Mercury*, 1 November 1916.

<sup>25</sup> Twelvetrees, 'The Tasmanite Shale Fields of the Mersey District', p. 64.

- <sup>26</sup> See financial analyses by Wade and Hardie contained in Final Report of the Parliamentary Standing Committee on Public Works enquiring into Railton-Latrobe Shale Oil Company's Property Purchase, Parliament of Tasmania, Parliamentary Paper no. 54, Tasmanian Government Printer, Hobart, 1916.
- <sup>27</sup> Progress and Final Reports of the Parliamentary Standing Committee on Public Works enquiring into Railton-Latrobe Shale Oil Company's Property Purchase', Parliament of Tasmania, Parliamentary Paper no. 54, Tasmanian Government Printer, Hobart, 1916.
- <sup>28</sup> See for example, *Hobart Mercury*, 10 August 1916.
- <sup>29</sup> Latrobe Shale Oil Agreements, Parliament of Tasmania, Parliamentary Paper no. 68, Tasmanian Government Printer, Hobart, 1916.
- <sup>30</sup> See for example, *Hobart Mercury*, 15 December 1916.
- <sup>31</sup> *Ibid.*, 25 January 1917.
- <sup>32</sup> *Ibid.*, 29 January 1917.
- <sup>33</sup> *Ibid.*, 2 February 1917.
- <sup>34</sup> See for example, *Hobart Mercury*, 26 January 1917.
- <sup>35</sup> Proposed contract between Railton-Latrobe Shale Oil Company NL and the Hon. Joseph Cook, Minister for the Navy, MP472/1, 8/19/8676, National Archives of Australia [hereafter NAA].
- <sup>36</sup> Minutes of meeting between representatives of Railton-Latrobe Shale Oil Co. NL and the Minister for the Navy, Hon. Joseph Cook, 30 September 1919, MP472/1, 8/19/8676, NAA.
- <sup>37</sup> Minutes of Naval Board meetings, 16 and 27 October 1919, MP472/1, 8/19/8676, NAA.
- <sup>38</sup> See for example, *Hansard*, 11 September 1919, pp. 12267-68.
- <sup>39</sup> A McIntosh Reid, 'The Oil Shale Resources of Tasmania', *Geological Survey of Tasmania, Mineral Resources*, no. 8, vol.1, 1924.
- <sup>40</sup> James, 'Report of Tasmanian Shale Oil Investigation Committee', p. 20.
- <sup>41</sup> *Prospectus of Australian Shale Oil Corporation*, 1924, VPRS 932 Unit 569, File 10165, Public Records of Victoria [hereafter PROV].
- <sup>42</sup> *Ibid.*
- <sup>43</sup> Report of Select Committee convened to examine the *Australian Shale Oil Corporation Bill*, 1924, (No 79), Parliament of Tasmania, Parliamentary Paper no. 51, Tasmanian Government Printer, Hobart, 1925.
- <sup>44</sup> Anon., 'Treatment of Tasmanite by the Bronder Process', Geological Survey of Victoria, Confidential Laboratory Report, Victorian Department of Mines, 1924.
- <sup>45</sup> Schedule to the *Australian Shale Oil Corporation Act*, 1924, (No 79), Parliament of Tasmania, Parliamentary Paper No. 51, Tasmanian Government Printer, Hobart, 1924.
- <sup>46</sup> Report of Select Committee convened to examine the *Australian Shale Oil Corporation Bill*, 1924, (No 79), Parliament of Tasmania, Parliamentary Paper No 51, Tasmanian Government Printer, Hobart, 1925.
- <sup>47</sup> *Hobart Mercury*, 23 January 1925.
- <sup>48</sup> *Ibid.*, 28 January 1925.
- <sup>49</sup> *The Australian Shale Oil Corporation Act*, 1925, Acts of the Tasmanian Parliament, No 72, 1925, Tasmanian Government Printer, Hobart, 1925.
- <sup>50</sup> Supplementary Prospectus of Australian Shale Oil Corporation, 1927, VPRS 932 Unit 569, File 10165, PROV.
- <sup>51</sup> Annual report of Australian Shale Oil Corporation Ltd., October 1925, VPRS 932, Unit 569, File 10165, PROV.
- <sup>52</sup> *Ibid.*, November 1926, VPRS 932, Unit 569, File 10165, PROV.
- <sup>53</sup> G.A. Cook, 'Report on visit to Tasmania in order to inform the Council's policy on assisting the oil shale industry', Confidential Report, Council for Scientific and Industrial Research, 1926.
- <sup>54</sup> S. Jones, 'Report on test of the Bronder Retort for Australian Shale Oil Corporation', Horticultural Press, Melbourne, 1927.
- <sup>55</sup> Anon., *Shale Oil, Tomorrows Fuel*, Information Booklet produced by Australian Shale Oil Corporation Ltd., State Library of Victoria Manuscripts Collection.
- <sup>56</sup> *Annual report of Australian Shale Oil Corporation Ltd.*, September 1928, VPRS 932, Unit 569, File 10165, PROV.
- <sup>57</sup> James, 'Report of Tasmanian Shale Oil Investigation Committee', p. 20.
- <sup>58</sup> Annual statements of account of Australian Shale Oil Corporation Ltd., 1927, 1928 and 1929, VPRS 932, Unit 569, File 10165, PROV.
- <sup>59</sup> *Annual report of Australian Shale Oil Corporation Ltd.*, September 1928, VPRS 932, Unit 569, File 10165, PROV.
- <sup>60</sup> *Annual reports of Australian Shale Oil Corporation Ltd.*, June 1929 and December 1930, VPRS 932, Unit 569, File 10165, PROV.
- <sup>61</sup> Bacon, 'A summary of the oil shale resources of Tasmania', p. 4.
- <sup>62</sup> James, 'Report of Tasmanian Shale Oil Investigation Committee', p. 21.
- <sup>63</sup> *Ibid.*

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- <sup>64</sup> Letter to the Prime Minister from the Tasmanite Shale Oil Company Ltd., 12 August 1930, A458, J500/19, part 1, NAA.
- <sup>65</sup> Letter to the Prime Minister from COR, 8 September 1930, A458, J500/19, part 1, NAA.
- <sup>66</sup> Letter to Tasmanite Shale Oil Company Ltd. from the Prime Minister, 13 September 1930, A458, J500/19, part 1, NAA.
- <sup>67</sup> Letter to the Prime Minister from the Tasmanite Shale Oil Company Ltd., 26 September 1930, A458, J500/19, part 1, NAA.
- <sup>68</sup> *Ibid.*, 28 October 1930.
- <sup>69</sup> See for example, Letter to the Prime Minister from Gippsland Petroleum NL, 16 December 1930, A458, J500/19, part 1, NAA.
- <sup>70</sup> See for example, evidence by A. Frood to *Royal Commission into Mineral Oils and Petrol and other Products of Mineral Oils, 1934-1937*, Parliamentary Papers, 1938, vol. 111, Commonwealth Government Printer, Melbourne, 1938, p. 807.
- <sup>71</sup> Minutes of meeting convened by the Commonwealth Government in connection with the shale oil industry in Tasmania, 2 December 1930, A786, G16/9, part 1, NAA.
- <sup>72</sup> Minutes of meeting of the Tasmanian Oil Shale Investigation Committee, 17 April 1931, A786, G16/9, part 1, NAA.
- <sup>73</sup> See for example, Correspondence to the Tasmanian Shale Oil Investigation Committee from various operators in the Mersey Valley, 22<sup>nd</sup> April to 5<sup>th</sup> May 1931, A458, J500/19, part 2, NAA.
- <sup>74</sup> See for example, Statement by A. Blakeley, Minister for Home Affairs in the Federal Government, regarding the possibility of investment of some of the £100,000 fund established for the repatriation of coal miners into the oil shale industry, *Hobart Mercury*, 16 January 1931.
- <sup>75</sup> See for example, Comment re condition for securing Government support in; *Report of Extraordinary General Meeting of Shareholders, Tasmanite Shale Oil Company Ltd.*, September 1931, p. 4, A458, J500/19, part 1, NAA.
- <sup>76</sup> Report of Extraordinary General Meeting of Shareholders, Tasmanite Shale Oil Company Ltd., September 1931, A458, J500/19, part 1, NAA.
- <sup>77</sup> See for example, Statement by A. Blakeley, Minister for Home Affairs in the Federal Government, regarding further development of the Crozier retort, *Hobart Mercury*, 16 January 1931.
- <sup>78</sup> Anon., 'Report on the performance of the Crozier Retort for treating Tasmanian Oil Shale', Mineral Oils Extraction Ltd., Confidential Report, 1924.
- <sup>79</sup> Annual report of the Tasmanite Shale Oil Company Ltd., December 1932, A786, G16/9, part 1, NAA.
- <sup>80</sup> Letter with attachments from A. Walker, manager at Latrobe, to head office in Melbourne, Tasmanite Shale Oil Company Ltd., 26 April 1933, A458, J500/19, part 2, NAA.
- <sup>81</sup> Letter to A.J. McLachlan, Minister for Development in the Federal Government, from Tasmanite Shale Oil Company, 19 June 1933, A458, J500/19, part 2, NAA.
- <sup>82</sup> Minutes of meeting convened by the Commonwealth Government to review implications of final report of the Tasmanian Oil Shale Investigation Committee, 7 December 1934, A458, J500/19, part 1, NAA.
- <sup>83</sup> Letter from C.C. Chambers to the Tasmanian Shale Oil Investigation Committee, 1 May 1931, A786, G16/9, part 1, NAA.
- <sup>84</sup> Prospectus of the Shale Oil (Demonstrating) Company Ltd., 1931 A458, J500/19, part 1, NAA.
- <sup>85</sup> Letter to J.J. Daly, Assistant Minister for Industry in the Federal Government, from the Shale Oil (Demonstrating) Company Ltd., 20 November 1931, A458, J500/19, part 1, NAA.
- <sup>86</sup> Anon., 'Confidential report on the Shale Oil (Demonstrating) Company's Pumpherstons retort and refining plant, Latrobe Tasmania', September 1932, A458, J500/19, part 1, NAA.
- <sup>87</sup> *Hobart Mercury*, 16 January 1931.
- <sup>88</sup> Minute of Federal Government Cabinet Meeting, 9 March 1931, A458, BT500/4, NAA.
- <sup>89</sup> L.G. Rogers, 'Report on the Tasmanian Shale Industry', September 1932, A458, J500/19, part 2, NAA.
- <sup>90</sup> James, 'Report of Tasmanian Shale Oil Investigation Committee'.
- <sup>91</sup> Minute of Federal Government Cabinet Meeting, 15 November 1932, NAA.
- <sup>92</sup> Minutes of meeting convened by the Commonwealth Government to review implications of final report of the Tasmanian Oil Shale Investigation Committee, 7 December 1934, A458, J500/19, part 1, NAA.
- <sup>93</sup> Bacon, 'A summary of the oil shale resources of Tasmania', p. 7.
- <sup>94</sup> Minute of Federal Government Cabinet Meeting, 17 April 1934, A461, B376/1/5, NAA.