

(d) It is reasonably clear that the common law of New Zealand is part of New Zealand law - which makes New Zealand legally closer to Canada and the United States than it is to Australia;

(e) The scope of the aboriginal title rule is quite uncertain. In particular it is difficult to be confident about whether the Courts would restrict such a claim to "pre-European" use of the resource. Even if they did so restrict it, it is difficult to be sure about what is meant by pre-European use and whether this could extend to the development of such uses by advanced technologies;

(f) The language used in s. 3 of the Geothermal Energy Act 1953 was insufficient to extinguish Maori interests in geothermal resources. In any event s. 3 is not repeated in the Resource Management Act 1991.

7.0 THE BACKGROUND TO THE 1952 AND 1953 ACTS

A. Geothermal Energy for Electric Power Generation

7.1 In 1947 the Hon. R. Semple, Minister of Works and Minister in Charge of what was then called the State Hydro-Electric Department presented the department's annual report to Parliament 100. Semple began by explaining the severe difficulties the country faced in terms of adequate supplies of electricity:-

"The past year has been one of great difficulty in the field of electricity supply. With increasing difficulty in obtaining any alternative means of supplying light, heat, and power, and in accord with the Government's general policy of encouraging local manufacture wherever possible, the demand for electricity supply has continued to grow. Unfortunately, however, consequent on the war and the subsequent disorganisation throughout the world, there are serious delays in obtaining the necessary plant

It is proposed to investigate this matter without delay and that is the use of natural steam for power-generation. "There is one possibility which must not be overlooked,

Maratai on the Waikato). There was, however, another option:- plants were being built at Roxburgh on the Clutha, and at with the existing programme of hydro-electric construction (new costs of an oil-fired plant. It seemed better to press ahead government was concerned about the high capital and operating plants¹⁰¹. Coal, however, was itself in short supply; and the failing to provide an adequate back-up system of thermal entailed had led to sustained criticism of the government for The severe energy shortage and the numerous power cuts that this

the Southern Alps." particular this has reduced the available power from Lake Taupo, Mangahao, and from the lakes and rivers rising in the rivers and lake basins with a westerly aspect. In prevailing westerly depressions which bring rain to all experienced abnormally dry periods with an absence of the limit, we have during each of the past two summers conditions, would tax our existing power resources to the "Superimposed on this general delay, which, under normal

system past breaking-point. Sample continued:- very dry summers which had strained the resources of the existing and dislocation caused by the war had been exacerbated by two The problems of rapid industrial growth combined with the delays

electricity is used." Switzerland, and in practically all countries where occurring in Great Britain, in Australia, in Canada, in delays in providing additional generating-plant are special to New Zealand; shortage of electricity and catch up on our delayed programme. The problem is not carry on local construction work at the rate necessary to the necessary skilled staff, labour, and materials to for additional generating-stations, and even in obtaining

...by putting it through a separator and using centrifugal force the water goes to the outside and the steam remains in the centre, so that it has been possible to produce steam almost completely dry. From the small bores at Wairakei at the present time enough steam is coming to generate between 5,000 and 6,000 kilowatts of electricity. These bores are only about 4", whereas at the Lardarello scheme in Italy there are bores up to 18" in diameter. When the Commissioner of Works paid a visit there he saw one bore of 18" in diameter that was producing steam

7.2 Nevertheless steps certainly were taken by Sempie. Officials of the State Hydro-Electric Department and the Ministry of Works, including the Commissioner of Works, travelled to Italy in 1948 to learn about the operation of the Lardarello plant at first hand. At that time Lardarello was producing about 300,000 kilowatts of electricity per year. In 1950 the first trial bores were put in place at Wairakei. By 1952 17 bores were in existence at Wairakei, the biggest being 6" in diameter, going down to depths varying between 600 and 1,500 feet. Ministry of Works and DSIR engineers were impressed by the results - only two of the 17 bores failed to yield steam - and temperatures were high, higher in some instances than at Lardarello, but were disappointed to find that the steam was wet, rather than dry. (Lardarello ran on dry steam). However, as the Minister of Works was able to advise parliament in 1952¹⁰²:-

and to put down trial bores in suitable locations. Natural steam would provide power comparable to water-power, in that it would be supplied by Nature." At that time the technology for development of geothermal resources was in its infancy. There was only one fully operational geothermal power station in existence anywhere in the world, at Lardarello in Italy. There was thus no realistic hope that geothermal power development could immediately cure the nation's energy shortage, and the principal emphasis continued to be on hydro-electric construction.

7.4 At the same time as the Geothermal Steam Bill was making its way through parliament, the government was actively involved in a joint venture with the British government aimed at extracting deuterium or heavy water from geothermal steam¹⁰⁴. ("Heavy" water is a substance which has the same chemical

B. The British Heavy Water Project

7.3 The legislation was therefore "sold" to parliament on the basis of the potentialities of geothermal resources to assist with the electricity needs of the country. There is no need to doubt that this was a major consideration with the Labour government and with the National government which replaced it after the 1949 election. There was, however, more to the legislation than that. There were two other important considerations influencing government, these being, firstly, the government's participation in a secret British project to extract heavy water from geothermal steam and, secondly, the problem posed by Maori objections to use geothermal steam at the proposed new pulp and paper mill being constructed at Kawerau.

"The idea is to get sufficient for a plant of about 20,000 kilowatts at the earliest possible moment, and when that is established we shall install the plant without delay."

possible¹⁰³:-

The objective was to install a small generating plant as soon as possible the quantity of steam available at Wairakei. as possible the quantity of steam available at Wairakei. We have gone as far as we can with the small drills. As soon as it was certain we could get steam in quantity we ordered bigger drills, and the first of these should be in New Zealand shortly. It will have a diameter of 15", and we are proposing to use that drill twenty-four hours a day, running three shifts, so as to determine as quickly as possible the quantity of steam available at Wairakei. Its prospects are excellent. We have gone as far as we can with the small drills. As soon as it was certain we could get steam in quantity we ordered bigger drills, and the first of these should be in New Zealand shortly. It will have a diameter of 15", and we are proposing to use that drill twenty-four hours a day, running three shifts, so as to determine as quickly as possible the quantity of steam available at Wairakei. It will be seen we are on the verge of a wonderful sufficient to generate 35,000 kilowatts of power....It

properties as ordinary water, but in which the hydrogen component of the water molecule is deuterium, an isotope of hydrogen with a mass about double that of ordinary hydrogen). The idea for the project had begun informally by means of a discussion between Dr Marsden, the scientific advisor to the New Zealand High Commission in London, and Sir John Cockcroft, Director of the Atomic Energy Research Establishment at Harwell. This was followed up by a letter from the British High Commission in Wellington to the government dated 17 March 1952:-

"The New Zealand Government will be aware that the potential Commonwealth demand for heavy water as a moderator in atomic piles equipment is now considerable. The present price of heavy water as a moderator in atomic piles equipment is now considerable. The present price of heavy water from Norway is about £75,000 per tonne and the cost (exclusive of capital charges) to the United States Government of heavy water from the Trail plant, which was erected at United States Government expense, is believed to be about half this figure. The future world price largely depends on production in the United States.... The High Commissioner has been asked to inform the New Zealand Government that the United Kingdom authorities attach great importance to the development of additional sources of supplies of heavy water, and to express the hope that the New Zealand Government will feel able to agree that a thorough survey of its potential production in New Zealand should be undertaken as a matter of urgency."

7.5 A few brief comments need to be made about the context of this initiative. In the early 1950s Britain found that the United States was not willing to share the technology of nuclear weapons, and Britain resolved to develop her own programme, to some degree in association with her Commonwealth partners. In 1952 a programme of weapons testing began in Australia¹⁰⁵. According to a DSIR memo of 5 August 1952 (copy on NZED 1,2/0/83):-

"The exact relationship of the supply of heavy water to the military and industrial application of heavy water is not known in New Zealand, but it seems probable that the certainty of adequate supplies at reasonable cost could affect the design of atomic power plants for submarines and other special purpose reactors."

7.6 Following receipt of the British High Commissioner's formal requests for New Zealand assistance, the Minister for Scientific and Industrial Research advised the Secretary for External Affairs that DSIR had already carried out some preliminary work relating to the distillation of heavy water from geothermal steam. This had included:-

(a) Tests of corrosion due to geothermal steam on a wide variety of metals likely to be employed in constructing distillation equipment.

(b) Heat Transfer tests and corrosion on mock-up heat exchangers.

(c) Geophysical prospecting of areas alternative to the well proven Wairakei area. The latter area because of its prospective use for electrical power production may not be available for extensive heavy water production for we do not agree that the low temperature steam so far available at Wairakei can be used for both purposes simultaneously¹⁰⁶.

The Minister of Scientific and Industrial Research advised that:-

"New Zealand will be prepared to assist in the erection and operation of a large experimental column at Wairakei to the limit of available manpower, materials and finance."

Meanwhile the chief engineer at Wairakei was instructed to use

"The indications were that sufficient steam was already proved for the initial heavy water plant and associated 40,000 kilowatt electric power generating plant for

7.8 The Kopia was considered as an alternative, but access turned out to be too difficult. Attention was next fixed on Waitotapu as a site for the heavy water distillation project. By November 1952 it appears that Waitotapu had been settled on and the British government appeared to have committed itself to a Waitotapu plant. Then for some reason there was a further change and a joint venture New Zealand-United Kingdom plant to cost £3,000,000 was decided on, to be built at Waitakere. Merz and McLellan, the engineering consultancy involved in planning Waitakere, worked closely with the British Atomic Energy Research Establishment at Harwell during 1954. In late 1954 the whole project became public when a British technical team arrived in the country in late 1954 and discussed the project fairly openly with the media. The Evening Post reported on 22 November 1954:-

"Some enquiries have been made as to the ownership of the land at Ohaki. Apparently there are more than 200 owners of the small area in which the springs are situated. With such a complex ownership it is likely that much trouble would be experienced in obtaining a lease or purchase. Also, it became apparent that some pressure would be brought by the owners to prevent drilling."

7.7 The site for the proposed heavy water plant was changed a number of times during the planning process. On 1 October 1952 the General Manager of the State Hydro-Electric Department advised DSIR that there was no objection to using Ohaki as the site for the proposed deuterium plant. This option was then dropped when it was realised that the land at Ohaki was in Maori ownership. On 16 October 1952 the DSIR advised the General Manager:-

the title "Heat Exchange Research" to cover the secret work at Waitakere on the experimental heavy water distillation project.

7.9 In the end the heavy water distillation plant was never built. The Electricity Department files I have located do not reveal why this was so. According to Robin Fry, whose one

interests of the respective governments. the supervision of consulting engineers representing the required was being designed by the United Kingdom under producing heavy water. The highly technical equipment proportion to the cost of producing electricity and Expenses would be shared by the two Governments in Mr Holland said a composite plant was to be built. Zealand and heavy water required by the United Kingdom. of two commodities - electric power required by New when referring to the joint enterprise for the production The Prime Minister, Mr Holland, said his last night electricity.

Zealand station which is to produce heavy water and established by the two governments to control the New are to nominate the directors of the corporation to be The United Kingdom and New Zealand Governments

"Joint Body to Control Heavy Water Station

23 November 1954:-

announced by the Prime Minister. According to The Dominion for The following day the heavy water project was officially

the same time: 1958." they were expected to come into production more or less at financing the first plant and New Zealand the second - and cost would be split between the two countries - Britain design would begin, as soon as we return to England'. The The job was an urgent one, said Dr Pratt. Detailed would probably begin within a year. were not insurmountable, he added, and actual construction Problems which had arisen, among them corrosion, designing team, at Wairakei yesterday. Kingdom Atomic Energy Authority and Leader of the British Wairakei, said Dr H.R.C. Pratt, a member of the United

paragraph on the heavy water project is the only published reference I have found on it, while the heavy water project influenced the design of the Waitakere power station, "due to cost factors the heavy water part of the project was ultimately dropped, and the design modified" 108.

C. Maori Land at Kawerau

7.10 One further dimension was the problem posed by Maori land at Kawerau, the site for the new pulp and paper mill which was intended to run (at least in part) on natural stream. The Kawerau project was a joint venture commercial operation involving the Crown and private enterprise. This was therefore a different type of application of the resource and one not provided for in the Geothermal Steam Act 1952, which was confined to the use of the resource for electrical generation. This issue seems to have become of importance after the enactment of the Geothermal Steam Act 1952 and was instrumental in the enactment of the considerably more comprehensive and sweeping Geothermal Energy Act 1953. On 23 July 1953 the Commissioner of Works advised the Minister of Works as follows regarding the situation at Te Teko (Kawerau) 109:-

"You are aware of the impasse which has arisen in regard to the acquisition of suitable areas at Te Teko for the production of geothermal steam for the proposed pulp and paper mill. The right has been secured to enter on Maori-owned property for the purpose of sinking the necessary bores but the owners have so far declined to reach any agreement as to the price of the land should the bores prove successful.

Various prices have been suggested even up to £1,2000 an acre. As it stands the land is worth very little, being scrub and fern covered and possibly used occasionally for grazing.

It is felt that if we enter the property and put bores down, it these prove to be successful a very heavy price will be demanded for the land.

The matter has been referred to the Solicitor-General's Office and the information we have to date indicates that the Crown has no right to acquire this land for any other purpose than the generation of electricity [this was due to the limited wording of the Geothermal Steam Act 1952¹¹⁰] and even in this latter case the question of compensation would have to be decided by the appropriate Court. The indication from the Solicitor-General's Office is that the Court would be likely to take a liberal view of the value of the land.....

Consideration should, I think, now be given to legislation extending the provisions of the Geothermal Act to give the State protection in regard to the utilisation of this steam in the national interest and on a basis wider than the utilisation of this asset for the production of electricity."

7.11 Not mentioned in the Commissioner's memorandum is the fact that an area of land in the same area with geothermal surface features had earlier been compulsorily taken from its Maori owners. This was Part Section 12 Rangitaiki Block, taken for thermal purposes under the Scenery Preservation Act in 1919¹¹¹.

8.0 THE GEOTHERMAL STEAM ACT 1952

A. Geothermal Power and Water Power

8.1 The Minister in Charge of the State Hydro-Electric Department, the Hon. W.S. Goosman (who was also Minister of Works and Minister of Railways) described the Geothermal Steam Bill as intended to:-

"...put geothermal steam in the same position as water for

the generation of electricity." 112

Its antecedent was the Water-power Act 1903. Section 2(1) of the Water-power Act states:-

"Subject to any rights lawfully held, the sole right to use water in lakes, falls, rivers, or streams for the purpose of generating or storing electricity or other power shall vest in His Majesty."

The water-power Act thus nationalised an aspect of the

development rights relating to a particular resource. This was

coupled with a power to local authorities¹¹³ and a restricted

right to licence private operators (private electricity

generation for supply to general consumers was forbidden¹¹⁴).

This was the approach and structure built on when the time came

to develop geothermal energy for electricity generation as a

supplement to hydro power.

B. The Geothermal Steam Act in Parliament

8.2 The first reading of the Geothermal Steam Bill took place

on 4 July 1952 and the full debate (2nd reading) was on 22 July

when the Bill was introduced by Hon. W.S. Goosman. The debate

focused in the main on the issue of nationalisation of the

resource. Members of the Opposition pointed out that Clause 3 of

the Bill in effect nationalised the geothermal resource for the

purposes of electricity generation. This was, however, a rather

difficult point for a Labour Opposition to pursue, committed as

it was in those days to nationalisation of key resources and

industry sectors. This is shown in the following exchange¹¹⁵:-

"The Hon. Mr McLAGAN. (Oppn., Riccarton).....[T]he Bill

proposes not only nationalization, but confiscation

without compensation. It is no wonder the Minister wanted

to get over the explanation of the Bill as rapidly as

possible. Clause 3 states:-

the State, and I think the generation of hydro-electric and geothermal power are among the things which the State must control in the interests of the people."

That a National MP could express such sentiments is a clear indication of how very different was the political climate of 1952 from today.

8.4 The other response to the nationalisation issue was

developed by Mr R.A. Bodkin, the Minister of Internal Affairs, who had supported Sir Apirana Ngata when the latter raised his concerns about the nationalisation of Petroleum in 1937¹⁹.

Bodkin, who had spoken eloquently of the requirements of the Treaty of Waitangi on that occasion, did not now mention it. His main concern was to rebut the Opposition's taunt that the

National Party had turned socialist, and he did so by arguing that the Geothermal Steam Bill made provision for private

enterprise - the objective of the Bill, as with the Petroleum

Act, was to licence use of the resource, not to appropriate it.

A necessary precursor to licensing the resource was to vest the

sole right to utilise it in the Crown. In so arguing Bodkin

revealed a more sophisticated grasp of the Bill than of any of

his parliamentary colleagues on either side of the House²⁰:-

"This Bill makes provision for private enterprise, because

once the Bill passes then, for the first time in the

history of the country, private enterprise will be able to

obtain a title for generating electricity by means of

geothermal steam."

This, it should be added, was not entirely correct. In the past

private enterprise could have obtained such a right only by

entering into private arrangements with landowners, as for

instance in the case of the Oil Baths at Rotorua. More

precisely, private developers would now be enabled to get a

"title" derived from the Crown, perhaps overriding the wishes of

landowners. Bodkin emphasised that Crown grants of similar

rights were not at all novel²¹:-

"From the earliest period of our history the Crown has granted various rights. The original freeholds were granted by the Crown to individuals. Take, for instance, the development of goldfields both in the North Island and the South Island. Water-rights were applied for and granted by the Crown to individuals for mining, industrial, or irrigation purposes. The Crown granted a licence, because only the Crown could grant a licence."

Turning to the present Act:-

"It is perfectly true that Clauses 3 and 4 reserve to the Crown the right to grant those licences. The Crown reserves the right to utilize geothermal steam. That is the first step necessary if the Crown is to grant rights to individuals. The position is that, if geothermal steam is to be harnessed at all, it can only be done following the expenditure of a vast sum of money....Would anybody in their sober senses suggest that an individual or a company would be justified in going to that expense unless a title could first be obtained. Obviously only the Crown can issue the title, and this Bill follows the same procedure as was operated away back in the eighteenth sixties when the goldfields of this country had to be developed."

8.5 It was Bodkin who made the only reference to Maori land in the entire debate, this being only an incidental mention in the course of the following exchange:-

"The Hon. Mr SKINNER. - Is there anything to prevent them [a power board] from developing geothermal steam on private land?

The Hon. Mr BODKIN. - What nonsense! Why, who would put a penny-piece into such a proposition? No one knows better than the honorable gentleman that geothermal

steam will never be developed on either Crown land or Maori land except under licence."

From what he goes on to say, Bodkin's point appears to be that geothermal development on private land could not occur due to the risk of neighbouring landowners drawing off the steam. In any event, his intervention left the Labour Opposition rather confused¹²³:-

"The Hon. Mr MASON (Waitakere). - Sir, the address we have just heard is one of the most remarkable I have ever listened to. Here we have a Bill which has the

purpose - and the proper purpose - of securing to the people the power generated from geothermal steam, but the whole burden of the speech of the honourable gentleman who has just resumed his seat is that it has the opposite effect - that is, to secure private enterprise in the enjoyment of geothermal power. We are surely entitled to some clear exposition from the Government as to what the

purpose of the Bill really is. Every member of the

Opposition, I imagine, welcomes the Bill if its central

idea is that secures for the people the use of geothermal power, but it becomes a different matter if we are to

understand that the purpose of the Bill is to secure it to private enterprise."

8.6 The Minister of Works, Mr Goosman, concluded the debate by attempting to clarify the respective interests of the Government and private enterprise¹²⁴:-

"The member for Riccarton tried to compare it [the Bill]

with the measures brought down by the previous government to deal with coal¹²⁵. Well, I do not know how one could

compare coal with geothermal steam. There is no

comparison. Coal is a solid quantity that can be handled, whereas geothermal steam is not. So there can be no

comparison between this Bill [and the Coal Act 1948]. The Member for Petone said that the Minister agreed that the

8.9 Lastly, the disadvantageous effects of geothermal exploitation at Wairakei and elsewhere lay in the future. The

8.8 The other part of the explanation may be that the Maori MPs, and Maori in general, were as keen to see electrical generation capacity expanded as anyone. They, presumably, would have been as fed up with the endless power shortages and power cuts of the 1940s as everyone else. The 1950s was, furthermore, a time of economic expansion when the ideology of progress reigned supreme.

8.7 As already indicated, these were not mentioned at all, and the question must be asked as to why not, especially in view of the extensive debate that surrounded the Petroleum Act in 1937. There are a number of possible explanations. One may be the political context. By 1952 all four Maori seats were Labour-held. Labour was in favour of nationalisation of resources, seen with the Petroleum Act 1937, the Atomic Energy Act 1945 and the Coal Act 1948. The four Maori MPs may have been Maori, but they were also presumably in favour of the socialist-leaning Labour programme of that time. Indeed there was a broad consensus that the state should play a predominant role in energy development.

C. Discussion of Maori Issues

only way to develop the natural resources of this country was by the Government taking them over. Very definitely I do not agree.... Licences have been granted all over the country [under the Water-power Act], and under this Bill licences may be granted just the same. There are factories that generate electricity, and feed into the Government lines. There will be nothing to prevent that. But where the State is doing the development, at high cost, it is necessary to protect the areas. In other areas there is nothing to prevent private enterprise from developing geothermal steam, exactly the same as is done with water power."

collapse of thermal systems miles away from Wairakei, as was indeed to occur, was not foreseen.

D. The Geothermal Steam Act 1952 Analysed

8.10 The Act begins by vesting the right to exploit the resource for the purpose of electricity generation in the Crown. Section 3 provides:-

"Subject to the provisions of this Act, the sole right to take, use, and apply geothermal steam for the purpose of generating electricity shall vest in the Crown."

8.11 Extensive powers relating to the investigation of geothermal fields and the construction of power stations are conferred by s.4. By s.4(1) the Minister was empowered to:-

(a) Take and use geothermal steam from any bore on any land;

(b) Erect, construct, provide, and use such works and appliances as may be necessary in connection with the taking, use, and application of geothermal steam for the purpose of generating electricity, and in connection with the transmission, use, supply and sale of electricity when so generated.

Section 5(10) conferred a power to enter onto any land for making surveys, investigations, tests and measurements, and to sink bores. Section 6 gave a general power of public acquisition:-

"The Governor-General may take, under the Public Works Act 1928, as for a water power work within the meaning of that Act, any land necessary for the taking, use, or application of geothermal steam for the purpose of generating electricity."

Section 7 gave to the Governor-General the power to grant

licences by Order in Council for the purpose of taking, using, and applying geothermal steam for the purpose of generating

electricity. Section 8 dealt with geothermal steam areas. Such

an area could be established by proclamation. Once established,

no person could sink a bore within the limits of the area without

the written consent of the Minister. The objective was to

protect those areas which the Crown had selected for electricity

generation. Section 9 made provision for compensation for

injurious affectation. There is no mention of Maori interests in

the resource in the Act whatever.

8.12 The Act had been explained to parliament quite correctly

by the Minister for Internal Affairs and the Minister of Works.

The Act certainly does nationalise use rights in the resource

insofar as electricity generation is concerned. But the

principal effect is to set up a licensing regime. It is only in

geothermal steam areas that the sinking of bores is prohibited

without Ministerial approval. Other than for the purpose of

generating electricity, landowners remained free to sink bores

wherever they liked. The common law rules - whatever they were -

would continue to apply. For electricity generation from

geothermal steam a licence was necessary under s.7. The Act was

an extension of the water-power Act (and the ancillary provisions

in the Public Works Act 1928) to electricity generation from

geothermal resources.

9.0 THE GEOTHERMAL ENERGY ACT 1953

A. Background

9.1 The following year, the Geothermal Steam Act was repealed

after having been in force for fifteen months, and was repealed

and replaced by the Geothermal Energy Act 1953¹²⁶. The 1953 Act

was modelled closely on the 1952 Act but was different in some

key respects and was considerably broader in its scope.

9.2 One factor which appears to have been influential in the decision to proceed with a rather more extensive bill was the situation which had developed at Kawerau. Here Maori landowners in fact, raised two problems. The 1952 Act allowed the taking of land under that Act for electrical generation only. The steam at Kawerau was intended to be used directly in the manufacture of pulp and paper and thus was not covered. Secondly, even if the land could be taken, it looked likely that doing so would prove extremely expensive since the value of the land would increase sharply due to the now-valuable geothermal resource underneath it. Although the Tasman Pulp and Paper project at Kawerau was mentioned in the course of parliamentary debate by the Minister of Works, nothing was said about the Maori land at Kawerau.

Clause 8 of the Bill, however, (s.8 of the Act) quite obviously was devised to deal with the situation at Kawerau. This was not the only legislative encouragement for the Kawerau project. Special legislation was also enacted relating to effluent discharges into the Tarawera River, because of a sewer water pollution problem today.

B. The Geothermal Energy Bill in Parliament

9.3 The Bill was introduced at its second reading once again by W.S. Goosman, Minister of Works and Minister in Charge of the State Hydro-electric Department. He began by announcing that¹²⁷:-

"The Bill is a very important one. We have arrived at the stage in the development of our geothermal resources when we are able to say that there is not any doubt about the future use of geothermal steam for the generation of electricity."

Goosman announced that a favourable report on development of a station at Waitakei had been received from an English consulting engineer (presumably from Merz and McLennan, who were to become the principal design engineers for the project). Goosman was enthusiastic, even exultant, about the prospects¹²⁸:-

"The Geothermal Steam Act vested in the Crown the right to use geothermal steam for the generation of electricity, but it is considered that that power is not wide enough in view of the fact that the steam can be used for other purposes including timber curing, tanning, the production of heavy water, milk drying, and other processes that require the use of heat. This Bill covers a wider field, and also gives protection against the handling of steam bores by inexperienced people. It is necessary to ensure that the use of these forces of Nature is probably controlled, and also that nearby tourist attractions are not damaged. In order to make the maximum use of geothermal steam, industries must be sited within a limited area, and consequently it is necessary for the Crown to control and licence geothermal energy. It may be necessary to close bores in the interest of public safety or to help certain important undertakings. The Crown has spent a considerable amount of money in exploring the field, and

Goosman explained the reasons for the new bill as follows:-

"By putting the station on the Waikato River, water will be easily available for condensation, and that will save about £50,000 worth of power a year in pumping the water. At Lardarello, big cooling towers are necessary. By putting a station on the Waikato River, we will do away with the necessity for cooling towers."

Waikato:-

He explained the advantages of siting the power station at

"It is probably as good as an oil strike. We do not know how far this geothermal power will be developed, but it is highly improbable that we will take from it will ever interfere with its volume.... It is just like poking holes into a boiler."

it is only right that it should eventually recover some of the money by way of licence fees."

9.4 The Labour Opposition was just as delighted with the

encouraging news from Waitakere and had little to say about the Bill apart from taunting the government yet again over its supposed change of heart over the matter of nationalisation of resources. Mr C.F. Skinner, the member for Buller, said 130:-

"Sir, the information which the Minister has given, is of great interest to the House and to the country. I think we can say that the investigations that were started a long time ago seem to have reached, perhaps not

culmination, but a very encouraging position. It must be a matter of considerable pride and satisfaction of those officers who were associated with this investigation in its early stages. I can remember when the previous

Minister of Works, Mr Semple, first sought authority to send the present Commissioner of Works to Italy to carry out the first of the investigations into the possible use

of geothermal steam. That was in 1948, I think, and it must be a tremendous satisfaction to Mr Semple to learn now that the latest bores, going down to a depth exceeding 3,000 feet, have proved so successful. The supply of

steam seems to be almost unending, and the pressures mentioned by the Minister are really phenomenal. The whole project sounds very promising, provided we can find, as I have no doubt we can, some way of safely harnessing these bores."

9.5 As in 1952, Maori issues and the Treaty of Waitangi was not mentioned.

C. The Geothermal Energy Act 1953 Analysed

9.6 The central provision is s.3(1):-

"Notwithstanding anything to the contrary in any Act, or

in any Crown grant or certificate of title or lease or other instrument of title in respect of any land within the territorial limits of New Zealand, the sole right to tap, take, use and apply geothermal energy on or under the land shall vest in the Crown, whether the land has been alienated from the Crown or not."

This is such an important provision that it seems worthwhile to attempt to consider carefully exactly what its effect is. There are obvious affinities with s.3 of the Petroleum Act 1937, s.8(1) of the Atomic Energy Act and s.3(1) of the Coal Act 1948. But the closest affinity is with none of these, but rather with the Water-power Act 1903, which vested water use rights for electricity generation in the Crown. As the Minister of Works indicated in 1952, the objective of the Act was to put geothermal resources on a similar footing to electricity generation from water, and this was in turn expanded in the 1953 Act. The legislative framework links geothermal resources with water, rather than with petroleum, uranium or coal. The legislation does not vest the geothermal resource as such in the Crown - as the Petroleum Act 1937 currently does with regard to petroleum - but instead treats it as an energy resource akin to water.

(Although "water resources" and "energy resources" are often distinguished, water is of course an energy resource in its own right, especially in New Zealand).

9.7 The Act also does appear to be based on an assumption (probably correct) that a geothermal reservoir is in effect groundwater. Section 3 becomes operative at the very point when the resource, considered in this sense, becomes a property right - at the point of abstraction. No one can acquire property in geothermal rights without a licence from the Crown. The Act does not really vest management rights in the Crown while leaving private property rights unaffected. Its intent, rather, is to make the existence of private property rights in the resource impossible without a licence since such an interest can arise only at the point of abstraction. This analysis does not, however, affect my earlier conclusion that the language of the

9.9 Section 4 of the Act allowed the proclamation of geothermal energy areas. Outside geothermal energy areas as so proclaimed - in fact only one has ever been proclaimed, Waitakere - landowners were permitted to sink bores on their own land for purposes of surveying, investigating and testing geothermal energy¹³² and s.5(2) conferred a very broad power allowing the Minister of Energy to close all bores within a 1.5 kilometre radius of Whakarewarewa¹³³. Section 8 is a special provision which fairly obviously is tailored for the situation at Kawerau, and appears to be designed to allow less than full-fee interests to be compulsorily acquired - thus facilitating the compulsory taking of rights of extract geothermal energy without involving the necessity of taking the land¹³⁴.

One effect of this definition is that minerals in solution in geothermal systems are included within the statutory appropriation of s.3. The definition was considerably broader than that in the 1952 Act which did not include minerals in solution within the definition¹³¹.

9.8 "Geothermal energy" is defined in s.2 of the Act to mean:-
 "...energy derived or taken from and produced within the earth by natural heat phenomenon; and includes all steam, water, and water vapour, and every mixture of all or any of them that has been heated by geothermal energy, and every kind of matter derived from a bore and for the time being with or in any such steam, water, water vapour, or mixture..."

provision is insufficient to extinguish aboriginal title interests in the resource. Although a property interest in the resource cannot in the ordinary course of things be lawfully obtained without a licence, this cannot apply to those who already have a property interest in the resource. Such an interest would need to be extinguished explicitly, or implicitly by vesting full ownership of the entire resource in the Crown. The Act does neither of these things.

relating to the generation of electricity from geothermal energy.

Section 11 conferred a further range of broad powers on the Crown relating to the generation of electricity from geothermal energy. Subject to the provisions of this section, the licensee under any licence to use or apply geothermal energy for industrial or commercial purposes shall pay to the Crown a rental computed at the rate and in the manner specified in the licence."

9.11 Section 10 of the Act permitted the Crown to levy a resource rental for use of the geothermal resource. Section 10(1) stipulated:-

"(b) Unless the Minister having regard to the public interest otherwise directs, it shall not be necessary to obtain a licence to sink a bore, or to tap, take, use, or apply geothermal energy for any domestic purpose whatever (including cooking, heating, washing and bathing), except where the bore proposed to be sunk or the bore from which the energy is derived is more than two hundred feet in depth."

This did not apply in a number of circumstances. Firstly, private landowners who were conducting investigations and tests of the geothermal resource on their own land did not need a licence 135. Secondly, private bores sunk in order to use the resource for domestic purposes were also exempt:-

"Notwithstanding anything to the contrary in any Act, instrument of title, or rule of law, no person shall sink any bore or tap, take, use, or apply geothermal energy for any purpose unless he has first obtained a licence granted by the Minister under this section."

9.10 Section 9 was the general licensing provision. Section 9(1) provided:-

Section 12 is the provision allowing bores to be closed. Section 13 deals with compensation for injurious affection. That there is to be no compensation in relation to the resource itself is made clear by s.14:-

"Notwithstanding anything in this Act or any other Act, compensation shall not be payable in respect of any geothermal energy on or below the surface of any land except so far as, at the commencement of this Act, the existence of the geothermal energy on or below the surface of the land is of actual benefit to the owners or occupiers of the land."

Exactly what "actual benefit" means in this context is difficult to explain, especially as the section has never been tested in court and was not debated in parliament. Section 15 dealt with the offences, and s.16 gave a generously-worded power to the Minister to make regulations.

D. Verdict on the Geothermal Energy Act

9.12 The Geothermal Energy Act was a product of its time - the post-war climate associated with rapid economic growth and an emphasis on development and "progress". It was a time, too, when state control of economic development and national resources seemed normal and progressive - an assumption that both the

National and Labour parties shared, though in varying degrees (as shown by the differing objectives of the parties in relationship to nationalisation of coal). As has been shown, the possibility of electricity generation from geothermal resources was regarded as an exciting novelty and technical challenge, and ultimately of a degree of national pride when the Wairakei geothermal power station turned out to be such a success.

9.13 At the time the obverse side of this happy picture was simply not apparent. The resource was seen as indestructible - an endless bounty of nature, waiting to be tapped. Destruction of surface features was not perceived as a serious risk, but one

doubts whether the attitude of politicians would have changed much even if it had been. It can also be said that the government was not entirely frank with parliament about some aspects of the situation. Nothing was said about Maori land at Kawerau, for instance; and the government certainly revealed less that it knew about the heavy water project - Goosman merely stated that the reason for the new Bill was to extend it to new industrial purposes, including "the production of heavy water" 136.

9.14 Despite these factors, the absence of any serious discussion of Maori interests in this resource still needs to be explained. Partly this can be explained by the sheer pervasiveness of the post-war emphasis on economic growth. All the same, the contrast with the debate over the Petroleum Act in 1937 remains puzzling. I have already suggested that one possible explanation for the difference in 1953 was that all four Maori MPs were by then Labour, who perhaps quite naturally wished to adhere to the party line in favour of nationalisation of resources. The Geothermal Energy Act was not an Act which the Labour Party could have felt comfortable about opposing, and the bill was indeed read a third time without a division 137. This can be contrasted with the situation in 1937, when Sir Apirana Ngata was of course an opposition member for Eastern Maori. Ngata belonged to the conservative, rather than the socialist, side of the political spectrum and could have had no ideological attachment to resource nationalisation as the four Labour Maori MPs presumably would have had in 1953. This, however, is speculation to a large degree. None of the four Maori MPs spoke on the matter. A further probability is that they would not have seen the Waitakere project as any sort of threat to Maori use of the resource, presumably intended to be taken care of by the exemptions provided for in s.9. (The use of the resource for "cooking, heating, washing and bathing" certainly appears to be aimed at protecting traditional Maori use of the resource at least to a degree along with the other domestic users). If so, s.9 reflects a perception that Maori interests in the resource were essentially of a local, almost "subsistence" nature.

9.15 The Geothermal Energy Act has been amended on a number of occasions and some of the amendments were relatively significant. Generally speaking, however, the basic structure of the Act remained essentially unchanged until the enactment of the Resource Management Act 1991.

9.16 Probably the most significant amendment was the Geothermal Energy Amendment Act 1966, which added a number of new sections relating to the powers of local authorities¹³⁸. These changes were made in tandem with the Rotorua City Geothermal Energy Empowering Act 1967. This Act, which transferred the Minister's powers under the parent Act to the Rotorua City Council in respect of the area within the limits of the city of Rotorua, is considered in Part 10. In 1969 the definition of "geothermal energy" was changed to exclude "water that has been heated by such [i.e. geothermal] energy to a temperature not exceeding 70 degrees C" from the definition¹³⁹. There have also been a number of changes to Section 10, the resource rentals provision, which was repealed and replaced in 1966¹⁴⁰ by the amending Act of that year, and again in 1977, on this occasion by the Ministry of Energy Act 1977¹⁴¹, which also substantially changed s.11 of the parent Act¹⁴². With the enactment of the Resource Management Act 1991 a completely new structure has come into existence. This Act will not be described in any detail in this report.

10. THE ROTORUA CITY GEOTHERMAL ENERGY EMPOWERING ACT 1967

A. Effect of the Act

10.1 The preamble to the Rotorua City Geothermal Energy Empowering Act 1967 reads:-

"WHEREAS it is expedient to enable the Rotorua City Council to utilise and control geothermal energy in the City of Rotorua for the benefit of the inhabitants of the city and

F. Amendments

accordingly to grant authority for the reticulation, in any specified part of the city and to control the sinking of bores for the purpose of obtaining geothermal energy in the city...."

The Act empowered the Council to control geothermal energy within the city limits. This was effected by giving the Council a special power to make the necessary bylaws¹⁴³ and by exempting the principal operative provisions of the Geothermal Energy Act 1953 from applying within city limits¹⁴⁴.

B. The Act in Operation

10.2 The administration of the Act by the City Council led to much criticism. In 1979 two major springs at Whakarewarewa, Papakura and Korotitua failed. Growing concern led to the establishment of a ministerial task force in 1983, which reported at the end of 1985 to the following effect:-

"Between 1967 and 1985 there had been a dramatic decrease in natural activity at Whakarewarewa including a 30% drop in natural heat flow. The water in hot springs and wells comes from the same supply - the geothermal aquifer. Recent rainfall does not mix with hot water in the geothermal aquifer. Neither does geothermal waste which is to put into shallow soakage. There has been a drop in pressure in the geothermal aquifer caused by draw off over a long period. Draw off increases in winter and decreases in summer. Pressures in the geothermal aquifer respond to this seasonal change and so do some hot springs. Wells closest to Whakarewarewa have a bigger effect on hot springs there than wells further away."¹⁴⁵

For this situation the Rotorua City (later District) Council in the opinion of many bears most of the blame. Heron J. in the Rotorua Geothermal Users case in 1987 stated¹⁴⁶:-

Following the revocation of the Ministerial delegation to the Council steps were taken to close down all bores within a radius of 1.5 kilometres of Whakarewarewa. This event, and its aftermath, will be dealt with in the next section.

field."

performance of geysers and springs in the Whakarewarewa in the Rotorua City was having a significant effect on the overwhelming body of opinion that the draw off of energy there was emerging over at least the last six years and criticism. It is important to remember in this case, surprised that its performance has been the subject of action taken by the District Council, it is not at all no final position to express any view of the course of the energy that was being consumed. Whilst the Court is no charges on an annual or any other basis for the use of consequences on the physical features of Rotorua have made notwithstanding evidence of a declining resource and its issued no licences in respect of the use of energy and of the normal methods of so doing. They have, it seems, regulate or control the use of the resource itself by any the engineering aspects, but have made no attempt to issuing of permits in respect thereof, focusing largely on have exercised control over the sinking of bores and the statutory power. On the evidence before me it seems they District Council has been a curious exercise of its The administration of the resource by the Rotorua Minister revoked the delegation.....

That remained the position up to 6 October 1986, when the use of geothermal energy within the district of Rotorua. (later became) the responsibility for the licensing of the [sic] delegated to the Rotorua District Council (as it the power of licensing, to a local body, and in 1968 it the Minister to delegate certain of his powers, including "Section 9(A) of the Geothermal Energy Act 1953 enabled

11.1 The question of the effectiveness, or otherwise, of the Rotorua City Council's exercise of its powers under the ministerial delegation 1968-86 leads naturally to the wider issue of the effects of post-war development on the geothermal resource. As indicated above, it was generally assumed that the resource was an inexhaustible bounty of nature, and concern about the possible effects on surface features, although certainly mentioned in parliament¹⁴⁷, did not assume much prominence until recently.

11.2 It has to be said that in terms of conservation of surface features the post-war record has been poor. A resource of great cultural significance to the Arawa and Tūwharetoa peoples (and not only those tribes, of course), as well as a major tourist attraction has been severely damaged. A century ago there were five geyser fields in existence - Rotomahana, Whakarewarewa, Orakeikorako, Waitakē and Spa (Spa is at Taupo). Only one now remains - Whakarewarewa. The Rotomahana field, admittedly, was destroyed by natural causes - the Tarawera eruption of 1886. The eruption destroyed the geysers at Rotomahana as well as the great sinter terraces, Te Parata (the White Terrace) and Otakapuarangi (the Pink Terrace), destroying as well Tūhourangi's lucrative tourist industry based on the spectacular sights of the Rotomahana area¹⁴⁸. The Spa, Waitakē and Orakeikorako fields, however, have all been destroyed by human activity since World War II¹⁴⁹.

11.3 At Geyser Valley, Waitakē, 244 thermal features were catalogued in a survey conducted by D.R. Gregg and A.C.M. Laing for the DSIR in 1951¹⁵⁰. There were 22 geysers and 122 cyclic flowing springs. But the effects of the Waitakē project in the region have been dramatic, drying out all the geysers and flowing springs at Geyser Valley and also at Spa near Taupo, which is 10 km away from the borefield. On the other hand thermal activities at Karapiti ("Craters of the Moon") have substantially increased. According to a report of the Waikato Valley Authority in 1987, Geothermal Management Planning: An Overview¹⁵¹:-

"Due to a dramatic decline in groundwater level flow regimes have completely altered and by 1968 the activity in Geyser Valley had completely changed from mainly flowing springs and active geysers to steam-heated, non-flowing pools, mud pools, fumaroles, extensive tracts of hot ground, and empty geyser basins. On the other hand, thermal activity at 'Craters of the Moon' (Karapiti) increased and resulted in several hydrothermal explosions. A rather unexpected consequence was that the draw-off at Wairakei had effects as much as 7-10 km away: Extinction of hot springs and geyser at Spa (Taupo) and enhanced activity of hot ground at Taupo Borough are largely responses to exploitation of the geothermal resource at Wairakei."

11.4 Damage caused by the Wairakei project to surface features has been compounded by damage caused by hydroelectric projects. The upper Wairakei is dammed at Aratatia, Ohakuri, Atiamuri, Whakamaru and Maraetai. The effects on surface geothermal features have been severe. The main effects are listed by the Wairakei Valley Authority as follows: -

- Artificial river level changes affected springs at Orakeikorako between 1941 and 1961;

- Removal of islands from the river in 1941 lowered river level permanently near Lake Taupo affecting the flow from hot springs at the Spa geothermal area in Taupo;

- Damming the river at Ohakuri in 1961 caused the river to rise 18 m at Orakeikorako. 75% of the hot springs, most geysers and some sinter deposits were submerged. Further, hot springs and bathing pools were flooded at Ohaki (Broadlands);

- Artificial control of the river flow at Aratatia dam periodically submerges about 30-50 hot springs downstream (at the Ngaawapurua Reserve);

- Both Atiamuri Dam and Maraetai Dam resulted in the drowning of an unknown number of hot springs.

The most significant loss was at Orakeikorako, where land belonging to Ngati Tahu was compulsorily taken, 75% of hot springs drowned and the last kaitiaki family obliged to leave. These events have been recorded in detail in Evelyn Stokes' report "Maori Issues at Orakeikorako" 153. The effect on the hot springs and geysers is described by E.F. Lloyd in a report written for the New Zealand Geological Survey in 1972¹⁵⁴:-

"On the left bank hot springs were confined to a strip along the river averaging 5m in width, except west of Papakowhatu, where the activity extends 610m from the river. On the right bank hot springs are more numerous. They were concentrated close to the river, but, where recent faults channel the hot water to the surface, flowing chloride springs emerge up to 160 feet above former river level. Mud pools and warm ground occur at an even greater elevation, extending 825m east from the river. All springs below the 950 foot contour have been submerged by Lake Ohakuri. They represent approximately 75% of the total springs prior to lake filling and include the well-known Orakeikorako Geysers and other geysers on the Papakowhatu."

11.5 The problems caused by draw-off at Whakarewarewa have already been mentioned. Following the cancellation of the ministerial delegation to the Rotorua District Council in 1986 the following further steps were taken:-

(a) A Ministerial decision exercised pursuant to s.9 of the Geothermal Energy Act to revoke all licences within a 1.5 kilometre radius of Whakarewarewa; and

(b) The promulgation of the Geothermal Energy Regulations 1961 Amendment No. 2 (1987)¹⁵⁵.