



THE UNIVERSITY OF  
**WAIKATO**  
*Te Whare Wānanga o Waikato*

# Legal Rights to Minerals in Geothermal Fluids

Barry Barton  
February 2015

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Research Report

Centre for Environmental, Resources and Energy Law  
University of Waikato

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ISBN 978-0-473-31289-3 (softcover)

ISBN 978-0-473-31290-9 (PDF)

This research was commissioned by GNS Science as part of a cross-disciplinary study, "From Waste to Wealth: Commercial Recovery of Products from Geothermal Fluids" contract C05X1307 funded by the Ministry of Business, Innovation and Employment, to assess the opportunities and barriers to commercial recovery of products from geothermal fluids.

Also available as GNS Science Miscellaneous Series 75, ISSN 1177-2441 (print) and ISSN 1172-2886 (online).

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CENTRE FOR ENVIRONMENTAL, RESOURCES AND ENERGY LAW / TE PUTAHI O TE TURE TAIĀO

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# EXECUTIVE SUMMARY

This report carries out a legal analysis of rights to the minerals that may be obtained from geothermal fluids extracted for the purposes of electricity generation and process heat. It is part of research into the commercial potential for the extraction of such minerals. Who has rights to these materials is not dealt with explicitly in New Zealand law, so for the most the legal position must be determined by the application of general legislation and general principles of law. The factual scenario that is the main focus of the analysis is a geothermal minerals operation that is ancillary or incidental to a geothermal energy facility.

The Resource Management Act 1991 (RMA) treats geothermal resources as a water resource. The analysis in this report concludes that the use of the term “water” in the RMA includes material dissolved or entrained in geothermal water, and the management of water under the RMA includes the granting of rights to such material as part of water more generally. This conclusion is reinforced by reference to other legislation. It is also clear that a regional council has jurisdiction over the materials in geothermal water, and has obligations to manage them under the RMA. Sound RMA reasons exist for a regional council to look favourably on geothermal minerals projects. The holder of an RMA water permit has the rights, otherwise vested in the Crown, to take and use water in terms that include the matter and material dissolved or entrained in water. Once it comes into the pipe system of the permit holder company, the water is the property of the company.

The application of the Crown Minerals Act 1991 to geothermal minerals operations depends on whether an operation constitutes “mining” within the meaning of the Act. On the one hand the CMA uses very general words which on their plain and ordinary meaning include geothermal minerals operations. It provides no exception for geothermal minerals, even when it carefully excepts other activities, and it provides no exception for a taking of minerals that is incidental or ancillary to another operation. On the other hand, the purpose and context provide indications that suggest that an ancillary or incidental operation is excluded, particularly where it involves an extraction of geothermal water, bearing minerals dissolved in solution, that is lawful. The assumption that such an exception can be implied involves a degree of uncertainty. As a matter of policy, it is very arguable that the uncertainty should be removed.

If a geothermal minerals operation is “mining” under the CMA, then the company must obtain a mining permit and must comply with other obligations under the Act. Obligations to supply information that is in due course made public are particularly notable. In addition, a geothermal minerals operator may find that its rights to mineral have already been granted to another permit holder.

The report goes on to analyze the rights of neighbouring private owners of land and minerals to prevent an operation from affecting the subsurface of their land. It appears to be highly unlikely that such a neighbour can succeed in legal action on private law grounds to obtain damages or an injunction. Even if such a neighbour did have a common law right to take legal action, the right is very likely to be overridden by the RMA.

The report shows that the Treaty of Waitangi and legislation enacted to give effect to it are not likely to have an adverse legal effect on a geothermal minerals operation.

As to geothermal water after extraction from the ground, and as to the minerals extracted from the water, they have the status of personal property, owned by the company or person that took them under the RMA water permit.



# TABLE OF ABBREVIATIONS

<b>AEE</b>	Assessment of Effects on the Environment
<b>CMA</b>	Crown Minerals Act 1991
<b>NZPAM</b>	New Zealand Petroleum and Minerals
<b>RMA</b>	Resource Management Act 1991
<b>WSCA</b>	Water and Soil Conservation Act 1967

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# 1 INTRODUCTION

This report is a discussion document which forms part of research into the commercial potential in New Zealand for the extraction of minerals from geothermal fluids.<sup>1</sup> It undertakes a legal analysis of rights to the minerals and materials that may be obtained from such fluids.

Geothermal fluids are extracted for the purposes of electricity generation and process heat, predominantly in the Taupo Volcanic Zone, but also in other parts of the country. The mineralization of the fluid varies from system to system, and, although the concentrations of minerals are not high, in some instances the quantities of fluid extracted are large. Silica is found in all high temperature geothermal fluid. It has some commercial value, depending on its character and grade, but its main significance is that it causes a build-up of scale in equipment and can make it more difficult to re-inject fluid into a subsurface system after use. Other materials that may be commercially viable for extraction are salts of boron and lithium.

That the costs of extraction from the ground have already been met suggests that the commercial viability of producing minerals from the flow of fluid in a power station or other facility is greater than it would be otherwise. Where silica must be removed to facilitate re-injection or more efficient electricity generation, another step in an extraction process may also have been paid for. It might therefore be possible that geothermal minerals operations can produce by-products and income flows in association with the use of geothermal resources for energy purposes.

Who has rights to the materials in geothermal fluid or brine is not dealt with explicitly in New Zealand law, so for the most part the legal position must be determined by the application of general legislation and general principles of law. The path taken to do so is as follows.

- Geothermal resources are treated as a water resource by the Resource Management Act 1991 (RMA), so the RMA is the first main aspect of the inquiry, also involving certain earlier legislation such as the Water and Soil Conservation Act 1967 (WSCA), and extending to the control and management of the extraction of minerals as part of geothermal resources.
- The next main issue is whether the Crown Minerals Act 1991 (CMA) applies to geothermal minerals operations in respect of the extraction of Crown-owned minerals, in such a way as to require compliance with its permitting system.
- The third issue is the rights of neighbouring private owners of land and minerals to prevent an operation from affecting the subsurface of the land.
- The inquiry concludes by reviewing issues concerning the Treaty of Waitangi and the law of personal property.

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<sup>1</sup> "From Waste to Wealth: Commercial Recovery of Products from Geothermal Fluids." The research project is led by GNS Science and funded by the Ministry of Business, Innovation and Employment, contract C05X1307.

Conventional methods of legal analysis of legislation and case law are used in order to ascertain the existing law and what is possible under it. Statutory interpretation is a major part of the analysis, and therefore receives special treatment in this Introduction. In all such cases the purpose is to ascertain what a New Zealand court would decide about a particular matter. On some matters it is possible to determine the law with clarity, but it is also necessary to identify the points where it is less easy to state the legal position with any certainty.

Options for law reform are explored in certain parts of the analysis. The report provides a foundation for wider law reform, but it does not attempt to produce any general blueprint for new law or new regulation for geothermal mineral resources.

It should also be noted that the report does not attempt to resolve all legal questions that could possibly emerge from geothermal minerals operations. Its purpose is to clarify the issues about the legal framework that are most relevant from a policy or strategic point of view.

## 1.1 Factual Scenario, Science and Technology, and Terminology

At present, there are no commercial-scale operations in New Zealand to extract minerals from geothermal fluids, and this report makes no attempt to predict the form that they might take, the targets that they will pursue, or the processes that they will use, if they eventuate. It is necessary, however, to state the assumptions about the facts that underlie the legal analysis. Different fact scenarios may well have legal implications.

The main factual scenario for this analysis is that a geothermal minerals operation is part of a geothermal energy development, where geothermal fluid is taken from the ground under an RMA water permit, and is used for the purposes of generating electricity and/or providing process heat. New equipment using some kind of extractive technology is installed in order to extract minerals from the geothermal fluid as it flows through the pipe network of the energy facility. In particular, silica may be removed in order to reduce the build-up of scale in the plant and to facilitate re-injection. Other dissolved materials can be extracted from the geothermal fluid, typically after the silica has been removed. (The silica does not contain useful quantities of other minerals, and may itself be dumped as waste if it cannot be processed into a commercial product.) In all such cases in this scenario, the recovery of mineral products can be regarded as ancillary or incidental to energy production, and the mineral can be regarded as a by-product; the recovery of minerals may not be economic without the energy production activity. There is arguably an alternative scenario, that mineral extraction is the primary purpose of a geothermal project, rather than an ancillary purpose; but that is less immediately foreseeable, and it is not pursued here.

As for the terminology that is used in this report, the term geothermal fluid will be used inclusively, to refer to water, steam and gases. However most of the materials of commercial interest are found in geothermal water (which can also be referred to as geothermal brine) rather than in the vapour (steam) or other gases. Most of those materials occur in the water dissolved in solution rather than in the form of entrained or suspended material. The RMA addresses geothermal resources as a form of water, and it will often be convenient in this report to follow that usage, but in doing so there is no specific intent to exclude other fluids. Equally, reference to dissolved materials is not generally intended to exclude entrained materials (that is, particles of materials in suspension). Nor is there any need to differentiate between minerals and other materials in most contexts in this report.

Legally, there may be a difference where legislation or a private instrument distinguishes minerals from other materials, even though they are all likely to be minerals in a technical sense.

## 1.2 Statutory Interpretation

One of the main methods of analysis used in this report is statutory interpretation. In particular, when the RMA controls the use of “water” does that include minerals, and when the CMA controls the “mining” of minerals, does that include geothermal minerals operations? Those general words in the legislation must be interpreted or construed to determine whether they apply to the particular activities entailed in a geothermal minerals operation. It is an interpretive problem that is common in law.<sup>2</sup> Because statutory interpretation is central to this report, it is desirable to explain the some basic relevant principles at this early stage. The principles are reasonably clear and well understood, but they are often difficult to apply to a particular situation.

**General principles.** The starting point is section 5(1) of the Interpretation Act 1999: “The meaning of an enactment must be ascertained from its text and in the light of its purpose.” In these words are to be seen the two main elements that are often in play in statutory interpretation; firstly the plain and ordinary meaning of the text, and secondly the purpose or intention of the legislation that may be indicated by specific words or the context of the particular text. The context may be an immediate one, in the wording and scheme of the Act, or it may be a broader one that includes an understanding of the problems that Parliament was seeking to remedy. In interpreting a statute, the courts are giving effect to the rule of law and the sovereignty of Parliament.<sup>3</sup>

The leading case on statutory interpretation is *Commerce Commission v Fonterra Co-operative Group Ltd*, where the Supreme Court said:<sup>4</sup>

It is necessary to bear in mind that s 5 of the Interpretation Act 1999 makes text and purpose the key drivers of statutory interpretation. The meaning of an enactment must be ascertained from its text and in the light of its purpose. Even if the meaning of the text may appear plain in isolation of purpose, that meaning should always be cross-checked against purpose in order to observe the dual requirements of s 5. In determining purpose the Court must obviously have regard to both the immediate and the general legislative context. Of relevance too may be the social, commercial or other objective of the enactment.

This indicates three steps to be taken:

- (i) The statutory text is to be considered in isolation of purpose, to determine its plain and ordinary meaning.
- (ii) The meaning, or possible meanings, of the text must then be cross-checked against the purpose of the legislation.
- (iii) In determining purpose, regard must be had to both the immediate and the general context. It may also be relevant to consider the social, commercial or other objective of the legislation.

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<sup>2</sup> Generally, see J F Burrows and R I Carter, *Statute Law in New Zealand*, 4th ed (LexisNexis, Wellington, 2009) p 291; R Carter and J McHerron, *Statutory Interpretation: a 2012 Guide* (NZLS CLE Ltd, Wellington, 2012).

<sup>3</sup> *R v Pora* [2001] 2 NZLR 37 (CA) at [103]-[106].

<sup>4</sup> [2007] 3 NZLR 767, [2007] NZSC 36 at [22] (SCNZ). Footnotes have been omitted from the quotation.

**Plain and ordinary meaning.** The meaning to be given to a term in a statute is its plain and ordinary meaning, or natural and ordinary meaning. Many cases in the courts are decided on little more than that. Dictionaries may be relied on to find the meaning. Obviously, if a statute gives a word a special meaning or definition in its interpretation section, that meaning must be given effect. However, such a definition may not solve all problems of interpreting and giving effect to the terms of a statute.

**Purpose.** The purposive approach is the standard approach taken by the courts to statutory interpretation.<sup>5</sup> Very often the grammatical meaning of the text gives effect to the purpose of the legislation, in which case there is no difficulty. Where a purely grammatical construction does not give effect to the evident purpose, then a court will search for a construction that does give effect to that purpose; it will regard context and purpose as essential guides to meaning.<sup>6</sup> Grammatical meaning and purpose are interdependent; “meaning from text in the light of purpose.”<sup>7</sup> Sometimes a statute states its purpose expressly, but it is often necessary to ascertain the purpose from an analysis of its structure and the wider context of its intended operation.

General words in a statute bring out a particular need for the purposive approach. General words will be given a construction that conforms with the purpose of the Act in question.<sup>8</sup> In our case, this relates to general words like “water” and “mining.” The purpose of the Act may show whether a broad meaning is intended, or whether a narrower or limited meaning is the one that gives effect to the purpose. General language in a statute can be “read down” to bear a narrower meaning than that of which it is literally capable. It may be that the general words themselves, read in the light of context and purpose, contain certain implications; then one is not really adding words to the provision, one is simply drawing out what is already implied as an unexpressed exception. Alternatively, the matter can be described as one of displacing an apparent ordinary meaning by a less usual one if it is required better to fulfil the purpose of the legislation, or if the wider context of the Act, or other factors, require it. Or the restriction may be taken as “read in” so as to avoid absurdity or unworkability or the frustration of Parliament’s purpose. Not all general words must be so restricted or read down. In every case, the proper reading of general terms in an enactment is a matter of construction of the text in the light of context and purpose.

**Special meanings.** In some cases, the legislative context and purpose may indicate that a word is used with a special technical meaning. A statute or regulation may use words in a way that has a particular meaning to those conversant with the field, trade or business that it regulates. For example, in a recent case the court decided that words used in regulations concerning genetic modification were technical words, used in science rather than in ordinary language, and were to be interpreted in the light of expert evidence about their meaning.<sup>9</sup>

Often, however, a court will resist the argument that special meaning should be preferred to the ordinary one. For example in prosecution for the crime where a person “stupefies” someone, the court declined to adopt a restricted medical or scientific meaning of the term, pointing out that the word

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5 Burrows and Carter, above n 2 p 205.

6 *Commerce Commission v Fonterra Co-operative Group Ltd*, above n 4 at [24].

7 *R v M* [2003] 3 NZLR 481 (CA) at [18] per Tipping J; Burrows and Carter, above n 2 p 208.

8 Burrows and Carter, above n 2 pp 210, 291, 296, 305-314, 356.

9 *Sustainability Council NZ Trust v Environmental Protection Authority* [2014] NZHC 1067.

has been in general usage in English for some centuries.<sup>10</sup> Similarly, where the RMA required a plan to “specifically identify” a tree, it was held not to intend a scientific sense of stating the genus and species.<sup>11</sup> The ordinary meaning of the words was applied.

**Context: Reading the Act as a whole.** There are many different aspects to context, but one that deserves particular note, as part of the immediate context, is that words are to be construed by reading the Act as a whole, taking into account related provisions and the organisation of the enactment overall. The courts will strive to interpret one provision so that it operates effectively and harmoniously with the other provisions of the Act. The courts will consider the scheme and purpose of the Act overall.<sup>12</sup> In addition, a court may ask whether a proposed interpretation fits in a logical way with other legislation.<sup>13</sup>

**Illogical interpretations.** The avoidance of illogicality and absurdity is another relevant consideration in the process of understanding of statutory text in the light of purpose. The courts will presume that Parliament does not intend to legislate in a manner which is absurd. If different interpretations are available, the courts will favour an interpretation that avoids a result that is “unworkable or impracticable, inconvenient, anomalous or illogical, futile or pointless, artificial, or productive of a disproportionate counter-mischief.”<sup>14</sup> While this is a wide meaning for the concept of absurdity, its use is restricted. Firstly, the court must have a clear view of the legislative purpose. Secondly, it must be satisfied that the absurdity would frustrate that purpose. Thirdly, the language of the statute must legitimately be capable of another meaning that is consistent with the purpose; if the words are plain and can have only one meaning, then the court must apply them even if the result is inconvenient or anomalous. Thus in a gambling control case the court agreed that its interpretation of the law would require the regulatory commission to undertake difficult and uncertain assessments, but that fell short of the absurdity that would suggest a different meaning.<sup>15</sup> The courts cannot re-fashion statutes in order to produce results that they think are more fair or more convenient; but they can resist interpretations that produce absurd results.

One way that an absurd or illogical interpretation can be avoided is by restricting or reading down a broad term, in the manner described above in relation to purpose. A broad term may be read down if an unduly literal interpretation of it would be absurd and would thwart the purpose of the enactment.

**New or unforeseen circumstances.** A statute will be applied and interpreted for conditions which may not have been foreseen at the time that it was enacted.<sup>16</sup> The words will not be governed by their meaning at the time of enactment, but will be interpreted to take account of changing circumstances such as new technology. Section 6 of the Interpretation Act 1999 says: “An enactment applies to circumstances as they arise.” However the principle is one of interpretation; it does not allow a court to write new laws.

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10 *R v Sturm* [2005] 3 NZLR 252 (CA). Also *Kerridge Odeon Corp v Auckland City* [1966] NZLR 266.

11 *Re Auckland Council* [2011] NZEnvC 129, (2011) 16 ELRNZ 433, [2011] NZRMA 546.

12 *R v Hansen* [2007] NZSC 7, [2007] 3 NZLR 1 (SCNZ).

13 *R v Pora* [2001] 2 NZLR 37 (CA) at [5]; *Agnew v Pardington* [2006] 2 NZLR 520 (CA) at [41].

14 *Frucor Beverages Ltd v Rio Beverages Ltd* [2001] 2 NZLR 604 (CA) at [28]; *Glenharrow Holdings Ltd v Attorney General* [2005] 2 NZLR 289 (JCPC) at [31].

15 *Skycity Auckland Ltd v Gambling Commission* [2007] NZCA 407, [2008] 2 NZLR 182 (CA).

16 *R v Hansen* [2007] NZSC 7, [2007] 3 NZLR 1 (SCNZ) at [14].

## 2 RIGHTS UNDER THE RMA

The logical place to begin the analysis of rights under the Resource Management Act 1991 is with the definition of the term “water” in the Act. We will then consider ancillary definitions in the RMA, and will then move to the Water and Soil Conservation Act 1967 and earlier geothermal legislation. The reason why definitions are important is not simply one of clarity in the terms used in legislation. Rather, a definition is where the legislature (Parliament) states the sphere of operation for an enactment, the extent of the jurisdiction of the bodies on which it confers powers, and the extent of the rights that it grants or allows to be granted. A statute sometimes gives a somewhat artificial meaning to a term, but the reason for doing so is to be specific about what it affects and does not affect.

In the RMA, the importance of the term “water” can be identified at several points in the regulatory fabric. It is the core of the prohibition in section 14 against using the resource without being expressly allowed by a rule in a plan or by a resource consent.<sup>17</sup> The functions of a regional council in section 30 include “the control of the taking, use, damming, and diversion of water” and on this statement of functions depends its powers under sections 61 as to policy statements and under sections 63, 66, and 68 as to plans, and section 87 as to resource consents.

### 2.1 The Extent of the Definition of “Water”

The main relevant definition in the RMA is “water.” Geothermal resources are treated as water. Section 2 provides:

**water—**

- (a) means water in all its physical forms whether flowing or not and whether over or under the ground:
- (b) includes fresh water, coastal water, and geothermal water:
- (c) does not include water in any form while in any pipe, tank, or cistern[.]

**Plain and ordinary meaning.** In order to understand this correctly, we will follow the steps in statutory interpretation identified above in the Introduction. We begin by ascertaining the plain and ordinary meaning of the statutory text; and we bear in mind our specific question, its application to geothermal minerals operations. The term “water” certainly has a recognizable plain and ordinary meaning, so that the task of interpretation is to ascertain the breadth of a term, rather than finding the meaning of an obscure expression or choosing between different meanings.

It is evident that the text of the definition does not expressly address the question of materials in solution or entrained in water. However, it is also evident that the text uses the term “water” in a broad, general way, that includes different types of water. Sea water, as a form of coastal water, is included, and sea water is certainly a kind of brine that contains materials dissolved in solution. Geothermal water is specially included. (Its definition is considered further below.) What we see, therefore, is that the text uses the term water in a sense where the water can vary in its composition,

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<sup>17</sup> Other aspects of s 14 need not be considered here.

and is still caught by the statute. The text gives no indication that the only water included is pure water. The plain and ordinary meaning of the text seems clearly to be that water includes geothermal water containing material dissolved in solution and material entrained in suspension in it.

**Purpose.** That apparent broad meaning of the word “water” can then be cross-checked against the purpose of the legislation. The RMA states its purpose expressly in section 5 in Part 2, which is well-known for the deliberate openness of its language, its meanings and its connotations, intended to allow the application of policy in a general and broad way.<sup>18</sup> The stated purpose of promoting the sustainable management of natural and physical resources is characterized by breadth in the meaning of those resources<sup>19</sup> and breadth and inclusiveness in what constitutes sustainable management. The same goes for the principles stated in sections 6, 7 and 8, which support the statement of purpose. From the purpose of the Act, and the way that it is expressed, one sees clear indications that a broad meaning should be given to “water” as including materials dissolved in water. That broad meaning appears to be consistent with the purpose of the RMA and the things that Parliament seeks to have done under it.

**Special meanings.** We noted earlier that in some cases the legislative context and purpose can indicate that a word is used with a special technical meaning. In this case, however, no such indication is to be seen. There is no indication, for example, that “water” means only pure water. The purpose of the RMA is a broad one, and the Act’s language, while carefully chosen, is not directed at any specialist trade or business or scientific discipline. The purpose of the RMA is expressed in ordinary language rather than specialist terminology. There is no obvious intention to use the term “water” in any narrow or artificial way.

**Context: Reading the Act as a whole.** We saw earlier that reading the Act as a whole is an important part of determining purpose and understanding both the immediate and general context. The RMA has for its overall scheme a system of environmental and natural resource management for New Zealand as a whole. Its scheme is one of close integration.<sup>20</sup> Aspects of the scheme that are relevant to the use of the defined term “water” can be identified. The prohibition of taking or use of water in section 14(2) is the basis of the regulatory framework; no person may take, use, dam, or divert water, unless allowed by a national environmental standard, a rule in a regional plan as well as a proposed regional plan, or a resource consent. Limited exceptions are provided for domestic use, stock use, communal benefit of tangata whenua from geothermal water, heat or energy; and firefighting. Taking open coastal water is restricted in the same section. Water pollution is regulated under section 15, prohibiting the discharge of a contaminant or water into water, or onto land in circumstances where it may enter water, unless allowed by a national environmental standard, a rule in a regional plan as well as a rule in a proposed regional plan, or a resource consent. “Contaminant” is widely defined, including a liquid or solid that changes or is likely to change the physical, chemical or biological condition of water. Under section 30, regional councils have the function of the control of the taking, use, damming and diversion of water, and the control of the quantity, level, and flow of water in any water body, including the control of the taking or use of geothermal energy. They carry out this function under a general duty

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18 *NZ Rail Ltd v Marlborough District Council* [1993] 2 NZLR 641. Generally see K A Palmer, “Resource Management Act 1991” Chapter 3 in D Nolan, ed, *Environmental and Resource Management Law* (4th ed, Wellington: Lexisnexis 2011).

19 “[N]atural and physical resources includes land, water, air, soil, minerals, and energy, all forms of plants and animals (whether native to New Zealand or introduced), and all structures”: RMA s 2.

20 Palmer, above n 18 pp 95, 103.

of achieving integrated management of the natural and physical resources of the region. They carry it out at a strategic level in the making of regional policy statements for the integrated management of the natural and physical resources of the whole region (sections 59 to 62) and the making of regional plans (sections 63 to 86G) which can include rules controlling the use of resources. In relation to water, rules may address maximum and minimum flow rates, minimum standards of water quality, or ranges of temperature or pressure of geothermal water: section 68(7). Rules may regulate water quality and allow discharges of contaminants into water: sections 69 and 70. Under those rules and strategic directives, councils decide whether to issue resource consents to use water resources, in the form of water permits for permission to take and use water, and discharge permits for permission to discharge a contaminants: section 87. Coastal water is sometimes dealt with separately (e.g. sections 14(1), 64, and 87(c)) but “water” is often used for sea water, freshwater, or geothermal water without distinction (e.g. section 14(2) for seawater from an estuary or harbour, section 15 for pollution, and section 87 for resource consents).

Consequently, reading the Act as a whole discloses three features. The first is that the term “water” is intended to be used in a range of circumstances in the natural environment. Water comes in different forms; sometimes it is seawater, sometimes fresh, and its quality varies. Water may contain contaminants, which change its physical, chemical or biological condition; but even with such changes it continues to be water.

Secondly, we observe that the term “water” is intended to be used in a wide range of situations in the framework. The regulatory framework of the RMA is tightly integrated, and that terms are used consistently in different parts of the framework. The Act does not provide multiple definitions of “water” for different parts of its general framework of regulation.

Thirdly, the scheme of the Act is to give regional councils a very general responsibility to administer water resources and control activities affecting water resources, including surface water, ground water, and sea water. Geothermal water is specifically included, and the Act as a whole plainly intends regional councils to manage geothermal water as part of its overall powers over water resources. The more particular matters of geothermal energy, and the heat or energy obtained from the material surrounding geothermal water, are added to that general responsibility.

Overall, a general non-restrictive interpretation of the term water seems to be entirely compatible with an understanding of the Act as a whole, in which water includes geothermal fluids and includes the materials dissolved in solution or entrained in suspension in them. Alternative interpretations are best understood, in fact, in terms of absurdity.

***Illogical interpretations.*** We saw that under a general rubric of absurdity the courts will avoid interpretations that produce results that are anomalous, illogical, or unworkable. The analysis so far shows that there are no such negative results from an interpretation of “water” that includes dissolved materials. What does produce such results is an interpretation that excludes those materials; that the word “water” is used in the RMA in a way that excludes dissolved and entrained materials. The argument for such an interpretation, which can be considered as a “counter factual,” could take different forms. It could mean that a regional council can only regulate pure water in making regional plans and granting water permits. That would mean that water with any turbidity or material in solution – most of New Zealand’s natural water – could not be the subject of a resource consent. That seems unlikely. Exactly how the prohibition of taking water in section 14 should work is



unclear as well. The legislator cannot have expected geothermal fluid to be extracted except with its dissolved and entrained material.

A second possible argument is that that a regional council can regulate water but only as water, without regard to the characteristics given to it by the materials entrained or in solution. That would mean that councils would have to disregard all characteristics of water given to it by those materials. That would destroy the RMA's capacity to consider the mineral content of water in an application for a spa or hot pool resort. Even more absurdly, it would destroy the RMA's capacity to manage water pollution.

A third possible argument is that a regional council can regulate all kinds of water, and it can grant rights to all kinds of water under a water permit, but it cannot give rights to the materials entrained or in solution, as not being truly part of the water. That will pose the question, who can grant those rights – who can grant rights to the salt in salt water, who can grant rights to the silt in river water? (The proposition could scarcely apply to geothermal water alone; it would have to apply to water generally.) Gaps would open up in the regulatory framework, and water management would become much more complex – quite apart from the clear RMA references to sea water as water and to the physical, chemical or biological condition of water being changed.

Any of these possible arguments would throw the statutory framework into disarray. They produce results that are unworkable, anomalous, illogical, and absurd; and that indicates that they cannot be based on sound statutory interpretation. They would thwart the RMA's purpose, without achieving any other discernible policy objective. They contradict clear indications in the Act of the broad unrestricted interpretation to be given to the term "water" in managing natural resources and conferring rights to take and use.

***New or unforeseen circumstances.*** We can also apply the principle that a statute will be applied and interpreted for conditions which may not have been foreseen at the time that it was enacted: section 6 of the Interpretation Act 1999. This helps explain why there is no special language for geothermal minerals operations. Another part of the explanation is that the RMA affects many specific activities, industries, and uses of resources without singling them out by name, not only because of its breadth, but also because of the intention of its drafters to avoid ad hoc and industry-specific regulation.<sup>21</sup>

***Result.*** It seems entirely clear that geothermal water is still water even if it includes dissolved or entrained materials, and that its management under the RMA includes the granting of rights to those materials in water as part of water more generally. The result is entirely manageable; it is an interpretation that allows practical effect to be given to the law. There is no justification for suggesting that those materials are free of RMA regulation or somehow subject to separate regulation.

Indeed, the use of the term "water" in the RMA involves none of the complexity that often makes statutory interpretation difficult. The word does not have multiple meanings. There is no need to add a qualification to make the legislation workable. There is no gap in the statutory language that calls out to be filled. There is no specialized or scientific meaning that competes with the natural and ordinary meaning of the word.

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21 Palmer, above n 18 p 93.

## 2.2 Ancillary Definitions in the RMA: Geothermal Water, Geothermal Energy

Brief mention has been made of terms in the RMA that at first sight seem decisive. In fact they are less important than “water” as the basic term. “Geothermal water” is defined in section 2:

**geothermal water** means water heated within the earth by natural phenomena to a temperature of 30 degrees Celsius or more; and includes all steam, water, and water vapour, and every mixture of all or any of them that has been heated by natural phenomena[.]

The term is used in section 14(3) in relation to communal use in accordance with tikanga Māori, in sections 14(2) and 30(1)(fa) in relation to the heat or energy from the material surrounding geothermal water, and in sections 68(7) and 128 as to the details of rules and conditions, along with ordinary water. The main point, however, is that geothermal water is a subset of “water.” (There is a degree of circularity in the definitions; “geothermal water” is of a kind of water, and “water” includes geothermal water.)

The same goes for “geothermal energy” defined in section 2:

**geothermal energy** means energy derived or derivable from and produced within the earth by natural heat phenomena; and includes all geothermal water[.]

Under section 30(1)(c) the control of its taking and use is a function of a regional council that is included as part of its function in controlling “water.” This subordinate position means that its exact meaning will not be analyzed in any depth here. In addition, our present question is rights to materials, rather than energy. The same goes for references at different point of the RMA, such as sections 14(2) and 30(1)(fa), to “the heat or energy from the material surrounding geothermal water”. Heat and energy are not our primary concern.

## 2.3 Water and Soil Conservation Act 1967

Even though it was repealed by the RMA in 1991, the Water and Soil Conservation Act 1967, mentioned above, has a key effect in relation to rights to water. Section 21 vested in the Crown the sole right to take and use natural water:

### 21 Rights in respect of natural water

(1) Except as expressly authorised by or under this Act, ... the sole right to dam any river or stream, or to divert or take natural water, ... or to use natural water, is hereby vested in the Crown subject to the provisions of this Act: ...

Provided further that any authorisation granted under the provisions of the Geothermal Energy Act 1953 shall not constitute an express authorisation within the meaning of this subsection.

This vested rights of a proprietary character in the Crown. It prevails over common law rights, eliminating many of the rights that the common law gave to a riparian owner of land.<sup>22</sup> This vesting is still in force because of section 354 of the RMA:

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22 F M Brookfield, “Water” in *Laws of New Zealand*, online looseleaf ed (LexisNexis), para 40.

### 354 Crown's existing rights to resources to continue

- (1) Without limiting the Interpretation Act 1999 but subject to subsection (2), it is hereby declared that the repeal by this Act or the Crown Minerals Act 1991 of any enactment, including in particular—
  - (a) section 3 of the Geothermal Energy Act 1953; and
  - (b) section 21 of the Water and Soil Conservation Act 1967; and
  - (c) section 261 of the Coal Mines Act 1979,—  
shall not affect any right, interest, or title, to any land or water acquired, accrued, established by, or vested in, the Crown before the date on which this Act comes into force, and every such right, interest, and title shall continue after that date as if those enactments had not been repealed.
- (2) Any person may take, use, dam, divert, or discharge into, any water in which the Crown has an interest, without obtaining the consent of the Crown, if the taking, use, damming, diversion, or discharge by that person does not contravene this Act or regulations.

The result is that rights to take and use natural water are still vested in the Crown; those rights are held, or owned, by the Crown. (One may note that the question of ownership of water *in situ*, in a natural body of water, is avoided. The common law has always done the same.) The RMA then declares, in section 354(2), that any other person can take or use the water in which the Crown has these interests, without obtaining a grant from the Crown of rights to do so, as long as he or she is in compliance with the RMA. That compliance can occur different ways, but the main one relevant to us is holding a water permit.<sup>23</sup> A water permit is a resource consent to do something that would otherwise contravene section 14 of the RMA: section 87 of the RMA. The relevant things that may not be done without a permit are to “take, use, dam, or divert” water. In summary, the Crown holds rights to take and use water, and can make grants out of those rights to private persons, and the law says that those grants are made under the RMA.

The definition of the “natural water” rights in which the WSCA vested in the Crown was:<sup>24</sup>

Natural water means all forms of water (including fresh water, ground water, artesian water, sea water, water vapour, ice, snow, and water or steam or vapour heated by geothermal energy, whatever its temperature) that are within the outer limits of the territorial sea of New Zealand; but does not include water in any form while in any reservoir (not being an aquifer) under the control of a public authority and used mainly for the water supply purposes of that public authority, or while in any pipe, tank, or cistern.

The analysis of the term “water” under the RMA seems clearly to apply to the use of the term under the WSCA; that water must include dissolved and entrained materials. The result is all the stronger because of the adjective “natural” which indicates that Parliament is considering water as it is found in its ordinary condition. It explicitly includes ground water and water or steam or vapour heated by geothermal energy.

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23 The main other ways are using water in a way that is a permitted activity under a regional plan or national environmental standard, or is a domestic, stock watering, communal, or firefighting use allowed by RMA s 14(3).

24 Amendments to this definition, and to section 21, between 1967 and 1991, do not alter the key characteristics that concern us.

## 2.4 Geothermal Energy Act 1953

The Geothermal Energy Act 1953 was New Zealand's first general geothermal enactment. Even though it has long since been repealed, and even though what it vests in the Crown is geothermal energy (rather than water), its definition of geothermal energy has one aspect that is important enough to add to our consideration:<sup>25</sup>

Geothermal energy means energy derived or derivable 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 such 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; but does not include water that has been heated by such energy to a temperature not exceeding 70°C.

To be noticed is that "geothermal energy" includes steam and water, and every kind of matter derived from a bore and for the time being with or in such steam or water etc. This kind of matter can only be materials, minerals, or gases of the kind that we are examining as the subjects of geothermal minerals operations. The vesting of the sole right to take and use geothermal energy in the 1953 Act was preserved by section 354 of the RMA, in the same way as it preserved the vesting effected by the WSCA. The significance is the reference to "matter derived from a bore" with or in water or steam. Although the Act has long since been repealed, and its effect overlaps to some extent with the WSCA and with the RMA, it is clear that the sole right to the matter in geothermal fluid is vested in the Crown.

## 2.5 Conclusions under the RMA as to Materials Dissolved and Entrained in Water

It is desirable to draw conclusions on the analysis thus far about the situation under the RMA. It seems to be beyond dispute that the use of the terms "water" in the RMA and "natural water" in the WSCA includes material dissolved or entrained in water, and in geothermal water as much as any other kind. Rights to the "matter" in geothermal fluids are specifically vested in the Crown by reason of the Geothermal Energy Act 1953. The consequence is that a regional council has jurisdiction under the RMA over those materials in water, and it has obligations to manage them just as it has for other aspects of water. That regional council jurisdiction takes shape in the making of regional policy statements and regional plans, and in the making of decisions on applications for resource consents i.e. water permits. Subject to the terms of the permit, the holder of an RMA water permit has the rights, otherwise vested in the Crown, to take and use water in terms that include the material dissolved or entrained in water.

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<sup>25</sup> Geothermal Energy Act 1953 s 2, as amended in 1966 and 1969. The Act worked in parallel with the Water and Soil Conservation Act 1967, but was supplanted for resource use purposes by the Resource Management Act 1991. It was repealed by the Health and Safety Act 1992. Its definition is similar to that in the Rotorua City Geothermal Energy Empowering Act 1967. Generally, see FM Brookfield, "Water" above n 22, para 40.

## 2.6 Council Powers Under the RMA

The foregoing analysis makes it clear that a regional council has jurisdiction over the materials dissolved or entrained in water, along with the pure water itself. But it is also desirable to consider the nature of the discretionary authority that a council holds, within that jurisdiction, and the extent to which the RMA provides guidance about its exercise in relation to geothermal minerals.<sup>26</sup> Thus there are two different tiers to bear in mind, the first being the jurisdiction of a council, and the second, the manner of exercise of that jurisdiction as a matter of discretionary authority, especially in granting a resource consent.

The discretionary powers of the regional council exist in a statutory context. For regional policy statements and regional plans, the Act states with great care the purpose for which those documents can be made, the matters that must be considered and taken into account in making them, and the procedure to be followed.<sup>27</sup> At this stage it does not seem that geothermal minerals are addressed in relevant regional policy statements or regional plans, those of Waikato Regional Council and Bay of Plenty Regional Council in particular. The statements and plans refer to the mineralized character of geothermal fluids, but not in relation to their commercial value or the possibility of extraction of the minerals. For the future it may be desirable for regional councils to identify objectives, policies and rules for geothermal mineral resources.

For resource consents (including water permits) the Act provides with similar care the purpose to be pursued in deciding whether to grant one, the matters that must be considered, and the procedure that is to be followed.<sup>28</sup> Among the matters that must be considered are the council's regional policy statements and regional plans. Conditions on a resource consent can only be imposed for a resource management purpose, they must fairly and reasonably relate to the approved development, and cannot relate to ulterior concerns. They may not be unreasonable, in the relatively strict sense of being conditions that no reasonable council, understanding its statutory duties correctly, could have imposed.<sup>29</sup>

Sound RMA reasons exist for a regional council to look favourably on geothermal minerals projects, either at the strategic level of policy statements and plans, or at the level of specific decisions on resource consent applications. Even though the factual and legal context within which the council operates is always relevant, the following reasons are likely to be applicable in many situations.

- (i) In terms of the section 5 purpose, a geothermal mineral resource should be capable of management in a way that enables people and communities to provide for their social, economic and cultural well-being, while sustaining its availability to meet the reasonably foreseeable needs of future generations, and while avoiding adverse effects on the environment.

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26 If there is a call-in or an appeal, the Environment Court or a board of inquiry usually exercises the power of decision that the Act granted to the regional authority: see in particular ss 149P(2), 149P(6), 149U(2), 149U(6), and 290. So references in this discussion to the powers of a regional council are intended to include the Court and such a board.

27 RMA ss 59 to 68 are the main provisions; and the evaluation report under s 32 is aimed at maintaining alignment with the Act's purpose.

28 RMA ss 104-104D are the main provisions concerning the matters to be taken into account and the statutory tests to be applied. The procedure for applications for resource consents is provided for in ss 87AA-121.

29 RMA s 108, and *Waitakere City Council v Estate Homes Ltd* [2007] 2 NZLR 149 (SCNZ) at [66], which affirmed the application in New Zealand of the "Newbury" principles, from *Newbury District Council v Secretary of State for the Environment* [1981] AC 578. "Planning purpose" has been replaced here with "resource management purpose."

(ii) Section 7 also comes readily to mind, first as to efficiency:

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to— ...

(b) the efficient use and development of natural and physical resources ...

(j) the benefits to be derived from the use and development of renewable energy.

There is a clear opportunity for efficiency in the use and development of resources, within the meaning of section 7(b), if mineral values are obtained along with energy. The mineral products would otherwise have to be mined or extracted separately, with resultant adverse effects on the environment. The adverse effects on the environment of extracting minerals from geothermal fluids that are being extracted anyway for use in a power station are likely to be minimal or even non-existent.

(iii) The extraction of minerals in the course of geothermal power production may make the use of geothermal energy more viable in commercial terms, which the Act defines as a form of renewable energy, thereby bringing section 7(j) into play.

(iv) Section 17 places a duty on every person to avoid, remedy or mitigate any adverse effect on the environment arising from an activity carried on by, or on behalf of the person, whether or not the activity is carried out in accordance with the provisions in the Act. Sections 5(2)(c) and 104(1)(a) tend in the same direction. Extracting minerals from geothermal fluid may avoid, remedy or mitigate adverse effects, if it reduces the amount of harmful material discharged to surface water or groundwater. (That reduction of adverse effects would obviously have to be balanced against any adverse effects that the extraction process might have.)

(v) The extraction of minerals may facilitate re-injection, such as by reducing the silica load, which can promote the long-term availability of the resources of a geothermal system to meet the needs of future generations. It would be a substitute for chemical control methods.

It seems arguable that the Act creates a presumption that water permits will include the materials naturally found in the water in question and the right to deal with them. The default position in the grant of rights to “water” is one that includes geothermal minerals. There would need to be RMA grounds to depart from that background expectation. Whether or not such a presumption exists, it seems very arguable that a regional council would need an RMA rationale for restrictions on a geothermal minerals operation. General convenience, for example, would not be a good rationale, nor would economic development policy or commercial considerations.<sup>30</sup> Discretionary decisions about geothermal minerals are defensible if they have an RMA rationale, and what we see is that such a rationale is readily available for decisions that allow and facilitate geothermal minerals operations.

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30 *Todd Energy Ltd v Taranaki Regional Council*, EnvC W101/2005, 7 December 2005.

Two particular points should be made about regional council administration in relation to possible geothermal minerals operations. The first is the distinction between water take and water use, which are separately identified by the RMA for control. A project needs resource consents for both take and use.<sup>31</sup> Both aspects must be considered even though it is the practice in the geothermal sector to issue a single resource consent for both.<sup>32</sup> It is unclear how far a regional council can go to control the use made of water the taking of which from the natural environment it has decided to be acceptable. On the one hand it can be said that, once allocated, the water can be used as the consent holder sees fit. On the other hand, section 7(b) requires it to have particular regard to the efficient use of natural and physical resources, and it is certainly common for a water permit to be granted for the irrigation of a specific area of land at a particular place.

The second point is that it is unlikely that many current water permits for geothermal projects address minerals in specific terms. In Appendix 1 below, examples are given of some geothermal water permits, but this report does not analyze them in detail and does not come to a conclusion about the extent to which they authorize geothermal mineral extraction. As for the authorization in a permit of a take of water, the discussion above makes it reasonably clear that a grant of rights to water in general terms includes rights to the materials in the water. The use of water that the permit allows is a different matter, however; a right to use geothermal water for electricity generation, for example, would not seem wide enough to include the extraction of minerals. In all likelihood, councils have not been asked to consider the matter directly.

The scope of a water permit as a resource consent may be capable of interpretation and clarification by reference to the original application for the water permit and the accompanying documents, in particular the Assessment of Effects on the Environment (AEE).<sup>33</sup> Sometimes a consent states that it is issued in general conformity with the AEE, but that is not essential. The law on the matter is evolving, but the AEE may be relevant to determining what uses and purposes were authorized by the regional council in granting a water permit. For example, a lot of detail in the AEE and other documentation about the control of silica before re-injecting geothermal fluid may justify a conclusion that the removal of silica and other materials was authorized by the water permit.

Where the purpose for which geothermal fluid may be used is specified in a condition of a water permit, and does not authorize a geothermal minerals operation, the holder can apply for a change of a condition of the consent, under section 127 of the RMA. The procedure is similar to the procedure for an original application for a consent. However where the use is expressed as the activity authorized, or as the purpose of the consent, section 127 may not be available.

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31 B Matheson and S Berry, "Water" p 515 at 551 in D Nolan ed, *Environmental and Resource Management Law* 4th ed (LexisNexis, Wellington, 2011), citing *Bruce v Canterbury RC*, HC Timaru CRI-2004-476-000015, 6 April 2005 at [24].

32 A practice has emerged in general water management (other than geothermal) of applying to take water without applying to use it, and then applying for the use of the water later on: *Central Plains Water Trust v Synlait Ltd* [2009] NZCA 609, (2009) 16 ELRNZ 65, [2010] 2 NZLR 363, [2010] NZRMA 237. The practice has been argued to be a good management approach: J Sinner and A Fenemor, *Opportunities for Separating the Take and Use of Water in Planning Frameworks and Resource Consents* (Ecologic, 2007).

33 D Kirkpatrick, "Land Use and Subdivision – Resource Consent Procedures, Designations and Appeals" p 241 at 299 in D Nolan ed, *Environmental and Resource Management Law* 4th ed (LexisNexis, Wellington, 2011).

## 2.7 Water Personal Property Once in a Pipe, Tank or Cistern

The legal status of geothermal water changes as it is brought under control and rendered into possession in pipes and containers. The most likely point where this happens is where the geothermal water enters the well from the surrounding rock, typically through screens that form part of the lower section of the well structure. At this point the water is no longer part of the land or part of the environment. Thus, under the RMA, the definition of “water” for the purposes of control and regulation excepts water in any form while in any pipe, tank or cistern.<sup>34</sup> The common law of water provided much the same result in that appropriated water was not subject to riparian rights.<sup>35</sup>

Once the geothermal water, including dissolved materials, has been taken into possession in this way, it has the status of personal property – goods or chattels – owned by the company or person that took it under the RMA water permit.

While the water is in the company’s system of pipes and vessels, actions that affect it are unlikely to require RMA resource consents. The company will, however, require a discharge permit if it releases water back into the environment by discharge or by re-injection into a geothermal field. In addition, its use of the water can be controlled under the RMA, at least to some extent, by the conditions of the resource consent for its taking and use.

## 2.8 Summary of the Position under the RMA

The terms “water” in the RMA and “natural water” in the WSCA include matter or material dissolved or entrained in water, including geothermal water, and the management of water under the RMA includes the granting of rights to such material as part of water more generally. The holder of an RMA water permit has the rights, otherwise vested in the Crown, to take and use water, in terms that include the materials dissolved or entrained in the water, subject of course to the terms of the particular permit. Under the RMA, lawful rights to those materials have been granted to the holder of the water permit. A regional council has jurisdiction over those materials just as it does for other aspects of water, and there are sound RMA reasons for a council to be open to their development. Once water is taken into possession in the pipes, tanks and cisterns of a permit holder company, the water, including material dissolved in it, becomes the personal property of the company.

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34 Note however that water in a water race, canal, or artificial reservoir behind a dam is probably not excepted, so that even though such water has been taken and brought under control its use is still subject to regional plans and water permits: *Alexander v Wellington Regional Council*, EnvC W043/2004, 25 May 2004. The issue of water as personal property is discussed further below.

35 Brookfield, “Water” above n 22 para 45 p 52.



## 3 CROWN MINERALS

We turn to consider the possibility that the extraction of minerals from geothermal fluid is affected by the Crown Minerals Act 1991. The minerals in geothermal water may be Crown-owned minerals, or may have their origin in Crown-owned minerals. We will identify the range of minerals that are the Crown-owned minerals, the meaning of “mining” under the Act, whether it includes geothermal minerals operations, and the position of the holder of a permit under the CMA. As under the RMA, the issues come down to a close examination of the language of the legislation.

The general scheme of the CMA can be described as aimed at the management of the minerals owned by the Crown, that is, by the state. The responsible Minister has general authority over Crown-owned minerals through the agency New Zealand Petroleum and Minerals (NZPAM). The Minister may issue permits to companies and individuals for the prospecting, exploration and mining of those minerals. Regulations and instruments called “minerals programmes” prescribe how the different kinds of permits can be acquired and held. Permit holders are held to a “use it or lose it” principle, and are obliged to pay royalties. The Act provides for permit holders to obtain surface access to land in which Crown minerals may lie. The Act provides only in a general way for health and safety and for the environment; environmental control is under the RMA and the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012. The Minister and others must have regard to the principles of the Treaty of Waitangi (Te Tiriti o Waitangi). Whether the CMA applies to a person’s activity depends, among other things, on whether the activity falls within the CMA’s use of the terms “mining” “Crown owned” and “minerals.”

### 3.1 Crown-Owned Minerals

There are three broad classes of minerals vested in the Crown and therefore subject to the CMA. The first is so vested by the declaration in section 10 of the CMA that petroleum, gold, silver and uranium in all lands are vested in the Crown. This class is unlikely to include geothermal minerals to any extent. The second class of minerals is vested in the Crown because of the Crown’s proprietorship of public lands such as lands administered by the Department of Conservation. In these lands all minerals are Crown-owned unless some specific action has been taken to transfer them to some one else. Depending on the pattern of land ownership in the district, this class is likely to include geothermal minerals. The third class is where Crown land has been alienated (e.g. granted or sold) subject to a reservation of minerals to the Crown. The formula for what minerals were reserved has varied; its present form is section 11 of the CMA. In many lands where geothermal resources occur, the Crown is likely to hold the rights to minerals in and under privately-owned land. The overall result is that many minerals in geothermal areas are Crown-owned minerals and therefore subject to the CMA.<sup>36</sup>

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<sup>36</sup> The Act applies to a “Crown owned mineral” which is simply defined as any mineral that is the property of the Crown. There may also be a class of substances that are not minerals but are part of land owned by the Crown. However, given the breadth of the core of the CMA definition, “naturally occurring inorganic substance”, there may not be much if anything in this category, and the matter is not investigated here. NB the CMA also deals with privately-owned minerals as to prospecting permits and as to unknown mineral owners, but neither matter is significant here.

We proceed on the assumption that at least some of the materials likely to be extracted in geothermal minerals operations are Crown-owned minerals within the meaning of the CMA. The likelihood of Crown-owned minerals increases when it is recalled that the water and minerals extracted from a bore come from different parts of a geothermal system and therefore from a significant area of land.

## 3.2 Interpretation of “Mining” under the CMA

What activities affecting such Crown-owned minerals are controlled under the CMA? The matter is largely governed by the the meaning of mine or mining under the Act. It is convenient firstly to set out the main provisions in the CMA that affect the matter. We then apply the principles of statutory interpretation that were explained in the Introduction, in much as the same way as we did for the RMA, and consider other relevant legal points. We summarize the arguments for and against the proposition that the CMA applies to geothermal minerals operations, and bring the results of the analysis together.

The purpose of the CMA is expressed in section 1A:

- (1) The purpose of this Act is to promote prospecting for, exploration for, and mining of Crown owned minerals for the benefit of New Zealand.
- (2) To this end, this Act provides for—
  - (a) the efficient allocation of rights to prospect for, explore for, and mine Crown owned minerals; and
  - (b) the effective management and regulation of the exercise of those rights; and
  - (c) the carrying out, in accordance with good industry practice, of activities in respect of those rights; and
  - (d) a fair financial return to the Crown for its minerals.

What is meant by “mineral” or “minerals” is dealt with by a definition in section 2:

**mineral** means a naturally occurring inorganic substance beneath or at the surface of the earth, whether or not under water; and includes all metallic minerals, non-metallic minerals, fuel minerals, precious stones, industrial rocks and building stones, and a prescribed substance within the meaning of the Atomic Energy Act 1945[.]

The main restriction on mining Crown-owned minerals is section 8 of the CMA. In full it reads as follows.<sup>37</sup>

### **8 Restrictions on prospecting or exploring for, or mining, Crown owned minerals**

- (1) No person may prospect or explore for, or mine, Crown owned minerals in land unless the person—
  - (a) is the holder of a permit granted under this Act which authorises the holder to do so, or is authorised to do so by the holder of such a permit in accordance with the permit, or is otherwise authorised to do so under this Act; and
  - (b) complies with sections 49, 50, 51, 53, and 54.

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<sup>37</sup> Section 8(2)(b) may be noted as a location or pattern for a possible amendment if geothermal minerals operations were to be exempted from obtaining CMA permits, although this report does not take a position on that policy decision. Section 8(2)(b) deals with materials that are already controlled by regional councils under the RMA. However it should be noted that minerals that are Crown-owned would not lose that status with such an amendment, and other aspects of the CMA still apply, such as those like s 49 which control access to land.

- (2) Subsection (1)(a) does not apply to the taking by any person of—
  - (a) any Crown owned mineral that—
    - (i) exists in a natural state in land of which the person is an owner or occupier; and
    - (ii) is in land which is not the subject of a permit in respect of such mineral—
      - for use for any reasonable agricultural, pastoral, domestic, roadmaking, or building purpose on land of which the person is an owner or occupier; or
  - (b) any sand, shingle, or other natural material in the bed of a river or a lake or in the coastal marine area unless otherwise specified in a minerals programme.
- (2A) Subsection (1) does not apply to the taking by any person of any Crown owned mineral in a legal road, whether formed, unformed, or stopped, if—
  - (a) the mineral is—
    - (i) coal; or
    - (ii) a mineral (other than coal) for which a Tier 2 permit would, but for this provision, be required;
  - and
  - (b) the road is within an area of land that otherwise contains privately owned minerals.
- (3) Subsection (1) does not prohibit prospecting or exploring for, or mining, gold in a gold fossicking area by means of hand held non-motorised machinery in accordance with section 98 or 98A.
- (4) This section applies subject to section 86 of the Ngāti Awa Claims Settlement Act 2005.

Under subsection (1) the key thing is that no person may “mine” without a permit. (Mining is the important issue, rather than prospecting or exploration.) What it is to “mine” is controlled by the CMA definition of “mining.”<sup>38</sup>

**mining—**

- (a) means to take, win, or extract, by whatever means,—
  - (i) a mineral existing in its natural state in land; or
  - (ii) a chemical substance from a mineral existing in its natural state in land; and
- (b) includes—
  - (i) the injection of petroleum into an underground gas storage facility; and
  - (ii) the extraction of petroleum from an underground gas storage facility; but
- (c) does not include prospecting or exploration for a mineral or chemical substance referred to in paragraph (a) ...

To these provisions, and the CMA as a whole, we can apply the principles of statutory interpretation in order to understand the true meaning of the legislation in relation to geothermal minerals operations.

**Plain and ordinary meaning.** Section 8 is the central provision for putting restrictions on taking Crown-owned minerals without a permit. It is a general prohibition, expressed in general language, followed by several specific exceptions. No express exception is made for geothermal operations, or for material recovered in the exercise of an RMA water permit. What is meant by saying that no person may mine is controlled by the definition of “mining” in section 2. Its language – “to take” and “by whatever means” – has a wide reach. The meaning of “mineral,” quoted above, is also very broad. On its plain and

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38 The definition of “mining” governs the interpretation of “mine” in s 8 because s 32 of the Interpretation Act 1999 says that parts of speech and grammatical forms of a word that is defined in an enactment have corresponding meanings in the same enactment.

ordinary meaning, or at least on an initial appraisal of its plain and ordinary meaning, section 8 appears to include the extraction of Crown-owned minerals by means of geothermal operations.

It is not likely that the meaning of “mining” in the CMA can be elucidated by reference to what courts have said about the meaning of the word in other legislation or in private contracts or conveyances. While such judicial decisions can be collected from different times and different countries, their relevance here is low, because of the definition of the term in the CMA, and because of the modern emphasis on purpose and context; to which we now turn.

**Purpose.** The next step in interpretation is to check the ordinary meaning against the purpose of the legislation. The CMA’s express statement of purpose in section 1A was quoted above. On its own, it does not seem to shed much light on questions about mining geothermal minerals. The promotion of mining for the benefit of New Zealand could occur with geothermal minerals falling or not falling under the CMA. However the references to good industry practice and fair financial return suggest an emphasis on industrial or commercial operations.

It was noted earlier that the interpretation of general words in a statute particularly call for a purposive approach, and that a general term, like “mining” or “take,” will be given a construction that conforms with the purpose of the Act. Sometimes that means that the general term will be read down to bear a narrower meaning. All terms used in a statute have boundaries on their meaning, and the courts must find those boundaries even where they are not clearly stated. In this case it is very arguable that the terms, especially “take,” are inherently limited, or must have an implied limitation read into them, so as to avoid absurdity or unworkability or the frustration of Parliament’s purpose. For example, it can be argued that “mining” should not be read so as to include the activities of boring a drainage tunnel, building a road with deep cuttings, or building a house with a basement. None of these activities is expressly excepted by section 8; so “mining” and “take” must be subject to unexpressed limits. While that may be so, it does not tell us exactly where the limit lies. Those examples, for instance, can be dismissed as cases of earthmoving, where the material removed is not the object of the exercise.

**Purpose: Ancillary or incidental effects.** Effects on Crown minerals that are ancillary to an activity that is not mining, and that is lawfully established, may be on the other side of such a boundary around the term “mining.” In the Introduction to this report, the main factual scenario for geothermal minerals operations was identified as one where the recovery of mineral products could be regarded as ancillary or incidental to geothermal energy production. In particular, silica is removed primarily to reduce the build-up of scale and to facilitate the re-injection of geothermal fluid. The silica may be dumped as a waste product where it has no commercial value. It is arguable that the purpose of the CMA is best implemented by excluding from its meaning of “mining” the extraction of waste products or of by-products that are incidental to the activities of a geothermal energy plant operating under the RMA.

This argument can be strengthened by reference to cases on competing rights to minerals in Canada. In *Borys v Canadian Pacific Railway*<sup>39</sup> the Privy Council held that a company with rights to oil was entitled to extract the oil even though there would be interference with another person's natural gas, as long as it acted reasonably. Following this and subsequent cases, a New Zealand geothermal operator would argue that it can exercise its RMA rights without getting consent for the incidental effects on CMA mineral rights. This would excuse the disposal of waste material such as silica. But *Borys* would not authorize the extraction of another person's minerals for sale (including the Crown's minerals) without accounting and compensation. For that, the geothermal minerals company would need to fall back on a more general interpretation of the CMA that excludes ancillary or incidental operations.

**Special meanings.** There is no particular reason to think that "mine" or "mining" is used in any special technical way, any more than is the word "take." Considerations under this heading do not seem significant in this case.

**Context: Reading the Act as a whole.** The immediate context of the key word "mine" in section 8 and in the CMA as a whole can be evaluated to determine what interpretation is consistent with the statutory purpose. Several items can be identified in that context.

- (i) "Mineral" is defined broadly in the CMA. There is great diversity here, including for example clays, aggregate, basalt, limestone, sand, and gravel. The diversity of mineral targets necessarily means a diversity of mining methods. Solution mining, for example, is an established technique for the extraction of soluble minerals such as salt, uranium, and potash. Copper can be extracted by *in situ* leaching. Solution mining is similar to the extraction of geothermal minerals.
- (ii) The inclusion of oil and gas, as fuel minerals, means that "mine" in section 8 extends, rather artificially, to cover two very different industries, the petroleum industry and the "hard rock" or non-petroleum mining industry. There are similarities between geothermal operations and petroleum operations, in drilling into a geological structure, extracting fluids, processing them for value, and on occasion re-injecting fluid to maintain reservoir pressure. On the other hand, petroleum, mining, and solution mining operations all have mineral extraction as their primary purpose rather than as an incidental purpose.
- (iii) The specific provision for an activity as uncommercial and unobtrusive as "gold fossicking" with non-motorised hand held tools (sections 8(3), 98 and 98A) indicates that it would be caught by "mining" otherwise.
- (iv) The other exceptions in subsections 8(2) and (2A) show that the legislature was alert to the fact that some activities which would otherwise be caught should not require mining permits, and dealt with them in express language. It can be inferred that a court should not be hasty in adding exceptions to a list that Parliament has carefully stated.

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39 [1953] AC 217 at 227. *Borys* concerned private ownership of "petroleum" meaning oil but not natural gas in the reservoir gas cap. (This is different from New Zealand CMA usage where petroleum includes oil and gas.) It has been followed in *McLean Estates Ltd v Aylesford* [2009] EWHC 697 and *Anderson v Amoco Canada Oil and Gas* [2004] 3 SCR 3, 2004 SCC 49. *Encana Corp v ARC Resources Ltd* 2013 ABQB 352 at [48] described its effect as: "The authorities have repeatedly found that holders of mineral rights are entitled to extract those rights, even if there is interference with and wastage of another's mineral rights." See N Bankes, "Summary Judgement Ordered in Outstanding Coal Bed Methane Cases" [ablawg.ca](http://ablawg.ca), 28 June 2013.

(v) The CMA backs up section 8 with stringent penalties. It is an offence to contravene or permit a contravention of the section 8 prohibition, by virtue of section 100(1). The offence is one of strict liability in that intention need not be proved. The maximum penalties on conviction are severe: two years' imprisonment or a fine of \$400,000, and \$20,000 a day for a continuing offence.<sup>40</sup> The directors and agents of a company can also be found guilty in some circumstances. This aspect of the immediate context could suggest a firm statutory purpose of retaining and protecting the Crown's mineral resources. On the other hand, the severity of the penalties could show that it is absurd to suggest that it was intended to include and criminalize the removal of geothermal waste materials and by-products, whether or not they are saleable.

**Illogical interpretations.** Under this head, it will be recalled, the courts will avoid interpretations that produce illogical, unworkable or absurd results. In large part, in this case they could do so by "reading down" the statute as to the term mining, that is, by determining that its meaning is subject to limitations, in order to prevent its generality from producing absurd results. This arose as to the purpose of the CMA, above.

The argument of reading down in order to avoid an absurdity is sometimes accompanied by a finding that it would be absurd for the enactment to apply to an activity. That may not be easy to advance here. Classifying a geothermal mineral operation as mining may not render the legislative framework unworkable; it simply brings the operation under the CMA, along with a variety of other kinds of mineral extraction activity. The fact that the activity is regulated under both the CMA and RMA may not in itself be unusual or absurd.

**New or unforeseen circumstances.** The principle that an Act applies to circumstances as they arise can be argued to mean that a court should be ready to see that geothermal minerals operations are covered by the CMA even though not mentioned expressly; but it is not a substantial argument.

### 3.3 Minerals Once Extracted

The CMA defines "mineral" as a "naturally occurring inorganic substance beneath or at the surface of the earth, whether or not under water".<sup>41</sup> The consequence is that geothermal minerals, once extracted, are no longer subject to the Act, even if they had been CMA minerals where they naturally occurred in the earth and if the act of extraction raises a CMA question. This is consistent with the operation of the RMA, discussed above, in relation to water (including dissolved minerals) removed from the ground under an RMA water permit and contained in the pipe system of the company. The water, and the minerals in it, have the status of personal property. It follows logically that any minerals that are extracted from that water are also personal property. Thus, a pile of silica or other material in a store, after having been extracted from geothermal water, is the property of the company.

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<sup>40</sup> Mining without a permit resulted in prosecutions in *Minister of Commerce v Roper*, Judge Kenderdine, DC Greymouth CRN6018003074, 9 September 1996 and *Landaus v Police*, Chisholm J, HC Greymouth AP2/96, 24 June 1996. In *Landaus* Chisholm J observed that one of the important functions of the CMA is the protection of the Crown-owned mineral resources of the country, and that prospecting, exploration and mining of such minerals are "tightly controlled." In *R v Saxton* [2009] NZCA 498 there was a conviction for stealing pounamu owned by Ngāi Tahu.

<sup>41</sup> Sections 10 and 11 of the CMA are similar in referring to a mineral existing in its natural condition in land. Minerals once extracted do not fall within the definition. The issue of water and minerals as personal property is discussed further below.

### 3.4 Conclusions as to the Application of the CMA

It is now possible to bring together all of these considerations under the two general heads of arguments for and against the application of the CMA to geothermal minerals operations that come within the factual scenario addressed by this report.

***The argument that the CMA includes geothermal minerals operations.*** The basic building block of this argument is the plain and natural meaning of “mine,” “mining” and “take” in the CMA. Broad words were deliberately chosen in the drafting of the Act, and they should be given broad effect. Mining means to take, win, or extract, “by whatever means” – surely giving very clear additional emphasis to the intended breadth of meaning. The minerals that are the target of this activity are also defined broadly. There is great diversity in the minerals identified as targets under the CMA, and that means diversity in mining methods. Oil and gas extraction is “mining,” so a degree of artificiality in the use of the term is to be anticipated. There are similarities between oil and gas and geothermal extraction activities.

The extraction of geothermal minerals under the factual scenario that has been identified cannot be excused as non-industrial or non-commercial. It cannot be excused simply for being on a small scale; the specific provisions for gold fossicking show that the Act intends to catch small operations. In any event the operations may well be on a substantial scale. The intention or purpose of a geothermal minerals operation is to recover Crown-owned minerals (and on a commercial basis), rather than simply to carry out earthworks or like operations which disturb minerals only incidentally.

Above all, there is no express exception in the Act for geothermal minerals operations. There are express exceptions for other activities, and a court should not be hasty in implying other exceptions when the legislature shows itself ready to identify exceptions. Further, there is no express exception in the Act for mineral extraction that is ancillary or incidental in its character. That feature of a geothermal minerals operation attached to a geothermal energy facility is not an automatic excuse. A minerals operation that is ancillary or incidental to a major geothermal energy facility could still be very large; “incidental” does not mean “small.”

The application of the CMA to such an operation may be onerous, but it cannot be described as absurd or illogical. The fact that the operation and the extraction of water may be consented under the RMA cannot be used to circumvent the CMA.

***The argument that the CMA does not include geothermal minerals operations.*** The basis of this argument is purpose and context, especially in reading general words. “Take” and even take “by whatever means” must have limits or boundaries on their meaning, inherent in their textual meaning but above all to be determined from the purpose and context of the enactment. These limits must exist even if we do not know exactly where they lie. Mineral extraction that is ancillary, auxiliary, subordinate, or incidental to another kind of operation may well lie outside the limits of “take” and “mine” for the purpose of determining what activities are brought under the permitting regime of the CMA. In particular, by-products or waste products are unlikely to be subject to the CMA. The CMA cannot have intended to control the removal of waste which has little or no commercial value. Oil and gas operations can be distinguished from geothermal minerals because their primary purpose is to extract the mineral materials, while the primary purpose of a geothermal operation is to extract energy even if there are mineral by-products.

The holder of RMA rights should be able to exercise them even if there is an effect on the Crown's mineral rights. The holder of the RMA water permit has a clear right to extract geothermal fluids, and is not obliged to conserve the Crown's minerals. Its extraction of geothermal water, bearing minerals dissolved in solution, is lawful. The water becomes its property as a good or chattel. It must use and dispose of the water in accordance with the RMA, but the water is no longer in the land, and is no longer subject to the CMA. The company can process its water and extract minerals from it as it sees fit, and those mineral materials are also its personal property.

The purpose of the CMA is therefore best implemented by reading the word "mining" as excluding the extraction of waste products or of by-products that are incidental to a geothermal energy plant operating under the RMA. Criminalization of such activities is unduly harsh, and cannot have been intended.

**Result.** It will be evident that both of these contending arguments can be made with some cogency in relation to a geothermal minerals operation falling within our fact scenario. It is not possible to say with any certainty which of them will prevail. The question remains unclear. There is considerable merit in the line of argument that an RMA water permit makes it lawful to take geothermal water and render it into possession, and that actions incidental to that taking must be lawful as well. Incidental or ancillary minerals extraction would therefore be legal without a CMA permit. This line of argument would particularly excuse the removal of silica as a waste material.<sup>42</sup> However, the fact remains that the CMA is intended to have a wide ambit. It makes no express exception for geothermal minerals operations. It makes no express exception for operations that are incidental or ancillary in character, and which may in fact be substantial minerals producers. To assume that some such exception can be implied involves a degree of uncertainty. Whether that uncertainty is commercially significant would have to be weighed up by the company concerned.

Earlier we identified an alternative scenario of a geothermal operation that has minerals, and not energy, as its primary purpose. Such an operation could not be brought within an implied exception of incidental or ancillary operations, and is more likely to be caught by the CMA.

**Dealing with uncertainty.** This uncertainty about the application of the CMA under the present law cannot be resolved in any conclusive way by carrying out further research. Nor will comparative analysis bring the matter to conclusion. The ordinary route for resolving such a matter is judicial proceedings. (An application for a declaration is sometimes a suitable procedure.) Whether the companies or agencies involved are sufficiently concerned to bring the dispute to court is naturally up to them; the courts will not act unless it is brought to them.

Whether it is satisfactory to leave the matter so uncertain is a clear policy question. It is very arguable that, if the uncertainty is removed, the investment climate and the quality of the regulatory framework will be improved. An amendment to the CMA would be the most obvious way to make it clear whether geothermal minerals operations are, or are not, covered by the Act, and if so on what terms. An amendment would remove the uncertainty, and would ensure that the result was suitable in policy terms rather than as the effect of legislation that was drafted without considering geothermal minerals specifically.

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42 The implications of this may affect current geothermal operations that remove silica from geothermal water in order to facilitate re-injection, but they are not examined further in this report.



### 3.5 Operating Under the Crown Minerals Act

If the CMA does apply to a geothermal minerals operation, what are the consequences? The most basic point, of course, is that the operator must obtain an exploration permit or mining permit for it under the CMA, and keep it in good standing. The CMA sets out the procedures and criteria that apply, and sets out the duties imposed on the holder of a permit.

It is important to note that the consequences of being subject to the CMA do not stop with the acquisition of a permit. The Act imposes other requirements that may be commercially significant. For example, transfers of permits are subject to approval by the Minister; provisions for access arrangements affect rights of access to the surface of land; fees (sometimes substantial) are payable under the Regulations; and royalties must be paid. In some circumstances annual meetings are required.

The obligations of permit holders to disclose information are a particularly significant consequence of operating under the CMA. The permit holder must keep detailed records and reports in respect of its activities in accordance with the conditions of the permit and the detailed requirements set down in regulations.<sup>43</sup> The reports extend to geological studies, surveys, drilling, feasibility studies, and mineral reserves, resources and production. These records and reports must be submitted to the Chief Executive of New Zealand Petroleum and Minerals (NZPAM, the agency responsible for administering the CMA). After the lapse of specified periods of time, usually no more than five years, NZPAM must make most kinds of the information publicly available.

To a limited extent, the CMA regime can be adapted to the special case of geothermal minerals operations without amending the Act. The Regulations can be amended by Order in Council. The Minerals Programme can be amended by a procedure prescribed by the Act. Either kind of amendment can make suitable provision for the particular case of geothermal minerals. An example of special provision for particular targets and technologies is where the Minerals Programme for Petroleum addresses gas hydrates, coal seam gas and underground gas storage.<sup>44</sup> Such tailoring can alter procedures for application for permits, the government's decision-making on applications, and permit terms and conditions, extensions, and renewals. But its scope is limited; the Programme cannot override the Act or Regulations, and the Regulations cannot override the Act. It should be added that there is no room for NZPAM simply to announce that it will not apply the Act to geothermal minerals operations.<sup>45</sup>

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43 CMA ss 90, 90A and 90B; Crown Minerals (Minerals Other than Petroleum) Regulations 2007 regs 44 to 44. The obligation to make information supplied by a permit holder available, after prescribed periods, to any person who requests it is in CMA s 90(6).

44 *Minerals Programme for Petroleum 2013*, 10.0.

45 The Chief Executive under s 7 of the CMA has the function of requiring compliance with the Act. Administrators have discretion in enforcement, but they cannot adopt a policy of not enforcing the law or treating it as suspended: *R v Metropolitan Police Commissioner ex parte Blackburn* [1968] 2 QB 118 (CA); *Hallett v Attorney General* [1989] 2 NZLR 87 at 94; *Fitzgerald v Muldoon* [1976] 2 NZLR 615.

### 3.6 Crown Minerals Act Permit Holder

The next issue is the rights of holders of prospecting permits, exploration permits, and mining permits under the CMA in relation to geothermal minerals operations. The issue needs to be dealt with in relation to both of the possibilities considered above as to the application of the CMA to a geothermal minerals operator.

The first assumption is that a geothermal minerals operation is “mining” within the meaning of the CMA and needs a permit. Usually, CMA permits state the minerals or class of minerals for which they grant rights.<sup>46</sup> A permit does not give rights to all Crown-owned minerals in its area, only the specified minerals. In addition, permits are generally granted on an exclusive basis with respect to the minerals for which they grant rights.<sup>47</sup> Thus a geothermal minerals operator who secures and maintains a CMA permit can expect to be free from competitive pressure from another CMA operator, because the CMA does not contemplate competing overlapping permit rights. However, if another company already has a CMA permit for the same minerals in the same lands, then the geothermal minerals operator will not be able to obtain the CMA rights that it needs without coming to a commercial arrangement with that company or waiting until its permit rights have expired.<sup>48</sup> Obviously, this is much more of a problem.

The alternative assumption is that a geothermal minerals operation is not “mining” and does not need a CMA permit. In that situation, the possibility arises that another company holds a CMA exploration or mining permit for the same land as the geothermal minerals operation and for the same mineral targets. Competition for the resource could ensue, and the company with the CMA permit could complain that the geothermal minerals operation is depleting its minerals. However, it is unlikely to have a legal basis for its complaint. The CMA gives the holder of a mining permit “a right to mine the Crown owned mineral”.<sup>49</sup> It does not give the permit holder any rights to the minerals in place in the ground, *in situ*, merely the right to take the minerals that may be there. What the permit holder does get to own is the minerals once extracted; every permit holder shall be the owner of all minerals lawfully obtained by it in the course of permit activities.<sup>50</sup> This is consistent with the limitation of the definition of minerals to “naturally occurring” minerals. It is also consistent with section 92 which says that a permit is neither real nor personal property, and which makes it difficult for a permit holder to sustain an argument that its proprietary rights have been the subject of trespass or other interference.

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46 CMA ss 30(1) to 30(3).

47 CMA ss 30(7) and 30(8).

48 The current term of a permit can be extended in some circumstances (ss 35, 35A and 36), and under certain conditions a permit can be upgraded to a subsequent permit (s 32) e.g. an upgrade from an exploration permit to a mining permit.

49 CMA s 30(3). It is unlikely that the Minister can in issuing the permit diverge from what the statute allows: *Cudgen Rutile (No 2) Ltd v Chalk* [1975] AC 520 (PC). But the terms of a specific permit should be considered.

50 Crown Minerals Act 1991 ss 30 and 31.

The main result of note is that, if the CMA is interpreted to apply to geothermal minerals operations, then the operator may in some circumstances find that another company with a CMA permit has prior rights to minerals in the same parcel of land. It may be thought desirable from a policy point of view to avoid this priority and conflict, in order to encourage geothermal minerals operations. The issue is connected to the policy question identified above of clarifying the application of the CMA generally, and an amendment of the CMA could deal with this particular point as part of the overall matter. But an alternative route for removing the conflict is to except the minerals extracted, or capable of being extracted, in a geothermal minerals operation from ordinary CMA permits. That can be done by making provision in the Minerals Programme and in the permits themselves where the permit area includes a geothermal system.

### 3.7 Summary of the Position under the CMA

A geothermal minerals operation of the kind contemplated in the present factual scenario is likely to use geothermal fluids drawn from an area where Crown-owned minerals occur. Whether a geothermal minerals operation is controlled by the CMA depends on whether it constitutes “mining” within the meaning of the Act. A careful application of the principles of statutory interpretation to the matter is required, along with reference to other relevant legal principles. On the one hand the CMA uses very general words which on their plain and ordinary meaning include geothermal minerals operations. It provides no exception for geothermal minerals, even when it carefully excepts other activities, and it provides no exception for a taking of minerals that is incidental or ancillary to another operation. On the other hand, the purpose and context provide indications that suggest that an ancillary operation is excluded, particularly where it involves an extraction of geothermal water, bearing minerals dissolved in solution, that is lawful. The assumption that such an exception can be implied involves a degree of uncertainty. As a matter of policy, it is very arguable that the uncertainty should be removed.

If a geothermal minerals operation is “mining” under the CMA, then the company must obtain a mining permit and must comply with other obligations under the Act. Obligations to supply information that is in due course made public are particularly notable. In addition, a geothermal minerals operator may find that its rights to mineral have already been granted to another permit holder.

# 4 PRIVATE PROPERTY RIGHTS

## 4.1 The Rights of Private Land Owners and Mineral Owners

The next set of issues that requires consideration is primarily in private law rather than under any statute. The question is whether the holder of privately-owned lands or minerals can object to a geothermal minerals operation. The most likely scenario is that the owners of such lands and minerals will be neighbours of a geothermal facility, and claim that the minerals or materials that are being removed from a flow of geothermal water have their origin in source material that forms part of their property, even though deep below the surface. Even if it seems unlikely that a neighbour could complain of real damage, one must bear in mind that the legal system gives considerable protection to property rights.<sup>51</sup> It may also be said that it is unlikely that any neighbour of a geothermal facility would want to make such a complaint; but in an analysis of possible legal risks it is important to evaluate its chances of success should it be made.

Minerals and other materials that are not Crown-owned minerals subject to the Crown Minerals Act 1991 are likely simply to be part of the land, and to be subject to the ownership rights of the owner of the land. They are an incident of the land, that is, an aspect or component of the land. There is no rule that restricts the depth to which the owner of land can assert his or her rights to the land.<sup>52</sup> They may fit one definition or another of "minerals" but if there has been no alienation of rights over them to another person then the definition will not be relevant. Where there has been an alienation of minerals to another private person, as a matter of private conveyancing (such as an exception or reservation when land is sold) minerals may be owned separately, but such severed or separated mineral rights are still private property, and the rights of their owners to redress for interference from a geothermal operation are much the same.<sup>53</sup>

The owner of land can defend his or her rights against an unauthorized intrusion; a trespass to land is a civil wrong. There is no depth at which an intrusion ceases to be trespass; in a case of directional drilling for oil and gas the company was liable for trespass even though there was no adverse effect on the plaintiff's enjoyment of the surface.<sup>54</sup> Direct interference with privately-owned minerals (or non-mineral materials) *in situ* owned by a land owner is unlawful. The same is the case for severed mineral ownership. The owner can sue for an injunction and obtain damages and remedies such as an account of profits that the interloper may have made.<sup>55</sup> However a geothermal operator is likely to avoid underground trespass by ensuring that it has proper authorization, typically by agreement, for any wells or like facilities under adjoining land. Nuisance is more likely to be relevant than trespass.

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51 We set questions of subsidence to one side on the assumption that subsidence is unlikely to be caused or exacerbated by the minerals dimensions of geothermal operations. We also put to one side questions that may arise under leases or other agreements that a geothermal operator may have made with landowners.

52 B J Barton, "The Common Law of Subsurface Activity: General Principle and Current Problems" pp 21-36 in D Zillman, A McHarg, L Barrera-Hernández and A Bradbrook, eds, *The Law of Energy Underground: Understanding New Developments in Subsurface Production, Transmission, and Storage* (Oxford: Oxford University Press, 2014).

53 The proprietor of an estate in fee simple in minerals *in situ* has possessory rights, but it is also possible for minerals to be held as a profit à prendre which is a proprietary but non-possessory interest.

54 *Bocado SA v Star Energy UK Onshore Ltd* [2011] 1 AC 380 (SC(E)), [2010] UKSC 35.

55 See R F MacSwiney, *Law of Mines, Quarries and Minerals*, 5th ed (Sweet & Maxwell, London, 1922) p 317-19.

## 4.2 Actions in Nuisance

In some circumstances a land owner has rights in the law of nuisance even if there is no direct intrusion into its land. A private nuisance is an unreasonable interference with a person's right to the use or enjoyment of an interest in land.<sup>56</sup> Noise, dirt, fumes, smells, and flooding caused by neighbours are standard examples of nuisance. If nuisance is proved, the land owner may be able to obtain damages and an injunction against further interference. In principle, the owner of severed possessory mineral rights has a right of redress for nuisance as much as the owner or occupier of ordinary land.

To be legally actionable as nuisance, an interference must be unreasonable in its effect on the plaintiff's land; the plaintiff must prove that the interference with his or her land is unreasonable.<sup>57</sup> This requirement strikes a balance between the conflicting interests of different occupiers of land, taking into account the nature of the harm, the nature of the locality, the intensity of the interference, and, to some extent, the social utility of the activity. Thus a geothermal company could defend itself by arguing that the effects of its operation are reasonable given the nature of land use in the district, especially if it is one where geothermal development is common. It could also say that the effects on the plaintiff's land, on microscopic pore spaces in rock deep below the surface of the earth without any emanation at the surface, is too technical and indiscernible to be unreasonable.<sup>58</sup> It could further observe that ordinary geothermal development will put materials and minerals in movement, whether or not they are being removed from the flow of geothermal steam and water in the company's plant. There are no decided cases directly on point. Overall, however, it seems likely that a geothermal minerals operator could be successful with such arguments, so that a neighbour would fail to establish that the operator's actions were unreasonable.

## 4.3 The Common Law on Groundwater

We turn more specifically to the law concerning groundwater and material in solution in it. Private rights to water that attach to land are generally addressed as part of the law of nuisance.<sup>59</sup> There is no New Zealand common law authority directly on the point whether the owner of neighbouring land can object to a loss of mineral and material due to geothermal extraction.<sup>60</sup> One must therefore consider the arguments that can be made from analogy and basic principles. There is a certain amount of law about groundwater that shows that the courts are reluctant to impose liability for actions that affect a neighbour's groundwater resources. From a legal point of view it seems quite reasonable to assume that geothermal water is a kind of groundwater, so that the case law on groundwater is applicable, either directly or by analogy.

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<sup>56</sup> B Atkin, "Nuisance" p 509 in S Todd, ed, *Law of Torts in New Zealand*, 6th ed (Thomson Reuters, Wellington, 2013).

<sup>57</sup> Atkin, p 517.

<sup>58</sup> Thus in *Smith v Inco Ltd*, 2011 ONCA 628, 340 DLR (4th) 602, a Canadian court held that a change in the chemical composition of soil because of the deposit of nickel particles had to be shown to have some detrimental effect on the land itself or rights associated with the use of the land before it could constitute nuisance.

<sup>59</sup> Atkin, above n 56, p 517. By private rights is meant non-statutory common-law rights. It is of course an area where statutory rights under the RMA largely overshadow private common-law rights

<sup>60</sup> There is not likely to be much in jurisdictions from which court decisions are persuasive in New Zealand courts, although the possibility has not been fully researched.

The common law has generally held that the owner of land has unrestricted rights to take water percolating through his or her soil or subsurface, whether or not it reduces the amount of water available to neighbours.<sup>61</sup> Water percolating through the subsoil is not subject to any equivalent of riparian rights, which apply to surface waters. The owner of land can take such water even if for no apparent good purpose.<sup>62</sup> This principle has been applied in mining cases such as *Wilson v Waddell*<sup>63</sup> to the effect that mining does not become unlawful even if it injures adjoining proprietors, such as where mining in a lawful manner allows cracks to open and allows water to enter. Like other natural unappropriated waters, the underground water itself *in situ* is not the subject of property; it is not an object of ownership.<sup>64</sup>

These principles were applied in New Zealand in *The King v Kamo Collieries Ltd*<sup>65</sup> where old underground coal mine workings extended under a government railway line. Over the years they had flooded, but the water provided support to the surface and protected the remaining coal pillars in the workings. The mining company was held to be entitled to dewater the mines from adjoining land, because the owner of land is not prevented from draining the soil, even if subsidence of a neighbour's land is the consequence.<sup>66</sup> It was held not to be a case of removal of support, and if the withdrawal of the water causes the pillars to burn or disintegrate, then that is *damnum absque injuria* – a loss without legal redress.

Parenthetically we should note that the idea of a loss without legal redress is not unknown in the legal system. Not all actions that affect a person adversely are legal wrongs. What we have seen above on activities that affect groundwater is an example. There are others in different parts of the legal system. For example, there is no common-law right to a view; a neighbour can build a fence or a building that wrecks one's view and causes loss to the value of one's land, without legal redress. Trade competition is another example; it is quite legal to cause losses to one's competitors and to drive them out of the market.<sup>67</sup> A large body of American law about rights to oil and gas is another example, in the law or rule of capture. "The owner of a tract of land acquires title to the oil and gas which he produces from wells drilled thereon, although it may be proved that part of such oil and gas migrated from adjoining lands."<sup>68</sup> This is not to say that there are many such cases, nor that they should stay free from law reform. Rather, the short point, in respect of geothermal minerals, is that a loss of value by a land owner or mineral owner is not in itself a ground for redress.

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61 *Acton v Blundell* (1843) 12 M&W 324, 152 ER 1223: Brookfield, "Water" above n 22 para 39. A natural watercourse flowing underground in a defined channel known at least by reasonable inference from observed facts, could attract riparian rights according to Brookfield, para 51, citing *Bleachers' Assn Ltd v Rural District Council of Chapel-en-le-Frith* [1933] Ch 356 at 365. However such distinctions in the old cases often depend on old ideas of geoscience and hydrology.

62 *Chasemore v Richards* (1859) 7 HLC 349, 11 ER 140; *Bradford v Pickles* [1895] AC 587. On the subject of the motive being immaterial if the use of the property is lawful, see M Taggart, *Private Property and Abuse of Rights in Victorian England: the Story of Edward Pickles and the Bradford Water Supply* (Oxford: Oxford University Press, 2002).

63 (1876) 2 App Cas 95. See *Salt Union Ltd v Brunner Mond & Co* [1906] 2 KB 822 at 832.

64 *Embrey v Owen* (1851) 6 Exch 353, 155 ER 579. It may be noted that the WSCA and the RMA are similar in avoiding reference to the ownership of water; rather, they address rights in water.

65 [1937] NZLR 1012. The case was argued in *Rotokawa Joint Venture Ltd v Waikato Regional Council*, EnvC A41/2007, 18 May 2007, but without affecting the result; the Court applied the RMA without regard to the common law concerning support or percolating waters.

66 *The King v Kamo*, above, p 1017, following *Popplewell v Hodkinson* (1867) LR 4 Exch 248. However a pumping of water with quicksand or running silt is an actionable interference with support: *Jordeson v Sutton, Southcotes and Drypool Gas Co* [1899] 2 Ch 217 (CA). *Jordeson* was quoted on subsidence and support in *Brouwers v Street* [2011] 1 NZLR 645 (CA) [2010] NZCA, leave to appeal refused [2011] NZSC 17.

67 The Commerce Act 1986 prohibits certain specified conduct but not competition as a whole; indeed it fosters it.

68 R E Hardwicke, "The Rule of Capture and its Implications as Applied to Oil and Gas" (1935) 13 Texas L Rev 391 at 393, cited by T Daintith, *Finders Keepers? How the Law of Capture Shaped the World Oil Industry* (Washington DC: RFF Press, 2010) p 7. Daintith shows that the law of capture has been less problematic where rights to petroleum are vested in the state, as in New Zealand, rather than in the land owner. The "law" of capture is therefore not established in New Zealand law.

## 4.4 Difficulties of Proof

Proving the case is a further barrier facing a land owner or mineral owner who complains that a geothermal operation has removed minerals or other valuable material. The plaintiff must prove all elements of his or her case. To show that the particular defendant company interfered unreasonably with enjoyment of the subsurface land could be difficult. For example, it may not be possible to say with any accuracy where dissolved materials have come from, and what changes have caused them to go into solution or suspension. Natural processes or other companies' actions may have been the cause. It may be difficult for the land owner to establish that the materials would have stayed in place but for the geothermal operation. Further, geothermal systems are inherently dynamic, and any given change of state could have multiple causes. To be sure, the degree of uncertainty about such matters could be reduced by increased geoscience research and exploratory effort. But even then, a land owner or mineral owner may struggle to prove to the satisfaction of a court that the minerals being produced by a geothermal operator are his or her minerals, and that they would have remained in place but for the extraction of them in geothermal water.

*Salt Union Ltd v Brunner Mond & Co*<sup>69</sup> illustrates such difficulties in proving the elements of a recognized cause of action in a similar factual context, even though it is not actual authority on a point of law. It concerned deposits of rock salt in Cheshire in the United Kingdom that had for centuries been worked by underground mining for solid salt and by pumping brine out from the top of the bed. From 1838, the mines began to collapse, so that the workings flooded and a lake formed on the surface. The inundated mines were all connected. The plaintiff Union members pumped brine at one place. The defendant Brunner Mond pumped from a shaft some 400 yards away. Its right was a deed of conveyance made in 1888 by the owner which conveyed to it the shaft with certain lands and a small quantity of rock salt lying under certain land adjoining, for the purpose of pumping brine from the flooded mine. Brunner Mond used these rights on a massive scale, and the Salt Union went to court to stop it. The Court found that some of the brine pumped by Brunner Mond came from the dissolution of rock salt belonging to the Union; but that some of it had also been derived from rock which did not belong to the Union. Perhaps the key fact was that the waters dissolving salt had become so interconnected that it was impossible to say where the rock salt had been dissolved. It was impossible to apply the ordinary principles of law relating to underground property. The Court held that when a person puts down a shaft and pumps in his or her own land (both of which acts are prima facie lawful) the act does not of necessity become unlawful simply because it turns out that the brine thereby obtained may be the result of dissolution of rock in someone else's property.<sup>70</sup> Quite possibly pumping to obtain a neighbour's rock salt would be actionable, although that would be a departure from the principle of the cases relating to underground water.<sup>71</sup> But one must heed the Judge's comment that the facts of the case were important to the result. The Court saw the matter as finely balanced, but was unable to conclude that the defendant had committed any actionable wrong; the defendant's pumping was not unlawful.

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69 [1906] 2 KB 822. No citations of the case in New Zealand courts have been located.

70 *Salt Union* above n 69 at 832.

71 E.g. *Chasemore v Richards* (1857) 7 HLC 349, 11 ER 140; *Salt Union* above n 69 at 831.

## 4.5 Extinguishment by Statute of Private Property Rights to Water

Another likely constraint on complaints by neighbours relying on private property rights is the legislation; the Water and Soil Conservation Act 1967 (WSCA) and Resource Management Act 1991 (RMA). It is well established that the RMA prevails over common law rights that are inconsistent with it. In the leading case, *Falkner v Gisborne District Council*,<sup>72</sup> a case about managed coastal retreat, it was held that:

The whole thrust of the regime is the regulation and control of the use of land, sea, and air. There is nothing ambiguous or equivocal about this. It is a necessary implication of such a regime that common law property rights pertaining to the use of land or sea are to be subject to it. ... The effect of all this is simply that, where pre-existing common law rights are inconsistent with the Act's scheme, those rights will no longer be applicable. ... [T]here is nothing in the scheme of the Act to suggest that the common law right cannot be infringed – quite the reverse. The Act is simply not about the vindication of personal property rights, but about the sustainable management of resources.

*Falkner* is consistent with earlier authority and has been followed on several occasions.<sup>73</sup> In the case of water, this authority means that common law rights to water cannot be exercised inconsistently with the powers of the regional council and others to manage water resources and enforce the regulatory framework. Riparian rights to water clearly cannot stand against the RMA.<sup>74</sup>

What is slightly less clear, however, is the issue specifically on point here; whether the RMA also prevents a neighbour from suing for harm done to him or her by a water user's actions even if they are carried out under an RMA permit. There is one case that says that the RMA does prevent such suits. *Saunders v Northland Regional Council* concerned the common law rights of neighbouring owners of land to be protected from the unnatural discharge and collection of stormwater on their land.<sup>75</sup> The Environment Court held that it would be inconsistent with the scheme of the RMA if discharges authorized under it were to give rise to a right of action at common law by the neighbours on whose land the discharges were made. Professor Brookfield, long recognized as an authority on New Zealand water law, took the same view. Writing about the effect of the RMA on common law water rights (about riparian rights more than groundwater) he says,<sup>76</sup>

Thus, a riparian owner, who pollutes a stream by discharging a contaminant into it without being permitted to do so by a planning rule, a resource consent, or by regulations, is subject to the enforcement provisions to the general exclusion of common law liability for breach of a downstream riparian owner's right to continuance of flow undiminished and unaltered in character.

Brookfield and *Saunders* therefore show that common law liability is excluded, in favour of statutory decision-making and enforcement. However the matter cannot be regarded as conclusively settled.

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72 [1995] 3 NZLR 622 at 632.

73 B Barton, "The Legitimacy of Regulation" (2003) 20 NZULR 364.

74 Even if they are not wholly abolished, according to Brookfield, "Water" above n 22 para 55 p 62.

75 *Saunders v Northland Regional Council* (EnvC decision A40/98, 27 April 1998 at [55]). The Environment Court properly reminded itself that it has jurisdiction to decide such matters of private law only to the extent necessary for its RMA duties, and that the decisions that it makes should be for public law RMA purposes: *Congreve v Big River Paradise Ltd*, HC Auckland CIV-2005-404-6809, Lang J, 4 August 2006.

76 Brookfield, "Water" above n 22 para 55 p 62.



There is a different line of authority in the case law that may be relevant, which suggests that the RMA does not override the neighbour's common-law right to take action against a water user for nuisance. A good illustration is *Hawkes Bay Protein Ltd v Davidson* where a meat-rendering company had an RMA permit from the regional council authorizing its discharges to air, but it was still held liable for the smell that severely affected its neighbours' use of their land. "Planning authorities cannot authorise nuisances and even if there be compliance with planning permission, such is not a defence to a nuisance action."<sup>77</sup> *Ports of Auckland Ltd v Auckland City Council*<sup>78</sup> explored the issues in more detail and came to a similar conclusion about noise from port operations affecting residences. Section 23 of the RMA provides some reinforcement for this approach, because it says that compliance with the RMA does not remove the need to comply with other legislation and rules of law.<sup>79</sup> *Varnier v Vector Energy Ltd*<sup>80</sup> particularly relied on section 23. In these cases the New Zealand courts have been following persuasive precedent in English courts.<sup>81</sup> Recently the highest English court has reaffirmed that planning permission is not a defence to private nuisance, and has downplayed the relevance of planning decisions to the character of a neighbourhood.<sup>82</sup>

However the law on the matter is evolving and points of distinction may mean that it does not allow proprietary claims like nuisance in the present case.<sup>83</sup> In applying English authority to New Zealand it is important to take into account differences between the legislation of the two countries. There seem to be two clear points of distinction. The first is that the English cases are almost all concerned with the effect of land use planning permissions, and not permits to allow specified noise, air discharge, or like emanations from the land.<sup>84</sup> *Coventry v Lawrence* for example concerned a motor sports stadium, which had obtained planning permission, and the noise that came from it.<sup>85</sup> The nuisance was not therefore directly permitted, in the sense that it would if it was noise of certain decibels or air discharges of certain quantities and character that had been permitted. In contrast,

77 [2003] 1 NZLR 536 (HC) at [19]. Generally see Atkin, "Nuisance" above n 56 p 548; and Q Davies and D Neild, "Nuisance and Resource Management" [2014] NZLJ 250.

78 [1998] NZRMA 481 (HC).

79 In *Falkner*, section 23 was held to be of no assistance to protect a right or rule of law which, upon proper construction of the statute as a whole, would otherwise impliedly be restricted or abolished.

80 [2004] NZRMA 193 (HC): application for summary judgment refused.

81 Initially *Wheeler v JJ Saunders Ltd* [1996] Ch 19. *Wheeler and Hunter v Canary Wharf Ltd* [1997] AC 655 were cited in *Rotokawa Joint Venture Ltd v Waikato Regional Council*, EnvC A41/2007, 18 May 2007 in an unsuccessful argument that the common law of nuisance, in relation to subsidence, prevented the grant of a resource consent. The Court made no real indication of its views on the point in issue here.

82 *Coventry v Lawrence* [2014] UKSC 13. Lord Neuberger for the majority at [94] held the view that the mere fact that the activity which is said to give rise to the nuisance has the benefit of a planning permission is normally of no assistance to the defendant in a claim brought by a neighbour who contends that the activity cause a nuisance to her land in the form of noise or other loss of amenity. The decision also considered the relationship between the different remedies of damages and injunctions.

83 M Lee, "Private Nuisance in the Supreme Court: *Coventry v Lawrence*" [2014] J Planning & Env L 705. She describes Lord Neuberger's apparently absolutist approach as a little fragile, and notes that Lord Carnwarth and Lord Clarke show more awareness of the diversity of administrative decision-making. Also see Lee, "Nuisance and Regulation in the Court of Appeal" [2013] J Planning & Env L 277, Lee, "Tort Law and Regulation: Planning and Nuisance" [2011] J Planning & Env L 986.

84 The English cases rarely show any curiosity about the precise character of the planning permission. *Barr v Biffa Waste Services Ltd* [2013] QB 455 (CA) took a more analytical approach. The case involved a waste management permit for a landfill, but (even though it included a condition about odour) it did not authorize the emission of smells, expressly or impliedly: pp 472, 487. This seems to support the proposition that authorizations for precisely what is complained of – the emission of odour, or the taking of water – must be treated differently in nuisance cases.

85 In *Coventry v Lawrence*, one planning permission appears to have been purely for land use; the other for land use with maximum noise levels: see [9]. The distinction between general land use permission and a permission for the very noise or other disturbance which is alleged to constitute the nuisance is noticed by Lord Neuberger at [83], but the point does not seem to have weighed heavily in the Judge's subsequent analysis.

the issue of a water permit under the RMA allowing for the taking or discharge of particular quantities of water leads directly to changes in the flow and character of natural water. There is one less link in the chain. The second point of distinction is the vesting in New Zealand in the Crown of the sole right to take, use and divert water, carried out by the WSCA. Rights granted under the RMA are carved out of these rights. There must be a correlative duty, or sufferance, imposed on others to accommodate that right; if others have common law rights to prevent or penalize the taking, then the legislation could not operate. That seems unintended. In the English nuisance cases, there is no equivalent of the 1967 vesting of water rights in the Crown and subsequent administrative allocation. These points of distinction suggest that a neighbour cannot succeed in nuisance against the holder an RMA water permit to use water in the way that the permit allows. It is likely that any proprietary claim by a neighbour is extinguished the legislation.

## 4.6 Conclusions on the Position of the Holder of Private Property Rights

Taking the matter as a whole, we see that it is highly unlikely that a neighbouring land owner or mineral owner can take legal action at common law to obtain damages or an injunction against a geothermal minerals operation operating under an RMA water permit. Such an action faces many obstacles. The common law right to take such action is tenuous. There are difficulties of substantive law, in that the courts have generally refused to give redress to a land owner for adverse effects on his or her use of groundwater. Such a plaintiff would have to show unreasonableness. If the plaintiff held such rights at common law, it is likely that they are overridden by the RMA and WSCA.

## 5 RIGHTS UNDER A TREATY CLAIM

The emergence of operations for the extraction of materials in geothermal fluids may engender a claim that the materials are subject to a claim by Māori under the Treaty of Waitangi. It may also engender a claim that the materials are otherwise owned by Māori, for example by virtue of the ownership of Māori land, or by virtue of the provisions of settlement legislation; but such a claim would have to be assessed on its merits as a matter of property law or statutory interpretation.

Three points about Treaty claims must be made in order to clarify the legal possibilities. The first is that the Treaty of Waitangi itself is not directly enforceable as a matter of New Zealand law; while far from being a nullity in constitutional terms, it does not provide the means for judicial relief without reference to legislation. In particular, the Treaty of Waitangi Act 1975 established the Waitangi Tribunal to hear claims from Māori about breaches of the principles of the Treaty. The second point is that the Tribunal can only hear claims against the Crown, either for its conduct or for legislation, not against private persons or companies. It cannot make recommendations for the return of private land to Māori or for the acquisition of private land by the Crown.<sup>86</sup> The third point is that the Tribunal's power is to make recommendations to the government. While highly influential, and usually accepted, those recommendations are not binding on the government, except in specific cases such as forestry land.

The Waitangi Tribunal has heard inquiries and issued reports on geothermal issues, notably in relation to Ngawha<sup>87</sup> and Te Arawa,<sup>88</sup> and the Central North Island generally.<sup>89</sup> Geothermal resources were an incidental part of the report on water issued in advance of the government's implementation in 2012 of the Mixed Ownership Model for state-owned enterprises.<sup>90</sup> There is no reason to think that these inquiries and reports excluded geothermal minerals in their consideration of geothermal resources as a whole.

The result is that the Treaty of Waitangi and legislation enacted to give effect to it or its principles are not likely to have an adverse legal effect on a geothermal minerals operation.

It is important to bear in mind that companies using natural resources in New Zealand generally put a great deal of effort into maintaining good relationships with tangata whenua in the light of the Treaty, with or without legal compulsion to do so. But it seems unlikely that the Treaty and legislation enacted to give effect to it or its principles will have an adverse legal effect on a geothermal minerals operation.

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86 Other features of the Treaty of Waitangi Act 1975 and practice under it, such as the restriction on filing new historical claims, need not be addressed in this discussion. Note R Boast, "Geothermal Resources in New Zealand: a Legal History" (1995) 6 Canterbury L Rev 1.

87 Waitangi Tribunal, *Ngawha Geothermal Resource Report* (Wai 304, 1993).

88 Waitangi Tribunal, *Preliminary Report on Te Arawa Representative Geothermal Resource Claims* (Wai 153, 1993).

89 Waitangi Tribunal, *He Maunga Rongo: Report on Central North Island Claims, Stage 1* (Wai 1200, 2007).

90 Waitangi Tribunal, *Stage 1 Report on the National Freshwater and Geothermal Resources Claim* (Wai 2358, 2012).

## 6 MATERIALS AS PERSONAL PROPERTY

This report has already considered the legal status of geothermal groundwater after it has been extracted, in relation to the RMA and the CMA, but it is desirable to bring together the different threads of the discussion relating to personal property. It was noted that under the RMA the definition of “water” for the purposes of control and regulation makes an exception for water in any form while in any pipe, tank or cistern. In geothermal operations, the most likely point where this happens is where the geothermal water enters the well from the surrounding rock, typically through screens that form part of the lower section of the well structure. At this point the water is no longer part of the land or part of the environment. The common law of water provided much the same result; water which had been appropriated or taken into possession was the subject of property, in the hands of the person having possession of it.<sup>91</sup>

As for the CMA, it was noted that the Act defines “mineral” as a “naturally occurring inorganic substance beneath or at the surface of the earth, whether or not under water” so that geothermal minerals, once extracted, are no longer subject to that Act. The extracted geothermal minerals are no longer susceptible to a claim of ownership by the Crown or a permit holder. A permit holder does not have rights to minerals *in situ*, as we have noted, but only has the right to mine them, at which point the permit holder becomes owner of the minerals.

Once geothermal water, including dissolved materials, has been taken into possession by having been extracted from the ground, it has the legal status of personal property, owned by the company or person that took it under the RMA water permit. Personal property, in this sense, is property in things other than land, which is real property.<sup>92</sup> It is goods or chattels. Water that has been appropriated or taken into possession is the subject of property, although only for the period of possession.<sup>93</sup> The owner may sue for interference with it, and its unlawful taking constitutes theft. It seems to follow inevitably that the same must be said for anything extracted from that water. Material removed from geothermal fluid, such as a pile of silica or other mineral in the storage facilities of the plant operator, will also have the status of personal property.<sup>94</sup>

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91 Brookfield, “Water” above n 22 para 45 p 52.

92 R T Fenton, *Garrow and Fenton’s Law of Personal Property in New Zealand*, 7th ed, vol 1 (LexisNexis, Wellington, 2010) p 1; R G Hammond, *Personal Property: Commentary and Materials*, rev ed (Oxford University Press, Auckland, 1992). Also see Property Law Act 2007 s 4.

93 Fenton, 2.46, p 221.

94 The rules of tracing, which allow an owner of property to identify assets that it has been converted into, are not examined here because they are unlikely to be relevant. They would only arise if a land owner or mineral owner could establish that the minerals were his or her property rights in the first place and were wrongfully taken. Generally see J Chevalier-Watts and S Tappenden, *Equity, Trusts and Succession* (Wellington: Thomson Reuters, 2013) p 351.

## 7 COMPARATIVE RESEARCH

This report has mainly addressed questions of the effect of current New Zealand law on the feasibility of geothermal minerals operations. The usefulness of comparative analysis in tackling such questions is limited. Where the question is one of statutory interpretation, the courts will examine what the New Zealand legislature has done, using principles developed in New Zealand law. Where the question is one of private rights such as property rights, the courts are likely to look more widely, and the analysis here has reflected that fact. As for options for amending the existing law, the usefulness of comparative analysis is similarly restricted, because few countries organize their geothermal law around water, as New Zealand does, and because the minerals dimension is a relatively small part of geothermal law as a whole.

A few brief notes can nonetheless be made about overseas examples. In Australia, calls have been made for purpose-specific legislation,<sup>95</sup> but few states seem to have done so. Victoria has the Geothermal Energy Resources Act 2005 (Vic) which vests all geothermal energy in the Crown, and defines that term and geothermal water apparently without addressing the question of dissolved material expressly. The Geothermal Energy Act 2010 (Qld) of Queensland does not do so either. New South Wales and Tasmania have brought geothermal resources under their mining legislation, while South Australia and Western Australia have brought them under their petroleum legislation.<sup>96</sup>

In Canada, British Columbia is one of the few jurisdictions to have a specific law for geothermal development. Its definition of “geothermal resource” particularly includes “all substances dissolved in the steam, water or water vapour obtained from a well”.<sup>97</sup> So the possibility of geothermal minerals operations has been addressed explicitly. In the United States, Nevada state law similarly includes in its definition of geothermal resource all dissolved or entrained minerals that may be obtained from the medium used to transfer heat; but the relationship of this declaration to federal and state mining laws, and private ownership, is complex.<sup>98</sup> If progressed further, these comparisons from other jurisdictions could provide insights into new possibilities; but they may not be easy to fit into the overall pattern of the New Zealand legislation.

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95 See A J Bradbrook “The Ownership of Geothermal Resources” (1987) *AMPLA Yearbook* 353 and “The Contents of New Geothermal Legislation” (1987) 5 *JERL* 81.

96 A Bradbrook and A Rønne, “New Advances in Geothermal Energy Law: A Comparative Analysis” p 309 in D Zillman, A McHarg, L Barrera-Hernández and A Bradbrook, eds, *The Law of Energy Underground: Understanding New Developments in Subsurface Production, Transmission, and Storage* (Oxford: Oxford University Press, 2014).

97 Geothermal Resources Act, RSBC 1996 c 171 s 1.

98 Nevada Rev Statutes 534A.010; S Harrison and M Gray “Geothermal Resources: Who Owns What?” (July 01, 2009, Nevada Lawyer ) <[www.mcdonaldcarano.com/read\\_news/view.asp?ID=77](http://www.mcdonaldcarano.com/read_news/view.asp?ID=77)>.

## 8 CONCLUSIONS

The conclusions of this analysis, based on the assumed factual scenario identified in the Introduction, may be stated in summary form.

- 1 The use of the terms “water” in the Resource Management Act 1991 (RMA) and “natural water” in the Water and Soil Conservation Act 1967 (WSCA) includes material dissolved or entrained in geothermal water, and the management of water under the RMA includes the granting of rights to such material as part of water more generally.
- 2 Rights to the “matter” in geothermal fluids are vested in the Crown by reason of the Geothermal Energy Act 1953.
- 3 A regional council has jurisdiction over those materials in geothermal water, and has obligations to manage them under the RMA.
- 4 The holder of an RMA water permit has the rights, otherwise vested in the Crown, to take and use water in terms that include the matter and material dissolved or entrained in water.
- 5 Sound RMA reasons exist for a regional council to look favourably on geothermal minerals projects.
- 6 While the plain and ordinary meaning of “mining” under the Crown Minerals Act 1991 (CMA) is broad enough to include a geothermal minerals operation, the purpose and context of the Act provide indications that suggest that an ancillary operation is excluded, particularly where it involves an extraction of geothermal water, bearing minerals dissolved in solution, that is lawful. The assumption that an exception can be implied involves a degree of uncertainty.
- 7 As a matter of policy, it is very arguable that the uncertainty about the application of the CMA should be removed.
- 8 If a geothermal minerals operation is “mining” under the CMA, then the company must obtain a mining permit and must comply with other obligations under the Act. Obligations to supply information that is in due course made public are particularly notable. In addition, a geothermal minerals operator may find that its rights to mineral have already been granted to another permit holder.
- 9 It is highly unlikely that a neighbouring land owner or mineral owner can take legal action at common law to obtain damages or an injunction against a geothermal minerals operation operating under an RMA water permit.
- 10 If a neighbour has a common law right to take legal action, it is very likely to be overridden by the RMA and WSCA.

11 The Treaty of Waitangi and legislation enacted to give effect to it or its principles are not likely to have an adverse legal effect on a geothermal minerals operation.

12 Once geothermal water, including dissolved materials, has been taken into possession, it has the status of personal property, owned by the company or person that took it under the RMA water permit, and it appears to follow that any minerals extracted from it would have the same status.

These points are conclusions about the existing law, as indeed is most of the analysis in the body of the report. In relation to virtually any of them, it is possible to proceed to ask questions about law reform.

- Is the law clear enough to provide adequate levels of regulatory and commercial certainty?
- What are the strengths and weaknesses of this particular policy setting?
- Is the existing law the best option from a policy point of view?
- What law reform options exist, and what effects will they have on the particular matter in hand and on the legal system more generally?

A sound understanding of the present law is the starting point for addressing such questions.



# APPENDIX 1

## Extracts from Current Geothermal Water Permits



## Wairakei, 2007

Waikato Regional Council issued resource consent 104706 on 3 October 2007 to Contact Energy Ltd to take from the Wairakei system on the following terms:

"Activity authorised: Take and use up to 245 kilotonnes of geothermal water, and associated energy and heat for electricity generation, supply and use of steam, water and condensate, drilling and testing of geothermal wells, and related and ancillary purposes[.]"

## Rotokawa, 2008

Waikato Regional Council issued resource consent 116565 on 23 January 2008 to Rotokawa Joint Venture Limited to take from the Rotokawa geothermal system on the following terms:

"Activity authorised: take and use up to 22,100,000 tonnes per year (at an average of 60,500 tonnes per day) with a maximum take of 70,500 tonnes per day of geothermal water and associated energy from underground strata for electricity generation; and for the supply and use of steam, water, heat and condensate for related and ancillary purposes and other downstream uses, within Consent Area 1 (as shown in Schedule ONE)."

## Tauhara, 2010

Waikato Regional Council issued resource consent 120544 in 2010 to Contact Energy Ltd to take from the Tauhara system on the following terms:

"Activity authorised: Take and use up to 213 kilotonnes per day of geothermal water and associated energy and heat within the Consent Application Area ... for any purpose directly or indirectly associated with the generation of electricity or the direct supply of steam, water or heat including well and aquifer testing and well maintenance[.]"

## Rotokawa, 2010

Waikato Regional Council issued resource consent 120489 on 6 Sept 2010 to Rotokawa Joint Venture Ltd to take from the Ngatamariki geothermal field on the following terms:

"Activity authorised: To authorise the take and use, at a maximum rate of up to 60,000 tonnes per day of geothermal water and associated energy and heat from underground strata for electricity generation; and for the supply and use of steam, water and condensate for related and ancillary purposes within the consent area shown in Schedule ONE."

## Kawerau, 2014

Bay of Plenty Regional Council issued resource consent 66862 on 14 March 2013 to Ngāti Tūwharetoa Geothermal Assets Ltd "to Take Geothermal Fluid within the Kawerau Geothermal System for use by third parties including for Commercial and Industrial uses" and specified:

"2.3 Any geothermal fluid supplied and used under this consent shall be for the following uses:

- (a) Direct heat uses including (but not limited to) pulp and paper processing, timber or wood products drying, and greenhouse heating;
- (b) Electricity generation;
- (c) Any combination of electricity generation and direct heat uses; and
- (d) Cascade use."



