Contents

GR Geothermal Resources

The explanation/principal reasons for the provisions in this section have been moved to Appendix 1.

The provisions in this chapter do not apply to geothermal water, heat or energy within the area covered by the Operative Rotorua Geothermal Regional Plan (refer to Map GR 1). The control of activities associated with the abstraction of geothermal water, heat or energy on the seaward side of mean high water spring is addressed under the provisions of the Bay of Plenty Regional Coastal Environment Plan.

Provisions relating specifically to geothermal water alone are contained within this section, while those applying to fresh water are contained within the Discharges to Water and Land section and Water Quantity and Allocation section of this regional plan. However, the provisions of those sections should be referred to where activities will affect both geothermal water and fresh water.

Geothermal Resources

Issues

GR I1 (Issue 48) **Geothermal values, surface features, and geothermal ecosystems can be degraded by inappropriate development of geothermal fields.**

Para 1 Geothermal fields in the Bay of Plenty region are part of the Taupo Volcanic Zone, and have the following values:

(a) Outstanding natural features and landscapes. On a national and international scale, high temperature (>70 degrees Celsius) geothermal fields and associated geothermal surface features are rare geological features.
(b) Intrinsic and amenity values of geothermal surface features and ecosystems. Geothermal surface features have iconic status to residents of the Bay of Plenty and wider New Zealand.
(c) Significant indigenous geothermal vegetation, geothermal ecosystems, and indigenous biological diversity. High temperature fields give rise to geothermal ecosystems, which are highly valued for their indigenous biological diversity. Geothermal ecosystems have adapted to extremes of temperature, pH, chemical composition and toxicant levels. Each area may be more than several hectares, and may contain species unique to that site.
(d) Maori cultural values and traditional uses, and taonga. Iwi have documented their knowledge and understanding of geothermal surface features and expressed this through myth, legend, oral history, and latterly, in written form.

Objective	*GR O2, GR O3, GR O4*
Policy	*GR P1, GR P2, GR P3, GR P4, GR P9, GR P10, GR P13, GR P14*
Method	*GR M3, GR M5, GR M6, GR M8, GR M11, GR M12, GR M13, GR M14*
Rule	*GR R1, GR R2, GR R3, GR R4, GR R5, GR R6, GR R7, GR R8, GR R9*

GR I2 (Issue 49) **Land use and development over or near geothermal surface features may have the following adverse effects:**

(a) Expose the community to geothermal hazards,
(b) Degrade geothermally dependent ecosystems, and
(c) Degrade or destroy geothermal surface features and taonga.

The causes of this issue are:

1 Inappropriate land use and development, including the infilling of geothermal surface features.
2 Land use development in areas on or near active or dormant geothermal surface features. Dormant geothermal surface features may become active due to large scale geologic movements, or as a result of human activities.

This is a risk management issue, which is particularly relevant in high-temperature (>70 degrees Celsius) geothermal fields.

Objective *GR O3, GR O7*
Policy *GR P2, GR P14*
Method *GR M3, GR M5, GR M6, GR M11, GR M12*
Rule *GR R9*

GR I3 (Issue 50) **Geothermal fluid contains toxic components and the discharge of such fluids to the environment can:**

(a) Contaminate water and soil resources.
(b) Damage aquatic or terrestrial ecosystems.
(c) Lead to flooding of a geothermal surface feature, taonga, or a geothermal ecosystem.

The effects on the environment from the discharge of used geothermal fluid depends on the physical characteristics or chemistry of the geothermal fluid, and the sensitivity of the receiving environment.

Objective *GR O5*
Policy *GR P1, GR P6*
Method *GR M1*
Rule *GR R9*

GR I4 (Issue 51) **The drilling and construction of geothermal bores can:**

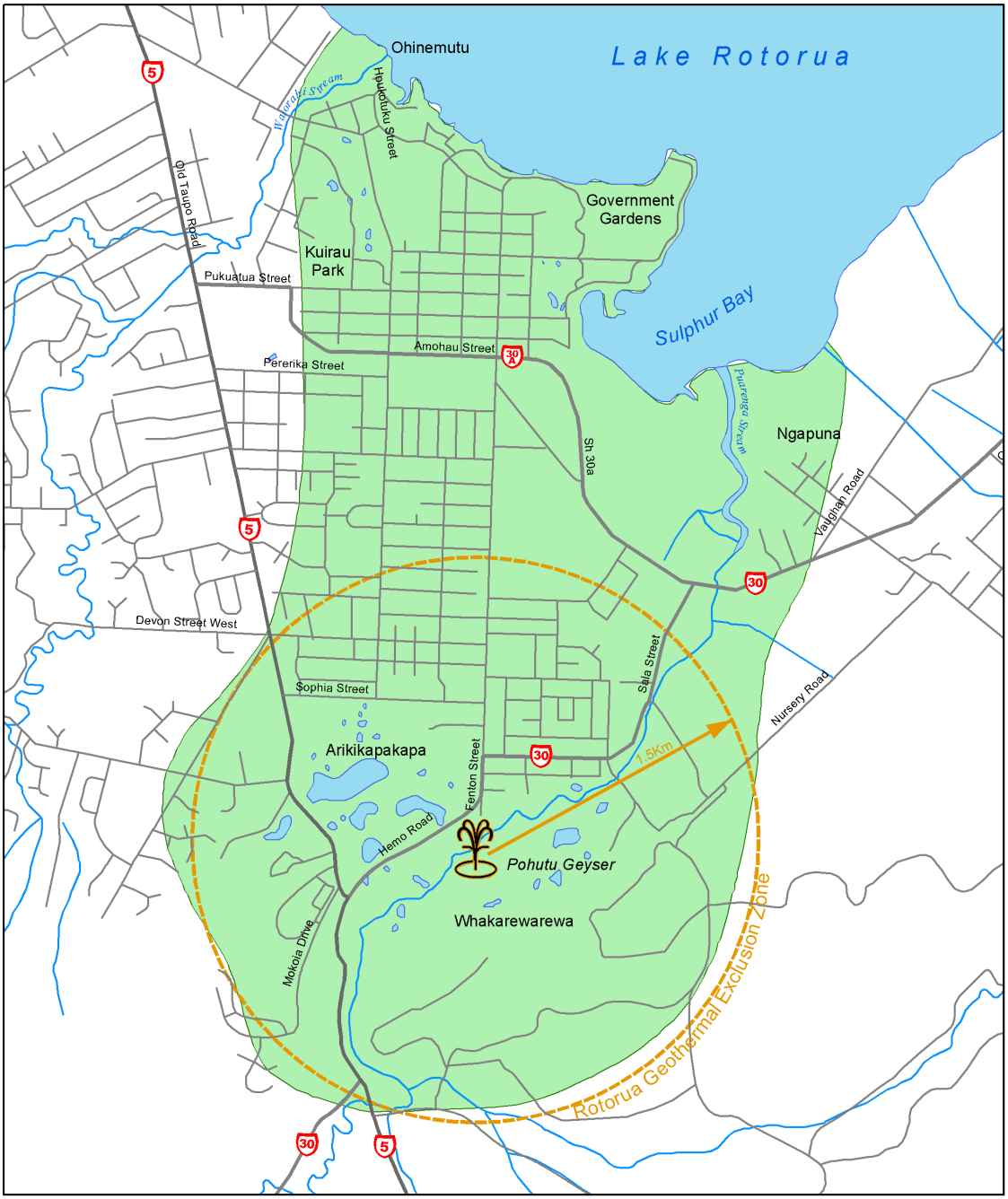
(a) Degrade natural field characteristics, including field pressure,
(b) Cross contaminate freshwater groundwater and geothermal aquifer systems,
(c) Contaminate water and soil resources as a result of the discharge of drilling fluids, and uncontrolled discharges from blowouts from bore construction, and
(d) Adversely affect existing users of the resource.

Objective *GR O6*
Policy *GR P1, GR P2, GR P11, GR P12*
Method *GR M10*
Rule *GR R4, GR R5, GR R6, GR R7*

GR I5 (Issue 52) **The damming and diversion of geothermal water may degrade geothermal surface features, ecosystems and taonga.**

Objective *GR O1, GR O3, GR O4*
Policy *GR P1, GR P3, GR P4, GR P9*
Method *GR M13*
Rule *GR R8*

Map GR 1 – Rotorua Geothermal Field as Covered by the Rotorua Geothermal Regional Plan



23/06/2003 **C1784**

1 0 1
Kilometres

Road
State highway
River
Exclusion zone
Rotorua geothermal field indicative area
Lake

This map shows an interpretation of the geothermal features of the Rotorua area. The small scale of this map has necessitated the omission of some small features and the exaggeration of others in the interests of clarity. This map should not be used for any work where specific investigations should be made.

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GR I6 (Issue 53) **The take of geothermal water, heat or energy may deplete the geothermal field, and degrade geothermal surface features, ecosystems and taonga.**

A contributing factor to this issue may be the lack of community awareness about the possible adverse effects of the use of geothermal resources, and the finite characteristics of the resource.

Objective	*GR O1, GR O4, GR O8*
Policy	*GR P1, GR P3, GR P4, GR P5, GR P7, GR P8, GR P10*
Method	*GR M2, GR M3, GR M4, GR M5, GR M7, GR M8, GR M9, GR M10,GR M13, GR M14*
Rule	*GR R1, GR R2, GR R3*

Objectives

GR O1 (Objective 65) Sustainable use and development of geothermal water, heat and energy with regard to the effects on geothermal surface features and ecosystems, and individual field characteristics.

GR O2 (Objective 66) Significant geothermal features are protected from inappropriate use and development.

GR O3 (Objective 67) Protection of significant indigenous geothermal ecosystems.

GR O4 (Objective 68) Preservation of outstanding geothermal surface features.

GR O5 (Objective 69) The reinjection of abstracted geothermal water into the same geothermal field from which it came, subject to an assessment of effects.

GR O6 (Objective 70) Geothermal bores are constructed to appropriate drilling standards.

GR O7 (Objective 71) Avoidance or mitigation of the effects of natural geothermal hazards.

GR O8 (Objective 72) Efficient use of geothermal resources.

Policies

GR P1 (Policy 119) To manage effects of the use and development of geothermal resources according to the following:

Table GR 1 Management of the Effects of the Use and Development of Geothermal Resources

	Issue	Policy
(a)	Geothermal surface features	(i) To preserve outstanding geothermal surface features. (ii) To protect geothermal taonga that have been identified and named by tangata whenua, and have special value. (iii) To protect significant geothermal surface features from inappropriate use and development. (iv) To protect significant indigenous geothermal ecosystems. This is subject to the Geothermal Management Group protection levels in GR P3.
(b)	Precautionary approach	(i) To constrain resource allocation based on the level of understanding of field dynamics and resource availability. This may include staged development of a field. (ii) To take into account the level of knowledge available, while recognising that perfect knowledge of the effects of geothermal resource use is not possible.
(c)	Efficient use	(i) To require the use of any geothermal water, heat or energy to be efficient. (ii) To promote multiple use of extracted resources, where this does not compromise reinjection. **Note:** – the efficient use of geothermal water, heat or energy will be assessed on a case by case basis.

	Issue	Policy
(d)	Users of the resource	To promote the integrated management of each individual geothermal field, including allowing, where appropriate, consortia or a single body to take and use geothermal resources from any one field. The appropriateness of multiple users, a single tapper, or a consortia, will be assessed on a case by case basis relative to the sustainable use of the individual field, including effects on existing users of the field.
(e)	Discharge of geothermal fluid	To actively encourage geothermal water to be reinjected into a geothermal reservoir, where appropriate to the circumstances and subject to an assessment of effects.
(f)	Geothermal abstraction	To recognise that: (i) Geothermal development can result in land subsidence. (ii) Geothermal resources are renewable, but limited resources, and have some finite characteristics similar to minerals.
(g)	Activities ancillary to geothermal abstraction and use	To sustainably manage the effects of ancillary activities.

GR P2 (Policy 120) To require the use and development of geothermal resources of the region to sustain the potential of the resources for the reasonably foreseeable needs of future generations.

GR P3 (Policy 121) To use the following Geothermal Management Groups to guide decisions on the take, use, damming and diversion of geothermal water, heat and energy:

1 Geothermal Management Group 1

>70 degrees Celsius, outstanding geothermal surface features, little or no development.

Protected geothermal systems – Complete preservation of the outstanding natural, intrinsic, scenic, cultural, heritage and ecological values of the following geothermal resources:

(a) Waimangu/Rotomahana/Tarawera
(b) Whakaari (White Island)
(c) Moutohora Island (Whale Island)

2 Geothermal Management Group 2

>70 degrees Celsius, outstanding or significant geothermal surface features, high level of development.

(a) Rotorua

Note: Management Group 2 is covered by the Operative Rotorua Geothermal Regional Plan, refer to that plan for policies and rules regarding the Rotorua geothermal field.

3 Geothermal Management Group 3

>70 degrees Celsius, significant geothermal surface features, unmodified fields.

High temperature geothermal systems available for sustainable use and development – The use (including abstraction) of geothermal water, heat and energy where significant geothermal surface features and geothermal ecologies are protected, and the adverse effects of the activity can be avoided, remedied or mitigated. It is recognised that the protection of significant geothermal surface features and ecologies is the major constraint on the development of these geothermal resources:

(a) Tikitere/Ruahine
(b) Taheke
(c) Rotokawa/Mokoia Island
(d) Rotoma/Tikorangi

Note – These fields contain significant geothermal features or ecologies. Resource consent applicants are to assess the scale and magnitude of the effects of a proposed activity on features and ecologies, and assess the significance of individual features and ecologies using the requirements of the Bay of Plenty Regional Policy Statement.

4 Geothermal Management Group 4

>70 degrees Celsius, few or no geothermal surface features, high to no modification of field

High temperature geothermal systems available for sustainable use and development – The use (including abstraction) of geothermal water, heat and energy where the adverse effects of the activity can be avoided, remedied or mitigated:

(a) Kawerau
(b) Lake Rotoiti (outflow is in the bed of Lake Rotoiti)
(c) Rotoma/Puhi Puhi

5 Geothermal Management Group 5

30-70 degrees Celsius, few or no geothermal surface features.

Low temperature geothermal systems available for sustainable use and development – The use (including abstraction) of geothermal water, heat and energy where the adverse effects of the activity can be avoided, remedied or mitigated, while recognising that the discharge of geothermal fluid is the major constraint on the development of these geothermal resources:

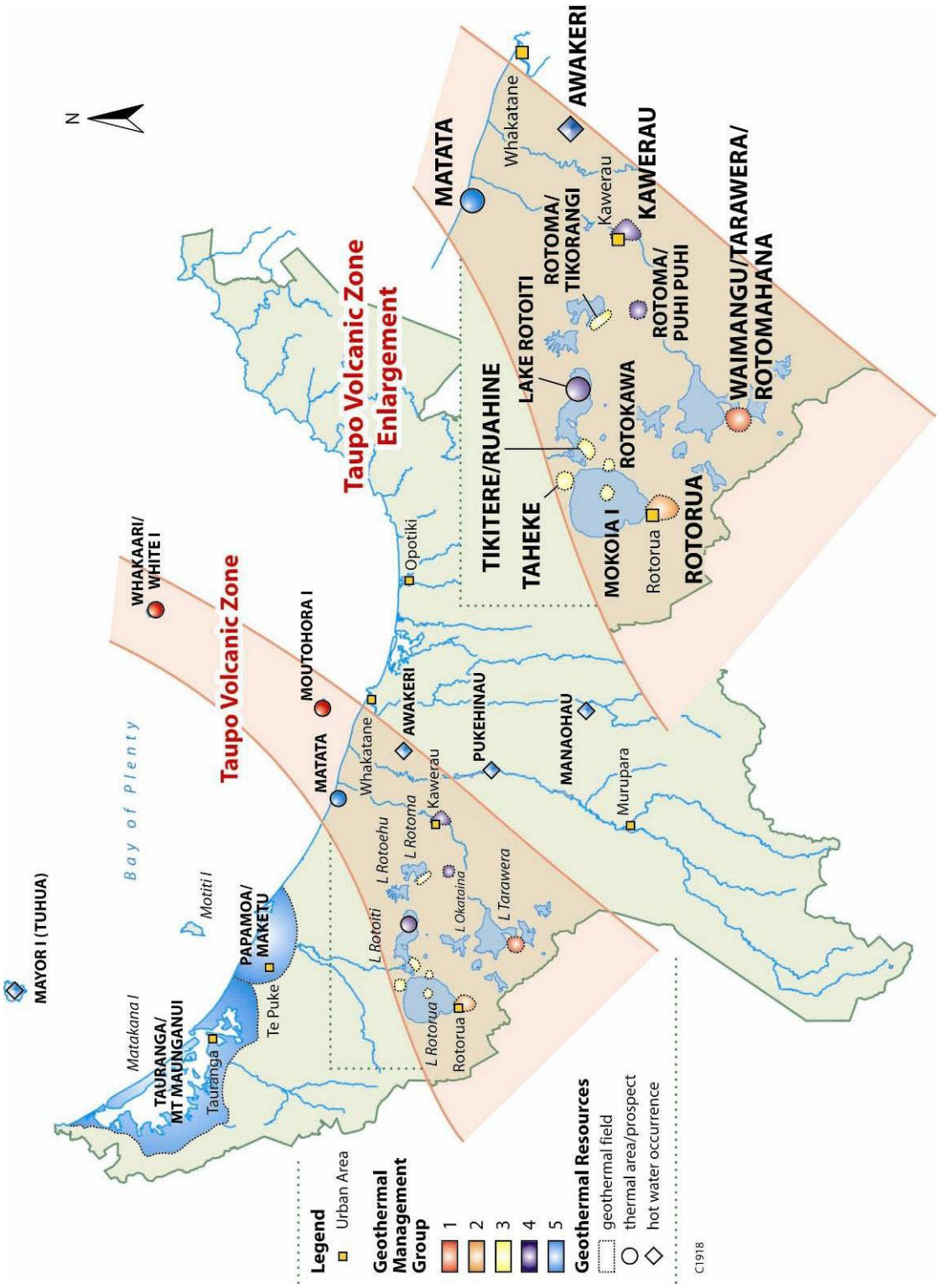
(a) Mayor Island (Tuhua)
(b) Tauranga/Mount Maunganui (Mauao)
(c) Papamoa/Maketu
(d) Matata (prospect)
(e) Awakeri
(f) Pukehinau
(g) Manaohau

Refer to Map GR 2 for the location of geothermal fields in the Bay of Plenty.

GR P4 (Policy 122)

To assess any new geothermal fields that are identified in the Bay of Plenty region to determine its Geothermal Management Group classification. To not allow development of an newly discovered field until it has been classified in an appropriate Geothermal Management Group. This can occur as part of the resource consent process.

Map GR 2 – Geothermal Fields in the Bay of Plenty



GR P5 (Policy 123) To allocate geothermal water, heat and energy according to GR P1 and GR P2, and the following:

Table GR 2 Geothermal Resource Allocation Methodology

	Issue	Policy
(a)	Efficient use	To require the efficient use of geothermal water, heat and energy by individual geothermal abstractions to ensure the amount allocated in terms of energy or heat (thermal) equivalents does not exceed an amount adequate to service the use sought. **Note:** – the efficient use of geothermal water, heat or energy will be assessed on a case by case basis.
(b)	First in first served basis	To allocate geothermal water, heat and energy on a first in first served basis while ensuring efficient use as defined in (a).
(c)	Tradable permits	To consider the use of tradable permits in geothermal fields where there is a high demand for geothermal water, heat and energy.

GR P6 (Policy 124) To manage the discharge of geothermal water according to GR P1 and GR P2 and the following:

Table GR 3 Management of the Discharge of Geothermal Water

	Issue	Policy
(a)	Reinjection	(i) To prefer reinjection where practicable and appropriate to the production method, field characteristics, and safety considerations. (ii) To encourage reinjection to occur at a location and/or depth where the temperature is similar to that of the discharge, unless alternatives are scientifically justified. (iii) To avoid, remedy or mitigate the adverse effects of reinjection on fresh water bodies.
(b)	Discharge to water	To allow the discharge of geothermal water to water only where: (i) The discharge of fluid is into the resource from which the fluid was originally extracted, or (ii) The discharge of fluid is to a surface or groundwater body that is geothermal or naturally influenced by geothermal inputs, or (iii) The effect on the environment is minor.
(c)	Discharge to land soakage	To manage discharges of geothermal water into and onto land by soakage to avoid, remedy or mitigate adverse effects on the environment, where the discharge: (i) Is at a location where groundwater is either geothermal or influenced by natural geothermal inputs. (ii) Is at a rate that allows for the soakage of the water into the ground, avoids flooding and erosion or scour. (iii) Is controlled to avoid adverse effects on infrastructural assets.

GR P7 (Policy 125) To recognise and provide for the use of geothermal water, heat and energy by tangata whenua in accordance with tikanga Maori and section 14(3)(c) of the Act.

GR P8 (Policy 126) To gather and maintain sufficient quality information to enable the effective management of geothermal resources, including contemporary modelling data where appropriate.

GR P9 (Policy 127) To manage the damming and diversion of geothermal water to avoid, remedy or mitigate adverse effects on the environment.

GR P10 (Policy 128) To raise community awareness of:

(a) The finite availability of geothermal water, heat and energy.
(b) The long-term effects of depletion of geothermal resources.

(c) The vulnerability of geothermally-dependant ecologies to adverse effects.
(d) Geothermal hazards.

GR P11 (Policy 129) To require the use of National Drilling Standards[32] for the drilling and installation of geothermal bores.

GR P12 (Policy 130) To require bore log information to be collected and provided to the Regional Council for the purpose of establishing an accurate record of geothermal resources in the region.

GR P13 (Policy 131) To identify geothermal surface features, ecosystems and taonga, the significance of such features and establish the degree of protection needed.

GR P14 (Policy 132) To work with city and district councils to avoid or mitigate the effects of geothermal hazards by:

(a) Encouraging land use and development to avoid areas with a high risk of geothermal hazard.
(b) Requiring land users and developers take effective measures to remedy or mitigate the adverse effects of geothermal hazards at sites that have a high actual or potential geothermal hazard risk.
(c) Assisting city and district councils to control the effects of geothermal hazards on the community.
(d) Supplying city and district councils with information on geothermal hazards where this is available.

Methods of Implementation

The Regional Council will:

Education, Promotion and Provision of Information

GR M1 (Method 240) Produce an information leaflet on the guidelines for the discharge of geothermal fluid in Management Group 5 areas. This may be carried out in conjunction with relevant city and district councils.

GR M2 (Method 241) Promote measures to ensure the efficient use of geothermal water, heat and energy, including:
(a) Measures for the optimum value usage from extracted geothermal water, heat and energy, such as:
  (i) The secondary use of extracted heat and water (cascade use), and
  (ii) The extraction of useable by-products (such as minerals) from water prior to reinjection or other discharge to the environment.
(b) Encouraging organisations, industry groups and individuals to develop ways in which their geothermal takes can be reduced through the adoption of good management practices.
(c) The use of down-hole heat exchangers.

GR M3 (Method 242) In conjunction with city and district councils, raise community awareness and understanding of geothermal resources and hazards using appropriate education and promotion techniques and mechanisms, including those listed in the Environment Bay of Plenty Environmental Education Strategy for Environment Bay of Plenty 1999-2005[33].

GR M4 (Method 243) Advise tangata whenua that a consent is not needed where section 14(3)(c)

[32] NZS 4411:2001 Environmental Standard for Drilling of Soil and Rock. Standards New Zealand, Wellington.
[33] Environment Bay of Plenty, 1999. Environmental Education Strategy for Environment Bay of Plenty 1999-2005 – Learning for a Sustainable Environment.

of the Act allows for the take and use of geothermal water, heat or energy where it is taken and used in accordance with tikanga Maori for the communal benefit of tangata whenua in the area and the activity does not have an adverse effect on the environment.

Working with Other Resource Management Agencies and the Community

GR M5 (Method 244)

In conjunction with city and district councils, agencies and interest groups (including the Department of Conservation), tangata whenua having local geothermal rangatiratanga, and the community, establish and maintain a register of all natural geothermal surface features and associated natural ecosystems. The register will:

(a) Identify, catalogue and describe each natural surface feature and its association to groups of geothermal surface features.
(b) Include natural ecologies associated to or dependent upon surface feature activity.
(c) Name geothermal taonga identified by tangata whenua, where acceptable to tangata whenua.
(d) Include both active and inactive natural geothermal surface features.
(e) Assess and describe the sensitivity of each natural surface feature to field pressure change and land development, and the protective measures needed to ensure the feature is sustained.
(f) Include a description of any historic and cultural associations to each feature with respect to its heritage value.
(g) Include, as practicable, quality scientific information relevant to each feature, in particular an assessment of outflow rates of geothermal fluid.
(h) Include location maps and other information presentations to ensure that the register can provide 'user friendly' quality information and be an effective planning device for developers and the public.
(i) Identify those surface features and ecologies that are considered to be outstanding or significant.
(j) Assist in hazard management by identifying surface features that may cause a hazard to the community.
(k) Identify the degree of protection needed for significant geothermal surface features.

Advocacy

GR M6 (Method 245)

Advocate that city and district councils develop suitable provisions for inclusion in District Plans, which will:

(a) Protect geothermal surface features and associated ecologies from the effects of land use development.
(b) Provide a buffer zone between land use and development, and geothermal hazards.
(c) Provide for the formal assessment of the effects on the cultural, spiritual, ecological, intrinsic, scientific and natural heritage values of geothermal resources that may occur as a result of subdivision and land use development.
(d) Restrict land use developments where there is a risk of exposure to geothermal hazards, or where land use development may increase the risk of geothermal hazards.
(e) Require resource consent applicants to include an assessment of geothermal hazard risk for any land use and development over or adjacent to geothermal resources, sites or features.
(f) Administer the following activities as discretionary activities:
    (i) Any interference with the physical structure of a geothermal surface features, and
    (ii) Any destruction of a geothermal surface feature, including

excavation, and

(iii) Any placement or deposition of any substance, including fill or waste materials, on, into or under any geothermal surface feature.

Regulatory Methods

Cross-Reference

Also refer to LM M17, LM M18.

Matters Relevant to Resource Consent Applications and Processing

GR M7 (Method 246)

Protect commercially sensitive information relating to the use and development of geothermal resources, in accordance with section 42 of the Act.

GR M8 (Method 247)

Require resource consent applicants to provide the following information, where the information is appropriate to the scale and significance of effects that the proposed activity may have on the environment:

(a) Modelling and research data relating to the potential of the field and its characteristics and values.
(b) The amount of geothermal resource available for allocation from the field.
(c) The extent of geothermal surface features and associated ecosystems.

The information is to be provided in such detail as corresponds to the scale and effects of the activity. This may require staged exploration and testing prior to any development.

Note: Information on geothermal surface features and associated ecosystems, and their values, may be contained in a register implemented under GR M5.

GR M9 (Method 248)

As part of the assessment of a resource consent application for the use or development of geothermal resources, consider:

(a) Requiring geothermal field development to be staged in order to establish field characteristics prior to full development, where appropriate to the scale and effects of the activity.
(b) Establishing, and as appropriate reviewing, the amount of geothermal resource available for allocation from the field as this relates to the sustainable use and development of the field. This may include establishing appropriate limits to allow for natural, seasonal or other variation in field water levels and pressure.

GR M10 (Method 249)

Use resource consent conditions to require persons who take and use geothermal water, heat or energy to:

(a) Install devices to ensure the efficient use of geothermal water, heat or energy where the abstracted amount in terms of energy or heat (thermal) equivalents does not exceed an amount adequate to service the use. This is to ensure the wastage of geothermal water, heat or energy is minimised.
(b) Measure their use of geothermal water, heat or energy.
(c) Measure the loss in field pressure resulting from the activity, where appropriate.
(d) Minimise heat loss from extracted geothermal water, heat or energy by:
    (i) Using an appropriate method to take and use geothermal water, heat or energy to minimise the heat loss from the abstracted water, heat or energy.

(ii) Installing and adequately controlling appropriate heat transfer equipment.
(iii) Insulating mass and heat abstraction and exchanger systems and associated pipework, where appropriate.
(iv) Effectively maintaining the heat exchange and reticulation system.

(e) Ensure that the borehead design and construction includes a manual bore control valve and provide for the installation of an orifice plate and water meter after the bore control valve, where practicable.
(f) Keep records of the takes of geothermal heat, fluid and energy for each geothermal field for the purposes of monitoring the effects of takes on the resource, and to aid the formulation of geothermal field models, where appropriate.
(g) Provide the Regional Council with geothermal bog lore information.
(h) Monitor subsidence where appropriate.

GR M11 (Method 250) Consider issuing a resource consent for multiple drilling sites within a defined area where an existing resource consent is held for the use and development of a geothermal field. The drilling consent will address the protection of geothermal surface features in accordance with GR P1 and GR P3; compliance with GR P11 and GR P12; and address adverse effects on other users of the field.

GR M12 (Method 251) Consider issuing composite consents for the development and use of geothermal resources, which will cover all relevant activities restricted by rules in this section of the regional plan.

Monitoring and Investigation of the Environment

GR M13 (Method 252) Determine the Geothermal Management Group classification of any new geothermal fields identified in the Bay of Plenty Region according to the following criteria:

Table GR 4 Classification of Geothermal Fields

	Geothermal Management Group	Geothermal Surface Features	Field Development	Field Temperature as measured at depth
(a)	Geothermal Management Group 1	Contains outstanding geothermal surface features. Contains significant indigenous geothermal ecosystems. Surface features and indigenous geothermal ecosystems may be of national or international importance.	The field has no or little development.	Hot (>70º Celsius)
(b)	Geothermal Management Group 2	Contains significant surface features, outstanding natural features, unique ecosystems, or significant indigenous vegetation. Surface features may be of national or international importance.	Field has been extensively developed to the detriment of the surface features, and should be restored.	Hot (>70º Celsius)

	Geothermal Management Group	Geothermal Surface Features	Field Development	Field Temperature as measured at depth
(c)	Geothermal Management Group 3	Contains significant surface features, or significant indigenous geothermal ecosystems. The significance of individual surface features in the field, and the effects on those features will be assessed using the Criteria for Assessing Specified Matters in the Bay of Plenty Region in the Bay of Plenty Regional Policy Statement.	Field has little or no development.	Hot (>70º Celsius)
(d)	Geothermal Management Group 4	Has few or no geothermal surface features.	High, little or no development.	Hot (>70º Celsius)
(e)	Geothermal Management Group 5	Has few or no geothermal surface features, may include springs.	Some development, depending on location and temperature.	Warm (>30 and <70º Celsius)

Notes:

The classifications for geothermal fields in the Bay of Plenty region are:

1 **Geothermal Management Group 1:**

(a) Waimangu/Rotomahana/Tarawera

(b) Whakaari (White Island)

(c) Moutohora Island (Whale Island)

2 **Geothermal Management Group 2:**

(a) Rotorua

3 **Geothermal Management Group 3:**

(a) Tikitere/Ruahine

(b) Taheke

(c) Rotokawa/Mokoia Island

(d) Rotoma/Tikorangi

4 **Geothermal Management Group 4:**

(a) Kawerau

(b) Lake Rotoiti

(c) Rotoma/Puhi Puhi

5 **Geothermal Management Group 5:**

(a) Mayor Island (Tuhua)

(b) Tauranga/Mount Maunganui (Mauao)

(c) Papamoa/Maketu

(d) Matata (prospect)

(e) Awakeri

(f) Pukehina

(g) Manaohau

GR M14 (Method 253) Continue to monitor the state of geothermal resources in the Bay of Plenty in accordance with the Regional Council's NERMN, and existing compliance and impact monitoring programmes.

Rules

Advisory Note

1 The rules in this section do not apply to Geothermal Management Group 2 – Rotorua field, which is covered by provisions in the Operative Rotorua Geothermal Regional Plan[34].

Take and Use

GR R1 (Rule 72) **Permitted – Take and Use of Geothermal Water, Heat or Energy in Accordance with Tikanga Maori**

The take and use of geothermal water, heat or energy, where:

1 The geothermal water, heat or energy is taken or used in accordance with tikanga Maori for the communal benefit of tangata whenua of the area, and
2 The activity does not have an adverse effect on the environment,

Is a permitted activity.

Explanation/Intent of Rule

To allow the take and use of geothermal resources in accordance with tikanga Maori, which is provided for by section 14(3)(c) of the Act.

GR R2 (Rule 73) **Discretionary – Take and Use of Geothermal Water, Heat or Energy**

The take and use of geothermal water, heat or energy, that:

(a) Is not prohibited by GR R3 in this regional plan, or
(b) Is not provided for under section 14(3)(c) of the Act, or
(c) Is not otherwise regulated by the Rotorua Geothermal Regional Plan, or
(d) Is not otherwise provided for by GR R5,

Is a discretionary activity.

Advisory Note

1 This rule includes the extraction of heat from a down hole heat abstraction system.

2 The take and use of geothermal water, heat or energy in Management Group 2 areas is covered by the Rotorua Geothermal Regional Plan (refer to Map GR 2).

[34] Environment Bay of Plenty, 1999. Operative Rotorua Geothermal Regional Plan.

Explanation/Intent of Rule

To allow the Regional Council to assess the adverse environmental effects of the take and use of geothermal resources on a case by case basis, where the activity is likely to cause more than minor effects. There is insufficient information on geothermal resources to use less restrictive approaches. Geothermal Management Group 4 areas are included in this rule as falling aquifer levels dues to over-abstraction have been evident in the past, which indicates that the effects of the take and use of warm water must be restricted to avoid adverse effects on the resource.

Assessment Criteria

When assessing resource consent applications under this rule, the Regional Council will have particular regard to, but not be limited to, the following provisions:

Objective	*KT O4, KT O5, KT O6, IM O1, GR O1, GR O4, GR O8*
Policy	*KT P5, KT P11, KT P14, KT P15, KT P17, KT P18, KT P19, KT P20, IM P1, GR P1, GR P3, GR P5*
Method	*KT M13, KT M17, KT M18, KT M20, KT M21, IM M10, IM M12, GR M2, GR M7, GR M8, GR M9, GR M10*

GR R3 (Rule 74) Prohibited – New or Increased Take and Use of Geothermal Water, Heat or Energy in Geothermal Management Group 1 Areas

Any new or increased take and use of geothermal water, heat or energy in Geothermal Management Group 1 area that:

1 Does not comply with section 14(3)(c) of the Act, or
2 Is not for monitoring or scientific research purposes and provided for in GR R5.

Is a prohibited activity.

Explanation/Intent of Rule

To prohibit new or increased takes which are not provided or in section 14(3)(c) of the Act (i.e. cultural uses of tangata whenua), or are not for monitoring and scientific purpose. GR R3 is necessary to preserve the outstanding geothermal surface features and other values of Geothermal Management Group 1 areas. The installation and use of geothermal bores for monitoring or scientific research purposes in Geothermal Management Group 1 areas is covered by GR R5.

Geothermal Bores

GR R4 (Rule 75) Restricted Discretionary – Installation of Geothermal Bores in Geothermal Management Group 5, and Take and Use of Geothermal Water, Heat or Energy for Bore Testing

The:

1 Drilling, construction and installation of any new bore or replacement bore for the purposes of obtaining geothermal water, heat or energy and taking of geothermal water for bore testing, or
2 Drilling, construction or installation of any reinjection bore,

including the take and use of water (including geothermal water), heat or energy for bore testing, and discharge of drilling fluids, where the activity is in a Geothermal Management Group 5 area, is a restricted discretionary activity.

The Regional Council restricts its discretion to the following matters:

(a) Location of the bore.
(b) Construction and development of the bore.
(c) Bore log information.
(d) Compliance with the National Drilling Standards 2001[35].
(e) Effects on existing bores.
(f) Pump and bore testing information.
(g) Administration charges under section 36 of the Act.
(h) Any financial contribution required under Appendix 2 of this regional plan.

Advisory Note

1 The installation of geothermal bores must also comply with Occupational Safety and Health regulations.

Explanation/Intent of Rule

To restrict the installation of geothermal bores in Geothermal Management Group 5 areas, while restricting the Regional Council's discretion only to those matters that are of concern in Geothermal Management Group 5 areas. It is an approach that recognises that installation of bores in warm water areas (<70 degrees Celsius) has a lower risk of causing adverse effects on the environment and affected parties than in Geothermal Management Group 1, 2, 3 and 4 areas (>70 degrees Celsius).

GR R5 (Rule 75A) Restricted Discretionary – Monitoring Bores in Geothermal Management Group 1 Areas

The:

1 Drilling, construction and installation of any new bore or replacement bore for the purposes of monitoring or scientific research purposes; and
2 Take and use of geothermal water, heat or energy for bore testing, and monitoring, or scientific research purposes; and
3 Discharge of drilling fluids; and
4 Discharge of geothermal fluid,

where the activity is in a Geothermal Management Group 1 area, and the purpose of the bore and take of geothermal resources is for monitoring or scientific research purposes is a restricted discretionary activity.

The Regional Council restricts its discretion to the following matters:

(a) Location of the bore.
(b) Construction and development of the bore.
(c) Bore log information.
(d) Compliance with the National Drilling Standards 2001[36].
(e) Effects on existing bores.
(f) Pump and bore testing information.
(g) Measures to protect outstanding natural features, landscapes, significant indigenous vegetation and significant habitats of indigenous fauna.
(h) The volume of geothermal resource abstracted.
(i) Measures to protect geothermal taonga.
(j) Measures to avoid, remedy or mitigate adverse effects from the discharge of geothermal fluid.
(k) The rate of take of geothermal resources.
(l) Duration of monitoring or scientific investigation.
(m) Administration charges under section 36 of the Act.

[35] NZS 4411:2001 Environmental Standard for Drilling of Soil and Rock. Standards New Zealand, Wellington
[36] NZS 4411:2001 Environmental Standard for Drilling of Soil and Rock. Standards New Zealand, Wellington.

Explanation/Intent of Rule

To provide for the installation of geothermal bores (and associated activities) for environmental monitoring or scientific research purposes in Geothermal Management Group 1 areas. GR R5 links to GR R3.

GR R6 (Rule 75B) Restricted Discretionary – Monitoring Bores in Geothermal Management Group 3 and 4 Areas

The:

1 Drilling, construction and installation of any new bore or replacement bore for monitoring purposes;
and
2 Take and use of geothermal water, heat or energy for monitoring purposes; and
3 Discharge of drilling fluids; and
4 Discharge of geothermal fluid,

Where the activity is in a Geothermal Management Group 3 or 4 area, and the purpose of the bore and take of geothermal resources is for monitoring purposes is a restricted discretionary activity.

The Regional Council restricts its discretion to the following matters:

(a) Location of the bore.
(b) Construction and development of the bore.
(c) Bore log information.
(d) Compliance with the New Zealand Standard: Code of Practice for Deep Geothermal Wells (NZS 2403:1991), or Health and Safety Guidelines for Shallow Geothermal Wells (Ministry of Commerce, 1996) whichever is applicable.
(e) Effects on existing bores.
(f) Pump and bore testing information.
(g) Measures to protect outstanding natural features, landscapes, significant indigenous vegetation significant habitats of indigenous faunas, and geothermal surface features.
(h) The volume of geothermal resource abstracted.
(i) Measures to protect geothermal taonga.
(j) Measures to avoid, remedy or mitigate adverse effects from the discharge of geothermal fluid.
(k) The rate of take of geothermal resources.

Explanation/Intent of Rule

To provide for the installation of geothermal bores (and associated activities) for environmental monitoring purposes in Geothermal Management Group 3 and 4 areas.

GR R7 (Rule 75C) Discretionary – The Installation of Geothermal Bores, Excluding Monitoring Bores, in Geothermal Management Group 3 or 4, and Take and Use of Geothermal Water, Heat or Energy for Bore testing.

The:

1 Drilling, construction and installation of any new bore or replacement bore for the purposes of obtaining geothermal water, heat or energy, or
2 Drilling, construction or installation of any reinjection bore,

including the take and use of water, heat or energy for bore testing purposes, and the discharge of drilling fluids to the environment, where the activity is in a Geothermal Management Group 3 or 4 area, and the activity is not for monitoring purposes, is a discretionary activity.

Advisory Note

1 The installation of geothermal bores must also comply with Occupational Safety and Health regulations.
2 The installation and operation of monitoring bores in a Geothermal Management Group 3 or 4 area is addressed by GR R6.

Explanation/Intent of Rule

To restrict the installation of geothermal bores, excluding monitoring bores, in hot water areas (>70 degrees Celsius) due to the high risk that the activity may have adverse effects on the environment. This allows the Regional Council to assess the adverse environmental effects of the activity on a case by case basis.

Assessment Criteria

When assessing resource consent applications under this rule, the Regional Council will have particular regard to, but not be limited to, the following provisions:

Objective	*KT O4, KT O5, KT O6, IM O1, GR O6*
Policy	*KT P5, KT P11, KT P14, KT P15, KT P17, KT P18, KT P19, KT P20, IM P1, GR P11, GR P12*
Method	*KT M13, KT M17, KT M18, KT M20, KT M21, IM M10, IM M12, GR M10*

Damming and Diversion of Geothermal Water

GR R8 (Rule 76) Discretionary – Damming or Diversion of Geothermal Water and Associated Structures

The:

1 Damming or diversion of geothermal water (including interference with the natural outflow from a geothermal surface feature), and
2 Associated structures,

Is a discretionary activity.

Explanation/Intent of Rule

To allow the Regional Council to assess the adverse environmental effects of the damming or diversion of geothermal resources on a case by case basis, where the activity is likely to cause more than minor effects. There is insufficient information to predict the effects of this activity and use less restrictive approaches. This rule includes the diversion of geothermal water underground via drainage.

Assessment Criteria

When assessing resource consent applications under this rule, will have particular regard to, but not be limited to, the following provisions:

Objective	*KT O4, KT O5, KT O6, IM O1, IM M14, IM M17*
Policy	*KT P5, KT P11, KT P14, KT P15, KT P17, KT P18, KT P19, KT P20, IM P1, GR P1, GR P9*
Method	*KT M13, KT M17, KT M18, KT M20, KT M21, IM M10, IM M12*

Discharge of Geothermal Water

GR R9 (Rule 77) Restricted Discretionary – Discharge of Geothermal Water by Reinjection

The discharge of geothermal water onto or into land in circumstances where it may enter water (including land soakage and reinjection) is a restricted discretionary activity.

The Regional Council restricts its discretion to the following matters:

(a) The location and depth of the discharge.
(b) Measures to protect outstanding natural features, landscapes, significant indigenous vegetation and significant habitats of indigenous fauna, geothermal surface features.
(c) Measures to protect geothermal taonga.
(d) Measures to avoid, remedy or mitigate adverse effects from the discharge of geothermal fluid.
(e) The rate and volume of geothermal discharge.
(f) Measures to avoid, remedy or mitigate adverse effects on other lawfully established users of the field.
(g) Measures to avoid, remedy or mitigate adverse effects on fresh water bodies.

Explanation/Intent of Rule

To provide for the reinjection of geothermal water, which is the preferred option in BW P8(a) of this regional plan.

GR R10 (Rule 77A)

Discretionary – Discharge of Geothermal Water

The discharge of geothermal water:

1 To water, or
2 Onto or into land (including land soakage),

Is a discretionary activity.

Advisory Note

1 The discharge of geothermal gases and steam to air is addressed in the Operative Bay of Plenty Regional Air Plan[37].
2 The discharge of gas into land is not controlled by this Regional Plan.

Explanation/Intent of Rule

To allow the Regional Council to assess the adverse environmental effects of the discharge of geothermal resources on a case by case basis, where the activity is likely to cause more than minor effects, and there is potential for significant adverse effects on the surrounding environment. There is insufficient information to predict the effects of this activity and use less restrictive approaches.

Assessment Criteria

When assessing resource consent applications under this rule, the Regional Council will have particular regard to, but not be limited to, the following provisions:

Objective	*KT O4, KT O5, KT O6, IM O1, IM O2, RL O1, RL O2, IM O3, IM O4, TH O1, RL O3, OH O1, GR O5*
Policy	*KT P5, KT P11, KT P14, KT P15, KT P17, KT P18, KT P19, KT P20, IM P11, GR P1, GR P6*
Method	*KT M13, KT M17, KT M18, KT M20, KT M21, IM M10, IM M12*

[37] Environment Bay of Plenty, 2003. Operative Bay of Plenty Regional Air Plan.