

Geothermal Resource Act
Consequential Amendments and Supporting Regulations
Consultation Paper

Table of Contents

Introduction	2
Background Information	3
Consequential Amendments.....	3
Geothermal Resource Definition	3
Test Holes and Wells	3
Geothermal Rig Licence	4
Health and Safety.....	4
Offence and Penalty.....	4
Regulations and orders made by the OGC.....	4
Regulations made by the Lieutenant Governor in Council	4
Regulations	5
Geothermal Resources Administration Regulation	5
Geothermal Operation Regulation	5
Environmental Protection and Management Regulation.....	6
Rent and Fees.....	6
Exploration Work Requirements	7
Well Reports and Geological Reports	7
Thermal Gradient Wells	8
Royalties.....	8
Anticipated Timelines	8

Introduction

This document is intended for the purposes of consultation only. The power to enact regulations under the *Geothermal Resources Act* (GRA) resides with Lieutenant Governor in Council. This document makes no assurances with respect to whether a regulation will be made, or as to its content.

British Columbia has significant geothermal energy potential which could generate firm renewable electricity. The provincial government is committed to supporting geothermal energy development by streamlining the regulatory framework for development.

Geothermal energy in British Columbia is vested with the Crown and regulated under the GRA and its associated regulations. Geothermal resources are disposed of through a framework of permits and leases. Geothermal exploration permits allow the holder the exclusive right to explore for geothermal resources and to convert the permit, after successful exploration, to a lease.

The responsibility for regulation of exploration activities and administration and tenure management under the GRA currently sits with the British Columbia Ministry of Energy and Mines (MEM or the Ministry). Consequential amendments to the GRA were developed within the *Oil and Gas Activities Act* (OGAA) in 2008. The Ministry intends to recommend the introduction of a regulation that will bring these amendments into force. The primary impact of these amendments is to transfer to the Oil and Gas Commission (OGC) the regulatory authority for geothermal drilling and geophysical activities. Adoption of the amendments requires the revision of the regulations under the GRA. MEM's objective is for the adoption of the amendments and supporting regulations to be completed in 2016.

The process for bringing the amendments into force and developing supporting regulations consists of the following stages:

- (a) Scoping – reviewing the consequential amendments passed within OGAA and the existing regulations;
- (b) Consultation Paper – this paper, which outlines the intentions of MEM and OGC, and is the basis for consultation with stakeholders and the public;
- (c) Drafting – preparing legal language for consideration by the Minister of Energy and Mines (“the Minister”), the Lieutenant Governor in Council (Cabinet) and the Board of the OGC;
- (d) Decision by the Lieutenant Governor in Council on whether to enact the Regulation; and
- (e) Implementation – informing government and external stakeholders of the regulatory requirements should the amendments and supporting regulations be brought into force.

This paper will outline the consequential amendments to the GRA and the intentions of the Ministry and OGC to solicit comments for consideration during the development of supporting regulations. Legislative changes to the GRA beyond the implementation of the amendments are not proposed at this time. For example it is not within the scope of this consultation or proposed regulatory changes to modify the disposition process, size or renewal requirements for permits and lease.

Background Information

Geothermal energy is the heat contained within the rocks and fluids of the Earth's crust. Where ground water temperatures are great enough, this thermal energy may be used to generate electricity or for direct-use applications. In British Columbia, geothermal resources greater than 80°C when produced at the surface are regulated under the GRA and its associated regulations. Geothermal resources are vested with the Crown and disposed of under the GRA through a framework of permits and leases. The GRA also regulates exploration and development activities.

Consequential Amendments

The GRA was developed in 1982 in response to geothermal exploration activity in the late 1970's and early 1980's. Consequential amendments to the GRA were passed, in sections 131-143 of OGAA, by the Legislative Assembly in 2008 but have not been brought into force. The intention of the Ministry is to bring these changes into force through a regulation passed by the Lieutenant Governor in Council. The primary impact of these amendments is to transfer to the OGC the regulatory authority for geothermal drilling and geophysical exploration activities, while MEM will continue to be responsible for geothermal tenure, including the issuance of permits and leases.

Geothermal Resource Definition

There is no change to the definition of a geothermal resource in the consequential amendments. The resource will continue to be defined as:

"geothermal resource" means the natural heat of the earth and all substances that derive an added value from it, including steam, water and water vapour heated by the natural heat of the earth and all substances dissolved in the steam, water or water vapour obtained from a well, but does not include

- (a) water that has a temperature less than 80°C at the point where it reaches the surface, or
- (b) hydrocarbons;

Therefore, neither the GRA, nor the proposed regulatory changes apply to low temperature geothermal or geoexchange systems for residential or commercial uses where the temperature of the resource when produced is less than 80°C.

Test Holes and Wells

Test holes currently under the GRA are defined as type of narrow diameter (less than 100 mm), shallow (less than 600 m) drill hole to obtain information about geothermal resources, typically subsurface temperature or geothermal gradient. This definition and authorizations are being removed from the GRA in order to align with well definition under OGAA. The definition of well has been updated within the GRA to align with OGAA.

The definition is:

"well" means a hole in the ground

(a) made or being made by drilling, boring or any other method for the purpose of producing a geothermal resource or through which a geothermal resource is or can be produced,

(b) used, drilled or being drilled for the purpose of injecting any substance into subsurface strata to assist the production of a geothermal resource, or to dispose of water produced in connection with the production of a geothermal resource, or

(c) used, drilled or being drilled for the purpose of obtaining information about a geothermal resource.

Geothermal gradient wells, drilled for the purpose of collecting subsurface information of a geothermal resource will be defined by regulation as a type of well, see the Thermal Gradient Well section below.

Geothermal Rig Licence

Geothermal rig licenses will be removed from GRA. A comparable requirement in the oil and gas sector for rig licences was repealed in 1994 from the Drilling and Production Regulation of the *Petroleum and Natural Gas Act*. Drilling rigs that currently provide services to the oil and gas sector are the same rigs that provide services to the geothermal industry. Those rigs, their crews and operations are currently adequately regulated under a suite of labour, health and safety and industry laws, standards and codes.

Health and Safety

Worker health and safety on geothermal work sites primarily falls under the jurisdiction of provincial worker health and safety legislation, as does worker health and safety for the oil and gas sector. In addition, the proposed GRA amendments also specify:

- machinery, equipment, wells and facilities must be kept in a safe condition,
- sites must receive a certificate of restoration from the OGC, and
- the OGC can issue health and safety orders.

Offence and Penalty

Offence and penalty provisions comparable with offence and penalty provisions within the GRA and regulations will be continued in the proposed amendments and supporting regulations to the GRA.

Regulations and orders made by the OGC

Amendments to Section 23 of the *GRA* allow the OGC to make regulations or issue orders related to the drilling and location of wells, and the production and conservation of geothermal resources.

Regulations made by the Lieutenant Governor in Council

Changes to Section 24 of the *GRA* specify the Lieutenant Governor in Council has the authority to make regulations regarding the issue and renewal, and the procedures and fees associated with permits and leases. Furthermore under Section 24 (p) the Lieutenant Governor in Council can apply sections 103 or 104 of the *OGAA* with or without modification which allows the application of the Environmental Management and Protection Regulation of *OGAA*.

Regulations

Existing regulations, including the Geothermal Drilling and Production Regulation, the Geothermal Geophysical Exploration Regulation and the Geothermal Resources Administrative Regulation, were designed with MEM having sole authority for geothermal tenure and activities. Revisions to the existing regulations are required to support the amended *GRA*. Table 1 outlines the proposed regulations.

Table 1 Proposed Regulations to support amended *Geothermal Resources Act*.

Authority	Ministry of Energy and Mines	Oil and Gas Commission
Proposed Regulations	<ul style="list-style-type: none"> • Geothermal Administration Regulation • Environmental Protection and Management Regulation 	<ul style="list-style-type: none"> • Geothermal Operations Regulation

Geothermal Resources Administration Regulation

The Geothermal Resources Administration Regulation will outline the fees and rental for permits and leases, the exploration work requirements for permits, and the release of information.

Geothermal Operation Regulation

Under the amended *GRA* and supporting regulations the Commission will be responsible for providing regulatory oversight of geothermal operational activities. In order to support this responsibility the Commission intends to consolidate all current operational geothermal regulatory provisions into a single Geothermal Operations Regulation. That regulation will then be updated with appropriate amendments that the Board of the Commission has been authorized to change.

The contents of the single operations regulation will include the following parts:

- Interpretation
- Geophysical Exploration
- Well Authorizations
- Well Positions
- Well Operations
- Production Operations
- Abandonment, Plugging and Restoration
- Well Administration
- Fees
- Offence
- Regulatory Matters

Environmental Protection and Management Regulation

Environmental impacts of oil and gas activities are regulated under OGAA by the Environmental Protection and Management Regulation (EPMR). The consequential amendments allow the application of the EPMR under sections 103 and 104 of OGAA to be applied to the GRA with or without modification. It is the intention of the Ministry to apply the Environmental Protection and Management Regulation without modification to geothermal energy exploration and development activities.

The EPMR is one of the natural resource regulations that establishes policy and practices for working within the natural environment of British Columbia. The EPMR is comparable to the Government Actions Regulation of the *Forest and Range Practices Act* that applies to forest sector for the same purposes. These regulations first establish environmental objectives and then establish practice requirements that uphold those objectives. Application of the EPMR will ensure that environmental protection regulations will apply equally to both the geothermal and oil and gas sectors.

Rent and Fees

Fees under the current GRA and regulations are charged for various permitting and tenure activities: including permit renewals, yearly rentals, and for approval of drilling authorizations. Application fees are used for cost recovery purposes, consistent with the fee-for-service model.

Exploration permits expire annually but may be renewed up to seven times through application to MEM. A proponent may apply to convert an exploration permit to a lease after drilling a geothermal well and submitting to MEM a development plan. A geothermal lease has a renewable 20 year term. Rent is charged yearly for tenure. Rent for an exploration permit currently rises from \$1 per hectare to \$5 per hectare over the permit's eight year life.

The GRA allows two types of drilling activities. Test holes are shallow, small diameter holes through which geothermal energy production is not possible, several of these holes may be drilled as part of an exploration program to measure subsurface temperature. As discussed in this paper, the consequential amendments remove the definition of test holes in the GRA to align with the OGGGA. Thermal gradient wells will replace the function of test holes in the modified regulations. Geothermal wells are large diameter wells, designed for very high temperature and pressure environments, through which geothermal fluids can be produced from, or reinjected into a reservoir.

Currently, test hole program and well application fees are nominal (\$20 and \$75 respectively) and have not been increased since the GRA was enacted in 1982. The OGC is proposing to normalize application fees for geothermal activities with the oil and gas sector, as equipment, practices and standards are similar. The OGC estimates fees for the review of applications for thermal gradient well programs would be approximately \$3000 and \$12,000 for geothermal well authorizations.

To offset this increased cost to industry, the Ministry proposes to reduce yearly rent for geothermal exploration permits (Table 2), shifting the regulatory costs associated with exploration from rent to application fees. In many cases the cumulative regulatory costs for a proponent to conduct exploration will be reduced. Modeling an average sized geothermal exploration permit of 3700 ha, with a thermal

gradient well program and three exploration wells, a proponent would save \$35,000 over the eight year life of a permit with the proposed changes.

Table 2 Current and Proposed Geothermal Permit Rent

	Current	Proposed
Rent Years 1-3	\$1/ha	\$500 per year
Rent Years 4-5	\$2/ha	\$500 per year
Rent Years 6-7	\$4/ha	\$500 per year
Rent Year 8	\$5/ha	\$500 per year
Permit Renewal Fee	\$500	No Change

Exploration Work Requirements

Work requirements required under section 7 of the GRA are a specified value of geothermal exploration required in each permit year. This work should follow the following principles:

- Geological or geophysical acquisition of data to evaluate the permit location.
- Interpretation of the acquired data.

The value of the work must exceed the amount specified in the Geothermal Administration Regulation or a payment must be made in lieu. Currently, under section 11 of the Geothermal Administration Regulation excess work done and recorded in a year may be carried over and applied to work requirements in the two years immediately following. It is the intention of the Ministry to maintain this provision. In addition, the Ministry proposes to allow a permit holder, who is unable to complete the exploration work required in any given year due to extraordinary conditions, to apply for an exception to defer the work requirements into the immediately following year.

Well Reports and Geological Reports

It is the intention of the Ministry to align the provisions of the collection and confidential status of well reports, including all relevant information collected during the drilling and analysis of a geothermal well, with OGAA. The confidential status of well reports will not be changed, and are recommended to remain confidential for two years from the date of the release of the drilling rig for the well.

Geological reports and an affidavit on the value of exploration work performed are required annually for the renewal of a permit. The Ministry intends to continue the requirement of annual geological reports including raw and processed data summarizing exploration activities and results claimed for exploration work requirements. Currently, these reports remain confidential for twenty-eight years which results in this information not informing further development of the industry. Therefore, it is the intention of the Ministry to release geological reports two years after the expiry of a permit or five years after the conversion of the permit to a lease.

Balancing the commercial interests of the industry with those of the public is an important consideration. With the geological reports remaining confidential until two years after the expiry of the

permit, exploration companies can keep exploration results confidential while the permit is active. On the conversion to a lease, earlier exploration results will remain confidential for 5 years allowing the company to pursue additional permits in the area of their lease with the advantage of the knowledge of their exploration results. These proposed changes will ensure data becomes publically available and will assist those interested in further exploration and research of potential geothermal resources.

Thermal Gradient Wells

Shallow drilling to determine temperature or temperature gradient is a fundamental tool in the exploration of geothermal resources. Alignment of the GRA with the OGAA removes test holes, however, the OGC intends to define a well classification for Thermal Gradient Wells under the GRA that will be built to the standards of Geotechnical Wells licensed under the *Water Sustainability Act*. This will allow shallow, less expensive, non-producing wells constructed for stratigraphic, hydrologic or temperature information to be drilled to existing standards.

The information collected from these wells will be an integral part of the exploration program. Therefore the Ministry intends to include a requirement for the submission of data collected from Thermal Gradient Wells. Data collected would be submitted to the MEM as required for exploration permits and expenses for thermal gradient holes could be applied to the required value of geothermal exploration.

Royalties

Royalties are charged for the right to produce a natural resource. Section 17 of the GRA specifies that any lessee who produces a geothermal resource for a purpose other than testing must pay a royalty, an amount in lieu or a prescribed royalty. Under this section an agreement approved by the Lieutenant Governor in Council may establish the rate and method of calculating the royalty or the payment in lieu. Under Section 24 (f) the Lieutenant Governor in Council may establish a royalty regulation that would apply where there is no agreement under section 17.

The consequential amendments are making no changes to these sections of the GRA, however, a prescribed royalty rate, or method of calculation may provide additional certainty for companies considering geothermal projects. At present, the Ministry is exploring a number of options with respect to the design of geothermal royalties. Written comments about potential royalty regimes can be provided to the Ministry through the submission process outlined below.

Anticipated Timelines

The period for public input on this intention paper will be open until December 4, 2015 Following the close of consultation, the Ministry will consider the input received and intends to complete regulatory drafting for presentation to the Lieutenant Governor-in-Council.

Implementation of the consequential amendments and revised regulations are targeted for late 2016.

Providing Comments

Responses to this Consultation Paper are being solicited until December 4, 2015.

Interested parties are invited to submit comments in writing to:

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