

**ALASKA STATE LEGISLATURE
SENATE RESOURCES STANDING COMMITTEE**

March 11, 2020

3:31 p.m.

MEMBERS PRESENT

Senator John Coghill, Vice Chair
Senator Click Bishop
Senator Cathy Giessel
Senator Joshua Revak
Senator Scott Kawasaki
Senator Jesse Kiehl

MEMBERS ABSENT

Senator Peter Micciche, Chair

COMMITTEE CALENDAR

SENATE BILL NO. 161

"An Act relating to geothermal resources; relating to the definition of 'geothermal resources'; and providing for an effective date."

- MOVED CSSB 161(RES) OUT OF COMMITTEE

PREVIOUS COMMITTEE ACTION

BILL: SB 161

SHORT TITLE: GEOTHERMAL RESOURCES

SPONSOR(S): RULES BY REQUEST OF THE GOVERNOR

01/22/20	(S)	READ THE FIRST TIME - REFERRALS
01/22/20	(S)	RES, FIN
02/10/20	(S)	RES AT 3:30 PM BUTROVICH 205
02/10/20	(S)	Heard & Held
02/10/20	(S)	MINUTE(RES)
02/21/20	(S)	RES AT 3:30 PM BUTROVICH 205
02/21/20	(S)	Heard & Held
02/21/20	(S)	MINUTE(RES)
02/24/20	(S)	RES AT 3:30 PM BUTROVICH 205
02/24/20	(S)	<Bill Hearing Canceled>
03/02/20	(S)	RES AT 3:30 PM BUTROVICH 205
03/02/20	(S)	<Bill Hearing Canceled>

03/11/20

(S)

RES AT 3:30 PM BUTROVICH 205

WITNESS REGISTER

STEVE MASTERMAN, Director
Division of Geological & Geophysical Surveys
Alaska Department of Natural Resources
Fairbanks, Alaska

POSITION STATEMENT: Provided an overview of SB 161.

SEAN CLIFTON, Policy and Program Specialist
Division of Oil and Gas
Alaska Department of Natural Resources
Anchorage, Alaska

POSITION STATEMENT: Answered questions regarding SB 161.

DAN SEAMOUNT, Geologic Commissioner
Alaska Oil and Gas Conversation Commission
Anchorage, Alaska

POSITION STATEMENT: Answered questions regarding SB 161.

ACTION NARRATIVE

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VICE CHAIR JOHN COGHILL called the Senate Resources Standing Committee meeting to order at 3:31 p.m. Present at the call to order were Senators Kiehl, Bishop, Giessel, Kawasaki, Revak, and Vice Chair Coghill.

SB 161-GEOTHERMAL RESOURCES

[3:32:00 PM](#)

VICE CHAIR COGHILL announced that the only order of business would be SENATE BILL NO. 161, "An Act relating to geothermal resources; relating to the definition of 'geothermal resources'; and providing for an effective date."

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STEVE MASTERMAN, Director, Division of Geological & Geophysical Surveys, Alaska Department of Natural Resources, Fairbanks, Alaska, advised that he will complete the presentation that he started at the introductory hearing of SB 161. He explained that his primary intent is to address the questions that came up during the previous hearing.

MR. MASTERMAN commenced his presentation, Alaska Department of Natural Resources SB 161 Geothermal Resources: Part 2. He displayed slide 2, Overview:

- Review of 21 February presentation
- DNR geothermal leasing history
- Purpose of SB 161
- Sectional summary
- Analysis of selected sections & responses to questions

MR. MASTERMAN displayed slide 3, Review of 21 February Presentation:

- Geothermal heat, where technically and economically accessible, is an excellent form of sustainable energy
- Hydrothermal systems are the most common form of energy extraction from geothermal heat
- Complex geologic parameters necessary for a viable geothermal resource, all present at one location, is rare
- Alaska contains several potential geothermal resources
- New technologies that will help expand geothermal development into less favorable geology are on the horizon

He said geothermal systems are present in a number of places in Alaska. Where it can be recovered, it is a very efficient and a cost-effective means to obtain electrical and heat energy. Hydrothermal systems around old intrusive bodies or volcanoes are the most common sources for geothermal heat in the Aleutians and across the belt of granitic bodies in the Interior. He said a fair amount of geologic information is needed to intercept the hot fluids and get them to the surface without over drawing the reservoir.

MR. MASTERMAN pointed out that geothermal energy technologies are changing with a wider array of geothermal resource development such as ground source heat pumps for homes, small

businesses, and university campuses across the nation. Current and future geothermal technologies need a broader understanding, he said.

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MR. MASTERMAN displayed a map of Alaska map on slide 4 that shows the granite and volcano related geothermal systems throughout the state. He said the map provides an overview of Alaska's hot springs broken into three different temperature bands: warm springs below 50 degrees Celsius on the surface, hot springs which are between 50 and 75 degrees Celsius, and high temperature hot springs that are above 75 degrees Celsius. Most of the hotter springs are along the Aleutians.

VICE CHAIR COGHILL noted that hot springs proliferate in the Interior.

MR. MASTERMAN agreed. He detailed that the springs in Interior Alaska are granite-related systems with most of the granites ranging in age from 50 million to 70 million years. He said geology plays an important part in understanding the granite-related system because fractures host the hot water.

VICE CHAIR COGHILL asked if there is any power at Manley Hot Springs.

SENATOR BISHOP inquired if an intrusive granite dome, like the Manly Hot Springs Dome, indicates geothermal resources.

MR. MASTERMAN answered that a granite dome is a good sign, but not all granites are alike. Geothermal resources require younger granites that are still cooling along with the right granite composition.

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MR. MASTERMAN paraphrased slide 5, DNR Geothermal Leasing History:

- Present: Currently there is one company, CYRQ Energy, with a pending application for geothermal exploration prospecting permit. A Best Interest Finding should be issued in Spring 2020.
- 2013: Augustine Island 26 tracts were offered. Only one tract was leased to a private individual and no exploration work was conducted as a result of that lease sale.

- 2008: Mount Spurr 16 tracts leased to Ormat and one private individual. Ormat purchased 15 leases in the 2008 sale and drilled on southern flank of volcano. They didn't find adequate temperatures in wells to pursue the project. The state has the data available.
- 1986: Mount Spurr On June 24, 1986, DNR offered 2,640 acres in two tracts. Both tracts received bids. The lease for Tract 1 expired in 1996, and the lease for Tract 2 was terminated in 1990.
- 1983: Mount Spurr DNR held its first geothermal lease sale in the Mount Spurr area on May 17, 1983. 10,240 acres in 16 tracts were offered in Competitive Geothermal Lease Sale 1. One tract received a bid. The lease for that tract was terminated in 1992.

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MR. MASTERMAN discussed the following bullet points on slide 6, Purpose of SB 161:

- Diversify Alaska's energy portfolio
 - More potential for providing affordable, renewable energy to villages
 - More potential for providing power to remote natural resource extraction projects
 - Promote clean energy industry job creation
 - Increase attention to Alaska's geothermal exploration program
- Streamline geothermal licensing by aligning with the oil and gas exploration license program, increasing feasibility for companies to develop resources
 - More time for a company to identify and prove resource to convert to leases
 - Conversion to leases based on completion of work commitment and submission of exploration plan instead of proving discovery of commercial resource
 - Doubles maximum acreage allowed for exploration license
- Reforms definitions for geothermal resources to focus on Commercial Use

MR. MASTERMAN summarized that the bill is threefold: diversify Alaska's energy portfolio, streamline licensing processes, and reform geothermal resource definitions.

He pointed out that Alaska's energy resources are very petroleum centered. Geothermal resources have the potential to be viable in rural communities. Streamlining geothermal licensing aligns with well established oil and gas leasing that will help with resource exploration.

He said redefining geothermal resources removes temperature criteria, brings the definition in line with the evolving geothermal industry, and brings focus on commercial uses.

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MR. MASTERMAN reviewed slide 7, Sectional Summary, Reflects Proposed Amendments:

- Section 1 (AOGCC)
 - Removes unnecessary reference to AS 41.06 from AS 31.05. (Related to Section 9)
- Section 2 (DNR)
 - Changes "permits" to "licenses"
 - Explicit exemption for geothermal resources intended for domestic, noncommercial, or small-scale industrial use (See also Section 10)
 - Amendment deletes "drawn from a depth with a ground temperature of not more than 30 degrees Celsius"
 - Removes preferential rights clause. This is an old water rights provision, not appropriate for commercial geothermal systems.
- Section 3 (DNR)
 - Changes "permits" to "licenses"
 - Replaces lease conversion requirement of commercial discovery with work commitment.
- Section 4 (DNR)
 - Changes "permits" to "licenses"
- Section 5 (DNR)
 - Changes "permits" to "licenses"
 - Increases maximum acreage from 51,200 to 100,000.
 - Adds provision for rental fees to be defined in regulation, rather than statute (easier to update).

- Section 6 (DNR)
 - Changes "permits" to "licenses"
 - Reduces primary term of license to 5 years with reference to lease conversion provision.
- Section 7 (DNR)
 - Adds new subsections providing for unitization of geothermal leases.
 - Uses same or similar language as oil and gas statutes in AS 38.05.180.
- Section 8 (DNR)
 - Replaces definition of geothermal resources. (Same as Section 11)
- Section 9 (AOGCC)
 - Amends AS 41.06.020(e), clarifies that AS 41.06 does not limit DNR's authority over geothermal resource management on state land.
- Section 10 (AOGCC)
 - Explicit exemption for geothermal resources intended for domestic, noncommercial, or small-scale industrial use (See also Section 2)
 - Amendment deletes "drawn from a depth with a ground temperature of not more than 30 degrees Celsius"
- Section 11 (AOGCC)
 - Amends definition of "geothermal fluid" to remove temperature references and better conform with other changes in this bill.
- Section 12 (AOGCC)
 - Replaces definition of geothermal resources. (Same as Section 8)
- Section 13 (AOGCC)
 - Repeals AS 41.06.005(b) and AS 41.06.030, since geothermal units are managed by DNR.
- Sections 14-17
 - General provisions for applicability and effective dates.

MR. MASTERMAN summarized that much of the bill replaces a permitting system with a licensing system. The current two-year permit changes to a five-year license term. The licensing system will attract geothermal exploration.

VICE CHAIR COGHILL asked if the genesis of the geothermal licensing program derives from oil and gas exploration licensing.

MR. MASTERMAN answered no. He specified that the bill provides more time for companies to explore an area before deciding on whether to move forward to the next step. Current statutes provide two years before a requirement to define a commercially developable resource. The bill provides more time and removes the requirement to define a commercially viable resource, which is substantive.

SENATOR BISHOP asked if a license holder could sell their five-year license.

MR. MASTERMAN deferred the question to Sean Clifton.

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SEAN CLIFTON, Policy and Program Specialist, Division of Oil and Gas, Alaska Department of Natural Resources, Anchorage, Alaska, answered yes, a license holder can assign their license to another party.

MR. MASTERMAN reviewed slide 8, Section 2: Private Use Exemption:

- New language (includes requested amendment):
 - A prospecting license or lease is not required under this section to explore for, develop, or use geothermal resources if the geothermal resource is intended for domestic, noncommercial, or small-scale industrial use.
- This explicitly excludes private geothermal users from a requirement to apply for a license or lease.
- The old definition of geothermal resources technically provided this exclusion.
- The updated definition made this exclusion necessary.

MR. MASTERMAN stated that the private use exemption explicitly excludes private geothermal users from requiring a license or a lease in order to develop their geothermal resources that are on their property. He noted that the governor requested that the legislation include a private use exemption.

SENATOR BISHOP said he assumes that the private use exemption still requires somebody to go through the permitting protocol to get drilling approval.

MR. MASTERMAN answered correct.

VICE CHAIR COGHILL asked if the bill easily defines small scale industrial use or if it is an open topic for discussion.

MR. MASTERMAN answered that he imagined that small scale industrial use is open to discussion because the legislation does not provide a numeric definition. He said a fish processing plant using geothermal energy is an example of small scale use, but Alcoa using geothermal energy for aluminum smelting is a large-scale-industrial-use example.

VICE CHAIR COGHILL said the examples are the two bookends but getting into the middle ground could be a little more difficult.

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SENATOR KAWASAKI noted that the bill removes the 30-degree Celsius requirement and asked why it was set in the original legislation.

MR. MASTERMAN answered that AOGCC requested the 30-degree requirement be withdrawn to provide flexibility in administering the exemption from regulations. He noted that home and small scale uses of geothermal energy are for low temperature systems. Statutes in the Lower 48 either use the arbitrary 30-degree number or the technical temperature limit for PVC pipe.

He reviewed the following bullet points on slide 9, Section 2: Preferential Rights:

- The preferential rights provision is being deleted because it is inappropriate to the situation (it's more relevant to water rights or other surface use cases not associated with the mineral estate).
- Surface owner rights are protected under AS 38.05.130.

- Rights to access the mineral estate are reserved under AS 38.05.125.
 - Surface owners must provide reasonable access to resource developers.
 - The same condition exists for oil & gas or mining.
- If a surface use agreement can't be reached, resolution process is in 11 AAC 86.145.
 - DNR holds a hearing wherein the developer must prove there is no other alternative location for the well or data acquisition.
 - If the Commissioner concurs, developer posts a bond to compensate landowner for any impacts and work progresses.
- Public notice is a part of the license issuance process, and surface owners would be included.

MR. MASTERMAN reiterated that the bill attempts to clarify a distinction between geothermal resources treated as an oil and gas or mineral estate and a surface estate.

He noted that Senator Kiehl brought up a possible conflict scenario between a small-scale geothermal system user for a home versus a company that leases an area around the home for geothermal use. He said there are statutory measures in place to resolve conflicts between surface and subsurface ownership.

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SENATOR KIEHL asked for further explanation of how the surface owner would be protected under AS 38.05.130.

MR. CLIFTON conceded that the statute is not very explanatory on repaying damages. He explained that the regulation under the statute, 11 AAC 86.145, clarifies how the commissioner approaches the problem. If the two parties cannot reach an agreement, then the commissioner will hold a hearing to hear both sides. If the developer cannot prove that there is another way to resolve the issue, then the commissioner will direct the developer to post a bond for landowner compensation.

VICE CHAIR COGHILL asked if amending AS 38.05.181 will impact the regulation under AS 38.05.130.

MR. CLIFTON answered that he did not think so. He explained that if a case came up where the division recognized a deficiency in the regulation, then they would try to revise the regulation.

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SENATOR BISHOP referred to the right to access a mineral estate under AS 38.05.125 and asked if the commissioner or a civil court would ultimately resolve a dispute between a developer and a landowner.

MR. CLIFTON answered that private landowners usually come to an agreement on surface use. However, the commissioner would intervene to ensure access to the mineral estate if the two parties cannot come to an agreement.

MR. MASTERMAN discussed the following bullet points on slide 10, Section 2: Preferential Rights:

- If a surface owner is already using geothermal resource, DNR protects the surface owner's rights under AS 38.05.130.
- If conflict arises, DNR ensures private landowners would not be left without heat or power, or otherwise damaged by commercial development.
- Scenario is unlikely because private landowners usually don't have financial resources to develop a commercially viable geothermal resource.

He said conflicts are not likely to happen because there are only a few places in the state where there are overlapping interests of geothermal resources and private land ownership.

VICE CHAIR COGHILL said there is a lot of public land in Alaska and private rights are something that Alaskans preciously hold to.

MR. MASTERMAN replied he does not think the bill degrades private rights; statutorily protections are in place.

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MR. MASTERMAN reviewed the following on slide 11, Section 2: Drilling regulations:

- Division of Oil & Gas (DO&G)
 - Licenses or leases access to the resource (subsurface use).

- Surface permitting (pads, facilities, and infrastructure) in support of exploration and development.
- Alaska Oil & Gas Conservation Commission (AOGCC)
 - Ensures prevention of waste, protects correlative rights, improves ultimate recovery, and protects underground freshwater.
 - Issues of permits to drill wells is AOGCC's jurisdiction.
 - Jurisdiction over geothermal triggered by temperature (>120 °C) or commerciality. New definition ignores temperature.
 - Domestic, noncommercial, or small-scale industrial geothermal well not under AOGCC authority.
 - Exception if well may encounter geothermal resources, fluid, or water of enough heat/pressure to threaten life/health.
- Department of Environmental Conservation (DEC)
 - If the incidental discharge enters surface water, need Alaska Pollutant Discharge Elimination System (APDES) permit.
 - DEC Division of Water has permitted geothermal discharges using Plan Review in Lieu of Permit.
 - Engineering Support and Plan Review (ESPR) conducts plan reviews for smaller systems in municipality (heating or cooling pumps at UAA, U-med district, hatchery, etc.).
 - DEC issues permits for hydrostatic testing, including flushing and aquifer pump testing.
 - General permit AKG003000 provides for coverage of land disposal or discharge to surface water.
 - One geothermal-related authorization issued in 2015 for the Akutan Geothermal Project.

He summarized that section 2 divides drilling regulation responsibilities between DO&G, AOGCC, and DEC. He said the section may address Senator Kiehl's earlier questions in that DO&G looks at drilling from the land management and surface permitting view point and they are also the entity who would be collecting any royalties and lease payments. AOGCC is looking at drilling from the permitting standpoint for the protection of ground water and the determination of whether the geothermal source is for private use or commercial use. DEC looks at

drilling from the standpoint of the environmental impacts from using the water and any discharges into the environment. DEC also issues permits for hydrostatic testing and for aquifer or pump testing. He said the various entities have different parts of the leasing, permitting, and environmental compliance aspect of a geothermal system.

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MR. MASTERMAN reviewed slide 12, Section 7: Royalty reduction:

- Royalty reductions are not permanently established under a unit agreement (AS 38.05.181(i)).
 - They are adjudicated under the authority described in sections AS 38.05.181(f) and (j).
 - Same language used in AS 38.05.180(p) (oil and gas unitization).
 - This aligns geothermal management with existing processes in oil and gas management.
- Royalties have never been paid on geothermal resources, so exact process not yet established.
 - Will be like the system used for oil and gas.
 - Royalties are 1.75 percent of gross revenue for the first 10 years of commercial operation
 - Royalties are 3.5 percent after 10 years (See AS 38.05.181(g)).
- This is like oil and gas royalties.
 - Royalties are paid upon removal of the resource from the lease or unit (i.e. sale), regardless of profit.
 - Geothermal energy isn't a measurable volume, so royalties are paid on gross revenues (AS 38.05.181(g)).
 - Royalty reduction provisions exist in statute for oil and gas and are evaluated by application to the Commissioner under specific circumstances provided for in statute (See AS 38.05.180(j), for example).
- If there is no production, there are no royalties.
 - License/lease rental rates are paid per acre.

MR. MASTERMAN explained that the royalty reductions in section 7 align with the present oil and gas royalties. The royalties are different, but the protocols are basically the same. He noted that the State has not charged for royalties on geothermal

resources, but the hope is to receive royalties from future resource development.

He detailed that geothermal royalties are 1.75 percent of gross revenue for the first 10 years and that increases to 3.5 percent after 10 years. He said geothermal energy is a little different than oil and gas in that it is not a volumetric product, so it is not like a barrel of oil or cubic feet of gas. Geothermal energy extraction is in the form of heat or electricity with royalties based on gross sales instead of the material production volume. He said no geothermal sales means there are no royalties.

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VICE CHAIR COGHILL asked if royalties would be based on the heat that a geothermal energy source produces.

MR. MASTERMAN answered that the royalty will be based on the energy sold, either heat or electricity.

He continued to explain that another change is that annual lease payments, which are statutorily set at \$3.00 per acre, would instead be set by regulation. This would make it easier for any necessary modification.

VICE CHAIR COGHILL asked if the lease payments would be based on geographical accessibility, thermal temperature, or some other criteria.

MR. MASTERMAN answered that he is not aware of any conversations within the department that would apply a variable rate to the leasing per acre. He said leases are based on a flat rate per acre for the entire state, but variable rates is an interesting concept depending on the attractiveness of the potential energy of the system.

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VICE CHAIR COGHILL explained that he asked because he wondered why a regulation would be more useful than a blanket statute when the idea is to generate better commerce capacity in the four very different geographic areas that have thermal energy in any kind of mass.

MR. MASTERMAN suggested Mr. Clifton respond.

MR. CLIFTON explained that DO&G wants the per acre rental rate to be competitive to attract people to develop the state's

resource. The statutory \$3 per acre is an archaic holdover that needs to be more flexible to allow the division to judge rental rates based on the circumstances. Statutory rates are much harder to modify.

[4:02:33 PM](#)

VICE CHAIR COGHILL asked if putting the rate out for public comment would be the division's way to test the market capacity.

MR. CLIFTON answered yes.

MR. MASTERMAN displayed slide 13, Section 11: Geothermal fluids:

AS 41.06.060(4) is requested to be amended as:

(4) "geothermal fluid means liquids, brines, water, gases, or and steam at ~~temperatures greater than 120 degrees celsius or any commercial use of liquids and steam naturally~~ or artificially present in a geothermal system; "geothermal fluid" does not include oil, hydrocarbon gases, or other hydrocarbon substances at ~~temperatures less than 120 degrees celsius;~~"

- Aligns with modernized definition for geothermal resources.
- Not limited by temperature because current technology enables development of cooler geothermal systems.
- Distinguishes geothermal fluids from hydrocarbon resources.

He explained that slide 13 details the division's request to amend the bill to change the definition of "geothermal fluids" to remove the reference to 120 degrees Celsius and specifically exclude hydrocarbons.

VICE CHAIR COGHILL asked if the committee had the amendment.

MR. MASTERMAN answered that he believes it is part of the bill packet.

MR. MASTERMAN displayed slide 14, Sections 8 and 12: New definition:

"Geothermal resources" means the natural heat of the earth; the energy, in whatever form, below the surface of the earth present in, resulting from, or created by, or which may be extracted from, such natural heat; and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases, and steam, in whatever form, found below the surface of the earth; but excluding oil, hydrocarbon gases, or other hydrocarbon substances.

- Modern definition for geothermal resources.
- Not limited by temperature because current technology enables development of cooler geothermal systems.
- Ensures all the State's mineral estate resources are captured in definition.
- Same definition being applied to both DNR & AOGCC statutes.

MR. MASTERMAN explained that slide 14 deals with the new definition for geothermal resource. It removes 120 degrees Celsius from the statute to allow more flexibility to include systems at lower temperature that could be utilizing some of the state's geothermal resources and generating electricity or heat. The definition would be the same for DNR and AOGCC.

SENATOR KIEHL noted that slide 13 shows that the definition of geothermal fluid in AS 41.06.060(4) includes water. However, the geothermal resources definition in slide 14 does not include water. He pointed out that the complex permitting system has AOGCC covering the safety risk of resource blowout, DEC is doing the water, and DO&G is doing the minerals in the water. He asked which department goes first in the process.

[4:05:41 PM](#)

MR. MASTERMAN replied he did not have an answer.

MR. CLIFTON explained that the first thing a commercial operation would have to do is disposal of the land or disposal of the mineral interest. The developer would first go through DO&G for the expiration license and then the lease process.

DO&G would generally approve drilling operations through a plan of operations, but the specific approvals for individual wells would come through AOGCC. Specific approvals for discharge and other related concerns would come through DEC.

SENATOR KIEHL asked if AOGCC will do safety and resource waste prevention as it does with hydrocarbons.

[4:07:40 PM](#)

DAN SEAMOUNT, Geologic Commissioner, Alaska Oil and Gas Conversation Commission, Anchorage, Alaska, explained that AOGCC is generally the last in line to approve drilling permits. They ensure the wells are drilled correctly, that the resource is not wasted, and that production is enhanced as much as possible. He said they have not fully figured out the costs for geothermal because it is more complex than oil and gas that is charged based on a formula of fluid production and injection. AOGCC will have to look at steam, water, or some other way to allocate costs for geothermal.

SENATOR KIEHL said his question was answered; AOGCC will ensure that geothermal resources are not wasted.

VICE CHAIR COGHILL remarked that geothermal energy is a work in process that hopefully sees some progress.

SENATOR BISHOP commented that the definition for geothermal resources warranted updating. He pointed out that Bernie Karl, [owner of Chena Hot Springs Resort], has proven that low temperature electron generation is possible.

VICE CHAIR COGHILL asked Senator Bishop to move the proposed amendment.

[4:09:52 PM](#)

SENATOR BISHOP moved to adopt Amendment 1, work order 31-GS2177\A.3, Radford, 3/2/2020.

AMENDMENT 1

Page 1, lines 13 - 14:

Delete "drawn from a depth with a ground temperature of not more than 30 degrees Celsius"

Page 4, lines 26 - 27:

Delete "drawn from a depth with a ground temperature of not more than 30 degrees Celsius"

Page 4, following line 27:

Insert a new bill section to read:

"* Sec. 11. AS 41.06.060(4) is amended to read:

(4) "geothermal fluid" means liquids, brines, water, gases, or [AND] steam [AT TEMPERATURES GREATER THAN 120 DEGREES CELSIUS OR ANY COMMERCIAL USE OF LIQUIDS AND STEAM] naturally or artificially present in a geothermal system; "geothermal fluid" does not include oil, hydrocarbon gases, or other hydrocarbon substances [AT TEMPERATURES LESS THAN 120 DEGREES CELSIUS];"

Re-number the following bill sections accordingly.

Page 5, line 16:

Delete "Section 14"

Insert "Section 15"

Page 5, line 17:

Delete "sec. 15"

Insert "sec. 16"

VICE CHAIR COGHILL objected for discussion purposes. He noted that the amendment came from the administration and asked Mr. Masterman for an explanation.

MR. MASTERMAN explained that the first part of the amendment removes the 30 degrees Celsius temperature limit on exclusions for domestic or small industrial uses. AOGCC made the request to provide more flexibility in the exclusion to small-scale users. He said this change broadens the range of geothermal systems or geothermal uses that the statute would otherwise exclude from leasing and licensing. This will benefit small users.

[4:11:06 PM](#)

VICE CHAIR COGHILL added that this refers to page 1, lines 13-14 and page 4, lines 26-27.

MR. MASTERMAN explained that the second part of the amendment changes the definition of "geothermal fluid." It removes the 120 degree Celsius temperature criteria, which broadens it to basically all fluids, and adds a specific exclusion for hydrocarbons. The change conforms with the other changes in the definition of geothermal resources.

VICE CHAIR COGHILL asked Commissioner Seamount if AOGCC supported the amendment.

COMMISSIONER SEAMOUNT answered that AOGCC is in favor of the bill and the amendment. They proposed removing the reference to temperatures of 120 degrees Celsius in the definition of general geothermal fluid so there is consistency and no confusion with geothermal resources. For example, one of the most successful geothermal projects in the world is in Klamath Falls, Oregon where the entire town is heated with temperatures of 87-112 degrees Celsius. He said he didn't know if AOGCC would define that as a geothermal resource at 120 degrees but somebody could make the case that they couldn't. He added that Chena Hot Springs Resort probably produces the lowest temperature power generation in the world at 74 degrees Celsius, so 120 degrees would not come close to applying.

He agreed with Mr. Masterman that removing the 30 degree Celsius reference would give the commissioner more flexibility and latitude.

VICE CHAIR COGHILL said everyone is very proud of Mr. Karl at the Chena Hot Springs Resort.

COMMISSIONER SEAMOUNT said he received his master's degree in geothermics and some literature says geothermal resources worldwide can change range from heat pump use at 10 degrees Celsius up to steam generation at 350 degrees Celsius. He reiterated support for the bill and amendments.

[4:15:19 PM](#)

VICE CHAIR COGHILL removed his objection to Amendment 1. Finding no further objection, he stated that Amendment 1 is adopted.

[4:15:38 PM](#)

VICE CHAIR COGHILL opened public testimony.

[4:15:55 PM](#)

VICE CHAIR COGHILL closed public testimony.

SENATOR BISHOP remarked that the state is obviously in new territory. He asked if DNR and AOGCC have reached out to a country like Iceland to inquire about geothermal best practices.

MR. MASTERMAN answered that inquiries are being made. He noted that he has reached out to geological associations in all the states to review their regulations, statutory definitions, and how they address issues with small scale versus industrial uses.

[4:17:27 PM](#)

SENATOR BISHOP moved to report CSSB 161, version 31-GS2177\A as amended, from committee with individual recommendations and attached fiscal notes.

[4:17:40 PM](#)

VICE CHAIR COGHILL said there being no objection, CSSB 161(RES) moved from the Senate Resources Standing Committee.

[4:17:58 PM](#)

There being no further business to come before the committee, Vice Chair Coghill adjourned the Senate Resources Standing Committee meeting at 4:17 p.m.