

In the Matter of the Adoption)
of Rules to Govern Oregon's)
Low Temperature Geothermal)
Ground Water Resources)

NOTICE OF RULE ADOPTION

Nov 11 1977
Rev Oct 1979

CERTIFICATE AND ORDER
for
FILING ADMINISTRATIVE RULES WITH THE SECRETARY OF STATE

I HEREBY CERTIFY that the attached copy is a true, full and correct copy of rule(s) adopted by the Water Resources Department on December 14, 1982
to become effective December 14, 1982
(Agency) (Date)

The within matter having come before the Water Resources Department after
(Agency)
all procedures having been in the required form and conducted in accordance with applicable statutes and rules and being fully advised in the premises:

NOW THEREFORE, IT IS HEREBY ORDERED THAT the following rule(s) be adopted: Perm. or Temp.
(List Rule Number(s) or Rule Title on Appropriate Lines Below)

Adopted: OAD 690-65-005 through 690-65-070
(New Rules)

Amended: _____
(Existing Rules)

Suspended: _____
(Temporary Only)

Repealed: 690-60-050, paragraph 47 and 690-61-181
(Existing Rules)

as Administrative Rules of the Water Resources Department
(Agency)

DATED this 14th day of December, 1982

By: *James E. Kern*
(Authorized Signer)
Title: Water Resources Director

Statutory Authority: attached

Subject Matter: Standards and Procedures for Low Temperature Geothermal Wells and Effluent Disposal Systems.

Statement of Need Attached: Fiscal Impact Attached:
For Further Information Contact: Lauren Forcella or Fred Lissner Phone: 378-8456

BEFORE THE DIRECTOR OF THE WATER RESOURCES DEPARTMENT
OF THE
STATE OF OREGON

In the Matter of the Adoption)
of Rules to Govern Oregon's)
Low Temperature Geothermal)
Ground Water Resources) STATUTORY AUTHORITY, STATEMENT
OF NEED, PRINCIPAL DOCUMENTS
RELIED UPON AND STATEMENT OF
FISCAL IMPACT

The Director of the Water Resources Department proposes to adopt rules that shall govern the development, use and management of the state's low temperature geothermal ground water resources.

1. Statutory Authority: ORS Chapter 183 and ORS Chapter 537.
2. Statement of Need: Legislation has directed the Water Resources Director to adopt rules for the disposal of low temperature geothermal fluids. Increasing use of ground water for thermal purposes throughout the state as a result of resource identification and demand for alternate sources of energy requires that minimum standards be set forth to insure the conservation and protection of the natural quality of the resource for all beneficial uses. The proposed rules provide standards and procedures not covered by existing administrative rules and encourage reinjection and the beneficial secondary use of the effluent.
3. Principal Documents Relied On: Oregon Administrative Rules, Chapter 690, Water Resources Department.
4. Fiscal and Economic Impact: The adoption of these rules is expected to increase certain costs for the development of the resource and impose a greater economic impact on owners of residential and small business utilization systems. The principal cost to the resource developer shall be for the cost of the construction and operation of a return well or the beneficial use of the effluent. This cost for a return well will include expenses for well completion, pump testing, and fluid quality testing. Specific costs are not available but are expected to be variable. Administrative cost to carry out this program will increase as a result of adoption of these rules.

Dated at Salem, Oregon this 14th day of December, 1982.

WATER RESOURCE DEPARTMENT


James E. Sexson, Director

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OREGON ADMINISTRATIVE RULES
CHAPTER 690, DIVISION 65 - WATER RESOURCES DEPARTMENT

STANDARDS AND PROCEDURES FOR
LOW TEMPERATURE GEOTHERMAL WELLS AND EFFLUENT DISPOSAL SYSTEMS

65-005 POLICY AND PURPOSE:

- (1) All Low Temperature Geothermal Fluids are part of the ground water resources of the State of Oregon and shall be administered by the Water Resources Director (Director) under the provisions of ORS 537.010 to 537.795. The Director recognizes that these fluids are developed primarily because of their thermal characteristics and that special management is necessary. Reservoir assessment of Low Temperature Geothermal Fluids shall be conducted by the Director in the same manner as ground water investigations outlined in ORS 537.665 and ORS 537.685.

- (2) The purpose of the following rules is to provide standards and procedures for the development, use and management of Low Temperature Geothermal Fluids, while insuring proper management of all ground water resources so maximum beneficial use of the resource will be most effectively attained.

- (3) These rules supplement OAR 690-10-005 to 690-10-045, 690-60-005 to 690-63-045, and 690-64-000 to 690-64-010. Rule 690-60-050, paragraph 47 and 690-61-181 are hereby rescinded.

DELETE:

[690-60-050 (47) "Thermal Ground Water": means ground water having a temperature greater than 90 degrees Fahrenheit or 32 degrees Celsius. (The statutes of Oregon delegate to the Department of Water Resources the appropriation and supervision of thermal ground water having a temperature of less than 250 degrees Fahrenheit or 121 degrees Celsius, and occurring within 2,000 feet of the land surface.)]

[690-61-181 CONSTRUCTION OF THERMAL OR HOT WATER WELLS:

All thermal or hot water wells having a maximum water temperature of less than 250 degrees Fahrenheit (121 degrees Celsius) and constructed to depths of less than 2,000 feet shall be constructed in conformance with rules 690-61-006 through 690-61-176. The bottom-hole temperature shall be measured and recorded on the water well report.]

65-010 DEFINITIONS:

- (1) Bottom Hole Temperature: The maximum temperature measured in the well or bore hole. It is normally attained directly adjacent to the producing zone, and commonly at or near the bottom of the borehole.
- (2) Low Temperature Geothermal Effluent: The outflow, discharge or waste fluid, with its associated dissolved or suspended constituents (being original or introduced), that is produced by a Low Temperature Geothermal Well and its utilization system.
- (3) Low Temperature Geothermal Fluid:
 - (a) Any ground water produced from a Low Temperature Geothermal Well which is used for its thermal characteristics; or
 - (b) any other fluids, approved by the Director, that circulate, with or without withdrawal, within a Low Temperature Geothermal Well, where in all cases of (a) and (b) the fluid circulated because of its thermal characteristics, is used for various heating and/or cooling purposes including, but not limited to, residential, commercial, industrial, electrical, agricultural and aquacultural applications.
- (4) Low Temperature Geothermal Reinjection Well: Any well as defined under ORS 537.515(7) that is constructed or used for returning Low Temperature Geothermal Effluent to a ground water reservoir.
- (5) Low Temperature Geothermal Well: Any well as defined under ORS 537.515(7) with a bottom hole temperature less than 250°F that is constructed or used for the thermal properties of the fluid contained within.
- (6) Nonstandard Low Temperature Geothermal Effluent Disposal System: Any Low Temperature Geothermal Effluent Disposal System in which one or more of the following conditions are met:
 - (a) Any portion of the effluent is disposed of in a manner considered non-beneficial by the Director. This includes, but is not limited to, disposal via storm sewer, drainage hole or direct discharge to land surface or a surface water body.

- (b) The effluent contains contaminants, other than heat, that have been added to the Low Temperature Geothermal Fluid.
 - (c) The effluent is reinjected to a ground water reservoir that is not considered suitable by the Director. Factors which may render a ground water reservoir unsuitable include, but are not limited to, chemical or physical incompatibility of the fluids involved or adverse hydraulic characteristics of the receiving reservoir.
 - (d) There are existing or potential problems or special conditions as determined by the Director. Problems or special conditions resulting from the effluent disposal system which may warrant a nonstandard designation include, but are not limited to, instability of near-surface earth materials, undue alteration of thermal characteristics, unreasonable head changes or downslope subsurface leakage of effluent.
- (7) Secondary Use: Consumption of Low Temperature Geothermal Effluent for beneficial use including, but not limited to, domestic, irrigation, stock watering, commercial and industrial uses.
- (8) Standard Low Temperature Geothermal Effluent Disposal System: Any Low Temperature Geothermal Effluent Disposal System in which one of the following conditions are met:
- (a) No contaminants except heat have been added to the Low Temperature Geothermal Fluid and the effluent is put to a Secondary Use.
 - (b) No contaminants except heat have been added to the Low Temperature Geothermal Fluid and the effluent is returned to the producing or other suitable ground water reservoir and there are no other existing or potential problems or special conditions as determined by the Director including, but not limited to, those factors, problems and conditions listed in 65-010 definition 6, paragraphs c and d.

SUBDIVISION I
WELL CONSTRUCTION STANDARDS

65-015 LOW TEMPERATURE GEOTHERMAL WELL AND REINJECTION WELL CONSTRUCTION: Low Temperature Geothermal Wells and Reinjection Wells shall be constructed in conformance with applicable rules (OAR 690-10-005 to 690-10-040 and 690-60-005 to 690-63-045) with specific additions and modifications as described in OAR 690-65-005 to 690-65-070.

65-020 LOW TEMPERATURE GEOTHERMAL REINJECTION WELL LOCATION: For appropriations not exceeding 15,000 gallons per day no Low Temperature Geothermal Reinjection Well shall be located within 75 feet of any existing Low Temperature Geothermal Well utilizing the same ground water reservoir without authorization from the Director, unless both the withdrawal and reinjection wells are on the same parcel of land and are used by the same ground water appropriator. A variance from the 75-foot setback requirement may be issued by the Director, following a written request for special standards (described by 690-60-040) by the water well constructor or landowner, who under the provisions of 537.753, is constructing the well, if hydrologic and thermal conditions permit closer spacing.

For appropriations exceeding 15,000 gallons per day, the appropriator shall submit plans for review to the Director or his authorized representative, indicating separation distances between production and reinjection wells on the parcel of land on which the production well is located, on the parcel of land on which the reinjection well is located, and on all adjoining parcels of land. In addition, the plans shall indicate the anticipated hourly production and reinjection rates, the maximum anticipated daily production, and any planned safeguards against undue thermal and hydrologic interference with existing rights to appropriate ground water and surface water.

65-025 DESCRIPTION OF PROPOSED USE: For any Low Temperature Geothermal Well or Low Temperature Geothermal Reinjection Well, the report required under ORS 537.762 prior to commencing construction shall identify the intended use of the well, the appropriator's name and the appropriator's mailing address.

65-030 IDENTIFICATION OF INTENDED WELL USE: Any Low Temperature Geothermal Well or Low Temperature Geothermal Reinjection Well shall be clearly identified as such on the water well report filed with the Water Resources Department.

65-035 WELL-HEAD PROTECTION EQUIPMENT: Adequate well-head equipment to insure public safety and the protection of the ground water resource shall be immediately installed on any Low Temperature Geothermal Well or Low Temperature Geothermal Reinjection Well when fluid temperatures of 65° C (150°F) or greater are encountered during drilling. Low Temperature Geothermal Fluids produced during drilling or testing of such a well shall be disposed of in such a manner as to minimize health hazards. A variance from the requirement for well-head protection equipment may be granted if a written request demonstrates that the equipment is not necessary to safely complete the well.

65-040 PUMP TESTING OF LOW TEMPERATURE GEOTHERMAL REINJECTION WELLS: All Low Temperature Geothermal Reinjection Wells shall be pump tested for a period of at least one hour; results must be recorded on the water well report. This minimum test shall be conducted as follows:

- (1) Prior to testing, the static water level in the well shall be measured and recorded.
- (2) Water shall be pumped into or from the well at a measured and steady rate; the rate shall approximate the maximum anticipated injection rate of the operating well.
- (3) For tests that withdraw water, only bailing or pumping the well is acceptable.
- (4) The water level in the well shall be measured and recorded both at the end of pumping and after one hour of recovery.
- (5) For proposed disposal exceeding 15,000 gallons per day the Director may prescribe a more detailed test that could include, but is not limited to, increased frequency of water level measurement, increased test duration and monitoring of observation wells. Such modifications will be required when possible impacts resulting from the development include, but are not limited to, thermal or hydrologic interference with existing water rights, water quality degradation or failure of well construction.

65-045 WATER TEMPERATURE MEASUREMENT: For any Low Temperature Geothermal Well that withdraws ground water, the water well report must include the maximum temperature measured in the borehole and its corresponding depth, and the temperature of the fluid as measured at the discharge point at the beginning and conclusion of a timed production test (i.e. pump or bailer test - air test unacceptable). The maximum temperature measured in the borehole and its corresponding depth is required on the water well report for a Low Temperature Geothermal Well that does not withdraw ground water.

65-050 ADDITIONAL STANDARDS FOR LOW TEMPERATURE GEOTHERMAL REINJECTION WELLS: Procedures required to reinject effluent into a Low Temperature Geothermal Reinjection Well must not cause failure of casing and seal material or other components of the well construction.

SUBDIVISION 2
LOW TEMPERATURE GEOTHERMAL EFFLUENT DISPOSAL

65-055 EFFLUENT DISPOSAL BY REINJECTION / FLUID QUALITY ASSESSMENT:
Prior to reinjection, users required to file for water rights shall supply the Director fluid quality information concerning the Low Temperature Geothermal Fluid, the Low Temperature Geothermal Effluent, and the ground water in the receiving zone of any Low Temperature Geothermal Reinjection Well for systems that withdraw and reinject ground water in order that the Low Temperature Geothermal Effluent Disposal System be classified as Standard or Nonstandard. The required information shall include a certified chemical analysis for the following parameters: Temperature, pH, Suspended Solids, Specific Conductance, Total Dissolved Solids, Total Coliform Bacteria, Arsenic, Boron, Calcium, Carbonate or Bicarbonate, Chloride, Iron, Magnesium, Manganese, Potassium, Silica, Sodium and Sulfate. If poor water quality or water quality incompatible with the reinjection zone fluids is suspected, the Director may require additional specific data. The Director may waive the requirement for specific portions or all of the chemical analysis if the fluid quality is known to be suitable for the intended withdrawal and reinjection.

SUBDIVISION 3
WATER RIGHTS PROCEDURE

65-060 PROCESSING OF APPLICATIONS: The appropriator shall make application for a water right to appropriate Low Temperature Geothermal Fluid unless an exemption is provided for under ORS 537.545.

65-065 EXEMPTION FROM WATER RIGHT PERMIT APPLICATION / USE OF LOW TEMPERATURE GEOTHERMAL FLUID: Low Temperature Geothermal Fluid appropriation for single industrial or commercial use including, but not limited to, electrical, agricultural, aquacultural, heating and/or cooling in an amount not exceeding 5,000 gallons per day shall be exempt from application for a water right as provided for under ORS 537.545. This exemption applies to the use of ground water for any such purpose to the extent that it is beneficial and constitutes a right to appropriate ground water equal to that established by a ground water right certificate.

65-070 WATER RIGHT LIMITATION FOR NONSTANDARD EFFLUENT DISPOSAL SYSTEMS: If the Low Temperature Geothermal Effluent is disposed of by way of a Nonstandard Low Temperature Geothermal Effluent Disposal System, the right to appropriate the Low Temperature Geothermal Fluid shall be inferior to all subsequent rights for beneficial consumptive use and/or to the rights of those appropriators who make use of a Standard Low Temperature Geothermal Effluent Disposal System. If a Nonstandard Low Temperature Geothermal Effluent Disposal System is upgraded to a Standard Low Temperature Geothermal Effluent Disposal System the associated water right retains the priority date established upon initial filing.

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