

WAC 332-17-110 Casing requirements. (1) All wells shall be cased to protect or minimize damage to the environment, surface and groundwaters, geothermal resources and health and property. The department shall approve proposed well spacing and well casing programs or prescribe such modifications to the programs as the department determines necessary for proper development, giving consideration to such factors as:

- (a) Topographic characteristics of the area.
- (b) Hydrologic, geologic, or reservoir characteristics of the area.
- (c) The number of wells that can be economically drilled to provide the necessary volume of geothermal resources for the intended use.
- (d) Protection of correlative rights.
- (e) Minimizing well interference.
- (f) Unreasonable interference with multiple use of lands.
- (g) Protection of the environment.

(2) Casing specifications shall be established on an individual well basis. The following specifications are general, but should be used as guidelines in submitting drilling permit applications.

(a) **Conductor pipe.** Annular space shall be cemented solid from the shoe to surface. An annular blowout preventer, or equivalent, remotely controlled hydraulically operated including a drilling spool with side outlets or equivalent may be required by the department. A kill line and blowdown line with appropriate fittings shall be connected to the drilling spool when same is required.

Conductor casing shall be set to a minimum depth of 15 meters (50 feet).

(b) **Surface casing.** This casing shall be set at a depth equivalent to, or in excess of, ten percent of the proposed depth of the well, provided, however, such depth shall not be less than 60 meters (200 feet) or extend less than 30 meters (100 feet) into bedrock. Surface casing holes shall be logged with an induction electric log, or equivalent, prior to running surface casing.

(c) **Intermediate casing.** This casing shall be required whenever anomalous pressure zones, cave-ins, washouts, abnormal temperature zones, uncased fresh water aquifers, uncontrollable lost circulation zones, or other drilling hazards are present or occur, and whenever the surface casing has not been cemented through competent rock units. Intermediate casing strings shall be cemented solid if possible from the shoe to surface. If a liner is used as an intermediate string, the lap shall be tested by a fluid entry or pressure test to determine whether a seal between the liner top and the next casing string has been achieved. The liner overlap shall be a minimum of 30 meters (100 feet). The test shall be recorded in the driller's log and may be witnessed by a representative of the department.

(d) **Production casing.** This casing may be set above or through the producing or injection zone and cemented above the objective zones. Production casings shall be cemented to the surface or lapped into the intermediate string. Overlap shall not be less than 30 meters (100 feet) and shall be pressure tested. Lap or casing failure shall require repair, recementing, and successful retesting.

(e) **Cementing of casing.** Conductor and surface casing strings shall be cemented with a quantity of cement sufficient to fill the annular space from the shoe to surface. A high temperature resistant admix shall be used in cementing production casing unless waived by the department, and shall be cemented in a manner necessary to exclude,

isolate, or segregate overlying formation fluids from the geothermal resources zone and to prevent the movement of fluids into possible fresh water zones.

A temperature or cement bond log may be required by the department if an unsatisfactory cementing job is indicated.

(f) **Pressure testing.** Prior to drilling out the casing shoe after cementing, all casing strings set to a depth of 152 meters (500 feet) or less except for conductor casing, shall be pressure tested to a minimum pressure of 35 bars (500 psi). Casing strings set to a depth of 152 meters (500 feet) or greater shall be pressure tested to a minimum pressure of 69 bars (1,000 psi) or 0.045 bars/meter (0.2 psi/ft) whichever is greater. Such test shall not exceed the rated working pressure of the casing or the blowout preventor stack assembly, whichever is lesser.

[Statutory Authority: RCW 79.76.050(2). WSR 79-02-001 (Order), § 332-17-110, filed 1/4/79.]