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**PERMANENT ADMINISTRATIVE RULES**

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I certify that the attached copies are true, full and correct copies of the PERMANENT Rule(s) adopted on 11/21/2014 by the  
Water Resources Department 690

Agency and Division Administrative Rules Chapter Number  
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To become effective Upon filing, Rulemaking Notice was published in the September 2014 Oregon Bulletin.

**RULE CAPTION**

Well construction rules focused on: Bentonite seals, deepenings, sparge wells, grout reporting and closed loops.  
Not more than 15 words that reasonably identifies the subject matter of the agency's intended action.

**RULEMAKING ACTION**

Secure approval of new rule numbers with the Administrative Rules Unit prior to filing.



**ADOPT:**

**AMEND:**  
690-200-0005, 690-210-0310, 690-210-0340, 690-215-0045, 690-240-0005, 690-240-0035, 690-240-0046

**REPEAL:**

**RENUMBER:**

**AMEND AND RENUMBER:**

**Statutory Authority:**  
ORS 183; ORS 536; ORS 537 & 540

**Other Authority:**

**Statutes Implemented:**  
ORS 183; ORS 536; ORS 537 & 540

**RULE SUMMARY**

- The rule changes vary in scope and include:
- Changes the classification of a sparge well from a geotechnical hole to a monitoring well.
  - Requires well constructors to calculate and report how much sealing material is required and how much is used when placing an annular seal.
  - Clarifies the requirements when deepening an existing well and requires a copy of the original well report or the original well report number to be submitted with the deepening well report.
  - Corrects a rule reference error in the Geotechnical Hole rules.
  - Clarifies that the quality of water cannot interfere with the proper hydration of bentonite in closed loop installations.
  - Allows unhydrated bentonite to be used to 200 feet through up to 50 feet of standing water to seal water supply wells.
  - Requires unhydrated bentonite to be screened during placement through water, water quality to be tested and describes when it cannot be used.

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OREGON ADMINISTRATIVE RULES  
WATER RESOURCES DEPARTMENT  
CHAPTER 690 DIVISION 210  
WATER SUPPLY WELL CONSTRUCTION STANDARDS

690-210-0310

Cement Grout

When using cement grout as the sealing material in a well, it must meet the following requirements:

(1) Cement grout used to seal a well shall be composed of a uniformly mixed slurry of Portland cement or High Early Strength Type III Portland cement and potable water, or High-alumina cement and potable water, mixed in the following proportions (Type of Cement -- Gallons of Water Per Sack of Dry Cement, respectively):

(a) Portland Cement -- 4-1/2 to 6;

(b) High Early Strength Type III Portland Cement -- 5-1/2 to 6-1/2;

(c) High-alumina Cement -- 4-1/2 to 6.

(2) Additives to increase fluidity, reduce shrinkage, or control time of set may be used in a cement grout mixture. Expanding agents such as aluminum powder may be used at a rate not exceeding 0.075 ounce (one level teaspoonful) per sack of dry cement. The powder shall not contain polishing agents. The addition of bentonite clay to a cement grout mixture is permissible but shall not in any case exceed five percent (5%) by weight of dry cement. Calcium chloride may be added to a Portland cement grout to accelerate the set but shall not exceed two pounds per sack of dry cement. High-alumina cement and Portland cement of any type shall not be mixed together for use in a well.

(3) Cement types other than those set forth herein shall not be used as a sealing material in a well except upon written approval of the Director of the Water Resources Department.

(4) In no case shall sand or aggregate be added to cement grout seal mixtures.

**(5) The volume of sealing material required shall be calculated prior to seal installation. The calculated volume and actual volume used shall be reported on the water supply well report.**

(Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540)

[Text to be deleted is bracketed]

**Language to be added is bolded and underlined.**

OREGON ADMINISTRATIVE RULES  
WATER RESOURCES DEPARTMENT  
CHAPTER 690 DIVISION 210  
WATER SUPPLY WELL CONSTRUCTION STANDARDS

690-210-0340

Method of Placement of Unhydrated Bentonite

(1) An upper oversize drillhole, four inches greater than the nominal inside diameter of the permanent well casing, shall be constructed to a minimum depth of 18 feet **below land surface**. The use of unhydrated bentonite as a [surface] casing seal shall not be allowed [below 50 feet from] **deeper than 200 feet below** land surface. In the event that the [subsurface] materials penetrated by the oversize drillhole cave, or tend to cave, an outer temporary surface casing shall be used to case out the caving materials [throughout] **during** construction of the oversize drillhole. The **outer** temporary surface casing shall be removed **during seal installation and** before completion of the well.

(2) In the event **ground**water is [present or] encountered during the construction of the oversize drillhole, only **unhydrated** bentonite chips manufactured to be [greater than ¼] **3/8** inch [or] **to ¾ inch, pellets or** tablets shall be allowed in the [sealing interval] **water-filled portion of the annulus**. A maximum of [25] **50** feet of water may be present [within] **in** the sealing interval. [Granular bentonite may be used if the annular space is dry] **Unhydrated bentonite shall be screened across a minimum ¼ inch mesh screen prior to being placed in the water-filled portion of the annulus to minimize the introduction of bentonite dust into the seal interval. Unhydrated bentonite shall not be used:**

(1) **In the water-filled portion of a temporary casing; or**

(2) **If there is any uphole flow in the annular seal interval.**

(3) [Placement of bentonite shall conform to the manufacturer's specifications and result in a seal that is free of voids or bridges.] **Unhydrated bentonite may only be used as an annular seal material below the water level in a well when the groundwater it comes in contact with does not exceed 800 parts per million (ppm) total dissolved solids (TDS).**

**(a) Unhydrated bentonite may be used as an annular seal material in water supply wells exceeding 800 ppm TDS if the bentonite manufacturer provides documentation that their product can be used in water that exceeds 800 ppm TDS.**

**(A) Prior Department approval is required before placement.**

**(B) The bentonite manufacturer's documentation and Department approval shall be submitted with the Water Supply Well Report as required in OAR 690-205-0210.**

**(b) In all cases, the TDS shall be reported on the Water Supply Well Report as required in OAR 690-205-0210.**

**(c) Regardless of the reported TDS, the quality of the water in the well shall not interfere with the proper hydration of bentonite.**

(4) After placement of the permanent casing, the annular space shall be filled to land surface with bentonite. The annular space shall be kept full **of bentonite to land surface** while drilling or driving casing. A

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**Language to be added is bolded and underlined.**

**calibrated** sounding [*or tamping tool*]**tape with weight** shall be used **continuously** in the sealing interval during [*pouring*]**bentonite placement** to measure fill rate and to **check for and** break up possible bridges, [*or cake formations. Care shall be taken to minimize the introduction of bentonite dust into the sealing interval.*]

(5) **Placement of bentonite shall conform to the manufacturer's specifications and result in a seal that is free of voids or bridges. Care shall be taken to minimize the introduction of bentonite dust into the sealing interval.** [*Pour rate shall be three minutes or slower per 50 pound sack in the water-filled portion of the annulus.*]

(6) **The volume of sealing material required shall be calculated prior to seal installation. The calculated volume and actual volume used shall be reported on the water supply well report.**

(7) **Unhydrated bentonite chip, pellet or tablet annular seals shall be hydrated from land surface with potable water prior to removing the drilling machine from the well site. The hydration shall begin once all of the bentonite annular seal material has been placed and shall end when the annular seal interval refuses to take more water or after at least one annular space volume of water has been placed.**

(8) **Granular bentonite may only be used as an annular seal material in a dry annular space above the interval where water was first encountered. Granular bentonite shall not be screened or hydrated during placement.**

(9) **Pour rate shall be two minutes or slower per 50 pound sack in the water-filled portion of the annulus.**

(Stat. Auth: ORS 536.090 & ORS 537.505 – ORS 537.795)

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**Language to be added is bolded and underlined.**