OREGON ADMINISTRATIVE RULES
WATER RESOURCES DEPARTMENT
CHAPTER 690 DIVISION 200
WATER SUPPLY WELL CONSTRUCTION STANDARDS

TABLE 200-1

WHICH SET OF STANDARDS APPLIES?

The Department currently regulates the construction of borings through which ground water could become contaminated. The type of boring (and its purpose) will determine which set of regulations apply. Questions often arise as to how a certain boring [ ]is to be regulated. In general, if the purpose of a boring is to seek water then it is considered a well. The table below [ ]lists common types of holes and which category they fall into. This is not a complete[ ] list of borings and there are [ ]other types of borings regulated by other agencies. Contact the Water Resources Department if[ ] there is a question as to what standard applies or what agency may need to be contacted.

The general standards and their Oregon Administrative Rule reference are:

Water Supply Wells	OAR 690-200 through 690-235
Monitoring Wells	OAR 690-240
Other Holes	OAR 690-240-0030
Geotechnical Holes	OAR 690-240-0035

Description of Boring:	Standards that Apply
Air Sparging Well	Monitoring Well
Aquifer Storage and Recovery Well	Water Supply Well
Cathodic Protection Hole	Geotechnical Hole
Community Well	Water Supply Well
Construction Hole	Other Hole
Dewatering Well	Water Supply Well
Domestic Well	Water Supply Well
Drive Point (Coring)	Geotechnical Hole
Drive Point Well (Dewatering)	Water Supply Well
Drive Point (Water Sampling)	Monitoring Well
Drive Point (Water Supply)	Water Supply Well
Dry (Disposal) Well	Other Hole
Elevator Shaft	Other Hole
Extraction Well	Monitoring Well
Gas Migration Hole	Geotechnical Hole
Geothermal Well	Water Supply Well
Gravel Pit	Other Hole
Heat Exchange Hole (Closed Loop)	Geotechnical Hole
Heat Exchange Hole (Open Loop)	Water Supply Well
Horizontal Drain (Slope Stability)	Geotechnical Hole
Horizontal Well (Monitoring)	Monitoring Well
Horizontal Well (Water Supply)	Water Supply Well
[*Hydrologic Data Hole*]	[*Geotechnical Hole*]
Incli[ ]nometer	Geotechnical Hole
Industrial Well	Water Supply Well

[*Text to be deleted is italicized and bracketed*]
Language to be added is bolded and underlined.

Injection Well (Water)	Water Supply Well
Injection Well (Remediation) (>72 Hours)	**Monitoring Well**
Injection Well (Remediation) (<72 Hours)	**Geotechnical Hole**
Irrigation Well	Water Supply Well
Monitoring Well[*(>72 Hours)*]	Monitoring Well
Municipal Well	Water Supply Well
Observation Hole	Monitoring Well
Permeability Test Hole	Geotechnical Hole
Piezometer (Electric)	Geotechnical Hole
Piezometer (Pneumatic)	Geotechnical Hole
Piezometer Well	Monitoring Well
Piling Hole	Other Hole
Post Hole	Other Hole
Power Pole Hole	Other Hole
Public Supply Well	Water Supply Well
Remediation Or Recovery Well	Monitoring Well/Water Supply Well
Rock Boring (< [*I O*]**10** Feet)	Other Hole
Rock Boring (> [*I O*]**10** Feet)	Geotechnical Hole
Seismic Shot Hole	Geotechnical Hole
Slope Stability Hole	Geotechnical Hole
Soil Boring (< 10 Feet)	Other Hole
Soil Boring (>10 Feet)	Geotechnical Hole
Soil Vapor Hole	Geotechnical Hole
Sparging Well	Monitoring Well
Storm Water Disposal	Other Hole
Sump	Other Hole (if < 10 ft. deep and > 10 ft. dia.)
Temporary Monitoring Well (<72 Hours)	Geotechnical Hole
Temporary Monitoring Well (>72 Hours)	**Monitoring Well**
Trench	Other Hole
Underground Storage Tank (UST) Pit	Other Hole
Vapor Extraction Hole	Geotechnical Hole
Wetland Delineation Hole	Other Hole

APPENDIX 1

Additional Requirements by Other State Agencies of Oregon

In the administration of ORS 537.505 to 537.795, the Director of the Water Resources Department has statutory authority under the provisions of ORS 537.780 "to prescribe and enforce general standards for the construction and maintenance of wells and their casings, fittings, valves, and pumps ..." Other agencies of the state have statutory responsibilities that relate either directly or indirectly to the construction and operation of public water supply systems and their source of water supply. These agencies and their responsibilities are listed as follows:

OREGON HEALTH **AUTHORITY**[*DIVISION*] 800 NE Oregon Street Portland, OR 97232 (serving more than three single residents) [*www.ohd.hr.state.or.us*] **http://www.oregon.gov/OHA/Pages/index.aspx**	ORS Chapter 448 — Municipal Water Supply Systems Public Water Supply Systems Community Water Supply Systems Source Water Protection
BUILDING CODES AGENCY 1535 Edgewater NW Salem, OR 97304-4635 www.cbs.state.or.us/extemal/bcd	ORS Chapter 446 — Electrical and Plumbing for all Commercial Enterprises Mobile Home Park Water Supply Systems
OREGON PUBLIC UTILITY COMMISSIONER 550 Capitol St NE Salem, OR 97301-2551 www.puc.state. or.us	ORS Chapter 757 — Private Owners (water supply systems, 200 homes or more)
DEPARTMENT [ ]OF ENVIRONMENTAL [ ] QUALITY 811 SW 6[1] Portland, OR 97204-1390 www.deq.state,or.us	ORS Chapter 468 — Water Quality Monitoring Underground Injection Systems Source Water Protection
SECRETARY OF STATE CORPORATION DIVISION Business Services Division Public Service Bldg., Suite 180 Salem, OR 97310 www.sos.state.or[ ].us	Business Registry for Water Districts

690-200-0028
Designated Special Area Standards

(4) Special Area Standards for New, Altered, Deepened or Converted Water Supply Wells in the "Mosier Area," Wasco County.

(a) As used in this rule and illustrated in Figure 200-8, the "Mosier Area" includes the area located in Section 36 Township 3 North, Range 11 East, Willamette Meridian; and Sections 31, 32, 33 and 34 Township 3 North, Range 12 East, Willamette Meridian; and Sections 1, 2, 3, 10, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 27, 34, 35 and 36 Township 2 North, Range 11 East, Willamette Meridian; and Sections 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 27, 28, 29, 30, 31, 32 and 33 Township 2 North, Range 12 East, Willamette Meridian. Beginning at a point of intersection of the Wasco County, Hood River County, State of Oregon and State of Washington lines; thence south along the Wasco and Hood River County line to the Southwest corner of Section 34, Township 2 North, Range 11 East of the Willamette Meridian; thence east to the Southeast corner of Section 32, Township 2 North, Range 12 East of the Willamette Meridian; thence north to the East ¼ corner of Section 32; thence east to the Southeast corner of the SW1/4 of the NW1/4 of Section 33; thence north to the Southeast corner of the NW1/4 of the NW1/4 of Section 33; thence east to the Southeast corner of the NE1/4 of the NW1/4 of Section 33; thence north to the North ¼ corner of Section 33; thence east to the Southeast corner of the SW1/4 of the SE1/4 of Section 28; thence north to the Southeast corner of the NW1/4 of the SE1/4 of Section 28; thence east to Southeast corner of the NW1/4 of the SW1/4 of Section 27; thence north to the Southeast corner of the SW1/4 of the NW1/4 of Section 27; thence east to the Center ¼ corner of Section 27; thence north to Southeast corner of the NE1/4 of the NW1/4 of Section 27; thence east to the Southeast corner of the NW1/4 of the NE1/4 of Section 27; thence north to the Northeast corner of the NW1/4 of the NE1/4 of Section 27; thence east to the SE corner of section 22; thence north to the East ¼ corner of Section 22; thence east to the Center ¼ of Section 23; thence north to the Southeast corner of the NE1/4 of the NW1/4 of Section 23; thence east to the Southeast corner of the NE1/4 of the NE1/4 of Section 23; thence north to the Northwest corner of Section 24; thence east to the North ¼ corner of Section 24; thence north to the North ¼ corner of Section 13; thence west to the Northeast corner of Section 15; thence north to the Oregon and Washington State line; thence west along the Oregon-Washington State line to the point of beginning.

(b) Well constructors shall provide at least 10 calendar days notice to the Department prior to the start of construction, alteration, deepening or conversion on any new or existing well in the "Mosier Area", in one of two ways:

(A) A Start Card submitted electronically at least ten (10) calendar days prior to the start of construction, alteration, deepening or conversion; or

(B) A Start Card mailed, faxed or hand delivered and received by the Department in Salem at least ten (10) calendar days prior to the start of construction, alteration, deepening or conversion.

(c) In cases where the additional notice requirement cannot be met the well constructor shall notify the Department by fax, telephone or e-mail prior to the start of construction, alteration, deepening or conversion. Department approval is required to proceed. Approval shall be either verbal, written or electronic.

(d) All new and deepened water supply wells developing water from the Columbia River Basalt Group in the "Mosier Area", as described in (a) above, shall be limited to one aquifer and shall be constructed in accordance with OAR 690, division 210 with the following additional requirements:

(A) All new wells shall have a nominal minimum well casing diameter of at least 6 inches.

(B) The well constructor shall provide the following information to the Department so that a case and seal depth can be determined. The well shall not be permanently cased and sealed prior to consultation with the Department:

(i) A rough log that describes the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation, the thickness of aquifers and available static water level measurements; and

(ii) Such additional information as required by the Department.

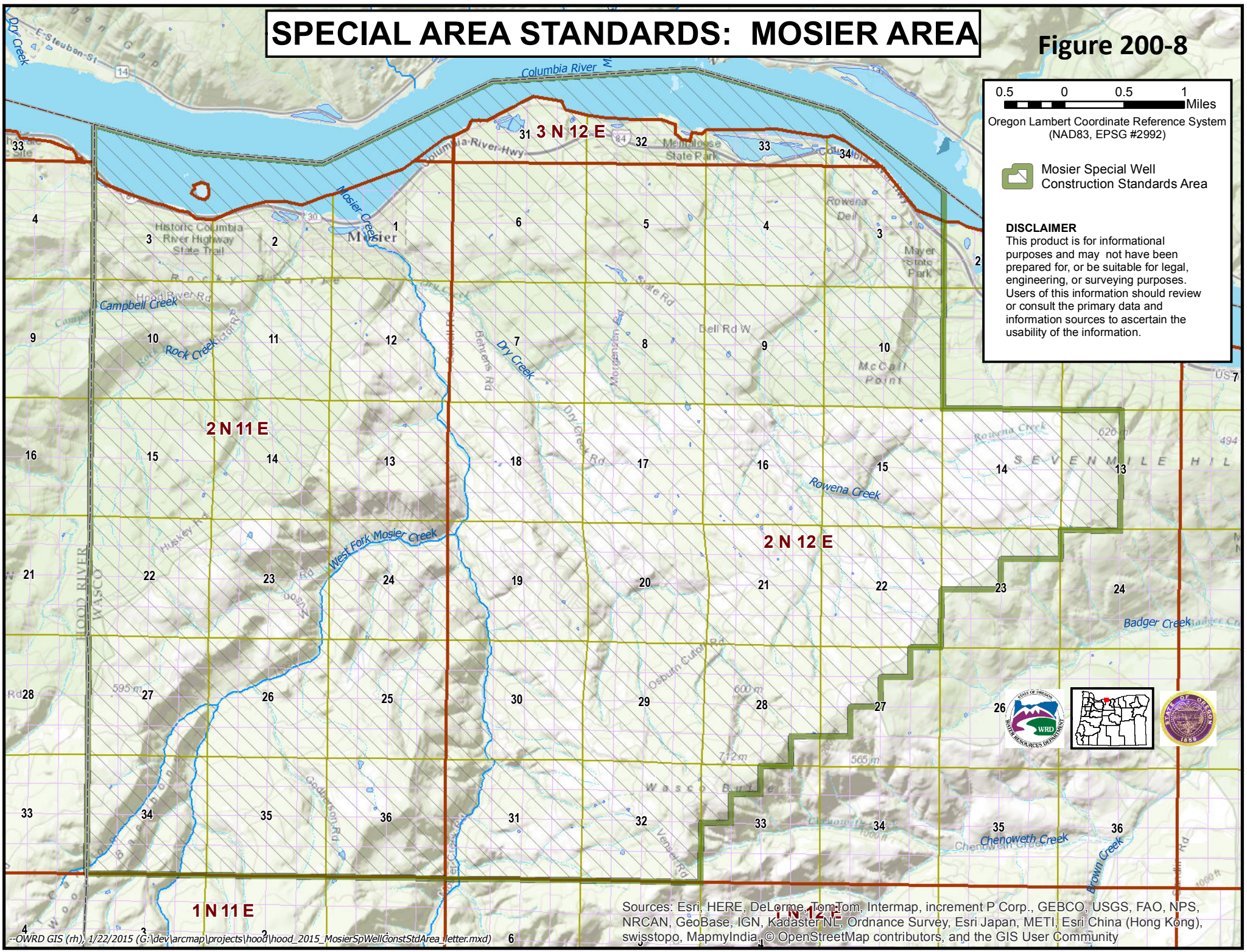
(e) Alternatives to the special area standards shall be approved only if it can be demonstrated that the alternative techniques proposed to be used are as effective as the techniques required in (d) above. Such alternatives require prior written approval by the Department. In addition, follow-up testing may be required by the Department to ensure the effectiveness of the alternative technique.

(f) All wells, in all aquifers, shall have a minimum 3/4-inch diameter dedicated measuring tube installed at the time of pump installation, pump repair or pump replacement (See Figure 200-5 and OAR 690-215-0200).

(g) Except as they may conflict with (d) above, all other provisions of Oregon Administrative Rules for Well Construction and Maintenance Standards apply.

SPECIAL AREA STANDARDS: MOSIER AREA

Figure 200-8



--OWRD GIS (rh), 1/22/2015 (G:\dev\arcmap\projects\hood\hood_2015_MosierSpWellConstStdArea_letter.mxd)

690-200-0050
Definitions

(86) "Public Water System" means a system for the provision to the public of piped water for human consumption, if such [*a*]system has more than three service connections or supplies water to a public or commercial establishment [*which*]**that** operates a total of at least 60 days per year, and [*which*]**that** is used by ten or more individuals per day[*or is a facility licensed by the Oregon Health Division*]. **Public water system also means a system for the provision to the public of water through constructed conveyances other than pipes to at least 15 service connections or regularly serves at least 25 individuals daily at least 60 days of the year. A public water system is either a "Community Water System," a "Transient Non-Community Water System," a "Non-Transient Non-Community Water System" or a "State Regulated Water System."**

(99) "Silt" means an unconsolidated sediment composed predominantly of particles between 0.06 mm and 0.00**2**[*5*] mm in diameter.

OREGON ADMINISTRATIVE RULES
WATER RESOURCES DEPARTMENT
CHAPTER 690, DIVISION 205
WATER SUPPLY WELL CONSTRUCTION STANDARDS; LICENSING

690-205-0185
Water Supply Well Drilling Machines

(1) All water supply well drilling machines being operated, other than under a landowner's permit, shall be plainly marked either with the bonded Water Supply Well Constructor's license number, the name of the bonded Water Supply Well Constructor, or the name of the well drilling business. The markings shall be permanently affixed on each side of the **machine**[*vehicle*]. Good quality paint or commercial decal numbers shall be used in placing the identification information on the drilling machine. In no case shall the constructor's license number, name, or business name, be inscribed with crayon, chalk, marking keel, pencil, or other temporary markings.

(2) In all cases, the license number, name, or business name, of the bonded Water Supply Well Constructor shall be removed from the drilling machine immediately upon change of ownership or change of control of the drilling machine.

690-210-0030
Placement of Water Supply Wells
(1) No person shall construct a water supply well**:** [*within 50 feet of any septic tank; 100 feet of a septic drainline or sewage disposal structure or facility; 50 feet of a closed sewage or storm drainage system (except those in or underneath a building); 50 feet of a confined animal feeding or holding area; 50 feet of any animal waste holding area such as a pond or lagoon; 100 feet of any sewage sludge disposal area; or 500 feet of a hazardous waste storage, disposal or treatment unit without written permission of the Director. Rain water gutter downspouts and drains are exempt from the above setback requirements. The constructor should consider whether greater distances are required for the protection of the ground water depending on the topography and local geology.*]

(a) W[*w*]ithin 50 feet of any septic tank; **or**
(b) Within 100 feet of a septic drainline or sewage disposal structure or facility; **or**
(c) Within 50 feet of a closed sewage or storm drainage system (except those in or underneath a building); **or**
(d) Within 50 feet of a confined animal feeding or holding area; **or**
(e) Within 50 feet of any animal waste holding area such as a pond or lagoon; **or**
(f) Within 100 feet of any sewage sludge disposal area; or
(g) Within 5 feet from a permanent structure or the roof, eaves or overhangs of a permanent structure. This includes decks or other additions to the structure that may hinder the ability of a drilling machine to get over the well. This does not include pump houses or other outbuildings that are easily moved; or
(h) Within 500 feet of a hazardous waste storage, disposal or treatment **facility**[*unit*] without written permission of the Director. [*Rain water gutter downspouts and drains are exempt from the above setback requirements. The constructor should consider whether greater distances are required for the protection of the ground water depending on the topography and local geology.*]

(2) A new water supply well may be constructed at the site of an abandoned septic tank or drain field one year after the septic tank or drain field is taken out of use. The abandoned septic tank shall be pumped by a DEQ licensed sewage disposal business to remove all contents. Following pumping, the tank shall be filled with reject sand, bar run gravel or other material approved by the on site sub-surface sewage permitting agent. The delivery line between the building and the tank shall be permanently capped or filled with cement grout. A water supply **well** shall not be constructed through an abandoned septic tank or septic drain line. The new water supply well shall be located to meet other setbacks as directed in section (1) of this rule.

(3) Rain water gutter downspouts and drains are exempt from the setback requirements.

(4) The constructor should consider whether greater setback distances are required for the protection of the ground water depending on the topography and local geology.

(5) Additional setback standards may apply to wells used for public water systems. See OAR 333-061-0050(2) or contact the Oregon Health Authority for more information.

690-210-0130

Sealing of Wells in Unconsolidated Formations Without Significant Clay Beds

Water supply wells drilled into unconsolidated water-bearing strata overlain by unconsolidated materials, such as sand, silt, or gravel, without significant clay beds, shall have a watertight, unperforated well casing extending to a minimum of eighteen feet below land surface. An upper oversize drillhole, four inches greater in diameter than the nominal diameter of the casing, shall be constructed to a minimum depth of 18 feet. To prevent caving, a temporary surface casing, at least 18 feet in length, shall be used throughout the construction of the annular seal space. The annular space between the permanent well casing and the upper, oversize drillhole shall be completely full of grout in accordance with OAR 690-210-0310 thru 690-210-0360 after the permanent well casing is set into final position. The temporary surface casing shall be removed from the well as the annular space is filled. (See Figure 210-**2**[*1*]) [Figure not included, see ED. Note.][ED. NOTE: Figures referenced in this rule are available from the agency.]

690-210-0140

Sealing of Water Supply Wells in Unconsolidated Formations with Significant Clay Beds

Water supply wells drilled into water-bearing strata overlain by unconsolidated deposits of clay, or sand and gravel in which significant interbeds of clay are present, shall have a watertight, nonperforated, permanent well casing extending at least five feet into a clay or other impermeable stratum overlying the water-bearing zone. In all cases, an upper oversize drillhole, at least four inches greater in diameter than the nominal diameter of the permanent well casing shall be constructed to this same depth. In the event that the subsurface materials penetrated by the upper drillhole cave, or tend to cave, an outer, temporary surface casing shall be used to case out caving materials throughout the construction of the oversize drillhole. If the clay or other impermeable stratum is 13 feet or less below land surface, the watertight, nonperforated well casing and the upper, oversize drillhole shall extend to a minimum depth of 18 feet below land surface. If necessary to complete the well, the single, permanent well casing may be extended below the required sealing depth prior to sealing the well with grout. If preferred, a smaller diameter casing, liner, or well screen may be installed. The annular space between the permanent well casing and the upper, oversize drillhole shall be completely full of grout in accordance with OAR 690-210-0310 through 690-210-0360 after the permanent well casing is set into final position. The temporary surface casing shall be removed from the well as the annular space is filled. (See Figure 210-**3**[*2*].)
[ED. NOTE: Figure referenced in this rule are available from the agency.]

690-210-0150

Sealing of Water Supply Wells in Consolidated Formations

(1) Water supply wells drilled into a water-bearing rock formation overlain by clay, silt, sand, gravel, or similar materials, shall be constructed in accordance with one of the following methods:

(a) Method 1 (Continuous Seal): An upper drillhole, four inches greater in diameter than the nominal diameter of the permanent well casing to be installed, shall extend from land surface to at least five feet into solid, uncreviced, consolidated rock overlying the water-

bearing rock formation below a depth of 13 feet. Unperforated permanent well casing shall extend to this same depth. The annular space between the casing and the drillhole wall within the rock formation shall be filled with grout. The upper annular space between the casing and the drillhole wall shall be filled from land surface to at least five feet into an impermeable clay stratum below a depth of 13 feet. The annular space between the upper and lower sealing intervals shall be filled with an impermeable sealing material. If necessary to complete the well, a smaller diameter well casing, liner pipe, or well screen may be installed. If cement grout is placed by a suitable method from the bottom of the casing to land surface (Methods A, B, D, Appendix **210-**3), the upper drillhole shall be at least two inches larger than the nominal diameter of the casing. (See Figure 210-**4**[*3*].);

(b) Method 2 (Step-Down Casing): An upper drillhole, four inches greater in diameter than the permanent well casing to be installed, shall extend from land surface to at least five feet into an impermeable clay stratum below a depth of 13 feet. Unperforated, permanent well casing shall extend to, and be driven into, solid, uncreviced, consolidated rock overlying the water- bearing rock formation. A lower drillhole, equal in diameter to the inside diameter of the upper permanent well casing, shall be constructed at least five feet into solid uncreviced rock overlying the water-bearing formation. A smaller diameter casing, at least two inches smaller in diameter than the diameter of the upper permanent well casing, shall extend at least five feet into the lower drillhole and at least eight feet into the upper permanent well casing. The annular space between the upper oversize drillhole and the permanent well casing, and the annular space between the smaller diameter lower casing and the lower drillhole, shall be completely filled with grout in accordance with OAR 690-210-0310 through 690-210-0360 after the permanent well casing and the lower casing are set into final position. (See Figure 210-**5**[*4*].);

(c) Method 3 (Under-Reaming): An upper drillhole, four inches greater in diameter than the permanent well casing to be installed, shall extend from land surface to at least five feet into an impermeable clay stratum below a depth of 13 feet. A lower drillhole, at least two inches greater in diameter than the diameter of the permanent well casing, shall be constructed at least five feet into solid, uncreviced, consolidated rock by under-reaming methods. Unperforated, permanent well casing shall extend to and be driven into solid, uncreviced, consolidated rock at the bottom of the under-reamed section following placement of the sealing material. The annular space between the upper oversize drillhole and the upper permanent well casing shall be filled with cement grout using Method C or bentonite. The annular space between the lower under- reamed drillhole wall and the permanent well casing, shall be completely filled with grout applied under pressure in accordance with the appropriate Method A, B, or D, in Appendix **210-**3. (See Figure[*s 210-5 and*] 210-6.)

(2) In all cases, (Methods 1, 2, or 3, above), if materials penetrated by the upper oversize drillhole cave, or tend to cave, an outer temporary surface casing shall be used to case out all caving material throughout construction of the oversize drillhole. The temporary surface casing shall be withdrawn as the annular space is filled with grout.

[ED. NOTE: Figures and Appendix referenced are available from the agency.]

690-210-0155

Additional Standards for Artesian Water Supply Wells

(1) Water supply wells penetrating into an artesian aquifer shall have an upper

oversize drillhole four inches greater in diameter than the nominal diameter of the permanent well casing. Watertight unperforated casing shall extend and be sealed at least five feet into the confining formation immediately overlying the artesian water-bearing zone. In all cases, a minimum of 18 feet of casing and casing seal will be required. If cement grout is placed by a suitable method from the bottom of the casing (Methods A, B, and D, in Appendix **210-**3 and Figure 210-**1**[*5*]), the diameter of the upper drillhole shall be at least two inches larger than the nominal diameter of the casing. To complete the well, smaller diameter casing, perforated liner, or a well screen may be installed.

(2) When artesian pressures are encountered in the absence of a confining formation, casing and casing seal requirements shall be determined by the Director upon written application. In the alternative, the person constructing the well may construct the well in conformance with the minimum standards for artesian wells with a confining formation, set forth in section (1) of this rule.

(3) If an artesian water supply well flows at land surface, the well shall be equipped with a control valve and a watertight mechanical cap, threaded or welded, so that all flow of water from the well can be completely stopped.

(4) All flowing artesian wells shall be equipped with a pressure gauge placed on a dead- end line. A petcock valve shall be placed between the gauge and well casing. (See Figure 210-7)

(5) All flowing artesian water supply wells shall be tested for artesian shut-in pressure in pounds per square inch and rate of flow in cubic feet per second, or gallons per minute, under free discharge conditions. This data shall be reported on the well report.

[ED. NOTE: Figures & Appendixs referenced are available from the agency.]

690-210-0220
Plastic Casing Joints

All plastic casing joints shall be watertight. Either "bell" type, threaded, or coupling hubs are approved. Hub couplings shall be of material meeting the specifications for plastic casings as set forth in OAR 690-210-0210. Joints shall be made by solvent cement in accordance with manufacturer's directions. Newly assembled joints require careful handling until the initial set has taken place, which varies with the temperature and the pipe size. The recommended initial set times are from manufacturer's recommendations (See Table 210-**4**[*3*]).

[ED. NOTE: Tables referenced are available from the agency.]

690-210-0230
Inner Casing

Inner casing installed into a well must meet the minimum requirements of well casing (OAR 690-210-0190). The space between the two well casings shall be sealed so as to prevent the movement of water between the two casings. Inner casing installed in a well shall extend or telescope at least eight feet into the lower end of the well casing. The inner casing must be centered and must be a minimum of one inch smaller in diameter than the outer casing if an under reaming method system is used. If other methods are used, the inner casing must be a minimum of two inches smaller in diameter than the outer casing. The grout must be placed in a positive manner in accordance with method A, B, D, or E (see Appendix **210-**3).

[ED. NOTE: Appendix referenced is available from the agency.]

690-210-0270
Pitless Well Adapters and Units
Surface seal requirements for well casing set forth herein shall also apply when a pitless adapter or unit is installed in a well. The seal shall cover that interval occupied by the pitless case from the point of casing connection to land surface. A cement grout seal shall not be allowed within the pitless unit or pitless adaptor sealing interval. The pitless adapter or unit sealing interval shall be sealed with unhydrated bentonite as described in OAR 690-210-0330 and 690- 210-0340. The pitless adapter or unit, including the cap or cover, pitless case and other attachments, shall be designed and constructed to be watertight to prevent the entrance of contaminants into the well from surface or near-surface sources. Pitless units shall be vented to the atmosphere. Refer to OAR 690-210-0210 if the pitless adaptor or unit is to be used in conjunction with PVC casing.
NOTE: Prior to installing pitless well adapters or units on public, community, municipal, or public utility water supply wells, contact the Department of Human Resources. (See references to Health Division regulation in Appendix **210-**1.)
[ED. NOTE: The Appendix referenced is available from the agency.]

690-210-0320
Methods of Placement of Cement Grout or Concrete
Cement grout or concrete used as a sealing material in a well shall be placed or forced upward from the bottom to completely fill the annular space to be grouted and shall be placed in one continuous operation without significant interruption. If temporary outer surface casing is used in the construction of the well, it shall be withdrawn as the grout or concrete is placed. (For acceptable methods of placement, see Appendix **210-**3 and Figure 210-**1**[*5*], 1986.)
[ED. NOTE: Figures and Appendix referenced are available from the agency.]

690-210-0380
Disinfection of a Well
Prior to or after being placed in the well, pumping equipment, sand, gravel and well casing shall be thoroughly hosed or sluiced with water, and shall be disinfected with a solution containing at least 50 parts per million chlorine. All water introduced into a well during construction shall be clean and potable. Upon completion, the well and its equipment, including the interior of the well casing, shall be thoroughly swabbed and cleaned to remove all of the oil, grease, and foreign substances. The well and its equipment shall be disinfected by thoroughly agitating and mixing in the well a solution containing enough chlorine to leave a residual of 25 parts per million throughout the well after a period of 24 hours. Disinfection should also occur following the installation of pumping equipment. (See Chart Recommendations for Disinfection of Wells, Appendix **210-**2.)
NOTE: Other public agencies may have jurisdiction over the discharge of chlorine in certain areas. The constructor should contact the Oregon Department of Environmental Quality or the appropriate city public works department for further information.

[ED. NOTE: The Appendix referenced is available from the agency.]

690-210-0400
Construction of Dug Wells
Dug wells that are [*between 12 feet in depth and*] 21 feet **or less** in depth shall be sealed **with grout from land surface** [*constructed with a watertight surface curbing extending from a minimum of 12 inches above land surface*] to within three feet of the bottom of the well. Dug wells greater than 21 feet in depth shall be ***sealed with grout*** [*constructed with a watertight surface curbing that extends from a minimum of 12 inches above land surface*] **from land surface** to a depth of at least 18 feet below land surface. **In all cases a watertight surface curbing shall extend from a minimum of 12 inches above land surface and continue the entire length of the sealed interval.** Open wells, sometimes called sumps, which exceed ten feet in average diameter **and are dug to a depth of ten feet or less** are exempt from these construction requirements, but are subject to all the requirements covering the use of ground water. (water right application).

690-210-0410
Buried Slab Construction
In a buried slab type well, the slab shall be at least 18 feet below land surface and shall be at least three inches in thickness. The slab shall be reinforced to withstand all stresses. The slab shall be sealed with cement grout at least one foot thick, and the well bore backfilled with grout [*or concrete*] in accordance with OAR 690-210-0300 through 690-210-0360*[and OAR 690-210-0430*]. (See Figure 210-13.)

690-210-0420
Surface Curbing
(1) The surface curbing required in OAR 690-210-0400 shall be of concrete, concrete tile, or steel. If concrete is used, the concrete wall thickness shall not be less than six inches. In the case of buried slab type wells, well casing meeting the minimum specifications given in OAR 690-210-0190 through OAR 690-210-0220 shall be used. (See Figure 210-13.)
(2) If precast concrete tile or steel casing is used for the surface curbing, the well diameter to the bottom of the surface curbing shall be eight inches greater than the outside diameter of the tile or steel, and the annular space shall be completely filled with grout [*or concrete*] in accordance with OAR 690-210-0310 **through** [*and*] OAR 690-210-03**40**[*15*]. (See Figure 210-13*[, 1986*].)

APPENDIX **210-**1

Additional Requirements by Other State Agencies of Oregon

In the administration of ORS 537.505 to 537.795, the Director of the Water Resources Department has statutory authority under the provisions of ORS 537.780 "to prescribe and enforce general standards for the construction and maintenance of wells and their casings, fittings, valves, and pumps ..." Other agencies of the state have statutory responsibilities that relate either directly or indirectly to the construction and operation of public water supply systems and their source of water supply. These agencies and their responsibilities are listed as follows:

OREGON HEALTH **AUTHORITY**[*DIVISION*] 800 NE Oregon Street Portland, OR 97232 (serving more than three single residents) [*www.ohd.hr.state.or.us*] **http://www.oregon.gov/OHA/Pages/index.aspx**	ORS Chapter 448	Municipal Water Supply Systems Public Water Supply Systems Community Water Supply Systems Source Water Protection
BUILDING CODES AGENCY 1535 Edgewater NW Salem, OR 97304-4635 www.cbs.state.or.us/extemal/bcd	ORS Chapter 446	Electrical and Plumbing for all Commercial Enterprises Mobile Home Park Water Supply Systems
OREGON PUBLIC UTILITY COMMISSIONER 550 Capitol St NE Salem, OR 97301-2551 www.puc.state. or.us	ORS Chapter 757	Private Owners (water supply systems, 200 homes or more)
DEPARTMENT [ ]OF ENVIRONMENTAL [ ] QUALITY 811 SW 6[1] Portland, OR 97204-1390 www.deq.state,or.us	ORS Chapter 468	Water Quality Monitoring Underground Injection Systems Source Water Protection
SECRETARY OF STATE CORPORATION DIVISION Business Services Division Public Service Bldg., Suite 180 Salem, OR 97310 www.sos.state.or[ ].us		Business Registry for Water Districts

TABLE 210-2
(690-210-0190)
(Minimum specifications for steel well casing)

Nominal Size (inches)	Outside Diameter (inches)	Wall Thickness (inches)	Weight Per Foot (pounds)
2	2.375	.154	3.**65**[*56*]
2-1/2	2.875	.203	5.79
3	3.500	.216	7.58
3-1/2	4.000	.226	9.11
4	4.500	.237	10.79
5	5.563	.244	13.70
6	6.625	.250	17.02
8	8.625	.250	22.36
10	10.750	.250	28.04
*12	12.750	.312	41.45
*14	14.000	.312	45.68
*16	16.000	.312	52.27
*18	18.000	.375	70.59
*20	20.000	.375	78.60

* Note: Steel casing installed in a well greater than a nominal diameter of ten (10) inches, having a wall thickness of .250 inch and meeting ASTM A-53 A or B specifications must not exceed the following depth limitations (Diameter - Maximum Depth, respectively):

1. 12 inches - 500 feet
2. 14 - 16 inches - 250 feet[*:*]
3. 18 - 20 inches - 100 feet

[Text to be deleted is bracketed]
Language to be added is bolded and underlined.

[*690-215-0015*

Accessibility to Well for Reconditioning, Repair or Abandonment

To enable drilling equipment future access to the water supply well for reconditioning, repair, or abandonment, the property owner should maintain a minimum five-foot separation distance between the well and any permanent structure.]

690-215-0200

Dedicated Measuring Tube

A dedicated measuring tube as described in 690-215-0060 shall be installed in any water supply well at the time of pump installation, pump repair or pump replacement in the following areas (See Figures 200-4, 200-5**,** [*and*]200-7 **and 200-8**):

1. Petes Mountain Area of Clackamas County (See OAR 690-200-0028(2));
2. Eola Hills Ground Water Limited Area of Polk and Yamhill Counties (See OAR 690-200-0028(3)[.]**;**
3. "Mosier Area" Special Area Standards area of Wasco County (See OAR 690-200-0028(4)).

[Text to be deleted is bracketed]
Language to be added is bolded and underlined.

690-220-0115
Unhydrated Bentonite and Method of Placement

(1) When abandoning a pre-existing well with unhydrated bentonite the Water Supply Well Constructor shall provide additional notification to the Regional Well Inspector or the Well Construction Program Coordinator in Salem by fax, e-mail or telephone 72 hours prior to starting abandonment work.[*The additional notice referenced under this section shall be effective January 1, 2009, through December 31, 2013.*]

(a) In case of an emergency, the additional notification is not required; however, the Water Supply Well Constructor shall notify the Department prior to beginning abandonment work as required in OAR 690-205-0200.

[*(b) The Department will review this provision prior to December 31, 2013, to evaluate the effectiveness of unhydrated bentonite in the abandonment of water supply wells.*]

(2) Unhydrated bentonite used in the abandonment of water supply wells shall meet the following requirements:

(a) Specifically designed for use in water supply wells; and

(b) Within industry tolerance for dry western sodium bentonite; and

(c) Free of polymers that promote bacterial growth; and

(d) Manufactured to be 3/8-inch or 3/4-inch; and

(e) National Sanitation Foundation (NSF) approved or have a swell index greater than 15 milliliters (ml) per 2 grams (gm).

(3) Powdered bentonite, bentonite grout or bentonite slurry shall not be used to abandon water supply wells.

(4) Unhydrated bentonite shall only be used to abandon water supply wells when in contact with water having less than 800 parts per million (ppm) total dissolved solids (TDS).

(a) Unhydrated bentonite may be used to abandon 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.

(5) Water supply wells with casing that is at least four inches in diameter and less than eight inches in diameter may be abandoned with unhydrated bentonite to a maximum well depth of 700 feet, if

being placed through water. Unhydrated bentonite may be used deeper with prior Department approval.

(6) Water supply wells with casing that is at least four inches in diameter and less than eight inches in diameter may be abandoned with unhydrated bentonite to a maximum well depth of 1000 feet, if being placed through air. Unhydrated bentonite may be used deeper with prior Department approval.

(7) Water supply wells with casing that is at least eight inches in diameter may be abandoned with unhydrated bentonite to a maximum well depth of 1200 feet, if being placed through water. Unhydrated bentonite may be used deeper with prior Department approval.

(8) Water supply wells with casing that is at least eight inches in diameter may be abandoned with unhydrated bentonite to a maximum well depth of 1500 feet, if being placed through air. Unhydrated bentonite may be used deeper with prior Department approval.

(9) Unhydrated bentonite shall be screened across a minimum 1/4-inch mesh screen during placement to minimize the introduction of bentonite dust into the sealing interval. The resulting seal shall be free of voids or bridges.

(10) A sounding or tamping tool shall be used in the sealing interval during placement to measure the fill rate and to break up possible bridges or cake formations.

(11) Unhydrated bentonite shall be poured at the manufacturers recommended rate in the water-filled portion of the drillhole and shall not be less than two minutes per 50 pound sack.

(12) In a dry sealing interval, (above the water level), bentonite shall be hydrated from land surface to a minimum depth of 50 feet below land suface. Unhydrated bentonite shall be hydrated with potable water in maximum ten foot lifts to ensure activation.

(13) The estimated and actual volume of sealing material used shall be calculated and reported on the Water Supply Well Report as required by OAR 690-205-0210.

OREGON ADMINISTRATIVE RULES
WATER RESOURCES DEPARTMENT
CHAPTER 690 DIVISION 240
MONITORING WELL, GEOTECHNICAL HOLE AND OTHER HOLE
CONSTRUCTION STANDARDS

TABLE 240-1

CONSTRUCTIONS STANDARDS THAT APPLY

The Department regulates the construction of borings through which ground water may become contaminated. The type of boring (and its purpose) will determine the construction standards that apply. The table below lists common types of holes and the standards that apply. This is not a complete list of borings and there are other types of borings regulated by other agencies. Contact the Water Resources Department if you have any questions.

The construction standards and the Oregon Administrative Rule that apply are as follows:

1. Water Supply Wells — OAR 690-200 through 690-235
2. Monitoring Wells, Geotechnical Holes and other Holes — OAR 690-240 through 690-240-0640
   - Other Holes — OAR 690-240-0030
   - Geotechnical Holes — OAR 690-240-0035 through 690-240-0049

Type of Boring	Construction Standards that Apply
Air Sparging Well	Monitoring Wells
Aquifer Storage and Recovery Well	Water Supply Wells
Cathodic Protection Hole	Geotechnical Holes
Community Well	Water Supply Wells
Construction Hole	Other Holes
Dewatering Well	Water Supply Wells
Domestic Well	Water Supply Wells
Drive Point (Core holes)	Geotechnical Holes
Drive Point Well (Dewatering)	Water Supply Wells
Drive Point (Water Sampling)	Monitoring Wells
Drive Point (Water Supply)	Water Supply Wells
Dry (Disposal) Well	Other Holes
Elevator Shaft	Other Holes
Extraction Well	Monitoring Wells
Gas Migration Hole	Geotechnical Holes
Geothermal Well	Water Supply Wells
Gravel Pit	Other Holes
Ground Source Heat Pump Borings (Closed Loop)	Geotechnical Holes
Ground Source Heat Pump Borings (Open Loop)	Water Supply Wells
Horizontal Drain (Slope Stability)	Geotechnical Holes
Horizontal Well (Monitoring)	Monitoring Wells
Horizontal Well (Water Supply)	Water Supply Wells

[Text to be deleted is bracketed]
Language to be added is bolded and underlined.

[*Hydrologic Data Hole*]	[*Geotechnical Holes*]
Inclinometer	Geotechnical Holes
Industrial Well	Water Supply Wells
Injection Well (Water)	Water Supply Wells
Injection Well (Remediation) (>72 Hours)	**Monitoring Wells**
Injection Well (Remediation) (<72 Hours)	**Geotechnical Holes**
Irrigation Well	Water Supply Wells
Monitoring Well[*(>72 Hours)*]	Monitoring Wells
Municipal Well	Water Supply Wells
Observation Hole	Monitoring Wells
Permeability Test Hole	Geotechnical Holes
Piezometer (Electric)	Geotechnical Holes
Piezometer (Pneumatic)	Geotechnical Holes
Piezometer Well	Monitoring Wells
Piling Hole	Other Holes
Post Hole	Other Holes
Power Pole Hole	Other Holes
Public Supply Well	Water Supply Wells
Remediation Or Recovery Well	Monitoring Well/Water Supply Wells
Rock Boring (<10 Feet)	Other Holes
Rock Boring (>10 Feet)	Geotechnical Holes
Seismic Shot Hole	Geotechnical Holes
Slope Stability Hole	Geotechnical Holes
Soil Boring (<10 Feet)(geophysical borings)	Other Holes
Soil Boring (>10 Feet)(geophysical borings)	Geotechnical Holes
Soil Vapor Hole	Geotechnical Holes
Sparging Well	Monitoring Wells
Storm Water Disposal	Other Holes
Sump	Other Holes (if < 10 ft. deep and > 10 ft. dia.)
Temporary Monitoring Well (<72 Hours)	Geotechnical Holes
Temporary Monitoring Well (>72 Hours)	**Monitoring Wells**
Trench	Other Holes
Underground Storage Tank (Ust) Pit	Other Holes
Vapor Extraction Hole	Geotechnical Holes
Wetland Delineation Hole	Other Holes

[Text to be deleted is bracketed]
Language to be added is bolded and underlined.

690-240-0355
Monitoring Well Drilling Machines
(1) All monitoring well drilling machines being operated, other than under a landowner's permit, shall be plainly marked either with the bonded Monitoring Well Constructor's license number, the name of the bonded Monitoring Well Constructor, or the name of the well drilling business. The markings shall be permanently affixed on each side of the **machine**[*vehicle*]. Good quality paint or commercial decal numbers shall be used in placing the identification information on the drilling machine. In no case shall the constructor's license number, name, or business name, be inscribed with crayon, chalk, marking keel, pencil, or other temporary markings.
(2) In all cases, the license number, name, or business name, of the bonded Monitoring Well Constructor shall be removed from the drilling machine immediately upon change of ownership or change of control of the drilling machine.

690-240-0475
Well Seals
(2)(c) When a mixture of cement and bentonite is used as a slurry for grouting, the cement shall be American Petroleum Institute Class A or B, or ASTM C-150 Type I or II neat cement. The slurry shall be no more than five percent, by dry weight*[of cement*], **of** sodium bentonite gel powder (3.75 pounds of bentonite per sack of cement). For each pound of bentonite added, up to an additional 0.7 gallons of water shall be added to the original neat cement mix. The water and bentonite shall be mixed first, and then the cement added to the bentonite slurry. The cement-bentonite mixture shall have a mud weight of approximately 14.1 pounds per gallon;

690-240-0525
Piezometers
It is prohibited to construct a piezometer in an area of known or reasonably suspected contamination. **NOTE:** The Water Resources Department and the Department of Environmental Quality have information sources to use in determining if contaminants are present. Customary drilling practice as conducted by licensed professional must be included as part of the appropriate inquiry to determine if contaminants are present or reasonably suspected.
(1) A piezometer is defined in OAR 690-240-0010[*(57)*]**(59)**. Piezometers are a type of monitoring well and shall meet current monitoring well rules except for the following:
(a) Borehole size with depth requirements:
(A) For piezometers with a sealing depth less than 50 feet deep, the borehole diameter shall be at least two and one half inches (2.5") larger than the nominal casing diameter. If the piezometer is constructed using a hollow stem auger drilling machine, the inside diameter of the auger must be at least 2.5 inches larger than the nominal diameter of the casing to be installed;
(B) For piezometers with a sealing depth greater than 50 feet deep, the borehole diameter shall be at least three inches larger than the nominal casing diameter. If the piezometer is constructed using a hollow stem auger drilling machine, the inside diameter of the auger must be at least 3 inches larger than the nominal diameter of the casing to be installed.
(b) Surface Completion:
(A) [*If the piezometer is completed above ground, it shall have a minimum casing height of one foot above finished grade and a lockable cap with lock shall be attached to the top of the casing. If*

vulnerable to damage, the] **P**[*p*]iezometer**s** shall be protected as described in OAR 690-240-0420 **concerning monitoring wells.**[*;*]
[*(B) If the piezometer is completed below ground surface, a lockable, watertight cap, with lock, shall be attached to the top of the casing. A vault or monument designed to be watertight, level with the ground surface, shall be installed to prevent the inflow of surface water. The cover must be designed to withstand the maximum expected loadings*].
(c) If an artesian piezometer flows at land surface, it shall be equipped with a control valve or a watertight mechanical cap, so that all flow of water from the well can be completely stopped. Flowing artesian piezometers are not required to be equipped with a pressure gauge placed on a dead-end line or a petcock valve;
(d) The special cleaning and drill cutting storage requirements in OAR 690-240-0450 shall not apply to piezometers because they may not be constructed in areas of known or reasonably suspected contamination. However, all equipment and materials used in the construction of a piezometer shall be free of foreign materials and contaminants prior to entry into the well;
(e) Use of commercially fabricated screens are not required for piezometers. The screens installed shall be in new or like new condition, being free of pits or breaks, and shall be free of foreign materials and contaminants prior to installation;
(f) The filter pack requirements of OAR 690-240-0460(5) shall not apply to piezometers because they are not constructed in areas of known or reasonably suspected contamination;
(g) A minimum three foot annular seal is required. If a grout slurry is used, the filter pack seal requirements of 690-240-0460(6) apply. If a piezometer is completed with a flush monument, the annular seal shall extend a minimum of three feet below the monument seal.