[APPENDIX 240-1

METHODS FOR ATTACHING WELL IDENTIFICATION TAG

MONITORING WELLS

Tags should be placed in an accessible and visible location.

For above ground completion wells:

Place tags at least 6 inches above ground level. Attach the tag to the outside of the protective casing.

The following methods are recommended by the Oregon Water Resources Department:

A. Strap the tag to the well casing or access port. Stainless steel bands or large hose clamps designed for exterior use are recommended. Straps may be available at electrical, auto supply or construction supply stores. Ultra violet resistant nylon straps are also acceptable. Any band used should be designed for exterior applications.
B. Rivet or bolt the tag to the well casing. Stainless steel rivets may be used.

For flush grade completion wells:

B. Rivet or bolt the tag to the inside of the monument skirting.
B. Band or strap the tag to the well casing.
C. Insert the strap or band into the concrete in the bottom of the vault.

Regardless of which method is used, the identification label must be easily readable.

Other options may be used provided the installation is permanent and visible. Please contact the Water Resources Department for other options.]

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

TABLE 240-1

WHICH[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]**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 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 **general**[construction] standards and the**ir** Oregon Administrative Rule **reference** [that apply]are[as follows]:

Water Supply Wells	OAR 690-200 through 690-235
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]**Description** 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 **Well**(Water Sampling)	Monitoring Wells
Drive Point **Well**(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 **Exchange Hole** [Pump Borings] (Closed Loop)	Geotechnical Holes
[Ground Source]Heat **Exchange Hole** [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.

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	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
Wet Soil Monitoring Hole	**Geotechnical Holes**

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

OREGON ADMINISTRATIVE RULES
WATER RESOURCES DEPARTMENT
CHAPTER 690 DIVISION 240
WELL CONSTRUCTION STANDARDS

690-240-0010

Definitions

(11) "Casing Seal" means the water tight seal established in the well bore between the well casing and the drillhole wall, above the filter pack seal, to prevent the inflow and movement of surface water or shallow ground water in the well annulus, or to prevent the outflow or movement of water under artesian or hydrostatic pressures. **This term is synonymous with "annular seal" or "surface seal".**

(17) "Confining **Interval**[Formation]" means **a low permeability material such as clay or solid, unfractured, consolidated rock**[the "impermeable" stratum] immediately overlying an artesian (confined) aquifer. (Figure 240-1)

[(46) "Impermeable Sealing Material" means cement or bentonite which is used to fill the open annulus.]

(4[7]**6**) "Jetted Well" means a well in which the drillhole excavation is made by the use of a high velocity jet of water.

(4[8]**7**) "Leakage" means movement of surface and/ or subsurface water around the well casing or seal.

(4[9]**8**) "Monitoring Well" means a well designed and constructed to determine the physical (including water level), chemical, biological, or radiological properties of ground[ ]water.

([50]**49**) "Monitoring Well Constructor" means any person who has a current water well constructor's license with a monitoring well endorsement issued in accordance with ORS 537.747(3).

(5[1]**0**) "Monitoring Well Constructor's License" means a Water Well Constructor's License with a monitoring well endorsement issued in accordance with ORS 537.747(3).

(5[2]**1**) "Monitoring Well Drilling Machine" means any driving, jetting, percussion, rotary, boring, auguring, or other equipment used in the construction, alteration, or abandonment of monitoring wells.

(5[3]**2**) "Order" means any action satisfying the definition given in ORS Chapter 183 or any other action so designated in ORS 537.505 to 537.795.

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

(5[4]**3**) "Other Hole" means a hole other than a water supply well, monitoring well, or geotechnical hole, however constructed, in naturally occurring or artificially emplaced earth materials through which ground[ ]water can become contaminated. Holes constructed under ORS Chapters 517, 520, and 522 are not subject to these rules. Examples of other holes are listed in OAR 690-240-0030.

(5[5]**4**) "Perched Ground[W]**w**ater" means ground[ ]water held above the regional or main water table by a less permeable underlying earth or rock material. (Figure 240-1)

(5[6]**5**) "Permeability" means the ability of material to transmit fluid, usually described in units of gallons per day per square foot of cross-section area. It is related to the effectiveness with which pore spaces transmit fluids.

(5[7]**6**) "Person" includes individuals, corporations, associations, firms, partnerships, joint stock companies, public and municipal corporations, political subdivisions, the state and any agencies thereof, and the Federal Government and any agencies thereof.

(5[8]**7**) "Petcock Valve" is a valve used to contain pressure which when opened will drain the line or pipe.

(58) "Petroleum" means gasoline, crude oil, fuel oil, diesel oil, lubricating oil, oil sludge, oil refuse, and crude oil fractions and refined petroleum fractions, including gasoline, kerosene, heating oils, diesel fuels, and any other petroleum-related product or waste or fraction thereof that is liquid at a temperature of 60 degrees Fahrenheit and a pressure of 14.7 pounds per square inch absolute. "Petroleum" does not include any substance identified as a hazardous waste under 40 CFR Part 261.

[(77) "Stratum" means a bed or layer of a formation that consists throughout of approximately the same type of consolidated or unconsolidated material.]

(7[8]**7**) "Sump" means a hole dug to a depth of ten feet or less with a diameter greater than ten feet in which ground water is sought or encountered.

(7[9]**8**) "Suspension" means the temporary removal of the privilege to construct wells under an existing license for a period of time not to exceed one year.

([80]**79**) "Unconsolidated Formation" means naturally occurring, loosely cemented, or poorly indurated materials including clay, sand, silt, and gravel.

(8[1]**0**) "Underground Injection" means the emplacement or discharge of fluids to the subsurface.

(8[2]**1**) "Underground Injection System" means a well, improved sump, sewage drain hole, subsurface fluid distribution system, or other system or ground water point source used for the emplacement or discharge of fluids.

(8[3]**2**) "Upper Oversize Drillhole" means that part of the well bore extending from land surface to the bottom of the surface seal interval.

(8[4]**3**) "Violation" means an infraction of any statute, rule, standard, order, license, compliance schedule, or any part thereof and includes both acts and omissions.

(8[5]**4**) "Water Supply Well" means a well, other than a monitoring well, that is used to beneficially withdraw or beneficially inject ground water. Water supply wells include, but are not limited to, community, dewatering, domestic, irrigation, industrial, municipal, and aquifer storage and recovery wells.

(8[6]**5**) "Water Supply Well Constructor" means any person who has a current water well constructor's license with a water supply well endorsement issued in accordance with ORS 537.747(3).

(8[7]**6**) "Water Supply Well Constructor's License" means a Water Well Constructor's License with a water supply well endorsement issued in accordance with ORS 537.747(3).

(8[8]**7**) "Water Table" means the upper surface of an unconfined water body, the surface of which is at atmospheric pressure and fluctuates seasonally. The water table is defined by the levels at which water stands in wells that penetrate the water body. (See Figure 240-1)

(8[9]**8**) "Water Well Constructor's License" means a license to construct, alter, deepen, abandon or convert wells issued in accordance with ORS 537.747(3). Endorsements are issued to the license and are specific to the type of well a constructor is qualified to construct, alter, deepen, abandon or convert.

([90]**89**) "Well" means any artificial opening or artificially altered natural opening, however made, by which ground water is sought or through which ground water flows under natural pressure, or is artificially withdrawn or injected. This definition shall not include a natural spring, or wells drilled for the purpose of exploration or production of oil or gas. Prospecting or exploration for geothermal resources as defined in ORS 522.005 or production of geothermal resources derived from a depth greater than 2,000 feet as defined in ORS 522.055 is regulated by the Department of Geology and Mineral Industries.

(90) "Wet Soil Monitoring Hole" means a shallow geotechnical hole set vertically in the ground and constructed to a depth of three and one-half feet or less for studying and/or monitoring the upper portion of the shallowest water-bearing unit within and immediately below the surface soil horizon.

OREGON ADMINISTRATIVE RULES
WATER RESOURCES DEPARTMENT
CHAPTER 690 DIVISION 240
WELL CONSTRUCTION STANDARDS

690-240-0024

Well Identification Label

(1) Within 30 days of completion of well construction, conversion, or alteration, the constructor shall permanently affix a well identification label to the wellhead **in an accessible and visible location in the following manner:** [as described in **Appendix 240-1**.]

(a) For above ground completions:

(A) Labels shall be at least six inches above ground surface and shall be permanently attached to the outside of the protective casing using a stainless steel band, stainless steel rivets, or screws.

(b) For flush grade completions:

(A) Rivet or bolt the label to the inside of the monument skirting; or

(B) Band or strap the label to the well casing; or

(C) Insert the strap or band into the concrete in the bottom of the vault.

(2) Identification labels may not be attached to pumps, pump equipment, water delivery lines, or well caps.

(3) The identification **label** number shall be recorded on the well report **at the time the report is submitted**.

(4) The well identification label shall be attached in such a manner as to be easily readable upon inspection.

(5) Identification labels shall be furnished by the Department.

([2]**6**) If a well identification label is already affixed to an existing well that is being altered, converted, or abandoned, the constructor shall record the identification **label** number on the well report.

([3]**7**) When a well that has a well identification label [(tag)]on it is permanently abandoned, the well identification **label**[tag] shall be destroyed. The well identification **label**[tag] shall not be reused.

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

OREGON ADMINISTRATIVE RULES
WATER RESOURCES DEPARTMENT
CHAPTER 690 DIVISION 240
WELL CONSTRUCTION STANDARDS

OAR 690-240-0035(3) Geotechnical holes [between ten and eighteen feet in depth]that do not meet any of the criteria spelled out in OAR 690-240-0035(2) do not require a geotechnical hole report to be filed with the Department, but shall be required to have a professional as described in 690-240-0035(4)(c) be responsible for the construction and abandonment of the geotechnical hole.

OAR 690-240-0035(4)(c) When a geotechnical hole report is required, [or if it is between 10' and 18' in depth,]the professional responsible for the construction, alteration or abandonment of a geotechnical hole shall have one of the following certifications or licenses at the time the professional signs the geotechnical hole report:

(A) A valid Oregon Monitoring Well Constructor's License;

(B) A valid Oregon Water Supply Well Constructor's License;

(C) Valid certification by the State of Oregon as a Registered Geologist; or

(D) Valid certification by the State of Oregon as a Professional Engineer.

OAR 690-240-0035(7) Cased permanent geotechnical holes

(a) Cased permanent geotechnical holes include but are not limited to: gas migration holes, cathodic protection holes**, wet soil monitoring holes,** and vapor extraction holes;

(b) [If p]**P**ermanent casing [is]installed in a geotechnical hole[, it] shall meet the casing requirements in OAR 690-240-0430, 690-210-0210, or 690-210-0190[and the sealing requirements in 690-240-0475].

(c) The borehole diameter for cased permanent geotechnical holes shall be at least four inches larger than the nominal casing diameter. If the cased permanent geotechnical hole is constructed using a hollow stem auger drilling machine, the inside diameter of the auger must be at least four inches larger than the nominal diameter of the casing to be installed. Cased permanent geotechnical holes installed using direct push technology shall meet the annular space requirements in OAR 690-240-0540.

(d) Cased permanent geotechnical holes, except wet soil monitoring holes, shall be sealed in accordance with the filter pack seal requirements in OAR 690-240-0460, and the casing seal requirements in OAR 690-240-0475.

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

(e) Wet soil monitoring holes shall have a casing seal that extends to a minimum depth of one-foot. The casing seal shall be placed in accordance with OAR 690-240-0475.

(f) Wet soil monitoring holes shall not exceed three and one-half feet in depth.

OAR 690-240-0035(10) Geotechnical Holes abandonment:

(a) Geotechnical holes shall be abandoned **in the following manner**[so that they do not]:

(A) [Connect water bearing zones or aquifers]**If it can be verified that the geotechnical hole was constructed in accordance with these rules, it shall be abandoned by filling the well from the bottom up with an approved grout as described in OAR 690-240-0475. The casing shall then be removed below grade, as compatible with local site conditions and land practices. The following are acceptable methods of original geotechnical hole construction verification:**

(1) A geotechnical hole report previously submitted to the Water Resources Department;

(2) Geotechnical hole information submitted to the Oregon Department of Environmental Quality;

(3) Other information as approved by the Water Resources Department;

(B) [Allow water to move vertically with any greater facility than in the undisturbed condition prior to construction of the geotechnical hole]**If the geotechnical hole construction cannot be verified by means listed in section (A) of this rule, or if the geotechnical hole was not constructed in accordance with these rules, the geotechnical hole shall be abandoned by completely redrilling the hole to a minimum of the original diameter. All casing, screen, annular sealing material, drill cuttings, debris, and filter pack material shall be removed prior to sealing.**[; or]

[(C) Allow surface water to enter the hole.]

(b) [Temporary g]**G**eotechnical holes constructed to collect a water quality sample shall be abandoned in accordance with OAR 690-240-0510.

690-240-0043

Construction Standards

(1) If permanent casing is needed in a ground source heat pump boring, it shall meet the standards set out in OAR 690-210-0190 through 690-210-0220 for steel and plastic.

(2) Site specific conditions shall be assessed to determine the best method and materials to be used for sealing the boring annulus to protect the groundwater resource and that method shall meet the standards set out in OAR 690-210-0300 through 690-210-0360 for sealing wells.

(3) The diameter of the borehole for cased and uncased ground source heat pump borings shall allow placement of the heat exchange loop and grout pipe to the bottom of the boring as follows:

(a) For installation of a 3/4 inch loop, the diameter of the borehole shall be a minimum of 4 inches;

(b) For installation of a 1 inch loop, the diameter of the borehole shall be a minimum of 4 1/2 inches; and

(c) For installation of a 1 1/4 inch loop, the diameter of the borehole shall be a minimum of 5 inches.

(4) The type of sealing material used shall be compatible with the heat exchange loop material and permanent casing material used in the construction of the boring.

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

690-240-0395

Monitoring Well Report Required (Monitoring Well Log)

(1) A monitoring well report shall be prepared for each monitoring well constructed, altered, converted, or abandoned including unsuccessful monitoring wells. The log shall be certified as correct by signature of the Monitoring Well Constructor constructing the monitoring well. The completed log shall also be certified by the bonded Monitoring Well Constructor responsible for construction of the monitoring well. A monitoring well report must be submitted by each bonded constructor (if drilling responsibility is shifted to a different bonded constructor), showing the work performed by each bonded constructor.

(2) The log shall be prepared in triplicate on forms furnished or previously approved in writing by the Water Resources Department. The original shall be furnished to the Director, the first copy shall be retained by the Monitoring Well Constructor, and the second copy shall be given to the customer who contracted for the construction of the monitoring well.

(3) The bonded Monitoring Well Constructor shall file the monitoring well log with the Director within 30 days after the completion of the construction, alteration, conversion, or abandonment of the monitoring well.

(4) The trainee or Monitoring Well Constructor operating the monitoring well drilling machine shall maintain a rough log of all geologic strata encountered and all materials used in the construction of the monitoring well. This log shall be available for inspection by the Watermaster or other authorized agent of the Water Resources Department or other delegated agency representative at any time before the monitoring well report is received by the Department. The rough drilling log shall be in handwritten or electronic form, or a voice recording.

(5) In the event a constructor leaves any drilling equipment or other tools in a monitoring well this fact shall be entered on the monitoring well report.

(6) A copy of any special authorizations or special standards issued by the Director shall be attached to the monitoring well report.

(7) The report of monitoring well construction required in section (1) of this rule shall be recorded on a form provided or previously approved in writing by the Department. The form shall include, as a minimum, the following:

(a) Name and Address of Landowner;

(b) Started/Completed date;

(c) Location of the well by county, Township, Range, Section, tax lot number, if assigned, street address, or nearest address, and either the 1/4, 1/4 section or Latitude and Longitude as established by a global positioning system (GPS);

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

(d) Start card number;

(e) Well identification label number (well tag number);

(f) Use of well;

(g) Type of work;

(h) Type and amount of sealant used and measured weight of the grout slurry as required in OAR 690-240-0475(2)(g);

(i) Temperature of water;

(j) Total dissolved solids (TDS);

([j]**k**) Map showing location of monitoring well on site, must be attached and shall include an approximate scale and a north arrow; **and**

([k]**l**) Such additional information as required by the Department.

690-240-0440

Additional Standards for Artesian Monitoring Wells

(1) Monitoring wells penetrating into an artesian aquifer shall have an upper oversize drillhole at least four inches greater in diameter than the nominal diameter of the permanent well casing except as noted in OAR 690-240-0525 concerning piezometers. Watertight unperforated casing shall extend and be sealed, according to OAR 690-240-0475, at least five feet into the confining **interval**[formation] immediately overlying the artesian water-bearing zone.

(2) If an artesian monitoring 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.

(3) All flowing artesian monitoring 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.

(4) All flowing artesian monitoring 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.

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

690-240-0510

Abandonment of Monitoring Wells

(7) When abandoning artesian monitoring wells, in addition to sections (1)-(6) of this rule, the flow shall be confined or restricted by cement grout applied under pressure, or by the use of a suitable well packer, or a wooden plug placed at the bottom of the confining **interval**[formation] immediately above the artesian water bearing zone. An approved **grout**[sealant] shall be used to fill the well to land surface as specified in OAR 690-240-0475.

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

OREGON ADMINISTRATIVE RULES
WATER RESOURCES DEPARTMENT
CHAPTER 690 DIVISION 240
WELL CONSTRUCTION STANDARDS

OAR 690-240-0525 Piezometers

(2) Piezometer well abandonment:

(a) Piezometer wells shall be abandoned as described in OAR 690-240-0510 concerning monitoring wells.

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

OREGON ADMINISTRATIVE RULES
WATER RESOURCES DEPARTMENT
CHAPTER 690 DIVISION 240
WELL CONSTRUCTION STANDARDS

690-240-0540

Direct Push Monitoring Wells and Piezometers

(1) Monitoring wells and piezometers that are installed using direct push technology shall comply with the applicable standards in these rules[for reporting, casing, screening, filter pack, filter pack placement, filter pack seal, development, surface seal, cleaning, protection, marking, and completion].

(2) Monitoring wells and piezometers that are installed using direct push technology shall also comply with the following standards:

(a) Only prepacked screens shall be used; and

(b) The outside diameter of the borehole shall be a minimum of **two**[one] inch**es** greater than the outside diameter of the well casing; and

(c) Granular bentonite shall not be used in the **casing** seal[ed] interval below the static water level; and,

(d) **Monitoring** [W]**w**ells and piezometers shall not be constructed through more than one water bearing formation and shall not be greater than 50 feet in depth[unless a special standard is obtained.]**; and**

(e) Monitoring wells and piezometers that extend deeper than 30 feet shall be equipped with centering guides to insure proper centering of casing. Guides shall be spaced at minimum ten foot intervals and attached to the casing.

(3) Monitoring wells and piezometers larger than two inches in diameter shall not be installed using direct push technology without prior Department approval.

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