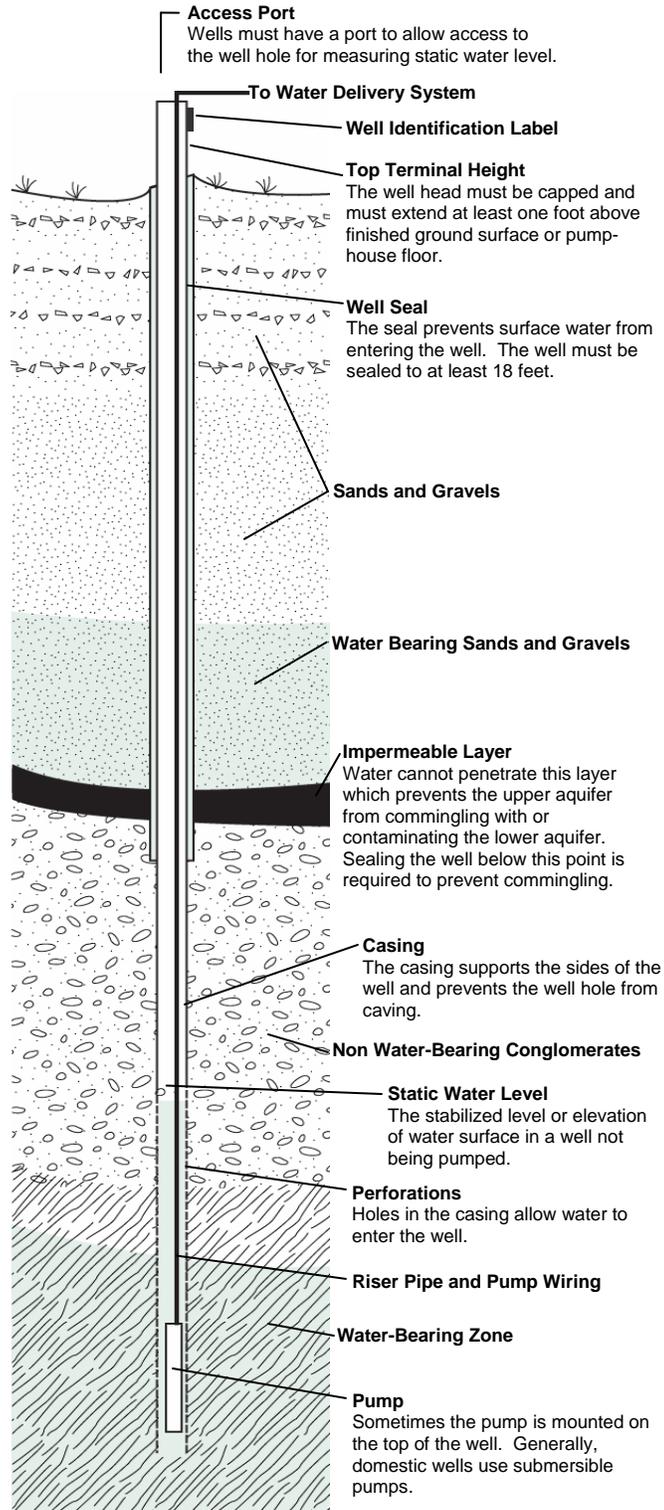


*A  
landowner's  
do it yourself  
guide to*

**WATER WELL  
CONSTRUCTION**

State of Oregon  
Water Resources  
Department

August 2007



*This booklet provides general information about well construction in Oregon.*

*The information included is primarily for those individuals who wish to construct their own water well.*

## Requirements

A Landowner's Well Permit and bond allow you to construct a water supply well on property you own. A separate permit and bond is required for each well. Before you drill the following must be submitted to the Water Resources Department (WRD) in Salem:

1. a completed Landowner Well Permit Application,
2. a \$25 permit fee,
3. a completed \$5,000 landowner's bond or irrevocable letter of credit, and
4. a well design plan describing how your well will be constructed.

You may obtain an application for a Landowner's Well Permit, a bond form, and a copy of current state well construction standards and regulations from the WRD website: [www.wrd.state.or.us](http://www.wrd.state.or.us).

## DESIGN PLAN

A sample plan is included in the Landowner Well Permit Application packet. Your plan should include the following:

- Casing type (PVC, steel),
- Casing diameter,
- Casing depth
- Sealing material
- Seal depth
- Approximate well depth

# Finding Ground Water

The amount and quality of ground water in an area can depend on yearly rainfall, geologic conditions, topography, distance to nearby wells, and surface water supply.

## **WATER WELL REPORTS (WELL LOGS)**

A useful tool for learning about the local ground water is the water well report, or “well log.” Well logs are prepared by well drillers describing how a well was constructed. Well logs describe the geologic formations encountered during construction of a well.

WRD has well logs for most of the water wells drilled in Oregon since 1955. However, the likelihood of finding records for wells drilled after 1970 is much higher than for older wells. Well logs are available on the Department’s website: [www.wrd.state.or.us](http://www.wrd.state.or.us).

## **WATER WITCHES**

Water witches or “dowsers” claim to predict the presence of water with hand-held tools such as forked twigs or metal rods. Since there is no scientific basis to dowsing, most geologists do not recommend the practice. Although most water witches charge only a modest fee, the U.S. Geological Survey and National Ground Water Association advise against employing a water witch to search for ground water.

## Well Placement

WRD has established rules to define where your well can be located. The following standards apply to the placement of wells:

- Locate the well away from septic tanks, sewage disposal areas (such as a drain field), and other sources of contamination such as stock yards, storm sewers, privies, or refuse dumps.
- WRD requires a *minimum* distance of 50 feet from septic tanks and 100 feet from sewage disposal areas. Soil type and topography in your area may require greater distances.
- Increase the distances in areas of highly permeable formations (i.e. sand and gravel).
- Run surface drainage away from the well on all sides; divert up-slope drainage away from hillside wells using berms or trenches.
- Locate the well above (higher in grade) disposal areas if possible.
- Locate the well at least five feet from buildings to allow access during maintenance, repair, testing, or redrilling. Remember to plan future well construction repairs or pump replacement before building a shelter around the well.
- Locate the well in an area free from flooding or plan extra precautions to protect it.
- Site your well as far as possible from neighboring wells. When wells are close together, they may interfere with each other.
- Site your well a safe distance from your property line. This will prevent difficulties with neighboring septic systems and boundary line inaccuracies.
- Two business days notice is required by law. Call the Oregon Utility Notification Center at (800) 332-2344 if you dig deeper than 12 inches.

- Be aware of transmission lines and overhead powerlines.

After legal, health and safety requirements, the main consideration in locating your well is convenience. If conditions allow, locate the well near where you will use the water and near a power source.

Contact your county health and planning departments for additional well location and permit requirements before you drill.

## Well Construction Standards

Oregon's well construction standards are rules designed to protect the ground water resource and the public by preventing contamination of the aquifer.

When the minimum construction standards cannot be met, the person responsible for drilling, altering, or abandoning the well must make application for a "special standard" from the Department. A special standard allows deviation from the minimum well construction standards. The request must be approved before completing the work.

## Common Well Terms

**ACCESS PORT** — All wells must have an access port for measuring the water level or a pressure gauge for measuring artesian pressure. The access port must be unobstructed. The access port should be capped to prevent surface water from entering the well casing.

**COMMINGLING** — Occurs when a well draws water from more than one aquifer. In no case shall a well be constructed to tap into multiple aquifers.

**PERFORATIONS** — Holes in the casing, which allow water to enter the well.

**SPECIAL STANDARDS** — A special standard allows deviation from the minimum well construction standards. The request must be approved before completing the work.

**STATIC WATER LEVEL** — The stabilized level or elevation of water surface in a well when it is not being pumped.

**TOP TERMINAL HEIGHT** — The casing of any well must extend at least 12" above the finished ground surface or pumphouse floor, and 12 inches above the local surface runoff level.

**WELL CASING** — Steel or plastic pipe installed to prevent the borehole wall from caving in and is also used to seal the upper portion of the well. The total length of casing used should be the same as that recorded on the well log.

**WELL DEPTH** — Can be measured by using a weighted line.

**WELL DEVELOPMENT** — Involves vigorously pumping the well to help clean out drill cuttings and to maximize production of the well. Development should result in a well which produces sand-free or mud-free water when operated properly.

**WELL IDENTIFICATION LABEL** — A preprinted stainless steel label attached to the well casing. This unique number identifies your well and will be used to track any future modifications to the well. *Please do not remove or cover this label.*

**WELL LOG** — A well log or well report is a physical description of how your well was constructed. Keep your copy of the well log. This is one of the more important records of your property.

**WELL SEAL** — The space between the borehole wall and the casing to prevent commingling or contamination of the aquifer. The seal should be placed in one continuous operation from the bottom upward. A proper seal consists of neat cement (cement and water) or bentonite (a dry clay) which extends from the ground surface to a minimum depth of 18 feet below land surface. The construction standards require a deeper seal depending on the formations encountered.

**WELL TEST** — A well test shows how much water the well produces. One of these methods is used: pump, air, or bailer. The static water level, the date, the drawdown at the end of the test period, the pumping rate, and the length of the test period are recorded on the well log. A one-hour minimum yield test is required when the work is completed on the well.

## Estimating Your Water Needs

To estimate your daily peak water demand, add the appropriate quantities of water for all uses which would likely occur. Peak demand in the home normally occurs at the beginning of the day, at bedtime, or during laundry or irrigation uses. The following guide will help you determine peak demand.

Type of Use	
<b>DWELLINGS</b>	Gallons per day
Typical single family home	
With conservation	.50/person
Without conservation	75/person
<b>LIVESTOCK</b>	Gallons per animal per day
Cattle/steer.....	12
Dairy (plus maintenance) .....	35
Goat .....	2
Hog .....	4
Horse/mule.....	12
Sheep.....	2
<b>POULTRY</b>	
Chickens (up to 100).....	10
Turkeys (up to 100).....	18

Some domestic water systems are designed to store water during times of low demand (such as night time). This stored water can be used later to supply water during peak demand (laundry, lawn watering). An experienced pump installer or plumbing contractor can plan a water system based on your needs and water source. In contrast to a domestic well, an irrigation well must be able to produce water at steady high rates for extended periods of time. Irrigation systems must be carefully designed to minimize pumping costs and to prevent excessive drawdown of the well.

## Obtaining Water Rights

Under Oregon law, all ground water is considered a public resource. In general, a water right permit must be obtained before using water from any well.

The following uses of ground water **do not** require making application for a water right permit.

- Group and single-family domestic use up to 15,000 gallons per day.
- Stock watering.
- Watering any lawn and/or non-commercial garden totaling one-half acre or less in area.
- Down-hole heat exchangers.
- Any single industrial or commercial development up to 5,000 gallons per day.

These exempted uses are on a per-property or per-development basis and cannot be increased. For example, you cannot double the amount exempted by adding a second well.

If you have questions regarding your ground water use and the requirement to obtain a water right permit, contact WRD's Customer Service Group at (503) 986-0801.

A number of Oregon counties may also require permits for certain developments. Contact your county government for local rules.

For uses requiring a water right permit, you must file an application with the Department, including a map of the proposed site to be developed. The application review process takes about eight months. This time allows the Department to review the application and also provides an opportunity for public comment on the proposed use. Application forms, a list of Certified Water Right Examiners, and rules and statutes governing well construction in Oregon are available on WRD's website at [www.wrd.state.or.us](http://www.wrd.state.or.us).

The Oregon Water Resources Commission is responsible for managing the ground water resource. In many areas, high demand on the ground water supply has required that new uses be restricted or prohibited. The uses which may be affected can also include those for which water rights are not required. Before making any expenditures on a planned well, you should consult with the Department to confirm that your planned use of water is permitted by the Department. (District watermaster offices are listed at the end of this brochure.)

### **Additional Information**

Oregon Water Resources Department  
725 Summer Street NE, Suite A  
Salem, Oregon 97301-1266  
Tel: (503) 986-0900  
Fax: (503) 986-0902  
Web: [www.wrd.state.or.us](http://www.wrd.state.or.us)

Department of Human Services  
Drinking Water Program  
800 NE Oregon Street, Suite 611  
Portland, Oregon 97232-2162  
Tel: (971) 673-0405  
Web: [www.oregon.gov/DHS/ph/dwp/](http://www.oregon.gov/DHS/ph/dwp/)

## District Watermasters



**Greg Beaman**  
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**Larry Menteeer**  
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 FAX (541) 774-6187

**Kathy Smith**  
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 (541) 471-2886 x223  
 FAX (541) 471-2876

**David Williams**  
 District 15, Roseburg  
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 FAX (541) 440-6264

**Mike McCord**  
 District 16, Salem  
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**Vern Church**  
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 FAX (541) 885-3324

**Darrell Hedin**  
 District 18, Hillsboro  
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 FAX (503) 846-7785

**Mitch Lewis**  
 District 19, Coquille  
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 FAX (541) 396-6233

**Sabrina White**  
 District 20, Oregon City  
 (503) 722-1410  
 FAX (503) 722-5926

**Joel Clark**  
 District 21, Condon  
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