

# Open Loop Ground Source Heat Pumps

## Considering installing an open loop ground source heat Pump?

Open loop ground source heat pumps (heat pumps) are systems that use the temperature differences in groundwater to heat or cool a structure. They withdraw water from below ground, pass it through a heat exchanger, and return the water to the aquifer or discharge it to the surface. While heat pumps have been around for years, they have increased in popularity due to their environmental benefits, such as energy efficiency and affordability.

There are environmental impacts to consider when planning and constructing a heat pump. Following the four steps below will help you identify the permits, requirements, and conditions that apply to your project. The term "permit" also includes environmental review processes, authorizations, certifications, licenses, and approvals.

For free assistance with identifying environmental permits, contact the Governor's Office for Regulatory Innovation and Assistance (ORIA) at <http://www.oria.wa.gov>.

**Financial Incentives** There may be rebates and tax credits available for heat pump installation. Check with your local electric utility and state and federal agencies.



### Step 1: Consider Environmental Factors.

When designing a heat pump system, there may be a number of environmental impacts depending on where and how the system is installed. Protection of groundwater quality and quantity are major concerns.

### Step 2: Complete a draft State Environmental Policy Act (SEPA) Checklist.

Answering common SEPA questions will give you an idea of what questions agency staff will ask and what information you will need for your application. For SEPA documents visit <http://www.ecy.wa.gov/programs/sea/sepa/e-review.html>.

### Step 3: Determine requirements for each permit and modify your proposal accordingly.

Agencies often have requirements and conditions that must be followed and guidelines that are recommended. If you have questions, contact the agency staff who will review your application. For help identifying your regional contacts, contact the ORIA Information Center.

### Department of Ecology or Waster Conservancy Board - Water Rights Permit.

Ecology or Board Contact: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

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## Local Jurisdictions (City or County) – SEPA, Shoreline Master Program, Critical Areas Ordinance, Grading, Building, Plumbing, and Mechanical.

City or County Contact: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

The city or county provides information about requirements that must be met during the planning and construction of the system. These may vary by jurisdiction. Use of the SEPA Checklist supports analysis of the environmental impacts of the project. SEPA must be completed before local, state, and federal permits can be issued. Permits under Shoreline Master Programs and Critical Areas Ordinances may be required if the project is located near a waterbody or other environmentally sensitive area. The city or county also issues building, grading, plumbing, and mechanical permits.

## State and Local Health Departments – Well Construction Inspection.

Health Department Contact: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

The Washington State Department of Health (DOH) has specific location and construction requirements for public drinking water wells. Heat pumps cannot be located within 100 feet of any drinking water supply, and in some cases may need to be further away. If a drinking water supply is near a potential location for a heat pump, contact the water supply authority or water well owner.

In addition to DOH requirements, the following local health departments approve and inspect new well construction: Clark, Grant, Jefferson, Mason, King, Kitsap, Kittitas, Okanogan, Pierce, San Juan, Skagit, Skamania, Snohomish, Spokane, Thurston, Whatcom, and Yakima.

These local health departments protect drinking water by ensuring that surface water cannot reach aquifers. Health departments do this by inspecting the seals between the well casing and the hole.

Contact your local health department for applications, well requirements, and inspections before well construction  
<http://www.doh.wa.gov/aboutus/publichealthsystem/localhealthjurisdictions.aspx>.

## Department of Ecology- Underground Injection Control (UIC) Registration or State Wastewater Discharge Permit.

Department of Ecology Contact: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

The use of more than 5,000 gallons of groundwater on any day requires a Water Right Permit from Ecology or a Water Conservancy Board. The use may be considered non-consumptive and beneficial: [www.ecy.wa.gov/programs/wr/rights/water-right-home.html](http://www.ecy.wa.gov/programs/wr/rights/water-right-home.html).

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## UIC Registration

Discharge to an injection well, dry well, or other method of underground disposal requires registration with Ecology's UIC Program. Contact the UIC Program at (360) 407-6143 or <http://www.ecy.wa.gov/programs/wq/grndwtr/uic/index.html>.

## State Water Discharge Permit

Discharge from the heat pump to land may require a State Wastewater Discharge Permit: <http://www.ecy.wa.gov/programs/wq/permits/index.html>.

## Department of Ecology- Notice if Intent to Construct a Well.

Department of Ecology Contact: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

A driller with a Washington State well operator's license is required for this activity. A property owner seeking to have a well-constructed is required to submit a Notice of Intent (NOI) to Ecology 72 hours prior to construction:

<https://fortress.wa.gov/ecy/wrwater/Wells/NoticeOfIntentGeneralInformation.aspx>.

Ecology also requires that a well report be submitted within 30 days of completion of the well.

## Step 4:

### Submit Applications

- Verify that a water right is available by contacting Ecology's Water Resources Program: <http://www.ecy.wa.gov/programs/wr/rights/water-right-home.html#contacts>.
- Submit applications for local permits.
- Usually, the local jurisdiction serves as the SEPA lead agency.
- Contact the local health department to set up an inspection before construction, if applicable.
- Apply for Ecology's UIC Program or State Wastewater Discharge Permit, whichever is applicable.
- Comply with Ecology's requirements for wells: use a licensed driller and submit an NOI and well report: <http://www.ecy.wa.gov/programs/wr/wells/wellhome.html>.

### Tips

- Any discharge to surface water requires a National Pollution Discharge Elimination System (NPDES) Permit for Ecology. Surface waters include all water bodies, storm sewers and sanitary sewers: <http://www.ecy.wa.gov/programs/wq/permits/index.html>.
- Groundwater returning from the heat exchanger can be used to water a non-commercial year or garden that is one half-acre or less in size.
- The Washington State Department of Health does not allow water discharge from a heat pump to go through septic systems or associated drain fields.
- A water right is a legal authorization to use a set amount of public water for a designated purpose <http://www.ecy.wa.gov/pubs/961804swr.pdf>

If you require this document in another format, contact Office for Regulatory Innovation and Assistance. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call (877) 833-6341.