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## Homeowners Enjoy Clean, Quiet Comfort of Geothermal Heating, Cooling and Domestic Hot Water



These energy smart homeowners not only took time to optimize their homes spectacular views. They also took time to research the best heating and cooling solution to optimize their homes comfort. The design called for radiant floor heating of the main levels and large garage/ workshop with additional forced air delivered to the upper levels of the home and heat for domestic hot water. Against the available alternatives of fuel-oil or propane the homeowners chose to stop burning their money and to install a safe, clean and energy efficient Geothermal system.

A Geothermal system has two main components, the **heat-pump** and a **heat-reservoir**. The Geothermal **heat-pump**, uses similar technology to that of a home refrigerator to exchange heat energy between the home's interior and the **heat-reservoir**. In this installation there are two WaterFurnace

Geothermal **heat-pumps**, partitioned simply from active living space behind a door. There is no combustion, so they're clean with no chance of carbon monoxide emission and only the pumps quiet whisper marks their operation.

The **heat-reservoir** for this home is the ground around it.

Buried horizontal about 5 feet beneath the surface of ½ acre of land, is the heat exchange ground loop. Header pipes run below ground from the home to connect the **heat-pump** to this ground loop.

The economics of this Geothermal system are that for every 4 units of

energy delivered by the **heat-pump**, 3 units are free energy obtained by the ground loop. On average the ground around a home absorbs about 47% of the suns energy that reaches it, far exceeding the needs of the home. In addition over a yearly cycle the system balances, extracting heat energy from the ground during the winter and returning heat energy, out of the home, in the summer.

This Geothermal system delivers the fossil fuel independence, reliability and comfort required. And the low operating costs keep these energy smart homeowners talking and smiling about their choice.



WaterFurnace heat-pumps [ Left: forced air. Right: for radiant floor ]

Smiling Energy Smart Homeowner