

## **Geothermal Heating and Cooling – in English!**

The new monastery building will be “green.” It will utilize “geothermal heating & cooling.” So, in simple English, **“How does that work?”**

By definition, geothermal is “heat from the earth” and in the case of the new monastery building it is also “cooling from the earth.” Three hundred feet below the site of the new building there is a constant temperature year round of about 51 degrees Fahrenheit. This temperature is warmer than the colder winter day air temperature and colder than the summer day air temperature. Simply stated, logic says we should be able to use the earth’s heat in the winter and cooling in the summer to moderate the temperature within the building. And that is exactly what we mean by “geothermal heating and cooling.”

In practice, things get quite a bit more complicated! When planning for the new monastery began, we hoped we could use Lost Lake, the 10,000 year old glacial lake on the property, as a source of heating and cooling. Early on, we learned that the lake was not deep enough or large enough in volume to provide a consistent heating and cooling source anywhere near 51 degrees year round.

Instead, we had to consider alternative ways to take advantage of the earth’s natural heating and cooling system. Late last summer we drilled a test well near the site where Benedict House used to stand, with the financial assistance of a grant from *Focus on Energy*. That test well was studied over the course of a few weeks to make sure it maintained the appropriate temperature to serve as a heating & cooling source. The test was successful!

The next step in the process was to do a computer modeling of the new building, where it would stand and the direction it would face, to compute the expected and maximum heating and cooling needs. From that modeling, the engineers were able to determine the size of the heat pumps needed and the therms of heating and cooling required to serve the building. That information gave them the input necessary to compute the number of wells that would be needed. In our case it is 39 wells, all 300 feet deep, located under the new parking area.

In case you’re wondering, we are not going to pump water out of the wells and deplete the ground water. The way the system works is that fluid circulates continuously from the heat pumps to the wells (flowing up and down the wells) until it is at the correct temperature to be used for heating or cooling. The heat pumps then provide the required heating and cooling in the building. No natural gas or other heating fuel is ever needed. **And that is good for mother earth!**

*–Neal Smith, executive director of administration  
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