

# SOLAR COLLECTORS

This house was constructed and completed in the Fall of 1985. At that time natural gas service was not available to anyone in Shorewood Subdivision. When asked, Xcel Energy would not or could not commit to a date when natural gas would be made available.

I was not interested in having fuel oil, propane gas, or all electric as a heating source. The subdividers advertised and encouraged passive and active solar use for the lot owners. Protective covenant number 10 recorded in volume 312 records page 468 ensures each lot owner has solar access.

I chose to install a modified closed loop together with a geothermal heat pump. My intentions were always to convert to a natural gas furnace when gas became available.

There is more than 1,000 feet of 4" schedule 40 pvc that lays under the concrete floor in the lower level and basement floor. This 1,000 foot loop holds approximately 700 gallons of water. The ten solar panels located on the ideal pitch roof heat recirculating air and this heated air passes over 60 feet of the ½ inch copper coil that is located in the basement furnace room. Twenty feet of the coil was dedicated to heat domestic potable water, and forty feet of coil heated the water in the 1,000 foot loop. The heat pump then extracted the heat from the loop and provided forced air throughout the home.

In 1993 natural gas was finally available and I traded in the heat pump for a high performance pulse gas furnace. I disconnected the use of the ground loop and now the 60 feet of copper coil is used exclusively to heat the domestic potable water. On a sunny day, the collectors will turn on when air in the collectors reaches a range of about 75 to 90 degrees and remain on until the air temperature in the collectors falls below the range. On a sunny day the collectors can easily heat the 50 gallon solar storage tank to a temperature greater than 120 degrees in a couple of hours. A timer has been installed to run the collectors in the most optimum time of the day. This solar storage tank is connected to the electric water heater located in the laundry room. When the demand for hot water is made, potable water first goes through the solar storage tank, then onto the electric hot water tank, then onto the faucet at the sink. The solar heated water may very well be warmer than the water in the electric hot water tank, therefore no electricity is used. The cost of operating a 50 gallon electric hot water tank serving a family of four is approximately \$700.00 per year. Even with many cloudy days or partly cloudy days there is a substantial savings realized.