No Well Needed For This House

by Jim Ruen for Farm Show Magazine (Spring 2008)

Why spend $22,000 drilling a well to get water you can't drink when water is free from the sky? For Christian Milaster there was no question. Rainwater and snow melt were was the way to go.

"Wells in this area are going down over 600 feet and getting water with high levels of nitrate," says Milaster, who lives in a part of southeastern Minnesota where sinkholes are prevalent.

The answer makes even more sense if you consider that his two-year old home is also off the electric grid. His small 1 kW wind turbine generates enough power for the house, but not enough for a 240-volt pump for a well. A low-power pump to fill a cistern would have required its own solar panel. To go on grid at his location would have cost him another $12,000.

To design his water storage system, Milaster calculated daily needs and then added capacity for an eventual family. He determined his 2,500 sq. ft. roof would supply him with 1,500 gal. of water from each 1-in. rain.

The only constraint would be having enough storage to carry him through winter. A friend who relies on a cistern for house water suggested having enough storage for 100 days, from the beginning of December to the beginning of March.

Milaster decided to go with 7,500 gal. of storage. He acknowledges that his system is overbuilt for a one-person household. While he only uses around 40 gal./day, he hopes to eventually have a family, so he installed three 2,500 gal. tanks in his basement. A fourth smaller tank installed outside stores over-run for potential yard and garden use.

"I started in December 2006 with a full system, and since then it has never dropped below 4,800 gallons," he says. "This winter, we had a little rain in January and some snow melt bringing it back up to 6,600 gal. by late March."

Milaster credits little things like the snow rakes he installed on his steel roof. They catch and hold snow until it can melt, rather than slide off the roof. The primary reason his “off-the-well” design works, however, is through conservation without a reduction in comfort. He has numerous water-efficient appliances such as a front-loading washing machine that only uses 16 gal. per load (instead of the typical 30 gal.) and a water-efficient dishwasher that actually displays the water use after each load (around 3.5 gal.). Especially his toilets, typically the highest waster of water in a household, are low-flush, dual-flush toilets designed in Australia. They give him a choice of flushing with either 0.8 or 1.6 gal. of water.

"I also have a backup system with a pipe inlet in my garage so I could have a tank truck bring in water in the case of an extended dry period," says Milaster.

Debris and dirt has been kept to a minimum in the system, thanks to leaf guard gutters. He still plans to install a first flush diversion system that would divert initial rainfall until the roof had been flushed clean. However, he notes that his 300-gal. settling tank has not collected any material to date. Water flows from the settling tank into the three main storage tanks, which are connected in line, maintaining equal levels at all times.

Milaster's only regret with his system is not installing an in ground cistern away from the house. High humidity in his water tank room has resulted in mold on the walls and ceiling that he is working to contain, if not eliminate.

"Once I have my full solar power system in place, I hope to get the humidity down in the room," he says.

Milaster plans to install a photovoltaic panel to add capacity to his current system. At this time, he still relies on a propane-powered backup generator when wind power is insufficient.

The only change ahead for the water system is a plan to install a reverse osmosis filtration system for drinking water. Currently he fills jugs with filtered water at nearby supermarkets.

"I haven't tested water quality yet, as a complete analysis would cost $120," he explains. "As a single person, I will only spend about $80 a year to bring in drinking water."

Milaster maintains a web page with extensive information about his off-well, off-grid home.

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