

The softest water in the world

We wanted a solar panel for hot water; the technology has been around for decades, continually being refined. We have roofs facing southeast and southwest, not overshadowed. We started to do our research, and immediately encountered a snag.

A solar panel needs soft water; if we put hard water through a solar panel it will fur up in a few years – and it's not just a case of putting some descaler in it! The first suggestion was to install a water softener. Well, OK, but it's an additional expense (we were quoted £800) to buy and install it, and there are continuing running costs. An indirect system, where the water going through the solar panel is used to heat the water in our hot water tank, would have needed us to install a new tank.

We live in a bungalow, with a detached barn (it used to be a smallholding). When we moved in about ten years ago we bought two old 500-gallon heating oil tanks, to use as water butts; with soaker hoses they kept our new hedges alive with the minimum of effort on our part. Once the hedges were established we had a large stock of rainwater – and there is nothing softer than rainwater!

We decided to use our rainwater to supply our hot water. We spoke to various people with expertise in rainwater collection systems, and were told no-one had ever done this before. Flushing toilets, yes, but not for contact with people. And in fact we were strongly advised against trying it. The constant cry was – sharp intake of breath and 'oh no can't do that - you'll get legionnaire's disease' or 'oh no we can't supply that – if you get legionnaire's (or any other disease) you could sue us'. No one at all was prepared to help us do what we wanted. That meant we had to design and build the prototype, and this article is the result of 3 years of our experiences, so that if you want to do the same thing, you won't need to make the mistakes we made – you can make different ones!

We started with two large tanks beside the barn, which were not interconnected, and neither were they very close to the house. First we connected them together, so that we had one large supply. We also connected a third tank to increase our capacity – a tall cylindrical tank holding 300 gallons. At first we connected them with garden hose, which was simple because we'd already put garden hose fittings on the tanks, and it's cheap to buy. However,



garden hose froze in the winter, so we had to turn off the taps at the bottom of each tank, so that if a hose split we wouldn't lose all our water - and that meant that if we had a few very cold days, we might not be able to access all of the water. So I replaced all the garden hose and fittings with 25mm blue water pipe, and lagged it using foam insulation - that which is sold for 28mm copper pipes fits nicely.



We chose the tank from which we would actually take the water simply because it was closest to the duct that we had laid in years ago, connecting the house to the barn. The water had to be filtered, and we fitted a strainer (small Y-piece seen here on the right), to catch larger bits, and then a garden pond filter.

The strainer has been no trouble, but as the rate at which the water is pumped is quite fast, with a small filter we were unable to supply the pump fast enough, and it cut out when it ran dry, so we had to increase the size of the pond filter. (Details at the end of article)



I spent a long time puzzling over the pump aspect. We needed to pump the water up to the header tank in the loft, and we had to make sure it stopped when the header tank was full. I considered using two float switches, one at the top of the header tank for 'off' and one near the bottom for 'on', but the wiring was going to be



complicated - it meant leading wires from the float switches to the pump, which was going to be in the barn. Then a friend suggested using a shower pump, which automatically stops when the pressure in the pipe builds up. Excellent! But we had to change the ball valve in the header tank, since a normal ball valve tends to 'bounce around' a bit as it fills, which would lead to the pump stopping and starting several times as it neared the top.



We found a valve that has a float that is constrained to move vertically, and so doesn't 'hunt', and this has been successful, although we've had a couple of occasions when the fact that the pressure has gone down hasn't registered with the pump – and suddenly the hot taps run dry.

Where the water came into the house we put in a tee-piece, and two stop-cocks, so that we can use rainwater for the washing machine when we're full, and then revert to mains water if the tanks get low (see photo).



Rainwater comes in through the white pipe at the bottom right, and goes straight up to the header tank in the loft. Lower white tee-piece leads to stop-cock and copper tee-piece, with mains water coming in through the copper pipe running along the bottom of the photo. Copper pipe going out of the top left leads to the washing machine

Up in the loft we similarly put in another tee-piece, and more stop-cocks to feed the toilet. Again, we can switch this to mains or rainwater, depending on our stock level.



We've extended our catching area, by placing water butts around the bungalow, which are also linked to the main tanks. They don't hold a lot of water; their prime purpose is to catch rainwater from the bungalow and allow it to feed into the other tanks. All of the tanks are arranged so that the tops are at the same level, so that they are all full at the same time. With them all connected, if one was lower than the others, it would overflow, and bring the others down to its level.

Since starting all this, we've also added one more oil tank, so we now have two 500 gallon tanks, one 300, one 250 and three 20 gallon water butts. The very hot dry summer of 2006 saw us running a bit low on some occasions, but 2007 caused no anxiety. I'd like to add another 300 gallons of storage, just to have a bit more peace of mind.



A few important caveats: I mentioned that no-one was prepared to advise us. As far as the powers that be are concerned, rainwater is in the same category as untreated sewage – you don't know what is in it. Certainly, birds do sit on our roofs! Someone even said, "Ooh, you can't do that, you'll get Legionnaire's disease." (Rubbish!) Concerns were expressed that someone taking a shower might swallow some of the water ... We both prefer baths, so we have chosen to ignore that and any other risks there might be, but that is our decision. After four years of bathing, washing up and washing clothes we're still in good health. And we've experienced other benefits of using soft water – less soap and it's easier to clean the bath etc.

We noticed in the first few months that the water was slightly brown. We'd washed out the tanks before doing the installation, so there would have been little debris in them – I think it was the effect of the soft water descaling the copper pipes that were in the house, but I may be wrong. In any event it did us no harm, and the effect didn't last.

This article is not a recommendation that you do the same. It is information about what we did, and if you choose to do something similar, we hope it will be useful. If you wanted to bring the water to drinking water standards you would need to chemically treat it, or install an Ultra Violet light device to kill any bugs. For this to be effective you might need to filter the water further, to be sure the bugs weren't hidden behind any small bits in the water.

Please contact us on ingleside@ingleside2.plus.com for any further information – we'll be very happy to help if we can.

When he's not building a prototype rainwater capture system to supply a Solar panel, keeping an eye on his small wind turbine or planning his next project – a photovoltaic panel – Tony works as a crystal healer. His wife, Stella, is a flower essence practitioner.

Details of the equipment used:

Pump: Stuart Turner Kenney KB6

Filter: Hozelock Bioforce 9000

Float valve: Fluidmaster 747UK Side Supply

Blue water pipe: 25mm, polyethylene, 12 bar

Insulation: Climaflex 28mm pipe lagging, 19mm wall

Fittings: Water butts and tanks come pre-threaded for BSP fittings. For plastic BSP fittings contact a specialist hydraulic fluid and compressed air factor. Blue water pipe fittings are available from your builders' merchant with the pipe, and will include a fitting to convert from BSP to 25mm blue water pipe.

Two brief postscripts

The first is an announcement from Severn Trent Water, during 2007, when Gloucester and its environs had been badly flooded: Andy Smith, water services director, said: "Water reaching your taps should not be used for drinking, food preparation, ice-making or cleaning your teeth. The water can be used for bathing, showering and flushing toilets."

(Source: BBC News website)

Obviously, non-drinking water can be used for bathing.

And this letter published in "The Countryman" in October 2008:

Some seventy-plus years ago, I was born and lived in a small village in the Chilterns called Stoke Row; we were like most families in the village not too well off. My mother was always looking for ways of making ends meet and decided to rent the front room to the local Doctor Pooley for his weekly surgery. The requirements were quite simple, make sure a large jug of water was available for mixing various medicines and in winter a good fire and the room warm and clean. Most villagers' illnesses when they came to the surgery, were for colds, tummy problems or aches and pains. They were dealt with in the following manner: for colds a red mixture, for tummy a white mixture, for aches and pains a brown mixture, all being diluted with water.

Our only supply of water came from a well collected from water off the roof of our house. My brother kept pigeons and most of their day was spent on the roof doing what pigeons do. There were lots of droppings but amazingly I do not recollect anyone who died from these wonderful mixtures, in fact many returned for a further supply.

Two things stick in my mind, was it my mother's water from the well with the microbes and pigeon droppings, or the doctor's various coloured mixtures from which people recovered (if they did?). I shall never know the answer.

JOHN PITT, OXFORDSHIRE

'nuff said!