Milking Water from the Hills

The Prehn Method

by Joe Summy

I thought I had seen it all when it came to trying to find water in the Hill Country of central Texas. As a teenager, I worked the towers on a windmill crew and had the pleasure of pulling many a rod and pipe. I know that when drilling for water, one is just as likely as not to hit bad water or no water at all. I had seen my uncles build earthen tanks, try to trap water from seeps during the wet times, and had even witnessed them dynamite old dried-up springs in futile and damaging attempts to squeeze the good earth for every drop of water they could. I thought that all the different ways to obtain more water had been exhausted, and I had become resolved that the only thing left was to transport it by pipelines.

As the population of the Hill Country grows and more and more people drill for water, the lower the water table becomes, with many wells failing during what seems to be periods of more and prolonged droughts. And, then there's the high cost and the public and political controversy of piping water from one area of the state to another. Texas has a better infrasture for moving oil and gas than it does for moving water. So, when my friend Kelly Prehn called and told me that he was milking water from the caliche hills on the wildlife management area he supervises and from his own property, I thought he had drunk too much muddy water caused by the early summer drought of 2002.

"It's hard to explain over the phone, but basically, I put a nipple at the base of one of the hills, and I'm getting more water than I ever expected. You just need to come out here and see for yourself."

I met Prehn at the entrance to the wildlife management area. The former ranch had been what my uncles would

Kelly Prehn takes a drink from one of his sites. Site Five produces about 280 gallons a day.

Site Two produces about 2,000 gallons a day. Notice the indicator grasses behind the trough.

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Prehn checks an armadillo hole for water. As he pulled out some of the wet dirt, water started to flow.

The milking system installed behind the armadillo hole. This is the site Prehn constructed by hand. Site One produces about 500 gallons a day.

have called a sorry piece of land. Overgrazing in past decades had caused the topsoil to wash away, and the hills and valleys were covered with Ashe juniper (Texas cedar to the locals) and other shrub brush. Before Prehn took over as manager, the ranch had been of little commercial use except for raising goats and cutting juniper for fence posts. Early historical accounts describe the Hill Country as a semi-prairie with grass as high as the stirrups on a saddle; there were also hills covered with oaks and other native trees, with small stands of junipers in the gullies between the hills and along the creek bottoms. Fencing and overgrazing by the early settlers changed all of that. Overgrazing caused the rich but shallow topsoil to wash away, and in a relatively short time the grasses were overtaken by the junipers and other brush.

Under the leadership of Kelly Prehn, the area is little by little regaining its original appearance. Although there is still a lot to do, you now can see glimpses of what the land was once like. A vital step to reclaiming the land has been the cutting and grinding (hydro-axing) of the junipers and other brush into mulch to keep the rain from washing away what little topsoil is left. A significant outcome has been that as the mulch gradually breaks down to organic matter, the native grasses have returned. Another important step was to stop the overgrazing, and a third significant step was to build a series of small dams to catch water from a seasonal creek. When it rains, a lot of water can be captured as the water runs off the many hills that drain into the creek. What is being done here is an excellent example of what can be done with good management to improve the land in a relatively short time.

As we drove through the rugged terrain, Prehn explained how he arrived at his method, "After studying the situation for some time and observing how water seeps from these hills when it rains, I decided to experiment with an idea that came to me one afternoon that I call 'milking the hills for water.' Actually, I'm doing what the old timers used to try to do; I'm just applying a more technical and scientific approach. One of the things of which I am most proud is that what I'm doing is environmentally friendly. The water that I'm milking would evaporate anyway, and there is not much disturbance to the land. At a few of the sites you can't tell that anything has been done except the installation of a trough, and there is one site that will probably surprise you. I even put in one site by hand, using only a pick and a shovel. You're not going to find any pumps, electrical lines or poles, windmills — nothing except some water troughs and one collection system. In fact, all the sites are now producing enough water to justify varying sizes of storage tanks, but in the beginning of this experiment I didn't know what to expect."

That day we visited four sites at the wildlife management area and one on the property Prehn owns in Blanco County. What I observed was nothing short of amazing.

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Prehn built a trough to store the water. The trough is full, and water is flowing down the gap. The junipers need to be removed to increase water flow, but this must be done gradually to prevent erosion.

Site Two produces about 2,000 gallon a day. There is enough overflow to have water in the seasonal creek. Notice the indicator grasses behind the trough.

THE SITES

These sites were visited before the unusually heavy rains of the summer of 2002. They were all demonstrably dry until the milking system was constructed. Water production at the sites varies from day to day, but Prehn estimates that they produce from 280 to approximately 3,000 gallons a day.

As with any experiment, ongoing records must be kept over an extended period of time, during different seasons of the year. In addition, although Prehn's procedures have been successful at all five sites, other sites need to be established — the more, the better. Initial results, however, demonstrate that his method has a high probability of success under the right conditions.

Furthermore, although all of the sites were meant for wildlife or livestock use, the quality of the water was high and would be good for human use with the proper filtration system. In fact, I tasted water from four sites, and some of it reminded me of the sweet spring waters we had on the family ranch when I was a young boy. Of course, the quality of the water will vary from area to area, and even from site to site within a specific area. In addition, what the water filters through will also determine the quality. It's very important to note that neither this writer nor Mr. Prehn recommend that anyone drink water from a source that hasn't been tested.

SITE ONE

Site One is located in a gap between two caliche hills overgrown with juniper trees. All one can see is a concrete water trough, which is overflowing with clear fresh water. Just by looking, one cannot guess the source. I sampled it and found that it tasted like it came from a pristine spring. Site One produces about 500 gallons a day. This site needs a small storage tank.

SITE TWO

Site Two is located near a wet season creek. The nipple is located directly behind the water trough. Again, all one can see is the trough. I sampled the water and thought it to be the best of all the sites. This site is a very productive one, producing about 2,000 gallons a day. It needs a large storage tank.

SITE THREE

Site Three is located on a slope, about 30 yards from a dry gap. It is the most productive of all of the sites, producing 3,000 gallons a day, and it certainly needs a very large storage tank. A tractor was used in the initial stages of construction. I

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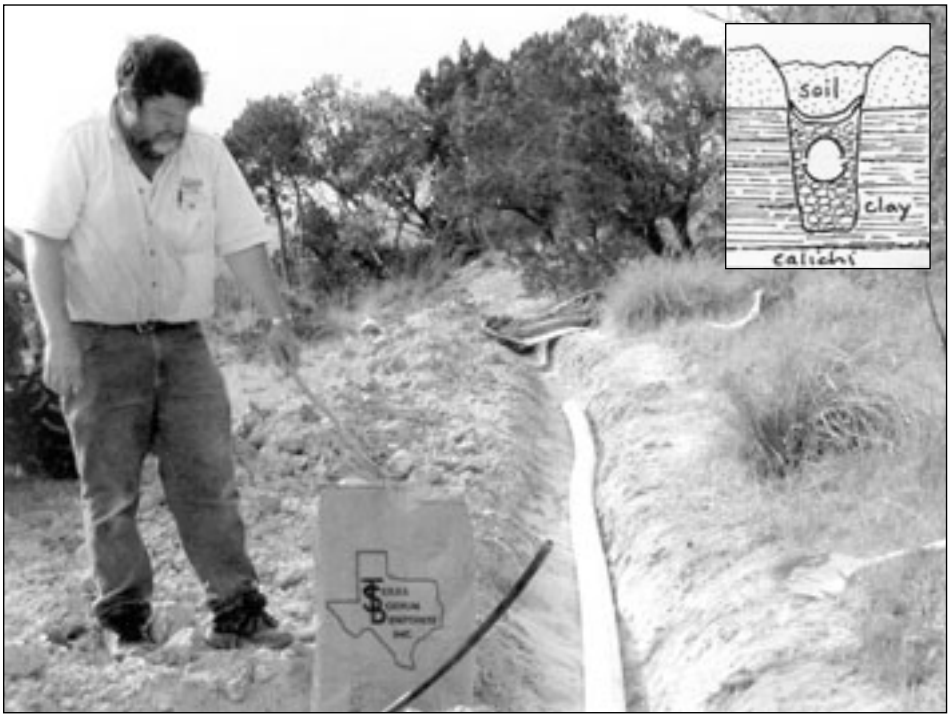
Site Four under construction. Prehn uses a tractor to dig the trench for the perforated pipe.



Prehn installs the pipe. Bentonite clay lines the trench.

did not taste the water at this site, which was the surprise site Prehn had mentioned earlier. Right in the middle of the pasture were two beautiful water features that look like they belong in someone's backyard. Again, the only things visible were the water features. I asked Prehn why he had put water features in the middle of the pasture. He answered that it was a good site with lots of water that would provide a nice surprise for visitors and make a great picnic area — so why not add a little whimsy to a practical project?

SITE FOUR

Site Four is located in a remote part of the wildlife management area, and is somewhat difficult to reach. It is the largest site and the only one that has an extra water collection system — a 300-gallon storage tank. The nipple is located at the base of a hill with the perforated piping system running horizontally for approximately 30 yards. A tractor was used at this site, and some of the junipers have been removed to increase the flow of water. Prehn believes that the removal of more junipers will increase the amount of water produced, but, because of possible erosion problems, the junipers need to be removed a few at a time and either left to lay where cut or hydro-axed and the mulch left in place. The water had a high mineral taste. This site produces about 600 gallons a day. When I visited Site Four, the trough was full, and water was running out of the top of the storage tank. This was particularly impressive, as I visited all of these sites during a dry period.

SITE FIVE

Site Five is located on 65 acres Kelly owns in northeastern Blanco County near Cypress Mills, about 15 miles from the other four sites. The water here, although clear and cool, tasted a little chalky. This could be because the nipples had just started to produce. After my visit, Prehn informed me that the water had lost its chalky taste, and now tastes as good as the water at Site One. The property has a wildlife exemption. As in the wildlife management area, Prehn is in the process of restoring the land. There is a seasonal earthen tank on the property, but until recently there has been no other source of water. Prehn has built a cabin on his place, and to supply water he first drilled two wells — both dry holes — at a cost (loss) of about $6,000. Being the resourceful person he is, Prehn then constructed a rain-collection system for the cabin. Since there is not a reliable source of water for the wildlife, he has also constructed a water milking system on the side of a hill. The site has three nipples and produces about 280 gallons a day, enough for the

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Covering the pipe with gravel.

Prehn places sacks on top of the gravel. It's not imperative to use sacks, any pipe covering will do.

wildlife. Because of his resourcefulness, Prehn has taken a piece of land that had no reliable sources of water and made it useful. There is now enough water for humans and animals, and the value of Prehn's property has certainly increased.

READING THE LAND

In using the Prehn Method you start by "reading" the land—- by observing the area during different times of the year. There are many seeps that appear promising, especially during wet periods, but don't be deceived! One must become knowledgeable about the characteristics of the local native grasses and trees — some of them are good indicators that water is present even if you can't see it. Indicator grasses and trees will vary from area to area and state to state. Prehn relies mostly on the indicator grasses, considering native trees as a reliable backup. In central Texas, he looks for the following:

Indicator Grasses

• Bushy Bluestem — Water will be present a minimum of 90 percent of the year. During wet periods there will be surface water.

• Lindheimer's Muhly — Under normal conditions there will be water under the soil surface most of the time.

• Switchgrass — A good supply of water will be available at least 50 percent of the time.

Indicator Trees

• Willow
• Sycamore
• Cotton Wood
• American Elm

Note that a combination of indicator grasses and indicator trees increases the likelihood that water is present.

THE PREHN METHOD

This method won't replace drilling for water. What it does is give the farmer or rancher another alternative that is reliable and cheaper. — Kelly Prehn.

Since this method works by natural gravity flow, there must be various levels of terrain, although Prehn does not rule out the possible use of some kind of pumping system at individual sites in the future. Overall, the method is quite simple, and can be summarized in nine steps:

1. Identify a site by looking for the indicator grasses and trees.

2. During a wet period, find areas where the water is coming to the surface and place markers so the site can be located later.

3. Begin trenching only during the driest time of the year — the drier, the better. A drought is the best time to do the trenching. If the milking method produces water during the driest times, you can be assured that there is a reliable source of water. Prehn

The site has been covered with earth trenched from the site. Notice the one-inch pipe; it has been connected to the nipples and is ready to be connected to the storage tank. Prehn seeds the construction site with native grass, and in a relatively short time the area will return to its original state, even much improved.

The storage tank for Site Four, with overflow on the tank and the water trough. Site Four produces about 600 gallons a day.

has found reliable sources of water at all of the sites constructed so far using his method. Remember, some trenching can be done by hand.

4. Dig the trench about 5 feet uphill (depending on the slope) from the markers that were put out during the wet season.

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5. Dig the trench horizontally, 12 to 18 inches deep, and as long as possible. Every linear foot of trench increases the volume of water.

6. There must be a good layer of clay to "milk" the water (getting the water from the ground into the perforated pipe). Clay soil must be on the bottom and on the downside of the trench. If not, use bentonite clay to seal possible leaks. Bentonite clay is a fine-structured colloidal clay that when wet swells to 10 times its original volume. Prehn uses it in all the trenches for extra assurances. A 50-pound bag costs about $5 and goes a long way.

7. Use 4-inch perforated pipe in the collection trench. Lay it on top of the bentonite clay. Cover the perforated pipe with a 4-inch layer of half to one inch clean gravel. Then place old feed sacks (Prehn's favorite because it has already been paid for and because it is slow to deteriorate) on top of the pipe so the covering soil won't clog the perforated pipe. Of course, you may use any pipe covering you wish. As the ground settles there should be no need for more pipe covering later. Prehn does recommend cleanout nipples at both ends of the perforated pipe, however.

8. Connect a 1-inch pipe to the 4-inch perforated collection pipe and run it as far as necessary to the trough or tank collection system. If you use a storage tank, hook up the water trough with a float valve for a reliable supply of water. Prehn has found that the volume of water produced from his sites necessitates various sizes of storage tanks. Of course, each site must be evaluated on its own merits. If you use the Prehn Method correctly and have selected a good site, water should start flowing within a few days.

9. Clean up the site and scatter native grass seeds over the construction area. The site will return to its original state — except for the storage system — in a short time. This is an earth-friendly method. In addition, the Prehn Method will not take water away from any aquifers, plants, animals, or any live streams — all of the water is being captured shortly before it would evaporate into the air.

Site on Prehn's property before construction. The white area is a road that goes around the hill. Prehn was originally concerned about this site because of a lack of indicators.

Prehn sums up his method very simply: "I believe that every rise in the ground is a potential place to find water that only evaporates—- they are nature's reservoirs of untapped water. The 'milking' system gives us an opportunity to use this water that would only be lost to the atmosphere anyway. It doesn't matter if you own one acre or thousands of acres, this method will work if you have the right indicators. And compared to drilling for water, it is a lot cheaper."

A final note: After this article was completed, the rains finally returned to central Texas, and production for the sites profiled have increased dramatically. Site Three, for example, was initially producing 3,000 gallons of water a day, but is now producing 10,000 gallons a day, and Site Five, which had the lowest production — initially 285 gallons a day — is now producing 600 gallons a day. Prehn is now turning his attention to further development of storage systems for the sites.

Joe Summy, Ed.D., is a retired educator. He is now a public speaker, writer, and consultant. For more information concerning presentations or site visits concerning the Prehn Method, contact Dr. Summy at P.O. Box 99, Johnson City, Texas 78636, e-mail <joesummy @moment.net>.