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Coping with Drought-Affected Private Water Supply Wells

Well Monitoring

1. Q. I am concerned that my water well may be going dry. Is it useful to try to monitor the water level in my well?

A. Wells “go dry” when the water level during pumping draws down below the pump intake. If you know the depth to the pump intake, then knowing the depth to the water level provides an indication of whether the well is at risk of going dry. If the depth of the pump intake is unknown, simply knowing the depth to water level is not very useful.

2. Q. I have heard that that the depth to water level in a well can be measured using a weighted string or long tape measure? This sounds relatively simple. Are there potential problems I should be aware of before attempting this?

A. Yes....quite a few. If the depth to water is not too great (probably 50 feet or less) and the water surface can be seen, then using a weighted line may work. In deep narrow wells, where it is difficult to see the water, using a weighted line becomes considerably more difficult; forcing the user to rely on sound or subtle changes in line tension to determine when the line enters the water, or requiring use of artificial lighting. Some problems that can occur include:

- In wells with deep water levels and low available light, it can be difficult to know when the weighted line has entered the water.
- Piping, pitless adapters, and wiring inside narrow wells may prevent insertion of a weighted line or result in entanglement of the measuring line.
- Well contamination can be caused by flashlights, mirrors, and other tools accidentally dropped down the well.
- The well can be contaminated by dirt loosened during removal and reinstallation of the well cap.
- Possible electrical shock hazard may be created by contact with defective pump wiring. NOTE: electrical power to the well MUST be shut off before removing the well cap.
- There is the potential for slips/falls and resulting injury if the wellhead is located below ground in a “well pit” or “frost pit.”

- Water depth information can be misinterpreted. When the well pump is switched on, it temporarily lowers the water level inside the well. When the pump shuts off, water from the aquifer flows back into the well, once again raising the water level.
`Distinguishing between temporary water level changes caused by pumping, and longer term fluctuations caused by a drought can be tricky.

Those who are unfamiliar with well construction and maintenance, water pumps, working with electrical wiring in damp environments, etc. and the associated hazards and required safety practices are advised to not try to open their well and measure water levels.

Water Supply Options

3. **Q. My water well produces only a small amount of water each time it is pumped. Is there any way to get more water from it?**

A. If the well produced plenty of water when it was constructed, the pump may have been installed at a depth considerably above the bottom of the well. If that's the case, it may be possible to have the pump intake lowered to take advantage of water at greater depth. Contact the firm that constructed the well and ask them to check their records to see if lowering the pump intake is a feasible option.

4. **Q. A regional rural water system pipeline runs through my property. If my well starts to go dry, will I be able to hook-up to rural water?**

A. That will depend on whether the regional water supply has excess delivery capacity at your location. Regional rural water system pipelines are typically built to handle the water needs of customers who signed up at the time the system was constructed. Building unused capacity to handle uncertain future demands is costly and can threaten the financial stability of a rural water system and drive up water rates for all customers.

Emergency Water Hauling & Storage

5. **Q. I am going to have water trucked to my home to supplement the water in my drought affected well. Are water haulers in Iowa regulated? How can I be sure that the hauled water is safe for human consumption?**

- A.** Probably because water hauling is not very common, water haulers in Iowa are not regulated by the Iowa Department of Public Health or the Iowa Department of Natural Resources. When contracting with a hauler to supply water to be used for human

consumption, be sure to let the hauler know that you are concerned about sanitation practices and the safety of the water. Request documentation confirming the source of the hauled water and insist that the water come from a treated public water supply.

Inquire about sanitation practices that the hauler uses when loading, hauling, and unloading the water. Tanker trucks don't set idle when there is no drought. Ask what products the tanker hauls during non-drought periods, and how the tank is cleaned prior to hauling drinking water. Human drinking water should be hauled in tanks designed for potable water transport and the tank should not have been used to haul or store fuel, pesticides, sewage, non-potable water, or other potential contaminants as it can be very difficult to ensure that such contaminants have been completely removed from the interior of the tank.

6. Q. When the water tanker comes to my home, they are going to dump the water into my well so that I can use the well pump to deliver the water into my house and farm water distribution system. Are there concerns that I should be aware of when using this strategy.

A. Dumping hauled water into a well can lead to the following problems:

- Loss of the hauled water – Hauled water that is dumped into a drought-stressed well will flow out the bottom of the well and be lost in the surrounding aquifer.
- Deteriorated water quality – dumping large quantities of water down a well may stir up fine sediment inside the well, leading to cloudy water.
- Possible well pollution – chemical or biological contaminants picked up during hauling could cause long-term well or aquifer contamination.

7. Q. What about storing hauled water above ground rather than dumping it into the well?

A. Using an above ground tank helps homeowners get the most benefit from money invested in water hauling because it guarantees nearly total recovery of all the water that is hauled. For small quantities of high quality water that will be used for human drinking water and food preparation, enclosed plastic storage tanks are usually the best option for maintaining the safety of the water (limiting entry of dust, insects, rodents, birds, etc.).

For larger quantities of emergency water storage for livestock operations, collapsible open-topped tanks offer greater storage capacity at a lower cost. Since these do not prevent contamination by dust, bacteria, insects, rodents, and birds, however, they are not considered suitable for human drinking water without additional water filtration and disinfection.

NOTE: A variety of collapsible tank options can be viewed on the Web. The following sites are provided only as examples of the kinds of open-topped tanks that are

available and key words that can be used to search for similar products. Mention of these websites does not indicate that these products have been tested by or endorsed by Iowa State University.

http://www.water-storage-tank.com/frame_tanks.html

<http://www.sei-ind.com/products/fireflex-pumpkin-tank>

http://store.interstateproducts.com/onion_tanks.htm?qclid=CPmF4LmdrrlCFaUWMgodqD0Akg

8. Q. If I decide to purchase a tank for temporary storage of hauled human drinking water, what should I look for?

A. If the water will be used for human consumption (drinking, food preparation, cleaning of surfaces that will contact human food or drink) it is recommended to purchase a storage tank having manufacturers product information indicating that it is suitable for potable water storage and/or that it meets the requirements NSF/ANSI 61 — a national health effects standard for devices and components that contact drinking water. This helps to ensure that the tank material does not release potentially harmful pollutants into the drinking water, and that pollutants introduced during manufacture of the tank have been removed.

9. Q. I cannot afford to purchase a new tank for hauled water, but own a large tank that has been used in the past to haul water and other things. If I rinse it out good would it be OK to use that tank for hauling or storing drinking water?

A. If a tank was ever used to haul pesticide solutions, fertilizers, or other potentially toxic chemicals it is risky to use it to haul or store drinking water. Rinsing alone may not remove all chemical residue and—if a small amount remains—the safety of the water is questionable.

Tanks that have not been used to haul potentially toxic substances but that have been in storage for long periods are likely to be bacterially contaminated since it is nearly impossible to prevent entry of rodents, birds, insects, and dust while in storage. Before using them for storage of human drinking water, their interior should be thoroughly flushed and then disinfected. Disinfection is generally unnecessary if the tank will be used only for livestock water as healthy livestock are generally acclimated to environmental levels of biological microorganisms in feed and water. If water shortage requires unsanitary water from dirty tanks or ponds to be pumped into livestock facilities, then the livestock watering facilities should be temporarily disconnected from a well and piping used to supply human drinking water so that unsanitary water is not accidentally forced into the human water supply.

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