

SUPPORT

ETAPUMP®

ADVANCE PLANNING INCREASES SOLAR PUMP SUCCESS

By Windy Dankoff

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Successful solar pumping is best assured by advance planning. For economic reasons, the system sizing is more critical than for a conventional pump. The drilling and the pump installation may be performed by different people. And finally, slow-running solar pumps can be more susceptible to clogging with dirt. Here are some ways to deal with these factors, and avoid problems in advance.

Cooperate with the driller

Cooperation between contractors is critical to a successful job.

- If one contractor is drilling the well and another party is installing the pump, have the driller install the well-top assembly and pipe interface, especially if it will include a pitless adapter and underground piping. This is a part of the driller's normal routine, and he'll already be excavating at the site.

- Have the driller develop the well (flush it out) until the water is relatively clean, even if there is an extra cost. Arrange this right from the start, in the contract.
- Ask for a careful well test and a copy of the well report. In case of a low-yield well, this can be critical to the system design.

Get good data — the well report

To make an informed decision about setting a pump, try to get accurate data for the water source. In most states, drillers are required to report the construction details and the performance of wells they drill. A well report includes estimates of static water level, recovery rate, and level(s) of the perforations where water enters the casing. You may be able to obtain the well report from the driller or (in most states) from the government office that oversees water resources and issues drilling permits.

Well data will allow you to estimate the drawdown of the well so a pump system can be selected for best economy (not to be much deeper and more powerful than necessary). However, expect reality to intervene. Well data is often missing or inaccurate. Groundwater conditions can change over time, and so can the condition of the well itself. It may be reasonable to ask the customer to pay a well contractor a few hundred \$ for a new well test.

How deep to set a solar pump

Our ETAPUMP submersible may be submersed as deep as necessary to ensure reliable water supply. The lift load on the pump is determined by the vertical head of water

measured from the SURFACE of the water in the source. Increasing the pump submergence (placing it lower in the well) will NOT reduce its performance, nor will it increase the stress or wear on the pump (unlike diaphragm pumps and air filled brushed type motors).

Reasons NOT to set the pump at the maximum possible depth, if it isn't necessary:

- It will increase the size requirements of pipe and cable.
- It will increase the chance of sand or sediment being drawn into the pump.

Plan ahead to reduce the chance of silting-up

ETAPUMP has strong resistance to normal concentrations of sand and clay in well water. But, sediment can settle from the drop pipe when the pump stops or runs very slowly. In extreme cases, it can block the flow. Here is our advice.

To avoid pumping dirty water:

- A new well should be purged or otherwise improved by the driller so it produces relatively clean water. A driller will often say „run the pump for a day or two and it will come clean“. But for a solar pump, it may be worth paying the driller extra if necessary, to purge the well.
- If the driller has left the site, a relatively large AC pump can be installed temporarily to purge the well, using generator power. Pump contractors often keep old pumps for this purpose. (This is also an opportunity to test the well.)

- Set the pump relatively high in the well. If it can be placed above the perforations in the well casing, most silt can be avoided. ETAPUMP includes a low-water probe to prevent possible dry-run. The pump can be set high, and lowered later if necessary.
- If the water source is a river or stream or pond, it is ideal to dig a shallow well next to the source, to obtain clean water. Otherwise, you use a fabric screen to coarse-filter the water. Wrap the pump in about 6 turns of coarsely woven „weed barrier“ fabric, or make a pump housing wrapped with fabric. The fabric has good resistance to clogging. It is sold at landscape supply stores.

If dirty water cannot be avoided:

- Reduce the size of the drop pipe. This maximizes the flow velocity to better exhaust sand particles. Refer to a pipe sizing chart and select the smallest pipe that does not impose excessive friction loss. Do this only for the drop pipe (vertical portion) in the well.
- Monitor occasionally by observing the rate or the daily volume of water pumped.
- After installation, measure the current draw of the pump, and write it down as baseline data. Later comparison can help you diagnose problems. A blocked pump will draw more current (it's harder to turn). A worn pump will draw less current (it's easier to turn).

Know the product in advance

Read the pump literature carefully in advance – both the spec sheet and the installation instructions. The ETAPUMP Instruction Manual contains a large amount of system and reference info. Download it from the ETAPUMP page on ▶ www.lorenz.de