

FLUTe – Flexible Liner Underground Technologies

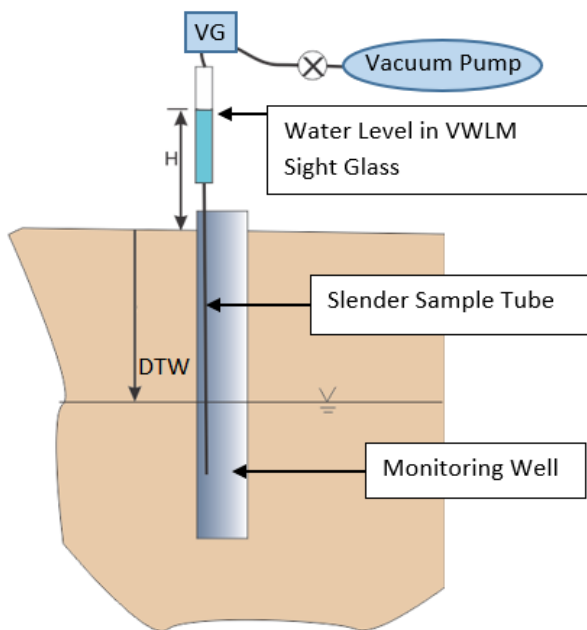
The FLUTe Vacuum Water Level Meter

The vacuum water level meter (VWLM) is a very simple device that allows one to measure the depth to the water table (DTW) in a slender tube that cannot accommodate an electric water level meter. The VWLM is advantageous for any system that uses peristaltic pumping (DTW is less than ~25 feet below the ground surface).

How does the VWLM work?

The VWLM works similarly to the process of drinking a beverage through a straw. If you reduce the pressure at the top of the straw, the liquid rises into your mouth. The VWLM uses the same principal by applying a partial vacuum to the top of the sample tube.

A vacuum pump is connected to the sample tube and a vacuum is applied. The magnitude of the vacuum applied determines how high the water level can be raised above the water table. The vacuum is increased until the water shows in the sight glass (Figure 1.).



*Figure 1. Vacuum Water Level Meter Design.
Depth to Water (DTW) = Vacuum Applied (VG) –
Height of Water in the Sight Glass Above Ground
Surface (H).*

Once the water rises into the site glass, the vacuum increase is halted by closing the valve to the vacuum source. The vacuum gauge (VG) displays the vacuum applied in units of feet of head that were required for the water to rise to the site glass.

Note, the level in the sight glass is well above the ground surface and therefore one must subtract the distance from the water level in the sight glass to the ground surface to find the DTW.

To calculate the DTW, simply follow the equation below:

$$DTW = VG \text{ (vacuum in feet of water)} - H \text{ (height of water level in site glass above the ground surface).}$$

To measure the DTW in another tube, such as that to a different port in a Shallow Water FLUTe multi-level system, simply drain the sight glass, connect to another sample tube, and repeat the process.