



Establishing the Monitoring Well Fixed Survey Elevation Reference Point

Background:

Reliable water table and potentiometric surface maps are essential to any hydrogeologic investigation and the design, installation, and maintenance ring wells and piezometers must be obtained to create these maps. Total depth measurements also need to be taken at times to determine if the well is being maintained properly. A surveyed elevation reference of an adequate ground water monitoring system is critical to producing accurate ground water elevation measurements. More information regarding water level measurements can be found in Ohio EPA's Technical Guidance Manual for Ground Water Investigations, Chapter 10: Ground Water Sampling (2006).

Guidance:

Measurements should be taken relative to an accurately surveyed and clearly visible elevation reference point on the monitoring well (typically the top of the monitoring well casing). For consistency, it is recommended that the reference point be on the north side of the inner well casing and be clearly visible with a notch or some other permanent method.

If the surveyed reference point is made on a removable well cap from which a pump is suspended within the well, then the reference point should be next to the water level measuring hole in the well cap and the orientation and depth of the well cap on the well casing should be marked. If the well cap is removed it should be replaced in the same place and orientation as before it was removed based on the marks on the casing.

The established elevation of the referenced point should be based on mean sea level. Another datum can be used as long as it is consistent across the monitoring well network. The degree of accuracy of the measured reference point depends on the level of accuracy needed. It is recommended that this point be surveyed to an accuracy of 0.01 foot. The elevation of an individual well should be re-surveyed when it:

- Has been damaged (e.g., by vehicle/heavy equipment).
- Shows evidence of frost heaving.
- Has been altered or modified (The well is cut shorter or extended).
- Shows evidence of settling over time.
- A new well cap is installed.
- The well cap is removed and replaced and the water level readings are significantly different.

In some cases, the entire network of wells may need to be resurveyed when there are unexplainable shifts in ground water flow direction that cannot be attributed to a single well. This is particularly true when the ground water table or potentiometric surface is flat and slight changes in elevation (even hundredths of a foot) could change the interpretation of flow direction and gradient.

Contact

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