

APPENDIX H

PROCEDURE FOR WATER LEVEL MEASUREMENT

1.0 OBJECTIVE

The objective of this procedure is to guide the collection of groundwater level data from observation wells.

2.0 BACKGROUND

Water-level measurements are fundamental to groundwater studies. Some of the major uses of water-level data are to indicate the directions of groundwater flow and areas of recharge and discharge, to evaluate the effects of manmade and natural stresses on the groundwater system, to define the hydraulic characteristics of aquifers, and to evaluate stream-aquifer relations.

3.0 EQUIPMENT

All equipment should be assembled, calibrated, and tested before arriving at the site. All items that potentially come in contact with the groundwater should be pre-cleaned.

Well Measurement Equipment

- Electronic water level measuring tape accurate to within 0.01 foot.
- Any additional project-specific sampling equipment as required.
- Field Logbook.
- Photographic record, if appropriate.
- Pressure transducer and data collection equipment

4.0 MEASURING POINT

For comparability, water-level measurements must be referenced to the same datum (elevation). The measuring point is established in reference to land surface datum and is the most convenient place to measure the water level in a well. Measurement points change from time to time, especially on private wells. The measuring-point correction of a water-level measurement converts the measurement to a distance above or below land surface at the well.

The measuring point must be as permanent as possible, clearly defined, marked, and easily located. If at all possible, position the point so that a leveling rod can be set on it directly over the well and also so that the measuring tape can hang freely when it is in contact with the measuring point. Frequently, the top of the casing is designated as the measuring point; because the top of the casing is seldom smooth and horizontal, a particular point should be designated and marked clearly.

5.0 METHOD

Many types of electrical instruments have been devised for measuring water levels; most operate on the principle that a circuit is completed when two electrodes are immersed in water. Commonly, a two-conductor cable and special probe are used. Current is commonly supplied by batteries.

Ordinarily, two-conductor electric tapes are 100- to 200-feet long and are mounted on a hand-cranked reel that contains space for the batteries and some device for signaling when the circuit is closed. Electrodes

are generally contained in a weighted probe that keeps the tape taut while providing some shielding of the electrodes against false indications as the probe is being lowered into the hole. The electric tapes generally are marked at 0.01-foot intervals.

Before lowering the probe in the well, the circuitry can be checked by dipping the probe in water and observing the indicator. The probe should be lowered slowly into the well until contact with the water surface is indicated. The electric tape is held at the measuring point and partly withdrawn; the band reading at the point held is recorded to provide the depth to water below the measuring point. It is good practice to take a second or third check reading before withdrawing the electric tape from the well.

The tape should not rub across the top of the casing because the measurement tape can become damaged.

In the event that a pressure transducer and automatic data logger is used, a manual water level measurement should be performed when the transducer is installed in the well and again when the well is accessed to download the data.

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