

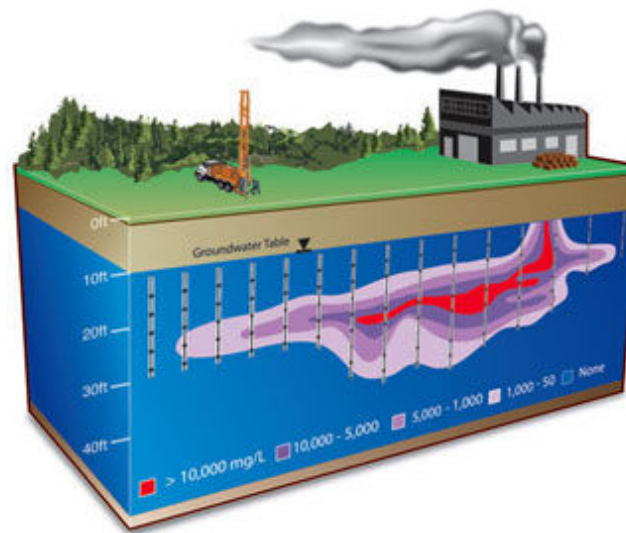
SITING A VILLAGE DRILL WELL

Dr. MARK KING



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Selecting the Well Location

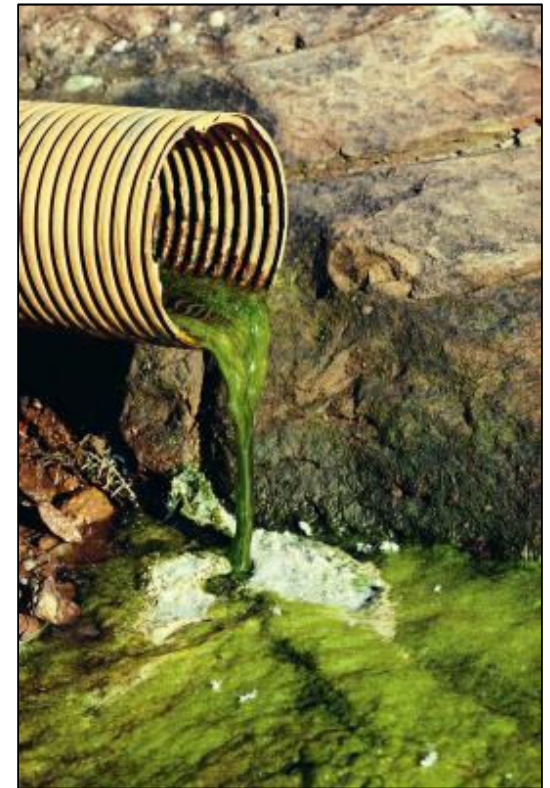


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GOOD VILLAGE DRILL LOCATION

- Before drilling a new well, the best drilling *location (within given constraints) must be identified*
- As a Trainer you must inform your clients about *hygiene* and the most hygienic location for the well
- Two important aspects, in terms of water quality:
 - The presence of sources of pollution such as *latrines, waste (dump) areas, fire places* and *fuel stations*
 - *Sun or shade* at the location of the well.



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GOOD VILLAGE DRILL LOCATION

Latrines

- Many clients will find it practical to construct the well close to the active area of the property, which may include a latrine
- Unfortunately, latrines are sources of (micro) organisms such as *bacteria*, *viruses* and *parasites*.
- These *pathogens* from the human waste in the latrines may move downwards *through permeable* layers, and cause local contamination of downgradient groundwater.



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GOOD VILLAGE DRILL LOCATION

Latrines

- A good well site should NOT be *down-hill* from a latrine.
- If it is difficult to determine the groundwater flow direction, construct the well at least **30 meters** away from the latrine.



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SUMMARY – SITING A VILLAGE DRILL WELL

- A Trainer should observe potential contaminant sources
- The new well should be placed in a manner that minimizes potential risks
- The trainer should point out any potential issues



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GOOD VILLAGE DRILL LOCATION

Sun or shade

- While drillers may prefer to drill in the shade, it is NOT the best location for a well.
- People visiting the well to fetch water will be unaware that harmful *pathogens* are traveling on the soles of their feet.
- For example the bacteria can be picked from street refuse or from a *latrine* if someone has just been to the toilet.
- These contaminants may be washed off the feet on the well pad, which is often wet



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GOOD VILLAGE DRILL LOCATION

Sun or shade

- These contaminants are a threat to the quality of the drinking water.
- When a well is placed in the shade, *bacteria* and *algae* will flourish.
- If the well surroundings can dry up daily, the sunlight will disinfect the well surroundings and create an environment that is hostile to *pathogens*



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GOOD VILLAGE DRILL LOCATION

- 1. Use “Regional Water Survey”**
- 2. What to Avoid:**
 - a) Livestock
 - b) Latrines
 - c) Other pollutants
- 3. What to Look for:**
 - a) Patterns from Google Earth
 - b) Deep-Root Trees and other known deep water vegetation
 - c) Termite Mounds
- 4. Other Methods:**
 - a) Dousing, Witching
 - b) Geophysical Survey

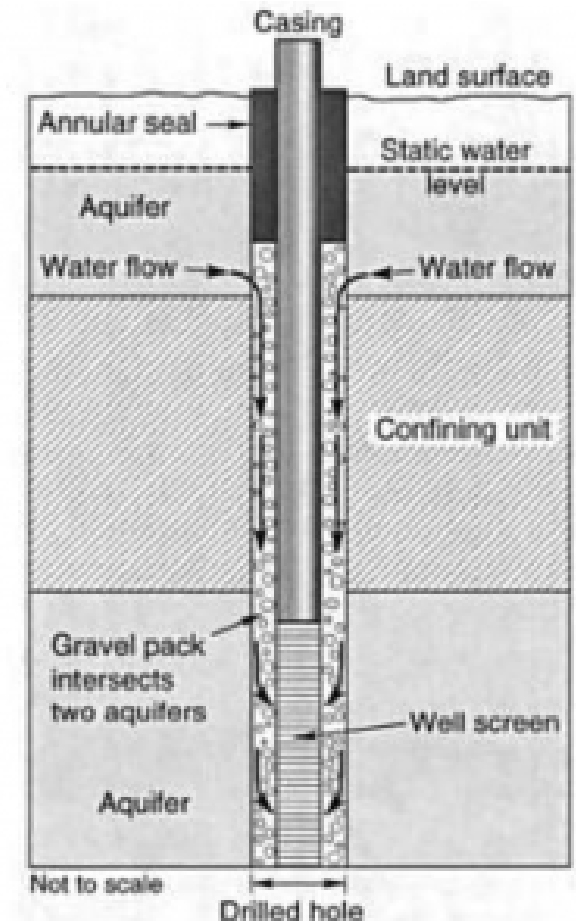
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HYGIENE IN RELATION TO GEOLOGY

Sanitary seal

- We have learned to drill through the impermeable layer to the second aquifer, in order to find clean drinking water. But by doing so, a new problem may be created!
- *A short cut may be created between the first and the second aquifer, so enabling contaminants to flow down from the shallow layer to the clean, second aquifer (and enter the well)*



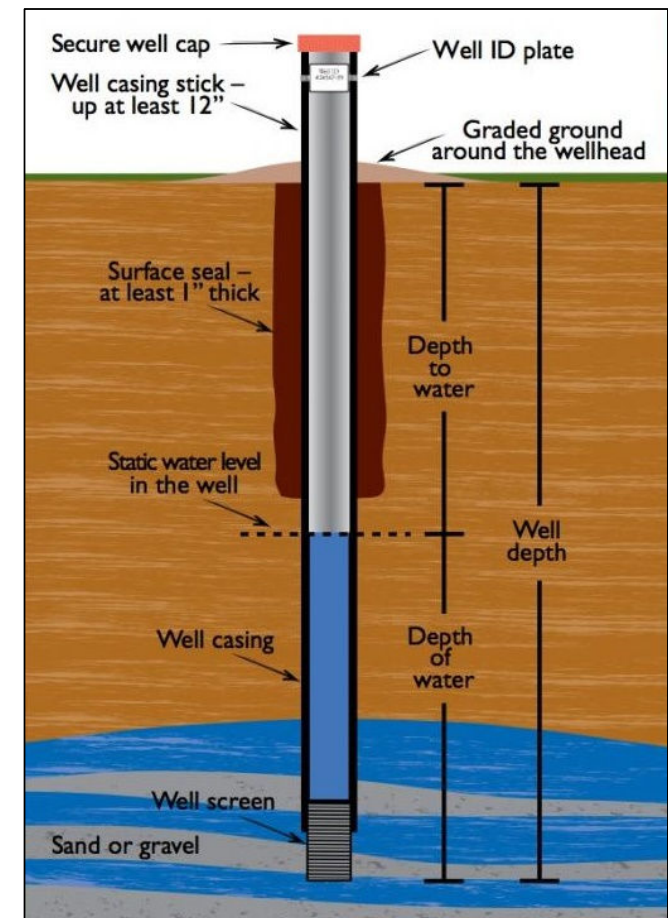
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HYGIENE IN RELATION TO GEOLOGY

Sanitary seal

- To prevent pathogens and chemicals from entering the well screen, a *sanitary seal* must be placed.
- When a borehole is drilled, a well-screen will be installed and a gravel pack placed.
- Then the impermeable layer must be sealed (closed), to prevent contaminants from traveling down into the second aquifer. This is done by a *sanitary seal*.
- The *sanitary seal* is made of cement or bentonite



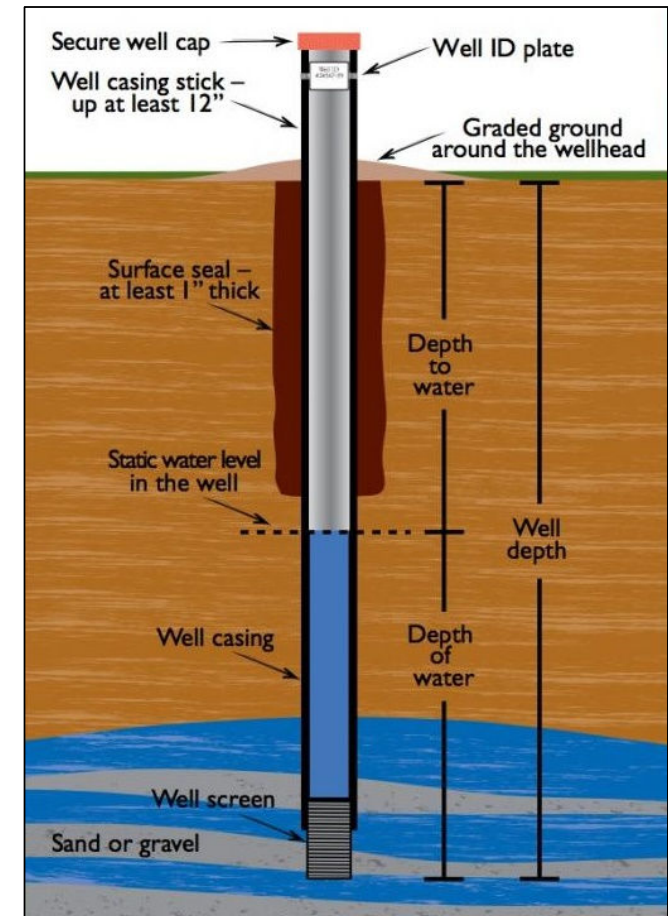
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HYGIENE IN RELATION TO GEOLOGY

Sanitary seal

- When only ONE *aquifer exists*, a sanitary seal with a thickness of at least 3-5 metres must be installed above the gravel pack, to prohibit any shallow contaminants from entering the well
- Otherwise, water (and pathogens) can travel down the loose material in the borehole backfill
- An impermeable seal will force the water to flow through the normal undisturbed soil, thus increasing the travel time and the filtration from the surface to the filter screen.



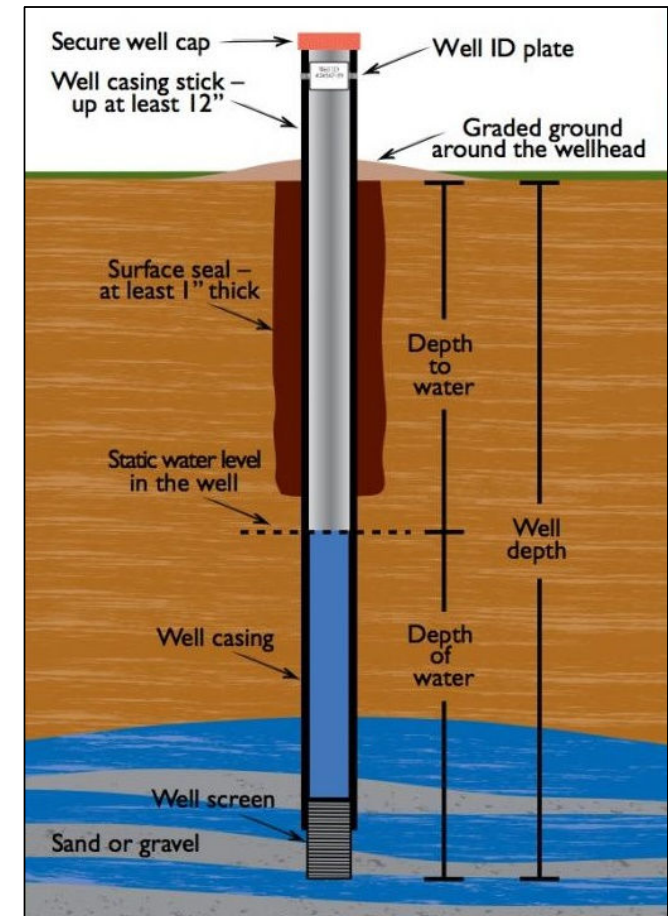
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