You and Your Water Well

The keys to our Hillside lifestyle are our onsite utilities (ie., water well and septic system). Without them, we would be forced to use public utilities, and these would mandate smaller lot sizes, and therefore increased density, because of the costs of sewer and water construction per living unit. Yet, I have found that most Hillsiders know little about these most important facilities upon which they are so reliant for comfortable living. So, I'm going to start a series on water wells--their construction and maintenance and troubleshooting the causes of common problems. This month we'll start with construction basics and definitions will be covered next month.

Construction:

- A national standard for the size of a domestic water well is 6" and most drill tools are sized for this.
- Because of the many boulders associated with our glacial terrain here in Alaska, 6" steel casing is used; actually the casing is 6 5/8" OD and normally the wall thickness is 0.25" so the ID is actually 6 1/8" but it is known as 6" casing.
- The casing is advanced into an unconsolidated water-bearing formation (ie., sand and/or gravel) or seated into bedrock.
- If bedrock is encountered (as it is in many of the Hillside wells above Hillside Drive and a few below), "open hole" is drilled below the casing until enough water is encountered in fractures to complete the well.
- Normally it is not necessary to case or line the openhole because the rock will stand open on it's own.
- The main method of drilling is "air rotary" using a tricone drill bit which is hung on drillpipe and rotated, thereby drilling up the earth. The drilled materials (drill cuttings) are then blown (circulated) out of the hole with high pressure air. Water and/or drill mud can also be used as a circulating medium but this is rarely done in Alaska because of freezeup and well development issues on low yield wells.
- In conjunction with the air rotary drilling, a casing hammer is used to simultaneously advance (drive) the casing.

- The sequence then becomes---drill a few feet ahead of the casing, pull the bit back and drive the casing. This is known as the "drill and drive" method.
- This sequence is repeated over and over until a water bearing formation is encountered and developed.
- When bedrock is encountered, as explained above, the casing is seated (driven) into it. Then openhole (ie, no casing) is drilled--usually with a downhole air percussion tool known as a downhole drill (DHD). Interestingly, a very large DHD was used to drill the 2000 foot hole which rescued the Chilean miners.
- Another effective but slow method of drilling water wells is known as cabletool drilling wherein a bit and heavy stem are suspended by cable downhole and drill with a reciprocal movement up and down in approximately 30" strokes pounding the earth and pulverizing it.
- With this method, the casing is also advanced/driven with the weight of the same tools driving on the top of the casing and is the cabletool variation of the drill and drive method.

- Currently, no one in the Muni uses a cabletool for drilling although they are used for well development and rehabilitation.

The Municipality of Anchorage has a very good and thorough set of construction standards for water wells. These are contained in paragraph 15.55 of the municipal code and can be accessed by going online to “www.muni.org/onsite”.

Next month, we’ll cover definitions and parameters of water wells. If anyone has a question about water wells please email the HALO website or this newsletter and we’ll get you an answer. If the question and answer are important to the overall understanding of water wells on the hillside, we’ll print them here.

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