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Well Grouting and Grout Seal Evaluation Techniques

By
Gregory B. Kuntz
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ABSTRACT

Grouting involves placing cement in the annular space between the casing and borehole to provide an impermeable seal between aquifers. Cements are manufactured to accommodate different chemical and physical conditions found in the subsurface environment. Class A, B, and C cements can be used to a depth of 6,000 feet. Class A cement is used when no special properties are required, whereas class B cement is sulfate resistant and class C cement rapidly develops compressive strength. Class G and H cements used with accelerators or retarders can meet a wide range of depth and temperature conditions. Additives can control curing time, density, filtration, viscosity, compressive strength, permeability, shrinkage, and heat of hydration.

Prior to grouting, annular space and borehole temperature and pressure must be determined. Casing centralization and whether to rotate or reciprocate the casing during cement placement should be evaluated. Whether to use a spacer fluid, a cementing plug, or the cement to displace the drilling fluid from the annulus should also be addressed. The volume of grout and method of grout placement will have to be determined.

The location of cement behind the casing can be determined by running a temperature log 6-12 hours after cement placement. Radioactive tracers mixed with the cement can be located by radiation detecting logging devices. The degree of bonding to the casing and the formation, along with channels within the cement, can be verified with a cement bond log and a pulse echo tool.

Copies of this report are available in the SCDNR's Columbia office.