



KEEPING DRILLERS OUT OF HOT WATER

*"I wish this product existed
a long time ago."*

First Drilling Group's Operations Manager

The underground drilling environment presents a myriad of challenges. Often groundwater is unexpectedly encountered in the drill hole. Extremely high flow rates and pressures are not uncommon. High pressure and high flow groundwater can have disastrous results for a drilling operation. Drillers may have to abandon operations or deal with hazardous working conditions. Beyond the obvious safety issues associated with groundwater, time and efficiency is lost as drillers try to deal with the sudden high pressure water gushing out of the drill hole.

AquaGuard from Fordia, is a patented solution that is designed to allow drillers to safely cross zones with high water in-flow. Fordia is a Canadian manufacturer who offers a complete range of high quality diamond tools, equipment and accessories to mineral exploration and geotechnical companies. The company recently launched AquaGuard, a product that can be used for **underground as well as surface drilling**. It was developed as a solution to the challenging conditions facing one of Fordia's customers.

CHALLENGE

First Drilling Group was tasked with drilling underground core holes in a zone of known high pressure, high flow, and high temperature groundwater. The rock was a broken fractured volcanic dyke with clay and sand in Nevada. To accomplish this without compromising core size, the drillers were faced with water spouting from the hole at a rate of 200PSI and 800 gallons per minute and temperatures in excess of 125 °F. **Their hole completion rate was only 50%** and working conditions were dangerous.

While recovering core samples, there was an increased risk that the inner tube would exit the drill hole at high speed due to excess water pressure pushing the tube out the drill string. What's more, drill crews had to deal with unrestricted high water flows that were pouring into the drill station every time they had to add a rod or change a tube. In some parts of the mine, conditions had become so difficult that the drill crews were faced with losing a hole or drilling with zero core recovery. Time was lost and **productivity dropped up to 50%**.





“The AquaGuard solution allows drilling crews to safely and effectively drill in geologic conditions that are extremely challenging,” stated H el ene Coulombe, Director of Sales at Fordia. “These customers can now recover high levels of quality core. We are thrilled to have this product available. **We are always looking for ways to make drillers lives a little easier.** It’s what we’re all about.” she added.

For more information about the new AquaGuard solution, visit **FORDIA.COM**.

SOLUTION

By using AquaGuard, water inflow was **reduced from up to 800 GPM to only 20 GPM**. The product’s valve partially limits the water from flowing into the drill string when positive pumping pressure is off. The valve closes on itself, similar to a check valve, when the inner tube is recovered using wireline coring methods. When the inner tube is pumped back into the hole, the AquaGuard valve will reopen to allow the tube to gain its locked position.

To create space for the AquaGuard valve in the rods, the AquaGuard core bit has a wider kerf (or cutting area), reducing the core to one size smaller than the actual hole. The customer’s drillers were using an HWL outside diameter with a NWL core size. The inner tube was the same diameter as the core (NWL) and required an AquaGuard adaptor to connect to the HWL head assembly. Once the drill hole advanced beyond the water inflow zone, drillers were able to trip all the rods and resume drilling with the original size without the need to reduce the hole.

RESULTS

The customer was very happy with the results. “I wish this product existed a long time ago,” said First Drilling Group’s Operations Manager. “Having to deal with high inflows for 12 hours consecutively is hazardous, strenuous and extremely time consuming. Using this system is much safer. With the limited water flow, adding rods and changing the inner tube was much more efficient. Our operating time was reduced significantly” he added. The AquaGuard valve **reduced inflows dramatically**. This reduction prevented core from being washed away. What’s more, Mine Operations appreciated the fact that the drilling station was not flooded with excess water flowing into the primary travel ways and eroding the roads.

Reduction of water inflow

