Newcastle University had recently drilled a 1000mtr deep geothermal borehole which produced heated water from deep in the Weardale granite formation.

The new project was to drill a recharge borehole into the granite several hundred metres away. The proposed borehole was to be 400mtr deep penetrating approximately 100mtr into the granite formation. A small spot core was also to be taken of the granite as this had never been seen in solid form. The strata to be penetrated above the granite consisted of a series of limestone, mudstone and whin sill layers, many of which were fractured, cavernous and particularly hard.
The borehole was drilled with Drilcorp’s Conrad Comax 800 Drilling Rig with various drilling techniques. Superficial deposits were drilled at 18.5” Ø with mud flush and a 16” Ø mild steel casing was installed to maintain the stability of the borehole. Mud flush drilling at 14.5 Ø was continued on down to 70mtr. However, serious flush losses in a cavernous limestone occurred and even repeated grouting failed to plug the large voids. This section of the borehole thus had to be cased off with a 12” mild steel casing. The borehole continued to be advanced at a 10.5” diameter and owing to the hardness of the strata, a down the hole hammer was used. The granite formation was found to be at 288mtr. Drilling continued 10mtr into the granite and then a heavy duty 245mm (95/8”) casing was installed and the annulus fully grouted.

Drilling continued to 410mtr at 8.5”Ø using air lift reverse circulation, taking a spot core at 296mtr. The borehole was subsequently capped off and it will be used for further scientific experiments in the future.