

August 20, 2004

IODP EXPEDITION 301: JUAN DE FUCA HYDROGEOLOGY SITE SUMMARY: SITE 1026

Three CORK borehole observatories were installed during Expedition 301, in Holes 1026B, 1301A and 1301B. The first of these systems replaced a CORK observatory deployed during an earlier expedition, whereas the second and third are in newly-drilled and cased holes. The new Hole 1026B CORK system was the simplest of the systems deployed during Expedition 301. It comprised a CORK-II body with 4-1/2" casing extending to 201.5 mbsf, and a single packer element set in casing near the bottom of the 4-1/2" casing. No 4-1/2" casing was installed below the packer element sub because the hole was completely cased to a depth below the liner, and there was no need to provide additional protection for the instruments hanging below the bottom plug.

The umbilical run in Hole 1026B comprised a single 1/2" packer inflation line and three 1/4" pressure-monitoring and fluid-sampling lines. The three 1/4" lines were run through the single packer and ended in small wire-wrapped screens that were attached just below the inflation element. All of the CORK systems deployed on Expedition 301 included nine pass-throughs within the packers and across the upper 10-3/4" casing seal, so that we could use a single design for these systems and achieve sampling and monitoring goals within multi-interval CORKs. Most of the extra pass-throughs in the Hole 1026B CORK were capped, but one line through the 10-3/4" casing seal was plumbed into a two-way valve in the CORK head so that during a future submersible or ROV dive expedition, it will be possible to check pressure below the casing seal but above the packer element. If the pressure monitored below the packer is different from that above the packer, this will give a positive indication that the CORK system is properly sealed. As with all other valves in the CORK head, this one was left open during deployment to prevent air from being trapped in the sampling and monitoring lines.

The Hole 1026B instrument string included three Osmosampler packages and two autonomous temperature loggers. One Osmosampler contains copper coils for gas sampling, another has Teflon tubing for fluid sampling and tracer injection, and the third one contains microbiological incubation substrate and an acid-addition Osmosampler for metals analyses.