Igapó Achieves Record Drilling Performance with BOREMAX® High-Performance Freshwater Fluid

CUSTOMIZED DRILLING FLUID HELPS SAVE OVER THREE DAYS OF RIG TIME IN MATURE FIELD

OVERVIEW

Igapó currently operates in four mature fields of the Ecuadorian Amazon, including in the Pucuna and Palo Azul fields. To help Igapó optimize its drilling performance, Baroid drilling fluids provided wellbore stability, zero issues while tripping, and longer exposition time with water-based mud (WBM). These drilling fluids also eliminated the necessity for wiper trips to condition the hole prior to the casing run.

On previous jobs in the Pucuna field, analysis of offset wells revealed issues related to wellbore stability and also wiper trips with backreaming. At the time, it was a common operational practice to run a wiper trip after each 40 hours of drilling and before each casing run.

CHALLENGES

The operator needed to drill a complex “J”-shaped directional well. The challenges included drilling a 4,700-foot-long (1432-meter-long) section, with a 12¼-inch hole, across heterogeneous lithology that included swelling clay, conglomerates, shale, limestone, and depleted sandstone – indicating high chances of wellbore instability and bit balling events, as well as offset wells with longer wiper trips and casing run times.

SOLUTION

To deliver a high-performance water-based mud (HPWBM), Baroid designed a customized BOREMAX® high-performance freshwater fluid for these wells through several tests and offset well analyses. Additionally, to ensure the successful drilling of this section, integrated Halliburton teams from Sperry Drilling, Drill Bits and Services, and Project Management worked together to optimize the hydraulics, drilling parameters, and operational procedures.

RESULTS

The 4,700-foot-long (1432-meter-long) section was drilled successfully in just one run, and all of the client’s objectives were achieved. The uniquely formulated BOREMAX drilling fluid provided superior hole cleaning, and also enhanced wellbore stabilization by “holding back” the different formations drilled along the section. No tight hole was observed, and tripping time was reduced, thus allowing the client to trip out on elevators instead of with backreaming. The casing string was also run without incident, and was cemented with full returns to surface, even after more than 168 hours of wellbore exposure to the BOREMAX high-performance freshwater fluid.
The section was completed 3.1 days sooner than planned. No shale sloughing, cavings, or mud losses were encountered during drilling, and no non-productive time (NPT) related to drilling fluid was incurred – thus achieving the best drilling trip times recorded as of that date in the Pucuna field. Key performance indicators (KPIs) are shown below.

Analyses of wiper trips show the best KPIs.

![Wiper Trip Speed, ft/hr](image)

**Fig 1. Wiper trip analysis.**

The drilling fluid properties were maintained easily within the programmed ranges and were also tailored during the section to achieve higher rates of penetration (ROPs).

![Customized Rheology](image)

**Fig 2. Rheology and ROPs in different wells.**