

## SECTION 8 - DRILLING REVIEW

## 8.6.4 Mud System and Solids Control

## 36" AND 26" HOLE SECTIONS

## Conclusion :

The use of weighted mud for hole displacements ensured hole stability and trouble-free running of both the 30" and 20" casing strings and the practice should be continued.

## 17-1/2" HOLE SECTION

## Discussion

The PHPA/ Polydrill/ KCl/ seawater mud system used in the 17-1/2" hole was developed based on ANOC's previous experience with PHPA muds in the area and it was used for the first time on this well. The system was successful in stabilizing the reactive Tertiary clays in the intervals of the hole where it was run according to the programmed specifications. For a PHPA mud, it displayed an extremely good tolerance to contamination by low-gravity solids. However, the system was allowed to be run outside the programmed specifications for a number of reasons :

- The new centrifuge hook-up was inadequate for processing 14.0 ppg mud for barite recovery. (It was later modified and functioned well.)
- Lack of familiarity with the new rig pit and mud mixing arrangement prevented effective mud maintenance with premix additions.

As a result, the reactive, low gravity solids loading was

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excessive for a large portion of the hole section. When attempts were made to restore the system to the programmed specifications, too little was done too late. This was the direct cause of the failed attempt to run the 13-3/8" casing. After restoring the system to the programmed specifications, hole conditions were again excellent and the casing was run without difficulties.

## Conclusion :

The PHPA/ Polydrill/ KCl/ seawater mud system was only partially successfully deployed on well 2/8-14.

## Recommendation :

Greater efforts must be placed on breaking in new rig equipment and familiarizing the drilling team with the requirements for maintaining the 17-1/2" mud system.

## Conclusion :

Experience on this well shows that the PHPA/ Polydrill/ KCl/ seawater mud system will provide excellent shale stabilization, cuttings encapsulation and hole conditions if it is run to the programmed specifications with a dilution rate of around 4 bbls of mud per bbl of new hole.

## Recommendation :

Continue to use and develop the PHPA/ Polydrill/ KCl/ seawater mud system on exploration wells in the area. In combination with improved holecleaning provided by the use of 6-5/8" drillpipe and the overgauge hole provided by the use of eccentric bits, the mud system has the potential to provide a much higher level of trouble-free drilling performance than that seen on well 2/8-14.

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## 12-1/4" AND 10-5/8" HOLE SECTIONS

The systems from the previous hole sections were continued in both the 12-1/4" and the 10-5/8" hole sections, with only gradual adjustments made to the composition. The effects of cement contamination were minimized by drilling out casings and cement plugs with a minimum volume of mud, kept separated from the uncontaminated mud used for drilling new hole. The washed out intervals seen on the 12-1/4" hole caliper log appeared to correlate with those intervals drilled near- or slightly under-balanced.

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## 8-1/2" AND 5-7/8" HOLE SECTIONS

## Discussion :

Again, the mud systems from the previous hole sections were continued in both of these sections. As a result, the mud system used on the well was essentially a continuous system from surface casing to total depth, gradually modified by allowing products to be depleted when the higher temperatures and changing requirements dictated changes to the composition. With bottom-hole temperatures exceeding 300°F and mudweights reaching 19.6 ppg, rheologies remained low and under complete control at all times.

## Conclusion :

The Hoestadrill/ Polydrill system used in the final interval of the well provided excellent thermal stability and rheology control. Hole conditions remained good throughout and hole wash-outs were minimal. The gradual adaptation of the mud system to increasing temperatures and changing requirements was successful but on a few occasions indications were seen of overtreating the system.

## Recommendation :

Continue to apply the high temperature mud formulations used on this well by placing more emphasis on a cost effective adaptation of the system as temperatures increase.