HYDRO-GUARD® Inhibitive High-Performance Water-Based Fluid
A High-Performance Solution for Reactive Formations and Environmentally Sensitive Locations

Challenge
Increasing environmental concerns and added costs for waste treatment and disposal cause operators to continually seek a water-based fluid that can emulate the performance of synthetic and oil based fluids. “High-performance” water-based fluids have been in the industry for several years, but from one fluids provider to another they can vary widely in performance reliability. With deepwater and offshore rig spread costs in excess of $1 million per day, it is crucial to increase drilling efficiency and reach total depth as fast as possible. This means having a reliable fluid that can provide wellbore stability under a multitude of formation types and their resultant challenges.

Invert emulsion fluids carry greater environmental liability than water-based fluids, requiring higher ancillary treatment costs which can represent 40-50% of total mud costs.

Overview
HYDRO-GUARD® water-based fluid is a clay-free system designed for maximum shale inhibition in highly reactive formations like those found in deepwater, but is also ideal for many land applications. Relying on polymeric chemistry for inhibition the HYDRO-GUARD system can provide wellbore stability, high rates of penetration and acceptable rheological properties over a wide range of temperatures. An added benefit is that it allows cuttings discharge based upon water based environmental restrictions.

Since no oil is used in the formulation, the HYDRO-GUARD system eliminates the need for cuttings processing and monitoring equipment. First introduced in 2002 this high-performance fluid has undergone continual improvement with several innovations made to its key additives. It has successfully run on many deepwater, shelf and land operations world-wide.

Benefits
HYDRO-GUARD systems use polymers to provide improved inhibition over conventional systems, effectively eliminating clay and significantly reducing solids content. The result is faster ROPs which are comparable to oil-based fluids. Benefits include:

- Maximum wellbore stability
- Improved hole cleaning
- Reduced torque and drag
- Lower ancillary rig costs
- Minimize environmental impact
- Low dilution rates

Both samples contain 24% Salt
No Polymers Added  With 2 ppb CLAY SYNC
Time span 10 minutes

CLAY SYNC® II shale stabilizer is one of the key additives in HYDRO-GUARD system which helps reduce clay dispersion as well as swelling

Features
- Highly inhibitive, non-dispersed system
- Uses unique polymer and inhibitive chemistry, contributing to:
  - Improved lubricity
  - Thixotropic rheological properties
  - Clay free, low colloidal content
  - Provides lubricious, thin filter cake
Features (cont)

- Exceptionally low MBT
- Ability to drill overbalanced
- Excellent cuttings integrity even in gumbo formations
- Reduced torque and drag

Gumbo Control

The HYDRO-GUARD system features two proprietary polymeric additives that can minimize shale hydration almost instantaneously.

- CLAY GRABBER® Flocculant can be effective at low concentrations; drill solids are encapsulated as they are produced at the bit.
- CLAY SYNC II® Shale Stabilizer adheres to the surface of reactive clays which helps reduce dispersion and hydration while improving cuttings integrity.

When using conventional water-based fluids, gumbo chains and boxes must be cleaned every few hours as they become plugged with large, sticky lumps of clay. The HYDRO-GUARD system “coats” the highly reactive clays, preventing them from adhering together, so the clay is easily removed from the system by the shakers. Field results show that bit and bottom hole assembly (BHA) balling – a problem that affects the overall drilling rate – is dramatically reduced with the HYDRO-GUARD inhibitive water-based fluid. The bit and BHA emerge from the wellbore with minimal solids buildup, significantly decreasing the need to spend expensive rig time removing accretion from the BHA and bit.

Applications

HYDRO-GUARD water-based fluid was designed for offshore, deepwater and shelf wells, but is also ideal for land applications. It has thermal stability up to 300°F (148°C) and a density range up 16.5 lb/gal. Difficult formations can now be drilled with a water-based fluid, where previously only invert emulsion fluids could do the job without excessive NPT. Difficult formations include porous sandstones, fractured limestones, impermeable shales and clays.

HYDRO-GUARD high-performance system is highly tolerant of low gravity solids and shows much lower incidence of small diameter particles.