

A laboratory setting with a microscope in the foreground, a glass jar containing a white liquid, and a graduated cylinder. The background is blurred, showing other laboratory equipment and blue lighting.

**Mi SWACO**

A Schlumberger Company

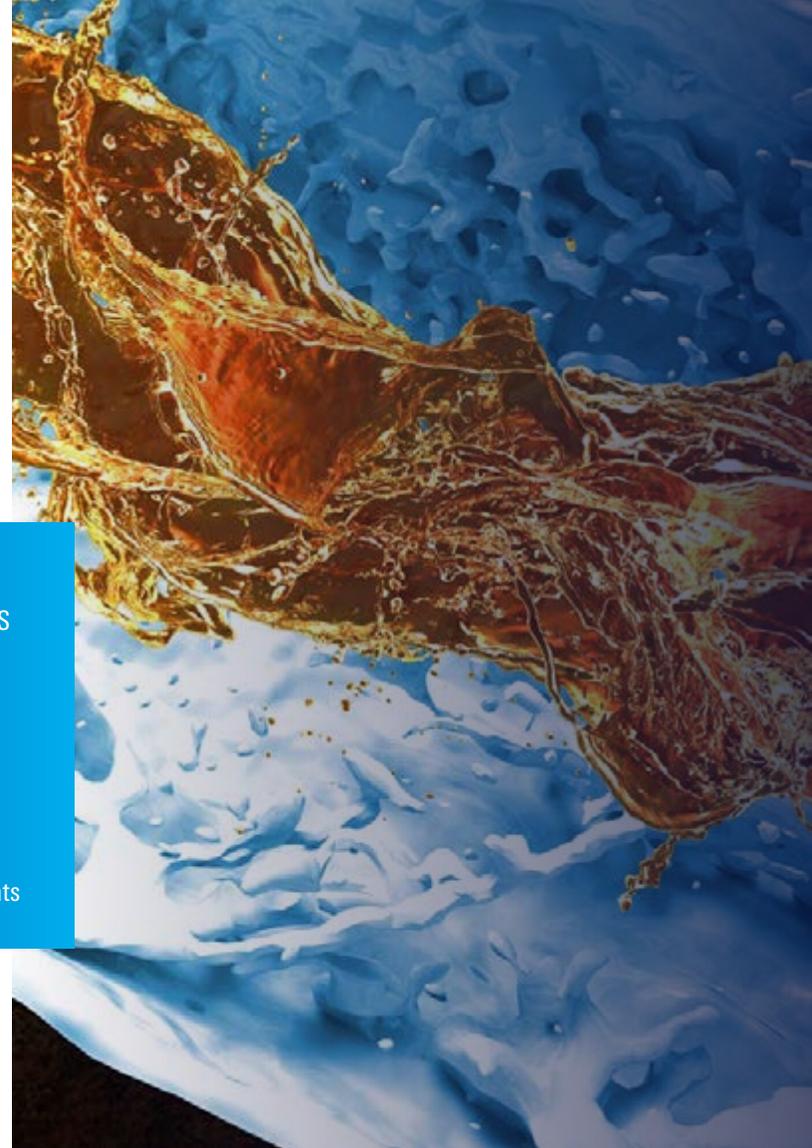
# VeraTherm

High-temperature water-based drilling fluid

# VeraTherm fluid— superior performance and high thermal stability

## **BENEFITS**

- Can be formulated over a wide density range 8.6–19.0 lbm/galUS [1.03–2.28 sg]
- Is compatible with most oilfield brines
- Contains fewer chemical additives
- Takes less time to mix in the field
- Provides long-term stability at high temperature
- Has excellent rheology profile with elevated low-end readings
- Tolerates high concentration of drill solids and other contaminants



Drilling wells with bottomhole temperature exceeding 300 degF [149 degC] requires the use of high-temperature stable drilling fluid systems. Formate brines and supplemental thermal stabilizers are used to help extend the thermal stability of conventional polymer-based drilling fluids. However, this approach fails to provide the long-term thermal stability needed for extended wireline logging operations and requires substantial treatments plus several trips to achieve desired thermal stability during drilling operations.

The VeraTherm\* high-temperature water-based drilling fluid provides a stable drilling fluid at high temperatures with minimal treatment similar to oil-based mud. In addition, this dynamic stability translates into excellent long-term static stability during tripping, logging, and casing running operations. The VeraTherm fluid outperforms formate and conventional synthetic-based polymer systems.

The VeraTherm fluid features a newly developed dual-function synthetic polymer, VeraVis\* branched synthetic polymer viscosifier and fluid loss additive, that provides enhanced rheological profile and fluid loss control along with long-term stability and low sag tendency at elevated temperature conditions above 300 degF [149 degC]. The long-term thermal stability characteristic of the VeraTherm fluid makes it ideal for use in high-temperature wells requiring extended wireline logging.

As a versatile system, the VeraTherm fluid can be formulated using any conventional oilfield brine, including formate brine, and can be designed for a wide range of applications, including overburden drilling, coiled tubing drilling, and intervention fluids. In addition, it can be designed as a reservoir drill-in fluid using acid-soluble bridging materials to minimize formation damage by depositing a thin, ultralow-permeability, and easy-to-clean filtercake on the face of the formation.

The superior performance and high thermal stability of the VeraTherm fluid have been proven under laboratory and field conditions.



# VeraVis additive—unique chemistry with a dual function

VeraVis additive is the unique chemistry that makes the VeraTherm fluid a versatile and high-performance, high-temperature drilling fluid system. It provides both fluid loss control and excellent rheological profile with elevated low-end readings that are essential for optimal hole cleaning in directional drilling and coiled tubing applications.



## Few and easy-to-mix chemical additives

The VeraTherm fluid contains fewer chemical additives and takes less time to mix compared with conventional high-temperature drilling fluids. VeraVis additive, the main chemical additive, disperses readily into the base brine and does not form fish eyes when added through a shearing hopper. Although mixing can be achieved without an agitator installed in the pit, it is recommended to use a pit system with an agitator for optimal mixing performance.

VeraTherm Fluid Compatibility	
Base Brine Type	Maximum Brine Density, lbm/galUS
Potassium chloride	Saturated
Sodium chloride	Saturated
Sodium bromide	Saturated
Sodium formate	Saturated
Potassium formate	11.0
Cesium formate	16.5
Calcium chloride	11.0
Calcium bromide	13.5
Calcium bromide and zinc bromide blend	15.0

Typical VeraTherm Fluid Formulation		
Product	Property Control, lbm/bbl	Function and Description
Base brine	As required	Base fluid and density
Defoamer	0.35	Defoamer
VeraVis additive	5–10	Primary viscosifier and fluid loss control
Sized calcium carbonate, barite, and hematite	As required	Bridging and weighting materials
Supplements	As required	Shale inhibition, lubrication, thermal stabilization, scavenging, and pH buffering

## Technical Report

Location: Southeast Asia

# Application of VeraTherm Fluid Eliminates Four Conditioning Trips, Saving 5 Days of Rig Time

### Temperature stability challenges

An operator required a high-temperature water-based drilling fluid to use on a high-temperature exploration well with reactive shale offshore Australia. Estimated temperature in the well was 300 degF [149 degC]; conventional water-based drilling fluid systems are not stable at this temperature, particularly for the longer time needed for wireline operations. This prospect had two potential reservoirs, one each in 8½-in and 6¼-in sections with respective lengths of 1,325 ft [404 m] and 1,952 ft [595 m].

### What Schlumberger recommended

Schlumberger proposed using VeraTherm fluid, and the operator opted to use the fluid based on lab results.

### What the operator achieved

The VeraTherm fluid was used to successfully drill both sections with no major issues, such as stuck pipe, hole cleaning, or wellbore stability. During the wiper trip to casing shoe after reaching TD, no tight spots were observed. Also, no polymer degradation or gelation was observed when pulling wireline tools back to surface. The operator plans to continue using the fluid on upcoming drilling campaigns.



## Technical Report

Location: Middle East

# VeraTherm Fluid Eliminates Conditioning Runs During Wireline Logging

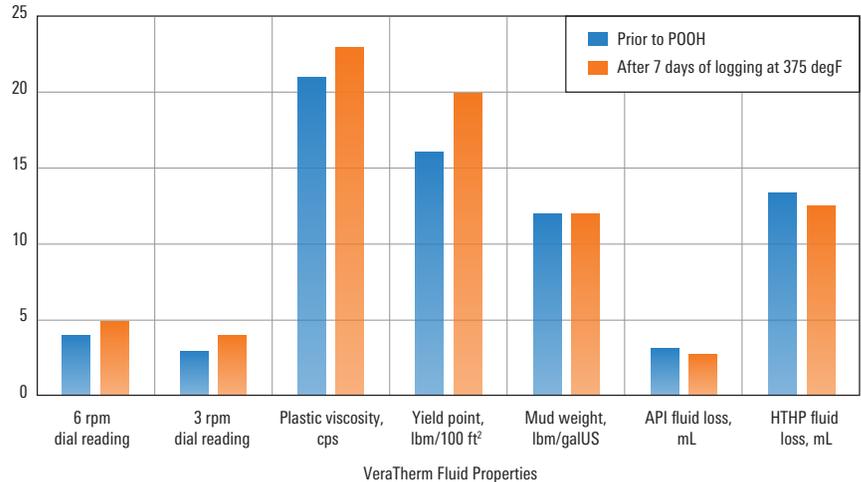
### Reservoir logging challenges

A cost-effective, high-temperature, water-based fluid solution was required to drill three intervals and maintain stability through wireline logging. Offset data showed a prevalence of barite sag, unsuccessful logs, and severe lost circulation. High-temperature oil-based systems were not considered cost efficient for this project due to the expected lost circulation in limestone formations.

Thermal stability was the major concern as wireline logging was expected to take multiple days. The fluid would be required to remain static in the wellbore at up to 375 degF [191 degC] and needed to be compatible with commercial scavengers.

### What the operator achieved

The VeraTherm fluid was used to drill the 12¼-in, 4,591-ft [1,399-m], and 8⅝-in, 2,706-ft [825-m] intervals, traversing limestone, shale, anhydrite, and dolomite formations. The fluid remained stable with no signs of barite sag for up to 9 days at 303 degF [151 degC] and 8 days at 320 degF [160 degC] in the intermediate sections. Wireline logging was successful in the 6-in interval without the need for conditioning trips for 7 days at 375 degF [191 degC] with high-quality data retrieval and minimal change in the fluid properties.



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[slb.com/veratherm](http://slb.com/veratherm)

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