



New scavenger eliminates H₂S concerns in mature offshore well

BaraScav™-1061 H₂S scavenger ensured safe and successful well re-entry for permanent plug and abandonment

CHALLENGE

- » Safely re-enter and permanently abandon an inactive well after 17 years with WBM in the wellbore
- » Unknown downhole WBM environment with increased risk of encountering H₂S
- » Ensure all sour gas was neutralized in the wellbore to protect the wellbeing of rigsite personnel

SOLUTION

Add BaraScav-1061 hydrogen sulfide scavenger, designed to:

- » Neutralize any H₂S through a non-reversible reaction
- » Dissolve in both water and oil-based fluids
- » Deliver non-toxic, effective results at low concentrations

RESULTS

- » No H₂S was measured by the gas detection equipment on surface
- » BaraScav-1061 effectively converted any H₂S in the old WBM to harmless reactants
- » Safe P&A operation was completed to customer satisfaction

GULF OF MEXICO

OVERVIEW

A major operator in the Gulf of Mexico planned to re-enter a temporarily abandoned (TA) well, dating back to 2004, for permanent plug and abandonment (P&A). During the original TA, water-based mud (WBM) with corrosion inhibitor was left in the wellbore. But with no scavengers added to the WBM, hydrogen sulfide (H₂S) gas was now a significant concern after the 17-year hiatus.

To accomplish the permanent P&A, a riser was run and displaced to 12.7 lb/gal salt saturated riser-vis (SRV) water-based fluid. The cleanout assembly was tripped in the hole to drill out the shallow cement plug. Pretreated water-based fluid containing 1.5 lb/bbl BaraScav™-1061 was circulated and conditioned with the existing fluid already in the hole, maintaining a 1.5 lb/bbl concentration for the entire system.

Once the fluid system was conditioned, the operator continued tripping and tagged the next cement plug at ~15,500 ft MD. The fluid system was circulated and conditioned incorporating additional, old water-based fluid while maintaining a 1.5 lb/bbl concentration of BaraScav-1061 for the total system. The water-based fluid system was then displaced to an 11.9 lb/gal BaraXcel™ 4 synthetic-based mud (SBM) system that was also pretreated with 1.5 lb/bbl of BaraScav-1061. Casing was cut and pulled, an additional cement plug set, and BaraXcel SBM left in the wellbore. The riser was finally displaced back to seawater, successfully completing operations for this final P&A project.

CHALLENGE

There was a high likelihood of sour gas in the wellbore due to the age of the well and the use of uninhibited water-based fluid in the earlier, temporary abandonment. The operator required a product that was both easy to handle and highly effective in treating H₂S, while also avoiding any safety issues, such as a reversible reaction leading to re-formation of the poisonous gas contaminating offshore waters and endangering personnel working at surface.

SOLUTION

During the early planning stages of an upcoming well that the operator planned to permanently abandon, a concern raised by their team was the high risk of exposure to H₂S gas. The Baroid Fluids team discussed this concern, in the context of a water-based fluid with no hydrogen sulfide scavengers being left in the well when it was first abandoned 17 years ago.

Based on these factors, among others, the Baroid Fluids team recommended using the new BaraScav-1061 hydrogen sulfide scavenger. The operator requested adding a concentration above the typical range as an extra precaution. Before well re-entry began, the fluids team at the rigsite built the 12.7 lb/gal WBM fluid system using SRV WBM cut back with seawater. BaraScav-1061 was added to the fluid in preparation for the commencement of P&A operations.

As the previous fluid in the wellbore was incorporated into the new fluid system during P&A operations, additional amounts of scavenger were added, as needed, to maintain the prescribed concentration in the overall system. Pre-treatment of the BaraXcel SBM with BaraScav-1061 served to reduce the risk of encountering H₂S at surface during the final fluid displacement prior to permanent abandonment.

RESULT

BaraScav-1061 hydrogen sulfide scavenger eliminated any measurable levels of H₂S gas during re-entry into a GOM well that had been temporarily abandoned and filled with water-based fluid for 17 years. The product easily mixed into the fluid system at the rigsite and, due to its non-toxic nature, risks to personnel were minimized on surface. The P&A project was successfully completed, meeting the customer's safety expectations. Due to the positive results of this initial BaraScav-1061 hydrogen sulfide scavenger application and rigsite safety being a high priority for every operator these days, its use has been expanded to all wells where H₂S concerns exist.