A deepwater Gulf of Mexico operator had plans to complete an oil well. In reviewing potential flow assurance issues, barium scale deposition was identified as a likely problem. This was due to the fact that the well was designed to be a seawater flood and the connate water was known to contain a high percentage of barium. Because seawater is high in sulfate, the mixing of a high barium water and the seawater in the reservoir creates a scenario for harmful scale deposition.

Barium sulfate scale is a non-acid soluble scale. Once formed, it is quite difficult to remove. Unlike carbonate scale, which is soluble in acid, barium scale must be handled in a progressive and expensive manner that includes chelating chemistry, sufficient downhole temperature, and long periods of soaking. Even under optimum conditions, barium scale removal often calls for the use of mechanical means such as coil tubing.

A plan was developed to address the issue by proactively treating the well against barium scale. The operator needed a scale inhibition strategy that both provided sufficient inhibition and lasted for a prolonged period. Liquid chemical alternatives offer good inhibitory service, but do not last for extended periods. The operator decided to use the Baker Hughes ScaleSorb™ Ultra offering.

ScaleSorb Ultra is based on the same concept as the established Sorb product line which has proven effective at providing long-term inhibition in numerous wells since 2005. ScaleSorb Ultra combines a high-strength nano material that is the same size as a proppant and that provides a high internal and external surface area onto which a robust
scale inhibitor is adsorbed. The end result is a proppant-sized material stronger than an intermediate strength proppant that contains a high amount of an active scale inhibitor.

The ScaleSorb Ultra 9004 inhibitor was mixed with the proppant on the fly during the frac pack for the operator. The well was put on production and immediately flowed both oil and water. After two months and two fluid sample tests, the analysis of the residual scale inhibitor found in the produced water demonstrates that the scale inhibitor from the ScaleSorb Ultra was still present and was still inhibiting scale in the formation.

These early results indicate that the ScaleSorb Ultra program will prove successful at inhibiting the formation of barium sulfate scale.