

## **Evaluation of Two Scale Inhibitors in Seawater Hydraulic Fracturing**

**Hicham El Hajj<sup>1</sup>, Tawfik Al-Ghamdi<sup>1</sup>, Prasad Karadkar<sup>1</sup>, and Mohamed Hamam<sup>1</sup>**

<sup>1</sup>Halliburton

### **Abstract**

In oil-rich areas, hundreds of millions of gallons of fresh water are pulled from local aquifers each year to support fracturing and related operations. In some regions, prices for using water for operations have doubled or tripled. Seawater has been used for offshore wells as a base fluid for drilling and well stimulation. However, using seawater in hydraulic fracturing can be a significant challenge; high salinity or unwanted salinity can drastically alter the effectiveness of the treatment fracturing fluid chemicals. Also, introducing seawater to the reservoir formation water can lead to rock softening, precipitated scaling, and organic reactions, which could sour the well and damage the formation.

Because unconventional oil and natural gas is trapped in low-permeability rock, pathways have to be created to allow oil and natural gas to move through the rock to the well and to enable it to be pumped to the surface. A common method of achieving this is to use hydraulic fracturing to “fracture” or crack the rock and create the paths required. Hydraulic fracturing is a stimulation technique used to increase the amount of hydrocarbons that can be extracted from a source rock. Hydraulic fracturing involves injecting large volumes of water, sand, or other proppant and specialized chemicals into producing wells under sufficient pressure to fracture low-permeability geologic formations containing oil and/or natural gas. The proppant holds the new fractures open to allow the oil or gas to flow freely out of the formation and into the production well.