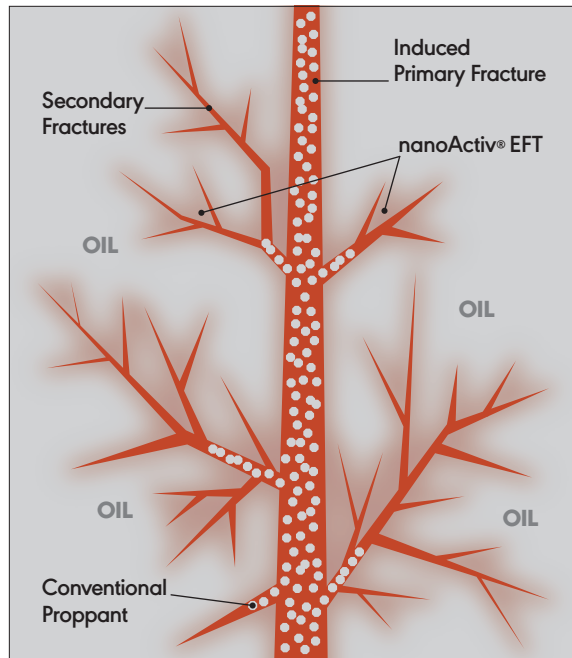


## Enhanced Flowback Technology

nanoActiv<sup>®</sup> EFT increases profits through greater initial oil and gas production. It is a nanoparticle micellar dispersion, which uses a synergistic combination of silicon dioxide nanoparticles, a soybean extract solvent, and a blend of surfactants. nanoActiv<sup>®</sup> EFT exhibits an extremely effective primary chemical action, enhanced with the added mechanical properties of nanotechnology. nanoActiv<sup>®</sup> EFT reduces interfacial tension and exhibits wettability modification, combined with the unique effects of diffusion, disjoining pressure, fragmentation, and reduction in interfacial tension. It improves stimulation fluid interaction near the created and propped fracture faces, and throughout the entire propped fracture network—increasing initial oil and gas production.

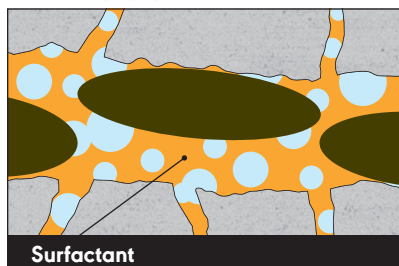
### The Challenge

Hydraulic fracturing can introduce a variety of fracturing fluid systems into unconventional reservoirs. When a lower salinity fracturing fluid comes into contact with a higher salinity low permeability formation, fracturing fluid filtrate can get trapped into the pore spaces due to a difference in osmotic potential. This can lead to an increase in the water saturation and a problematic decrease in hydrocarbon mobility in pore spaces.



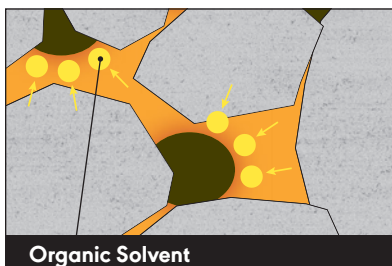
*nanoActiv<sup>®</sup> EFT reaches surfaces adjacent to both primary and secondary fractures to improve cleanup and flow efficiency.*

nanoActiv® EFT reaches into small pore spaces—releasing more immobilized oil than ever before—delivering significantly more efficient and complete flowback of the treatment fluids over a shorter period of time.



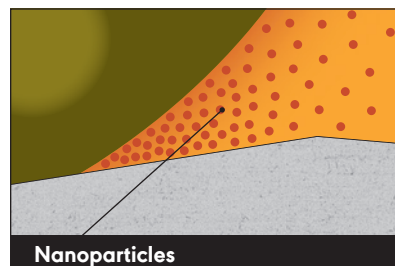
**Surfactant**

- reduces interfacial tension
- mobilizes immobile water-block zones
- enables more efficient fluid flow



**Organic Solvent**

- improves the mobility ratio
- reduces oil viscosity
- increases primary flow



**Nanoparticles**

- stabilizes the micellar dispersion
- applies disjoining pressure to free oil
- fragments oil into smaller droplets

## The Solution

nanoActiv® EFT effectively displaces hydrocarbons by reducing the interfacial tension of the fracturing fluid and mobilizing immobile water-block zones in pore spaces. The presence of nanoparticles in nanoActiv® EFT significantly increases the efficiency of the technology by contacting more surface area with a Brownian-motion, diffusion-driven mechanism known as disjoining pressure. The nanoparticles in nanoActiv® EFT fragment hydrocarbons into smaller droplets, allowing efficient recovery of fluids pumped and onset of rapid production. It cleans up residual fracturing fluid components such as residual gel and maintains maximum flow capacity of the proppant pack.

## Application

nanoActiv® EFT is designed to be pumped in the body of the fracturing fluid as an additive at concentrations between 1 gallon and 5 gallons per 1,000 gallons of fracturing fluid. This allows nanoActiv® EFT to aid in a more efficient and complete flowback of the fracturing fluid—radically increasing the percentage flowback over a shorter time period.



Watch the video at  
[nanoActiv.com/EFT](https://nanoActiv.com/EFT)

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