

Polymer Flooding



Description:

Improve macroscopic sweep efficiency with water soluble polymers to increase oil production rate and accelerate recovery.



Application:

Reservoirs suffering from water channeling issues due to poor mobility control of water (viscous oil and/or unfavorable relative permeability).



Results:

With the successes of the Daqing and Pelican Lake projects, two full-field polymer flood implementations, The EOR Alliance has demonstrated its capability in designing successful polymer flood projects. The design includes reservoir characterization, laboratory study, modeling (PumaFlow™ software), recommendation for surface facility and on-field assistance.

Challenges:

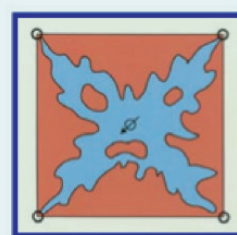
- Select stable polymers (thermally, chemically and mechanically) in reservoir conditions.
- Potential injectivity issues related to operational constraints or reservoir characteristics.
- Polymer behavior in the reservoir (simulations and forecast).

Solutions:

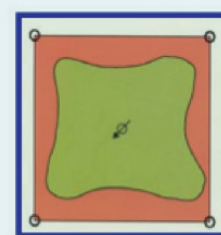
- Performance evaluation workflow for polymer selection, injection strategy definition and data generation for reservoir simulation.
- Anticipate any potential operational issues (injectivity issues, viscosity loss, polymer degradation, etc.).
- Evaluate the process through reservoir simulation work, including reservoir characterization/history matching, 1D to 3D simulations.

Objectives:

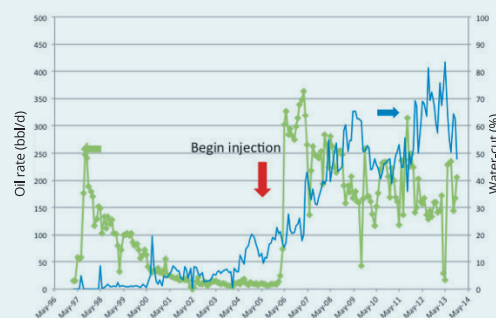
- Reduce risks of failure through careful preparation, stepwise implementation and continuous monitoring.
- Extend the application of Polymer Flooding to difficult reservoir conditions (heavy oil, high salinity, high hardness, low permeability formations, high temperature, etc.) considering readily available commercial EOR polymers.
- Demonstrate that for new developments, EOR scenarios should be considered early.



Water flooding



Polymer flooding



Well 15-34-081-22W4 production history

References: SPE165234, SPE166256, SPE164083, SPE27819, SPE28601, SPE169673, SPE169715, SPE171105, SPE174050, SPE180739, SPE180852, SPE181499, OTC25919, SPE190415, SPE190180.