

Produced Water Solutions

EOR Process

Introduction

Enhanced oil recovery (EOR) processes are utilized to increase production from mature oil and gas fields that are not responsive to conventional production techniques. Some of the more common EOR processes utilize thermal, such as steam assisted gravity drainage (SAGD) and fire flood, and chemical addition, such as polymer flood, alkaline surfactant polymer flood, and carbon dioxide floods. EOR processes are increasingly more common in Western Canada, Oman, Western US and the North Sea. Produced water from EOR processes must be treated to a very low level oil in water for reuse or for surface discharge.



Challenge

- Strong emulsions are created by high alkali and surfactant concentration, high temperature, and the presence of diluents and other chemical additives to lower the viscosity.
- High concentrations of solids, polymer and chemical additives, in addition to the emulsions, also make it difficult for conventional technology to treat.
- The oil in water can vary from mostly free oil to completely emulsified oil depending on the production rate, polymer injection rate, and the fingerprint of the oil in water.
- Conventional tertiary treatment typically saturates prematurely with high viscosity oil.
- Inlet concentrations of oil in water vary from 50 to 3,000 ppm and solids from 100 to 2000 ppm.
- A consistent discharge of less than 10 ppm oil in water is required.

MYCELX Technology and Solution

- The complete oil removal package consisting of (MAS) MYCELX Advanced Separator, (RE-GEN) back washable media and Polishers are utilized for EOR produced water.
- Custom designed filtration substrates are used in each stage of the system. Each substrate has been permanently infused with the MYCELX Polymer and provides the widest range of oil removal on the market today.
- The primary treatment stage, the MAS, uses chemical affinity to enhance coalescence and increase oil recovery.
- The secondary stage, the MYCELX RE-GEN, uses chemical adsorption to remove oil, solids and oil coated solids.
- The tertiary treatment system, the MYCELX Polishers, uses cartridge filtration through a gradient approach to permanently remove oil and grease.

Performance

- Inlets may vary between 50 to 3,000 ppm on oil and grease, 100 to 2,000 ppm on suspended solids, 50 to 1,000 ppm on polymer concentration, 1 to 10 cP on viscosity and 0 to 1,000 ppm on surfactant concentration. Outlets of the complete oil removal system are 10 PPM, solids less than 4 microns.
- The chemical attraction of the MYCELX Polymer ensures reliable performance and minimizes the impact of varying feed conditions on downstream processes.
- The MYCELX system can recover oil in water up to 95% of the inlet oil concentration through the primary and secondary systems.
- MYCELX removes all phases, free, dispersed and emulsified oil.

