



**CASE STUDY**

# Enhanced Oil Recovery

**CUSTOMER:** Major Oil and Gas Company

**LOCATION:** North America

## Application

Removal of oil in produced water generated during polymer flood process increasing oil recovery up to 98% from primary and secondary systems

**FLOW RATE:** 200m3/hr of Produced Water

### OBJECTIVE OF THE TREATMENT

Remove oil and suspended solids from produced water to less than 10 ppm to enable produced water to be reused for polymer re-injection.

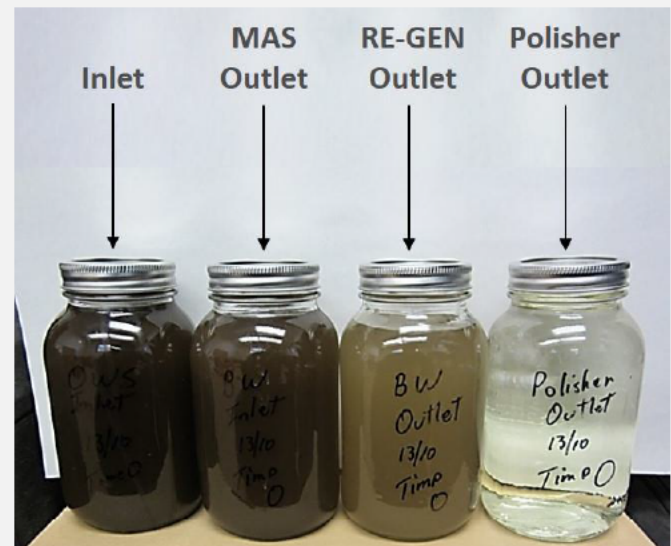
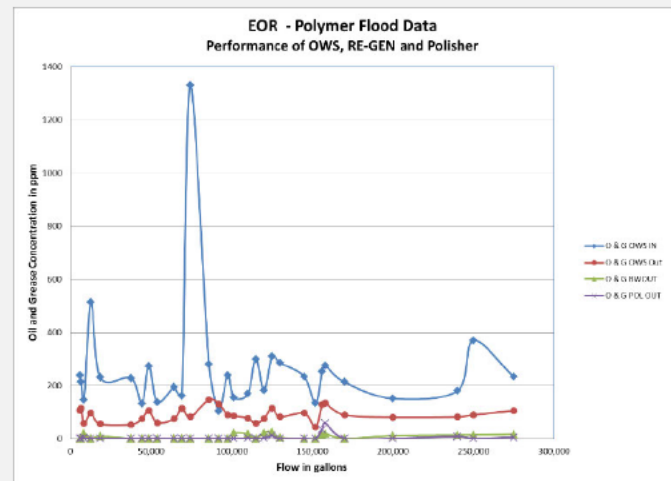
### DATA

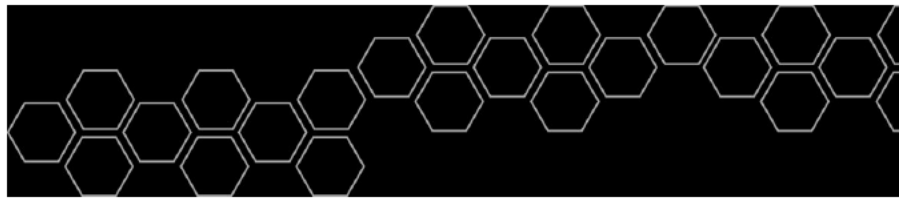
**Inlet:** Oil & grease 500 to 2500 ppm;  
TSS: 2 – 101 ppm

**Outlet:** Oil & Grease below 10 ppm;  
TSS: Below 10 ppm

**Temperature:** 30°C – 45°C

**Pressure:** Operating Pressure 75 psi





## Challenge

A major oil and gas company in North America implemented an Enhanced Oil Recovery (EOR) process in a mature field with medium-heavy oil. The EOR technologies utilized were polymer flooding and Alkaline Surfactant Polymer (ASP) flooding. While this increased production rates significantly, it resulted in highly emulsified produced water with higher concentrations of oil from the free water knockout outlet.

The produced water from the free water knockout system was emulsified with oils, solids and residual polymer from the EOR process. It contained 200 ppm – 2500 ppm of oil and grease with 50 ppm – 1000 ppm of solids; all with varying viscosities. The high levels of oil and suspended solid concentrations resulted in increased consumption of chemicals to maintain production levels and these concentrations also contributed to process reductions or plugging of the reservoir formation. Conventional filtration technologies were unable to consistently treat the water to less than 10 ppm necessary for recycling the produced water and minimizing the usage of chemicals required for polymer flooding.

## SOLUTION

The MYCELX solution was customized to solve the unique problems and water characteristics that were found during the pilot trial. This enabled MYCELX to provide a robust, compact solution which is a combination of a primary, second and tertiary oil removal systems to remove inlet oil of 2500 ppm to less than 10 ppm. The system utilized patented oleophilic filtration media to attract, recover and remove various oil types at varying concentrations.

MYCELX systems are custom designed to remove oil from water for recycle even with varied emulsion strengths, concentrations and viscosities. Systems typically consist of three stages:

- Primary: MYCELX Advanced Separator (MAS)
- Secondary: MYCELX RE-GEN
- Tertiary: MYCELX Polishers

MYCELX systems are designed per ASME, NACE and ABSA requirements on the pressure vessels, instrumentation and skids.

## IMPACT

- Inlet to the MYCELX complete oil removal system varied between 200 ppm - 2500 ppm of oil with viscosities varying between 2 cP to 7 cP
- Oil recovery from produced water was up to 98% from the primary and secondary oil removal systems
- MYCELX system effectively removed oil in the produced water to customer specified levels of less than 10 ppm
- Easy to operate and low maintenance system; thus saving time and internal resources
- The MYCELX solution was able to handle upset conditions of the upstream production process

