



Winner of the 2015  
**Water Management  
Company of the Year**

## CASE STUDY

# Sheen-free Ponds for Hydraulic Fracturing

**CUSTOMERS:** Multiple Customer Sites

**LOCATIONS:** New Mexico and Texas, U.S.A.

## Application

**Treatment of produced water for reuse in hydraulic fracturing**

### FLOW RATE

3,000 – 28,000 BPD

### OBJECTIVE OF THE TREATMENT

Treat hydraulic fracturing produced water for reuse and surface water containment storage:

Sheen-free water

Oil & Grease: <10 mg/L (Avg. Inlet 202.4 mg/L)

Total Suspended Solids: <25 mg/L (Avg. Inlet 195.0 mg/L)

Total Iron: <5 mg/L (Avg. Inlet 84.2 mg/L)

### DATA

Average discharge levels with MYCELX:

Oil & Grease: 2.7 mg/L

Total Suspended Solids: 14.2 mg/L

Total Iron: 1.38 mg/L



## Challenge

This case study will cover three hydraulic fracturing sites requiring a fail-safe solution for no oil sheen and lower production costs through recycling produced water. According to New Mexico Rule 34 oil sheen compliance requirement, 19.15.34.13 Operational Requirements for Recycling Containments, states that “the operator shall maintain and operate a recycling containment in accordance with the following requirements: The operator shall remove any visible layer of oil from the surface of the recycling containment.”

A single production well in New Mexico's Delaware Basin was sourcing water from equalization tanks on the pad site. The second location, a multiple production well, was sourcing water from numerous pad sites on a large land lease. The two sites were on a large shale formation that necessitated horizontal drilling but fresh water sourcing is limited and expensive with costs ranging from \$2.00 - \$3.50 per bbl including delivery to the site. All the operators produced high salinity water from their Delaware Basin operations. The MYCELX system removed TSS and iron so that the service company could effectively reuse the water as frac supply for both slick and cross-linked fluid systems. However, in order to store and recycle 125,000 and 350,000 bbl of water, TSS (Total Suspended Solids) and O&G (Oil and Grease) particulates, iron and VOCs (Volatile Organic Compounds) had to be reduced for regulatory compliance.

A third multiple production well site in Texas' Cline Shale was constrained by their lease from bringing new fluids to the site and was not able to drill a water well as originally intended nor has access to disposal wells on the property. This required the operator to recycle 4,000 to 4,200 BPD produced and flowback water to do slickwater fracs in their vertical wells. While Texas regulations are not as conservative as New Mexico, producers must still mitigate oil sheen from their 50,000 bbl water pit.

## SOLUTION

Working with oilfield service providers, MYCELX engineered site specific sustainable water treatment approaches that allowed producers to recycle and reuse produced water and/or flowback, thus preserving water sources while minimizing the deterioration of roads.

MYCELX employed their RE-GEN systems which incorporates a MYCELX proprietary granular backwashable media and optimizes the efficiency of the MYCELX Polishers. The polishers instantly and permanently removed oil and grease without desorbing or becoming water saturated. An oxidative chemical precipitation of iron was also administered, providing a high quality brine at a lower cost than freshwater, brackish water or other water sources.

## IMPACT

- MYCELX reclaimed a combined site total of over 720,000 bbls of water for reuse that was once considered unrecoverable.
- The Cline Shale installation has recovered 190 bbls of sellable skimmed oil out of 115,000 bbl of produced and/or flowback water processed to date.
- Total solutions costs for the Delaware Basin and Cline Shale sites ranged from 35 - 55% savings over conventional water.
- MYCELX's modular system implementation coupled with fast-to-market rental fleet capabilities eliminates transportation costs to operators that have water routing networks on their leases.

