

Case study: Eagle Ford, South Texas

FULLSWEET mixed production scavenger removed H₂S, eliminated penalties

Hydrogen sulfide (H₂S) is dangerous, toxic, and corrosive. To comply with environmental and safety regulatory policies, it must be removed prior to transporting from drilling sites to storage tanks. The need for an effective H₂S scavenger is essential because H₂S contamination is increasing globally.

A customer in South Texas had a production pad comprised of three producing wells in the Eagle Ford shale. The comingled production rates were 11.4 bbl oil, 11.7 bbl water, and 2,400 MCF gas per day. The total produced fluids contained 136 ppm of hydrogen sulfide in the gas phase. The wells were being produced to a separator 100 feet away. The sales points of the gas and oil were another 100 feet downstream of the separator and the gas specification was 80 ppm.

The customer had injected 21 gallons per day of a metal-based liquid scavenger downstream of the separator. The product could manage to achieve the lower H₂S concentration below 80 ppm but it generated solids, making the oil's basic sediment and water (BS&W) off spec. This resulted in

pipeline cleanouts to remove the spent solids. The customer also had to pay penalties for transferring off-spec oil to the sales pipeline.

To help the operator combat the BS&W issue, Baker Hughes recommended the new, first-of-its-kind **FULLSWEET™ mixed production H₂S scavenger**. The dosing point was brought forward upstream of the separator to increase the contact time. At a rate of 17 gallons per day, the H₂S was decreased to 80 ppm in the gas phase. After a couple of days of using the FULLSWEET scavenger, no solids, no emulsion, and no scaling tendencies were observed, and the dosing rate was decreased even further to 15 gallons per day. This dosing rate resulted in a very low specific consumption — 1.0 gallon per 1 lb of H₂S removed.

The FULLSWEET scavenger not only met the operator's requirements, but also helped eliminate the need for a gas sweetening tower, avoiding additional CAPEX of approximately \$250,000 USD as well as additional operational expenditures, and penalty payments.

Challenges

- Sour multiphase production
- Side effects with organo-metal-based scavengers
- Underdeposit corrosion caused by iron sulfide, solid deposits, and product specification problems
- Short contact time

Results

- Removed H₂S cost-effectively in mixed production system
- Provided a more cost-effective treatment when compared to triazine or fast-acting metal-based scavengers
- Caused no mineral scale or other solid deposit to form
- Produced no emulsion or impact in oil/water separation; no need for additional demulsifiers
- Delivered lower hydrogen sulfide values than other mixed production scavengers at lower dosages
- Required no phase separation
- Eliminated penalty payments
- Saved approximately \$250,000 USD in CAPEX