

Pressure Pumping Services, AcidSure® System

Increase Oil Production by 379% and Gas Production by 449% in HP/HT Well

Objectives

- Generate conductive fractures to stimulate production within the perforated interval in a high-pressure/high-temperature (HP/HT) well.
- Determine the optimal combination of stimulation fluids for an acid-frac job to boost production in a carbonate reservoir.

Our Approach

- Weatherford fracturing-fluid experts worked with their Interpretation and Evaluation Services (IES) colleagues to evaluate the productive potential of a carbonate reservoir. Their nodal analysis indicated that the reservoir, with 3% porosity and 0.71 mD permeability, required stimulation to increase production to a commercially viable rate.
- The Weatherford team performed preliminary acid-frac tests to identify stimulation fluids that could generate optimal fracture lengths while etching the zone of interest. Using offset-well samples, they ran solubility tests on formation cuttings. Next, they conducted fluid-compatibility tests on oil samples, followed by etching tests on a core. After reviewing test results, the team recommended the AcidSure fluid system for its etching capabilities and the ViscoGen™ system for its diversion properties.
- At the wellsite, the team conducted an injectivity test after the well was perforated. The team then performed a mini-frac treatment to acquire critical job-design data and refine the acid-frac job parameters.
- The team carried out the acid-frac treatment in accordance with the job design and witnessed an increase in surface pressures to indicate successful diverting-agent performance. They performed the entire operation with no equipment or safety problems.
- Following the stimulation treatment, production rates indicated optimal fracture generation across the zone of interest.

Value to Customer

- The AcidSure treatment generated a network of conductive fractures that resulted in a significant improvement over initial production rates. Oil production increased from 648.7 to 3105.89 BPD, and gas increased from 4.9 to 26.92 MMSCFD.
- By conducting thorough testing, the Weatherford team was able to determine the optimal combination of stimulation fluids to address the reservoir conditions unique to this well.

Production	Before Acid Frac	After Acid Frac
Oil (BPD)	648.7	3105.89
Gas (MMSCFD)	4.9	26.92

Before-and-after comparison of acid-frac results on 1/4-in. choke reveals significant gains in oil and gas production.

LOCATION

Veracruz State, Mexico

WELL TYPE

Onshore HP/HT gas and condensate producer

DIRECTIONAL WELL DESIGN

J-shape

FORMATION

Mid-Cretaceous carbonates

LINER SIZE AND SETTING DEPTH

7-in. at 22,966 ft (7,000 m) MD

TUBING SIZE AND SETTING DEPTH

3 1/2-in. at 22,287 ft (6,793 m) MD

TEMPERATURE

320°F (160°C)

PRESSURE

16,000 psi (110 MPa)

DEPTH OF PERFORATED INTERVAL

22,303 to 22,473 ft (6,798 to 6,850 m) MD

PRODUCTS/SERVICES

- Pressure Pumping Services
- AcidSure fluid system
- ViscoGen crosslinked acidizing fluid
- Interpretation and Evaluation Services
- Nodal analysis
- Core testing
- Cuttings evaluation

