SandSure™ Engineered Sand-Control Fluid System Key to Successful Acid Stimulation, Sand Control in Gas Wells, Increases Production by 182%

Post-operation production behavior of well Pandereta 8.

Objectives

- Optimize drawdown without generating sand production.
- Improve well production and minimize downtime in relation to surface equipment damage.

Our Approach

- Between 2020 and 2021, the operator and Weatherford developed a 1D sand production model for three La Esperanza field wells. The study confirmed that the formation was weak and susceptible to fines migration, even with a low drawdown, which negatively affected well production.
- Based on these findings, between Q4 2021 and Q1 2022, Weatherford experts evaluated multiple solutions across different product lines. In conjunction with the operator, it was determined that chemical treatments with the SandSure fluid system were the most viable option, as this solution is more adapted to the actual well conditions, formation, and operational logistics. After several global meetings in Houston in 2023, the intervention plan with the SandSure fluid system was approved.
- In addition, a complete study of sand characterization in the Pandereta and Clarinet wells by Weatherford, using X-ray fluorescence (XRF) and X-ray diffraction (XRD) methodologies, conglomeration and acid dissolution tests complemented with surface tension measurements below 30 dynes/cm, and imbibition tests to avoid gas entrapment due to water input. This study would ensure an optimal surface gas recovery as an additional benefit for the acid stimulation.

LOCATION
Colombia

WELL TYPE
Dry gas

FORMATION
Golden Swamp

HOLE SIZE AND ANGLE
8-1/2 in., 37°

CASING SIZE AND TYPE
9-5/8 in., 47#

LINER SIZE AND TYPE
Casing: 7 in. (7677-9519) 26#
Production tubing: 3-1/2 in. (0-8151) 9.2#

TEMPERATURE
156°F (68°C)

PRESSURE
2,524 psi (17.4 MPa)

DEPTH
8,515 ft (2,595 m)

OTHER
- Porosity: 13%
- Permeability: 150 mD
- Length of Effective Open Perforations: 116 ft (35 m)

PRODUCTS/SERVICES
- SandSure fluid system
- SmartDual acid system
- Divergent
- Coiled tubing unit

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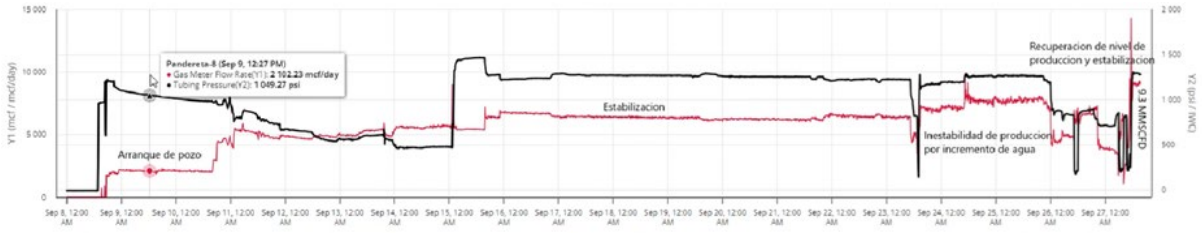
Our Approach (continued)

- In 2024, the Pandereta 8 well, which experienced frequent shutdowns due to abrasion damage in the surface equipment, was selected as a pilot. Laboratory tests were performed to validate the effectiveness of the treatment, which were reviewed and approved by a multidisciplinary team between the operator and Weatherford.
- The intervention included a SmartDual acid treatment, which eliminated the damage caused by scale and fines, followed by the application of the SandSure fluid system to stabilize the formation in a clean, unconsolidated environment. The operation was executed without deviations from the plan or operational inconveniences.
- During the well reactivation phase, weekly follow-ups were carried out to ensure that variations in drawdown did not affect the effectiveness of the treatment. A staggered strategy was implemented, limiting the initial pressure to a maximum of 50%, which allowed the drawdown to be increased from 88 psi to 144 psi (0.6 MPa to 0.9 MPa) without sand migration. As a result, gas production increased from 3.3 MMSCFD to 9.3 MMSCFD, with zero sand production and non-abrasion damage in surface equipment.

Value to Customer

- By using the SandSure engineered sand-control fluid system, the operator increased gas production and effectively prevented the migration of fines from the formation to the surface.
- This rigless solution increased production by 182% while the drawdown increased 64%.



Production behavior of well Pandereta 8.

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