



PETROLIZE® Enzymatic System Revives Dead Perforated Wells, Restoring Production for a Leading European Operator.

SPE-228965

Location: Eastern Europe

A leading European operator faced chronic production decline across mature cased-hole perforated wells. Multiple acid stimulations and solvent washes failed to restore inflow due to deep and persistent polymeric organic blockage formed during earlier drilling and completion operations. Production had dropped to near-zero, rendering the wells effectively non-productive.

The operator deployed PETROLIZE® Enzymatic System, an advanced biochemical cleanup formulation engineered to dissolve polymer-based residues inside perforation tunnels; zones unreachable by traditional highly corrosive HCl acid systems. The treatment successfully revived two dead wells and restored sustainable production.

CHALLENGE

The wells were historically drilled with polymer-laden drilling fluids, leaving behind cellulose-based and synthetic polymer filter cake residues along perforation tunnels. Challenges included:

- Repeated HCl acid stimulations failing to dissolve polymeric blockages
- Wells showing zero or near-zero inflow.
- Damage located deep inside perforation tunnels.
- Risk of secondary formation damage and corrosion if further acid treatments were attempted

A biochemical degradation pathway was required to target polymeric damage directly

SOLUTION

Epygen deployed the PETROLIZE® Enzymatic System consist of specially developed Cellulase Enzymes to break down cellulose-based biopolymer mud into simpler sugars, improving fluid flow. The enzyme solution, combined with Bio-acetic acid and Bio-surfactant injected at perforated points in the formation, targeting clogging materials like biopolymers and carbonates. The recombinant enzyme blend targeted mud filter cake residues formed during drilling and completion, restoring permeability across perforations.

Operational execution included:

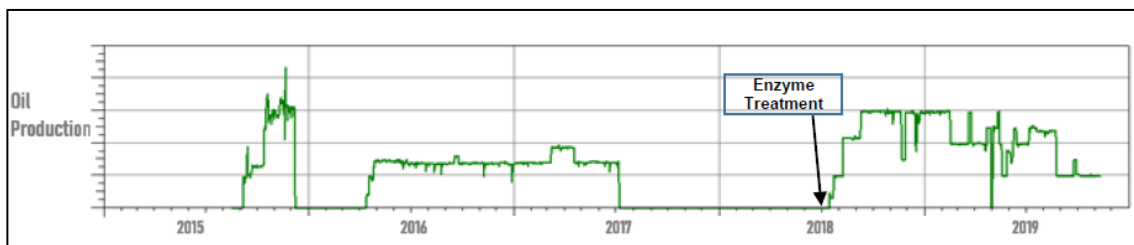
- Zone Isolation: Packer placement and pressure testing.
- PETROLIZE® treatment solution: low pressure pumping at a controlled rate.
- Enzymatic Soak Period: 12-hour shut-in to allow polymer hydrolysis.
- Overflush: 5 m³ displacement with brine solution.
- Flowback: Removal of the cleanup fluid and production re-initiation.

A targeted laboratory customization program was carried out to ensure the enzymatic system matched the specific damage conditions present in the perforated intervals. The formulation was optimized through temperature-conditioned activity testing, polymer-specific hydrolysis assessment, and comprehensive compatibility screening with produced fluids, brine chemistry, and completion metallurgy. Multiple candidate blends were evaluated using core-based percolation testing to simulate fluid movement through perforation tunnels, allowing precise adjustment of reaction rates, penetration behavior, and treatment volume. This tailored enzymatic system ultimately provided deeper access into restricted perforation pathways, more efficient polymer breakdown, and a predictable restoration of permeability—consistently delivering superior performance to

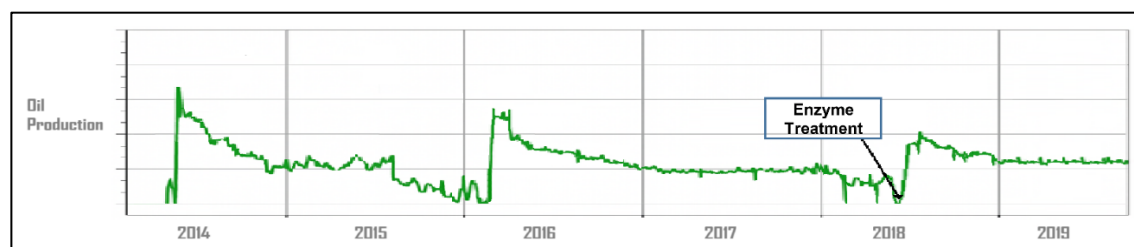
conventional acid treatments unable to reach or dissolve the underlying damage.

RESULTS

The PETROLIZE® treatment delivered strong performance across both wells:



Graph 1: Well #1 Production restored after Petrolize® enzymatic treatment.



Graph 2: Well #2 Production restored after Petrolize® enzymatic treatment.

Production remained stable for an extended period, demonstrating durable removal of deep formation damage. Laboratory validation showed significant reducing sugar release, confirming complete polymer hydrolysis.

CONCLUSION

The PETROLIZE® Enzymatic System provided a reliable, Non-Corrosive environmentally friendly alternative to acid stimulation for reviving dead perforated wells. Its biochemical action effectively hydrolyzed polymeric blockage into simple sugars, which are unreachable by conventional methods. For operators managing mature assets or repeated acid failures, PETROLIZE® represents a proven path to restore sustainable production.

**** This success is documented in SPE-228965, presented at the 2025 SPE/ Abu Dhabi International Petroleum Exhibition and Conference, scheduled for November 3–6, 2025, in Abu Dhabi, UAE.**