

# World's First Gravel-Packed Uniform Inflow Control Completion

## Problem

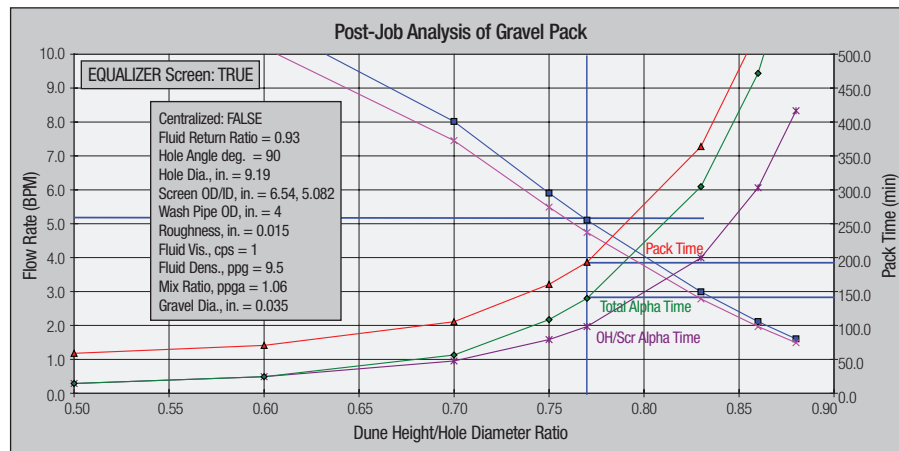
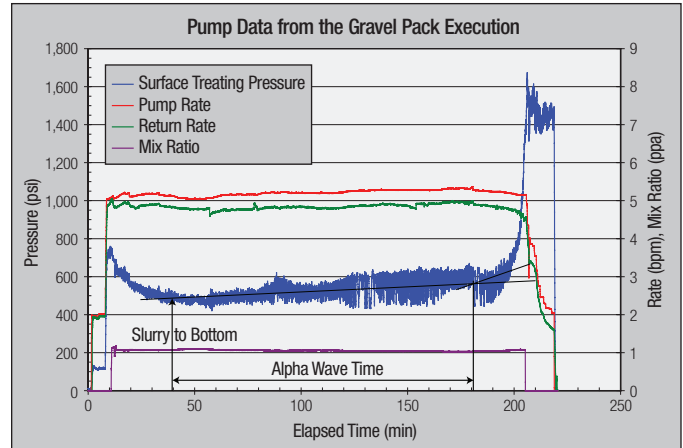
Previous wells in the Etame field used openhole horizontal gravel packs, which have had excellent performance regarding sand control but offered no protection against early water breakthrough. If a portion of the lateral was situated immediately above high-permeability Dentale sand, the well would be at risk of early water breakthrough and subsequent reduced recovery if it was completed with a standard openhole gravel pack.

## Solution

A gravel pack was performed using an EQUALIZER™ Helix ICD with an EXCLUDER™ sand screen. The job was performed using GPDESIGN software. Before performing the gravel pack, special evaluations were performed to analyze the differences in flow dynamics between standard screens and the ICD screens. The operation was started by pumping 9.5-ppg NaCl completion fluid at 5.2 bpm with 4.8 bpm returns; 16-30 mesh gravel pack sand was infused into the brine at 1 ppa. The pumping operation took 220 minutes and a total gravel pack time of 180 minutes. A total of 42,650 lb (19345 kg) of sand were placed below the packer.

## Results

The well was completed and flowed back in late July 2005. For the first year, the well continued to produce at the flat production rate of 6,700 BOPD and it hit the 2 million barrel production mark in less than 10 months. No water was produced.



## Project Details

- Permeability: 1800md
- Porosity: 30%
- Oil viscosity: 3.6 cp
- Oil density: 36 API
- Bottomhole Temperature: 158°F (70°C)
- Screen diameter: 5.5 in.
- Wellbore diameter: 8.5 in.
- Production rate: 10,000 bpd
- Project Date: July 2005
- Project Location: West Africa

