Complete Zonal Coverage and Less Water Production in Colombia

Case study: Petrobras uses innovative matrix acidizing diverter to increase oil production 300%

**Challenge**
Acidize water injection wells to boost oil production without increasing water cut.

**Solution**
Develop OilMAX* diversion and conformance control for matrix treatments to cover zone and reduce water cut.

**Results**
Increased oil production 300% and reduced water cut 10%.

In wells where water cut often exceeded 90%, OilMAX diverter allowed oil production to increase 300% and water cut to decrease 10%.

**Operator seeks zonal coverage without increasing water cut**
A brownfield in Colombia produces from the Caballos formation, a highly laminated sandstone formation with permeabilities ranging from 50 to 100 mD. The field was put under water injection, resulting in calcium carbonate scaling. Thus, Petrobras needed to routinely acidize wells, but water cut often exceeded 90%. To mechanically divert the treatments across the laminated sands, the company used straddle packers, which required a workover rig. Treatments were then bullheaded down the casing annulus at the highest possible matrix rates to reduce costs. This strategy had mixed results, however. Water cut increased with little to no increase in oil production. Petrobras sought a diversion technique for effective zonal coverage that would not increase water cut.

**Team designs matrix acidizing diverter**
OilMAX diversion and conformance control for matrix treatments was developed for this job. Composed of a new-generation viscous relative permeability modifier (RPM), the fluid directs treating fluids away from high-water-cut intervals. It provides complete zonal coverage while reducing water cut.
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“Optimizing the treating fluids and ensuring effective diversion eliminated the need to pull the completion and so reduced overall treatment costs by over 70%.”

Oscar Julian Jaramillo
Stimulation technical engineer
Petrobras Colombia

After laboratory testing, the OilMAX fluid was alternately pumped with acid down the casing annulus—without pulling the completion.

**Treatment increases production and reduces water cut**
The treatment enabled an oil production increase of as much as 300% and a water cut reduction of up to 10%. Without needing a rig on location, this improvement also saved the company 6 days.