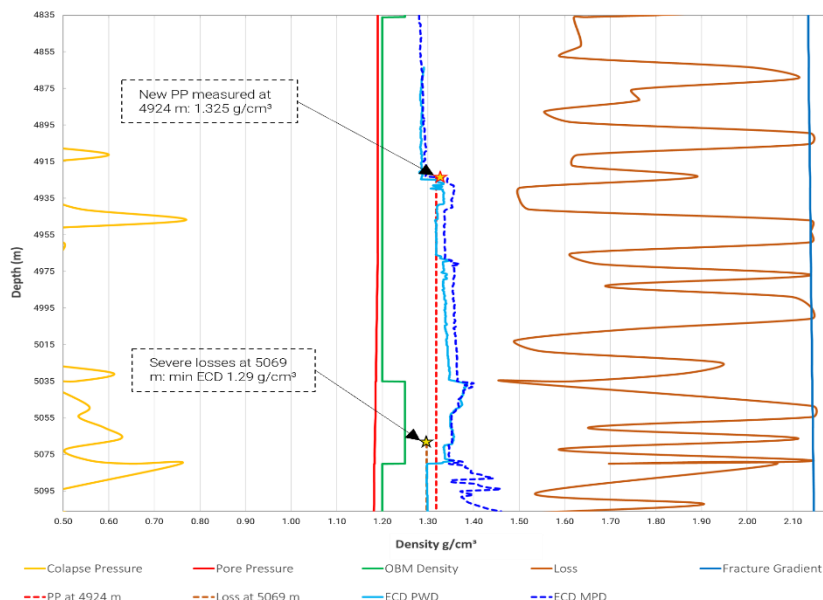


High-Performance MPD Solutions Navigate Extreme Reservoir Conditions, Deliver Best-Performing Wells in Field, Unlock New Resources



The operational window in one of the wells.

Objectives

- Drill the reservoir section through the highly fractured Cretaceous formation.
- Manage surface pressures to drill a reservoir section with no conventional operational window, overcoming the unexpected high pore pressure in the Upper Cretaceous and severe losses in the Middle Cretaceous.
- Drill under controlled-loss and underbalanced conditions, maintaining extreme operational parameters.

Our Approach

- To meet Mexico's goal to boost production from 1.6 to 1.8 MMBPD and 4,400 to 5,000 MMSCFD required not only further exploration but also the development of increasingly complex reservoirs—some of which are inaccessible with conventional drilling methods.
- One of the new fields presented a nearly nonexistent operational window in its reservoir section. To overcome this, Weatherford experts integrated managed pressure drilling (MPD) into the well design from the outset, aiming to minimize mud losses and control gas influx during drilling.

LOCATION

Mexico

WELL TYPE

Directional

FORMATION

Cretaceous

HOLE SIZE

8-1/2 in.

DEPTH

16,751 ft (5,106 m)

17,470 ft (5,325 m)

PRODUCTS/SERVICES

- Victus™ Intelligent MPD System (Well B3)
- Model 7800 rotating control device (Well B3)
- Modus™ Managed Pressure Wells Solution (Well B7)
- Model 7875 rotating control device (Well B7)



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Our Approach (continued)

- Unexpected high pore pressure in the Superior Cretaceous combined with very high permeability in the Middle Cretaceous created two incompatible pressure zones. This scenario rendered conventional drilling approaches unviable, and isolating the Superior Cretaceous was not an option due to its geological significance. For instance, in Well B3, the pore pressure in the Superior Cretaceous reached 1.33 g/cc, while losses in the Middle Cretaceous began at an equivalent circulating density (ECD) of 1.29 g/cc. Similarly, in Well B7, pore pressure and mud loss onset values were recorded at 1.23 g/cc and 1.19 g/cc, respectively.
- The operator created clear objectives: drill the well at least to the base of the Middle Cretaceous or towards the top of the Lower Cretaceous. The solution was to drill underbalanced in the Superior Cretaceous while managing controlled mud losses in the Middle Cretaceous. This was achieved by maintaining a surface backpressure of up to 1,500 psi (10.3 MPa) in Well B3 and 1,100 psi (7.5 MPa) in Well B7, using specialized personnel and high-performance MPD equipment.
- Field personnel drilled under extreme formation conditions by safely handling high backpressures (1,100 to 1,500 psi) in the annular space.
- The MPD technology effectively controlled mud losses and managed surface gas flaring due to underbalanced conditions in the Upper Cretaceous.
- As a result, Well B7 has emerged as one of the best producers in the field.

Value to Customer

- By using Weatherford MPD technology and expertise, the operator extended the reservoir section under extreme downhole and surface conditions, delivering two of the best-performing gas and condensate wells in the field.
- The Weatherford team executed drilling operations under extreme conditions without compromising safety or well integrity.
- MPD effectively managed pressure variations and mitigated operational risks, preventing nonproductive time (NPT).
- The operator maximized hydrocarbon recovery potential by accessing sections of the reservoir made reachable only with the advanced capabilities of Weatherford MPD technology.
- Field personnel performed safe closed-loop drilling in the presence of hydrogen sulfide (H₂S). Production testing recorded concentrations up to 180,000 ppm.



The Modus managed pressure wells solution enhances operational performance with simple, precise pressure management while capturing data in a digital platform.

