

ConocoPhillips Efficiently Collects Representative Fluid Above Saturation Pressure in Low-Permeability Reservoir, Alaska

Focused acquisition and strict rate control using the Ora platform acquire representative fluids in a reservoir close to saturation pressure for accurate insight

By using the Ora* intelligent wireline formation testing platform's controlled pumping capabilities in a tight rock reservoir, ConocoPhillips was able to collect single-phase fluids in a constrained pressure window in record time for critical real-time downhole fluid analysis (DFA).

Fluid sampling challenges

Oil sampling in the tight Middle Cretaceous reservoirs of Alaska can be challenging because the reservoir pressure is very close to the fluid's saturation pressure. If a fluid sample is not acquired and maintained at reservoir pressure for analysis, it cannot provide truly representative data. Additional challenges are posed by the reservoir's low permeability, which means that deep invasion and low pumping rates are the main hurdles when attempting fluid sampling in open hole.

What was attempted first

In this low-permeability environment, focused sampling techniques are not employed because operating dual pumps with a traditional focused probe would inevitably push the flowing pressure below saturation pressure, leading to the collection of nonrepresentative samples. This meant reliance on nonfocused inlets due to their increased area open to flow, but deep invasion required slow pump rates and long station times as the norm in attempting to collect representative samples.

What Schlumberger recommended

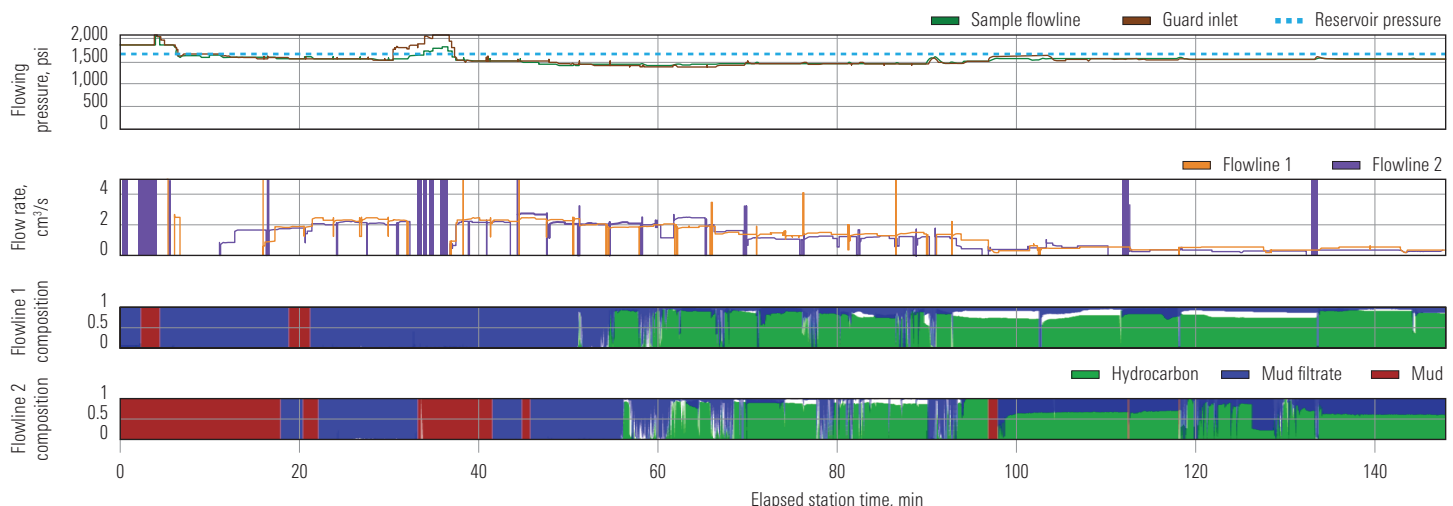
The new Ora intelligent wireline formation testing platform provides the following advantages to successfully manage fluid sampling close to

saturation pressure in low-permeability rock with the added benefit of reduced operating time:

- Control of pump speed at rates down to 0.2 cm³/s using the platform's 5,000-psi displacement unit enables using focused inlets in low permeability.
- Focused radial inlets acquire low- to no-contamination samples in record time because mud-filtrate invasion is actively diverted using the guard inlet.
- Ora platform's component integration significantly shortens the toolstring for shorter rig-up and rig-down times and decreased cable tension—for less likelihood of sticking.
- Further efficiencies are realized with automation of the inlet setting process using a feedback loop between probe and pump to accelerate element inflation.

What ConocoPhillips achieved

By successfully capturing representative, high-quality fluids in less time, the Ora platform provided ConocoPhillips with critical, real-time DFA for the field development plans while minimizing rig use and controlling overall operational risk. For example, at one station in 2.5-mD/cP-mobility rock, the dual flowline pumps acquired representative fluid samples at less than 100 psi using rates lower than 1 cm³/s.



The Ora platform efficiently performed focused single-phase fluid sampling in 2.5-mD rock. The dual pumps precisely controlled the flow rate to achieve a drawdown of less than 100 psi.