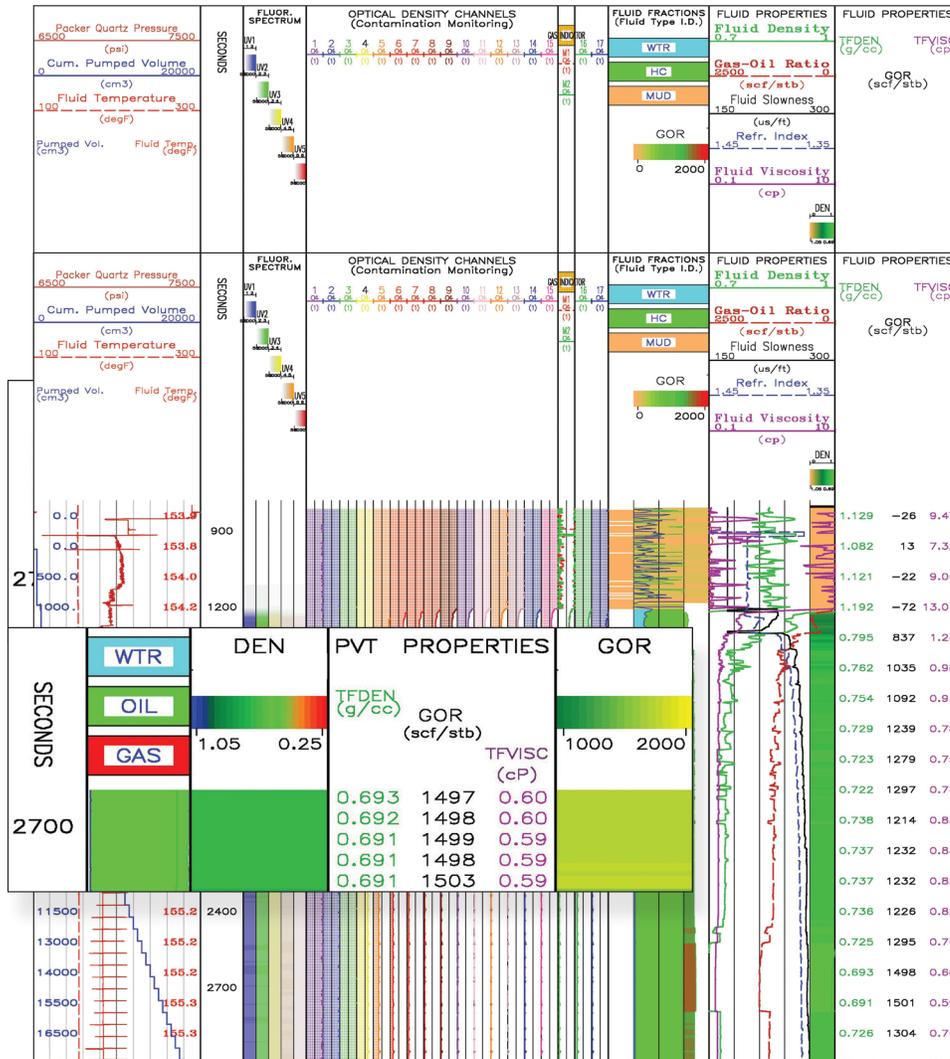


Case study: Norway

# RCI and IFX systems provide real-time fluid data and analysis in the North Sea



The IFX module provides a real-time interpretation of the contamination levels when sampling.

An operator in the North Sea wanted to determine the petrophysical characterization of the field to map the level of H<sub>2</sub>S concentrations and to predict the reservoir's behavior during production. One of the concerns was taking the samples with low enough contamination for accurate pressure/volume/temperature (PVT) testing.

Baker Hughes had been using the **Reservoir Characterization Instrument™ (RCI) service** exclusively in a well development sampling campaign for this operator as its titanium construction minimizes loss of corrosive gases and compounds when sampling. The tool's nickel alloy sample chambers reduce the adsorption of corrosive

- ### Challenges
- Long sampling times due to optical density masking actual sample contamination
- ### Results
- Analyzed gradients and fluid composition
  - Obtained fluid samples with minimal contamination
  - Collected real-time density, viscosity, gas-to-oil ratio, and sound speed measurements

gases and compounds ensuring that PVT measurements within 10% are possible, which eliminates the need to perform additional expensive and time-consuming well tests.

The **In-situ Fluids eXplorer™ (IFX™) system** was used to determine the contamination levels when sampling by determining the density, viscosity, and sound speed stability measurements.

The sound speed measurement records the response of the acoustic travel time across the fluid so it is very sensitive to gas coming out of solution and contamination changes.

The samples collected by the RCI service were contained in single-phase nitrogen charged sampling tanks. These tanks efficiently obtain downhole samples, keeping the hydrocarbons above or equal to formation pressure or at external atmospheric conditions. By using previous generation optical density spectroscopy, in addition to the new tuning fork technology, an accurate downhole PVT analysis of the reservoir fluid was obtainable.

The Baker Hughes **LiveWire™ service** provided real-time fluid interpretation and contamination analysis. We worked

closely with the PVT laboratory that analyzed the samples to make sure the correct procedures were in place to extract the formation hydrocarbon from the sampling tanks. Baker Hughes geosciences professionals were able to provide 24/7 coverage as needed, providing the client the necessary information to optimize their production strategy.

