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The Filling History of the Valhall Field, Norway: Implications for Future Development

The Valhall Field is an Upper Cretaceous oil field located in Block 2/8 of the Norwegian Sector of the Central North Sea. The reservoir is the high porosity chalk of the Tor and Hod Formations. The field was discovered in 1977 and went into production in 1982. To date the field has produced 450 mmbbl of oil and has a further 610 mmbbl of remaining oil reserves. In 2002 a satellite platform was placed on the southern flank of the field. Drilling from this platform aims to access reserves in the southern sector of the field.

We performed an integrated petroleum systems study to understand the distribution of both petroleum and porosity from a 'bottom-up approach' across the field and identify any potential sweet spots for development. The aim is to use the fill history to predict the distribution of fluids, understand the nature of the oil water contact across the field and predict the porosity. We combined a semi-regional basin modeling approach with detailed reservoir geochemistry, using all the available geochemical, PVT, temperature and pressure data from Valhall and the surrounding fields. Together with a structural reconstruction of the field, we can then understand the initial distribution of petroleum in place.

Finally we compared the results with independent evidence from 4D seismic fluid imaging, integrating the 'top down' and 'bottom up' approach to understanding the workings of the petroleum system.