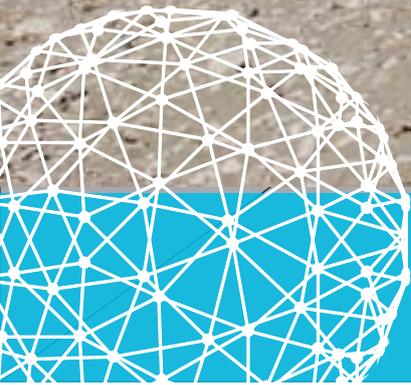


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University of Manchester HFF-DOL

Integrated sedimentological and diagenetic evaluation of hydrothermal dolomite, Cretaceous-Eocene, Hamman Faraun Fault Block

This three year project was led by the University of Manchester, in collaboration with the University of Bergen and the University of Bristol. The project team were located primarily in the School of Earth, Atmospheric and Environmental Science at the University of Manchester, within the Basins Research Group. This group delivers research and teaching within the field of Petroleum Geoscience.



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BACKGROUND

The HFF-DOL project was a JIP facilitated by ITF in response to a call for proposals within the realm of carbonate reservoirs in 2009, and sponsored by Saudi Aramco, Total, Statoil and BG-Group.

The project aimed to quantitatively and spatially describe an exposed succession of partially dolomitised Eocene limestone in the Gulf of Suez. The carbonate research group at the University of Manchester had been established in 2008 and the successful funding of this project allowed the team to grow to one of the largest carbonate research groups in the UK - from 2 to 15 PhD students.

CHALLENGE

Dolomitisation is a process whereby limestone is recrystallised by fluids, often resulting in reorganisation of the pore network which might strongly impact reservoir fluid flow. It is common for both limestone and dolomite to host large volumes of hydrocarbon, but the volume of oil recovery is often poor. This typically reflects multi-scale heterogeneity imparted by variations in pore type, size and connectivity.

Well-described reservoir analogues are critical to the development of hydrocarbon reservoirs as they allow 3D geocellular models to be built within data-poor subsurface settings. These models are used to plan well placement and predict oil recovery efficiency.

The study area for this project was world-class and allowed the research group to quantify the shape, size and distribution of dolomite and porosity and represent that in a 3D geocellular model.

ACTION

Funding provided for 1 PhD student, 1 post-doctoral researcher and staff costs. The project was further supported through additional studies by masters students at Universities of Manchester and Bergen.

Communication with industry sponsors was maintained through quarterly progress reports, annual sponsor meetings and video conferences. Sponsor engagement was positive and supportive throughout the project. The University of Manchester delivered a report and a 1-day technology transfer workshop at each of the sponsors offices at the end of the project.

The only difficulty encountered was a dramatic change in the political climate in the Middle East, which meant that the

Foreign and Commonwealth Office rendered Sinai a no-go area from 2012 onwards. Fortunately, several field campaigns had been conducted by this point and sample material has been transported to Manchester. In consultation with sponsors, the research team re-structured the project continued to completion.

The PhD student completed her PhD (Hirani, 2014) and the post-doctoral researcher moved into employment. As a result of this JIP, a new collaborative joint industry project has resulted, led by the University of Manchester, jointly with Universities of Bergen, Bristol and Liverpool, continuing much of the work initiated by the ITF project

RESULT

A suite of data was developed and was used to populate a 3D geocellular model (Hollis et al., 2013) as well as a novel conceptual model to explain the occurrence and timing of dolomitisation (Hollis et al., 2017). The data has been fully transferred to the sponsors for embedment in their knowledge management systems and the results will be published in scientific journals in the near future.

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