

A Question of Physics and Scale during Enhanced Oil Recovery

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ABSTRACT: Our global need for petroleum liquids is expected to continue to rise for the next 30-40 years. The supply can be met through exploration, unconventional resources (oil sands, shale oil), and improving and enhancing recovery of our already producing conventional crude oil fields. Offshore Newfoundland oil represents approximately 20% of Canada's conventional oil production. The prolific Hibernia field along with Terra Nova, and White Rose are in declining production but all having outperformed initial life of field estimates. Extending field life requires both improved and enhanced oil recovery strategies both of which are field specific.

Enhanced oil recovery is the manipulation of fluid-fluid and fluid-rock properties to better microscopic oil recovery while considering injection schemes that will enhance areal and vertical sweep efficiency at the field scale. Research conducted through laboratory scale experiments coupled with field scale simulation can provide the valuable information regarding the optimisation of the EOR technique for that specific field and reduce economic risk. The fundamental and dynamic nature of the physics underlying the fluid-fluid and fluid-rock interactions is key to our understanding, mathematical description and engineering of better enhanced oil recovery techniques to optimise oil recovery.

This presentation highlights a few recent enhanced oil recovery techniques that the Hibernia EOR Group are investigating, our contributions to understanding how the EOR techniques function (roles and behaviour), mathematical descriptions of EOR at all scales, and questions that remain unanswered.

ALL ARE WELCOME!!!