

# New Approaches and Tools for Light and Tight EOR

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## *Abstract*

*Light and tight oil formations exhibit significantly different properties and flow behaviour as compared to more conventional reservoirs. Due to the extremely low permeability and poor connectivity, the tight oil production rate can drop to 10% of its peak value after the first year, with an ultimate primary recovery of only 3 to 10% of the original oil in place. Improved and Enhanced oil recovery (IOR and EOR) and well stimulation technologies are needed for boosting the economic value of tight oil reservoirs. However, mature EOR technologies encounter new challenges upon being applied in tight oil reservoirs. Enhanced waterflooding and gas flooding are considered the two most promising technologies, and have been piloted in some light and tight oil fields in Saskatchewan, along with the implementation of a few innovative variations. This presentation discusses the relative advantages and potential of the various enhanced oil recovery methods. Results of the laboratory experiments with waterflooding, surfactant flooding and gas flooding are presented and compared to industry experience with these processes. We will also discuss new approaches and new laboratory techniques and tools to evaluate petrochemical and petrophysical properties, flow mechanisms of fluid–rock systems, and help to improve the understanding of reservoir characteristics such as reservoir fluid properties, geophysical properties, geomechanical properties and geochemical properties as key concepts for the planning of a successful reservoir production strategy.*

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**Petro Nakutnyy** is a manager of the EOR Processes business unit at the Saskatchewan Research Council (SRC). Petro's group is focusing on the improved and enhanced oil recovery of the light and tight oil fields. Petro has worked on a variety of light, medium and heavy enhanced oil recovery (EOR) projects including waterflooding, chemical flooding, permeability modification and water shut-off, electrical heating and artificial intelligence. His main areas of interest are waterflooding, chemical flooding and optimization of oil recovery processes. Petro has authored more than a dozen technical papers, and has one patent related to laboratory testing methods. Petro is a professional engineer, SPE member and holds a MSc in Petroleum Engineering.