

# BRUTUS



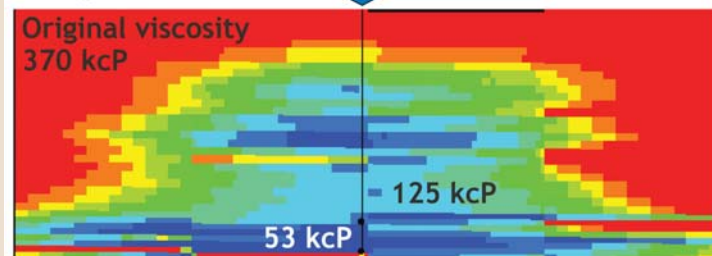
## BRUTUS

Brutus (patent pending PC WO2008/070990) is a reservoir preconditioning process that use water films and residue water or bottom, top, or middle water zones in the reservoir as a conduit for injection and movement of aqueous or non-aqueous fluids loaded with a preconditioning agent or agents through the reservoir prior to cold or thermal heavy oil and oil sand bitumen recovery techniques.

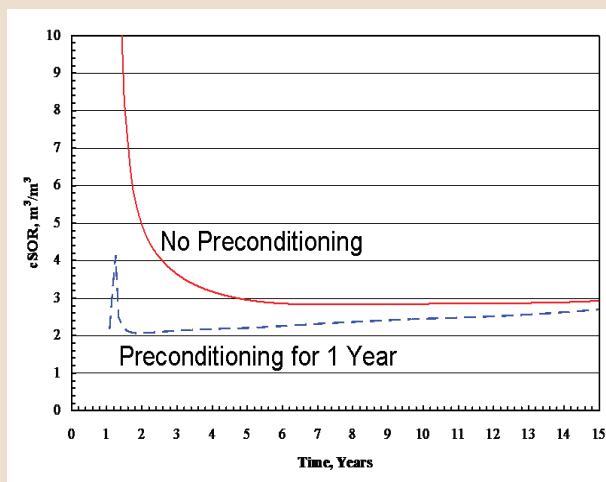
This method relies on the relatively significant water saturation (15 to 30%) in the oil-rich pay zones, and the much higher mobility of the water than oil at cool reservoir conditions (6 to 30°C) in heavy oil and oil sand reservoirs of Western Canada. The method is especially beneficial in reservoirs with mobile bottom and top water or water zones and very viscous oil, allowing for rapid and extensive distribution of aqueous phase fluids throughout a reservoir.

In Brutus, preconditioning agents are injected into the targeted regions of the reservoir in the water films or residual water, allowing the agents to have a chemical, physical, and/or biological interaction with separate injected reactants or by reaction of one or more injected reagents with the oil and/or reservoir rock that increases the oil phase mobility or oil quality. This can be conducted as a preconditioning low pressure waterflood. Distribution and conformance of preconditioning reagents can be controlled in cold production, CSS, and SAGD or other thermal operations that use vertical, deviated, horizontal, slim bores, or smartwells with adaptive pressure control and monitoring to distribute reagents in required zones.

**Injection of water + solvents**  
for 8 months at ↓ reservoir conditions



**Oil Viscosity after Water Preconditioning**



This technology may allow for recovery of bitumen that cannot be cold produced in remote areas, and will improve thermal recovery operation efficiency. Well placement and process operation can be defined by using our IMPROVE optimizer software and reagent conformance using multiple wells across a field can be easily determined by using our CONFORM optimized process technology. This technology can be used to control inter-well pressure distributions to place reagents uniformly with monitoring to enhance conformance control. Economic models are available and indicate Brutus can double the NPV of typical SAGD operations.

For more information on Brutus, or any other Gushor Technologies, please contact us at [info@gushor.com](mailto:info@gushor.com).

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