

April, 19, 2013

IETP Project Descriptions

Imperial Oil Ltd.

Project Title: Cyclic Solvent Process (CSP)

Location: Imperial Oil's Cold Lake Project

Total project cost: \$100,000,000. IETP Royalty Allowance: \$10,000,000.

Project Summary: Imperial Oil is proposing an alternative to thermal recovery processes to reduce direct greenhouse gas emissions from production by more than 90 per cent. The Cyclic Solvent Process (CSP) eliminates the need for large amounts of energy and water to generate steam. The process will use propane and propane-diluent solvent injection-production cycles to mobilize the heavy oil rather than using steam, which is typically used to produce these reservoirs.

Contact: Pius Rolheiser, 403-237-2710

Cenovus Energy Inc.

Project Title: 10MW Chemical Looping Steam Generator (CLSG)

Location: Christina Lake Thermal Project, east of Conklin

Total project cost: \$62,000,000. IETP Royalty Allowance: \$10,000,000.

Project Summary: This specialized steam generator has been adapted to keep CO₂ separate from other gases emitted during the combustion process, thereby avoiding the costly and energy-intensive process of removing the CO₂ post-combustion. It is anticipated this process will result in a capture-ready stream of pure CO₂, which could significantly reduce the cost of carbon capture and storage.

Contact: Brett Harris, 403-766-3420

Perpetual Energy

Project Title: Low-Pressure Electro-Thermally Assisted Device (LEAD)

Location: 75km north of Red Earth

Total project cost: \$18,200,000. IETP Royalty Allowance: \$5,460,000.

Project Summary: The project is designed to develop the bitumen in a reservoir that is too viscous for conventional production, but does not require as much heat as most current thermal projects. The pilot will use three parallel horizontal wells with electrical cables to conduct heat throughout the targeted bitumen formation. Water and/or solvent will be injected concurrent with the electrical heating. This process requires less energy and less water than conventional steam assisted gravity drainage (SAGD) operations.

Contact: Linda McKean, 403-269-4475

Cenovus Energy Inc.

Project Title: Suffield Main Sand Alkali Surfactant Associative Polymer Flood

Location: CFB Suffield, near Medicine Hat

Total project cost: \$17,900,000. IETP Royalty Allowance: \$5,370,000.

Project Summary: This polymer flooding technique allows for increased recovery from Alberta's challenging conventional oil reservoirs. In addition, this pilot is expected to encourage the conservation of fresh water in enhanced oil recovery. The polymer improves the flow by thickening and pushing the oil out of the pores of the reservoir, while the alkaline and surfactant work to further 'scrub' the oil from the rock.

Contact: Brett Harris, 403-766-3420

Canadian Natural Resources Limited

Project Title: Water Management through Water Treatment Technologies

Location: Canadian Natural Resources Limited's Horizon Site, Fort McMurray

Total project cost: \$8,320,000. Total IETP Royalty Allowance: \$2,496,000.

Project Summary: Two separate treatment processes involving several technologies will be constructed to test their ability to treat, recycle and re-use high saline and process affected water. If successful, many of the water management challenges facing oil sands mining operations can be addressed, in particular reducing the amount of fresh water required for mining operations.

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