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# **Cold Lake Heavy Oil Development - A Success Story in Technology Application**

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### **Abstract**

Cold Lake is an ultra heavy oil operation in north east Alberta, Canada operated by Imperial Oil Resources, an ExxonMobil affiliate. It currently produces 24,000 m<sup>3</sup>/d (150,000 barrels per day) of 100 Pa-s (100,000 cP) oil using over 4,000 wells. Commercial operations began in 1985 utilizing a thermal recovery technology called cyclic steam stimulation (CSS).

Recovery estimates for the field have increased from an initial estimate of 13% to a current estimate of greater than 30% original bitumen in place (OBIP). This increase in recovery is the result of technology research, development and application across the field in all disciplines - geology, reservoir, subsurface, facilities, materials science, water treating and handling and power generation.

This presentation will outline the development and application of several key technologies which have enabled significant breakthroughs in operations and production at Cold Lake. Specific technologies discussed include the CSS process, pad design, surveillance with 3D and 4D seismic, horizontal well application, water recycle and treatment, steam generation, and co-generation as it applies to Cold Lake.

Conclusions presented include: The Cold Lake project, utilizing the Cyclic Steam Stimulation (CSS) process, is a world class venture; continuous development and application of technology is key to continued success in unconventional resource applications; phased development accelerates technical learning application, improves resource recovery and improves project economics; and integrated surface and subsurface designs are necessary to fully optimize operations.