Blast from the Past

Dr. Karl Clark spent seven years researching the extraction of bitumen from oil sands. In 1929, he received a patent for n1s discovery in a small Edmonton laboratory, while working with the Alberta Research Council. The achievement of this patent has significantly impacted the' development of the Heavy Oil Region in Alberta. His invention introduced alternative ways of extracting oil, developed new technology and opened up huge job opportunities.

Dr. Clark built upon the earlier experimentation of Sidney Ells, who used hot water to separate the oil from the oil sands. Clark's work involved mixing hot water within the oil sand to produce slurry, which is then, piped using hydro transport pipelines. The pipelines condition and transport the slurry to an extraction plant. At the extraction plant, the slurry is separated into three layers: water, sand and bitumen. The bitumen is skimmed off the top and processed further. The skimming process will be repeated until all of the bitumen has been recovered. In Ells' earlier work, the slurry was conditioned on-site in large wooden drums, bitumen was skimmed and the remaining sand and water poured back into the environment. Ells' process was also very labor intensive, primitive and small-scale. The new extraction process of Dr. Clark has decreased the amount of wasted bitumen that is released back into the ecological systems which will cause temperature and pH level fluctuations. His process allowed the extraction of a barrel of bitumen to use 40% less energy. Also, performing the skimming process in a controlled space has allowed companies to maintain perfect temperatures and maximize the amount of bitumen that is collected per skimming. In 1949, Clark was able to demonstrate the efficiency of his hot water extraction process to produce 500 tons of sand in 24 hours, obtaining 90% of the bitumen. In 1967, Suncor incorporated the hot water extraction process near Ft. McMurray. It is the largest single recovery simulator under contract to Petrofina Canada.

In 1972 the Alberta Research Council got involved in twelve separate projects related to oil sands research, including geological studies, bitumen upgrading and utilization, production methods and environmental research. Recently in the year 2000, infrared technology has been used to map oil sand grade remotely, at the mine, which can potentially reduce operating costs for mining companies. The use of CT (Computed Tomography) scans, which were originally used in the medical field, has been used to observe the flow of oil and water in the in-situ processes. In 1982 the establishment of the Industry ACCESS program allowed membered companies to share information generated by research teams and use the mathematical model to predict where oil is and how it will behave. Suncor Energy Inc. developed a new heavy oil extraction process that will lower costs and reduce greenhouse gas emissions. The process requires less water and will generate less CO2 than the current steam methods. The oil sands industry currently spends about $8 million dollars per year in environmental studies and monitoring emissions, which

is a great source of employment.

Oil sands have been very beneficial to the Canadian economy. In the Athabasca and Fort McMurray region the oil sands contain 175 pillion barrels of reserves that are still in the ground. Oil sands have and will continue to provide a tremendous development opportunity for Canada and its energy future. Canada's oil is internationally competitive. 15% of all American natural gas and 10% of petroleum product is supplied by Canada. Canada is the third largest producer of natural gas and the ninth largest producer of crude oil. The NAFTA agreement has opened doors to international markets. Last year, Syncrude reached 87.2 million barrels of oil as an annual product, which is about 238 000 barrels per day. The company is expecting to see an increase in production to 350 000 barrels per day in 2006. Alberta is also in the process of increasing the skilled labor force in the province. Alberta has currently 40 000 apprentice trades people in the oil field. The industry in the Fort McMurray region employs 1 200 Aboriginal people and did $210 million dollars worth of business with Aboriginal firms within this past year.

Dr. Karl Clark's discovery of an alternative extraction technique has lead to much new advancement in the oil industry. Introduction to alternative ways of extracting oil has developed new technology and is opening new employment opportunities. Alberta's Heavy Oil Industry has had a very successful centennial period. The future of oil in western Canada looks very promising and I am excited about contributing to the industry as an Engineer.

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