

Syncrude Canada Ltd.

Oil Sands History

The written history of the oil sands dates back over 200 years ago when the first Europeans spotted bitumen along the riverbanks of the Athabasca River. The local Aboriginal people had already long been tapping the resource to waterproof their canoes.

Exploration

The first European to see the Athabasca oil sands was fur trader Peter Pond, who was lured to the area in 1778 by tales of the rich fur harvests there. Other explorers were equally fascinated by the oil sands, including map maker David Thompson and Arctic explorers Franklin, Richardson and Simpson.

The first government-sponsored geological study of the oil sands was initiated in 1875 and carried out by John Macoun. Robert Bell headed another government expedition into the area seven years later.

Commercial Development

The first attempts to develop the Athabasca Oil Sands commercially were made under the assumption that the bitumen in the area must be coming from pools of oil deep beneath the surface. In an attempt to locate these pools, Alfred von Hammerstein drilled the first wells in the region, north of Fort McMurray. Altogether, between 1906 and 1917, about 24 wells were sunk in the search for the mother-lode of oil. None were successful at finding oil, but they did discover salt which became a major industry in the Fort McMurray area for 50 years.

In 1913, Sidney Ells, a young engineer employed by the federal Department of Mines, began his work in the oil sands, which was to last until 1945. Ells was an early advocate of the hot water flotation method of separating bitumen from sand and he conducted a number of experiments to test this technique. He was the first to bring out samples from the area for laboratory testing. As a result, oil sand was shipped to Edmonton to be tested as road paving material. While the paving was successful, oil sand could not compete economically with imported asphalt and the project was dropped.

In the 1920's, entrepreneur R.C. Fitzsimmons used the same hot water flotation process to produce bitumen for roofing and road surfacing at a plant near Bitumount, 80 kilometres north of Fort McMurray. By 1942, however, financial difficulties forced him to sell the operation. In 1948, the plant was taken over by the Alberta Government to investigate extraction methods with large scale equipment.



By 1949, the plant was processing 450 tonnes of oil sand a day, but it was closed because the government was not interested in launching a commercial venture. Data from the experiments was used as the basis for a major study of the viability of commercial production.

Dr. Karl Clark, a scientist with the Alberta Research Council in the 1920s, pioneered experiments with a hot water flotation process which involved mixing oil sand with hot water and aerating the resultant slurry. This would then separate into a floating froth of bitumen and a clean layer of sand which would settle to the bottom of the tank. The hot water flotation method pioneered by Ells, Fitzsimmons and Clark proved, over the years, to be the most viable method of extracting oil from the sand.

In 1936, another developer, Max Ball, founded Abasand Oils Ltd. His plant west of Fort McMurray produced diesel oil from the oil sands. There was a brief flurry of interest in his project, especially during World War II. When the plant burned down after being purchased by the federal government, the project died with the buildings.

The 1950's saw another upsurge of interest in the oil sands when the publication of an Alberta Government report indicated that production from the sand could be a profitable venture.

In 1962, the Government of Alberta announced an oil sands policy to provide for the orderly development of oil sands in such a manner that it would supplement, but not displace, conventional crude oil policy.

The first project off the mark was the Great Canadian Oil Sands (GCOS) Project. GCOS went through a number of ownership changes after its incorporation but, by 1963, prior to the construction decision, ownership rested with the Sun Oil Company (later Suncor Energy). The Suncor project came on stream in 1967 and became the world's first oil sands operation.

In the meantime, **the Syncrude consortium was formed in 1964**. Syncrude's initial objective was research on the economic and technical feasibility of mining oil from the Athabasca oil sands. Syncrude's proposal for a production facility was finally approved in 1969.

In 1973, construction began on the Syncrude site and, after five years of construction, the first barrel was shipped on July 30, 1978. The official opening of the Syncrude Project was on September 15, 1978. Production steadily increased in the ensuing years and, on April 16, 1998, the billionth barrel was sent down the pipeline, five years ahead of schedule.



The Syncrude operations are located on the Athabasca Oil Sands Deposit in northeastern Alberta, Canada.

Oil sand is composed of sand, bitumen, mineral rich clays and water. Bitumen, in its raw state, is a black, asphalt-like oil — as thick as molasses. It requires upgrading to make it transportable by pipeline and usable by conventional refineries. The upgraded bitumen product consists of naphtha, light and heavy gas oils that are combined to produce a light, sweet crude oil that we call Syncrude Sweet Blend.

Water makes up about 4% of the oil sand by weight. It surrounds each grain of sand, keeping it separate from the oil. Without this water envelope, the oil and the sand could not be separated by the water-based extraction methods we now use.

According to the Alberta Energy and Utilities Board, Alberta's oil sand deposits contain approximately 1.7 trillion barrels of bitumen, of which over 175 billion are recoverable with current technology, and 315 billion barrels are ultimately recoverable with technological advances. The Athabasca Oil Sands Deposit is, by itself, the largest petroleum resource in the world.

Oil sand is visible on the banks of the Athabasca River, north and south of Fort McMurray, but most of the oil sand in the area lies buried 50 metres or deeper under muskeg and overburden.

The origin of the oil is a controversial subject among geologists, but the predominant theory is that it evolved in highly organic Cretaceous shales in the southern portion of the Alberta Sedimentary Basin. Underground pressure forced the oil to soak into the existing silt grade sediments and localized sand bodies of the McMurray formation.

Syncrude's Operations Overview

Syncrude Canada Ltd. is one of the largest producers of crude oil from oil sands.

The crude oil production facility has the capacity to produce over 15% of Canada's total oil requirements. To do this, we surface mine oil sand, extract the raw oil known as bitumen from the sand using water-based processes, and upgrade that bitumen into sweet light crude oil by fluid coking, hydroprocessing, hydrotreating and reblending.

The final product, Syncrude Sweet Blend (SSB), is sent by pipeline to three Edmonton area refineries and to pipeline terminals which ship it to refineries in Canada and the United States.



The Syncrude operation is comprised of four major technology areas: Mining, Extraction, Upgrading and Utilities. As well, Syncrude invests more than \$40 million annually in science and technology, and is among the top 50 companies in Canada for Research and Development (R&D) investment. Syncrude holds 21 active Canadian and U.S. patents.

Interesting Facts

Take a glance at some of the amazing and interesting facts about the Syncrude operation...

- Site preparation commenced in December 1973
- 43 million field work hours to construct the Syncrude Project
- 10,300 people employed at peak construction
- Syncrude employs more than 5,000 people and an average of 1,500 contract maintenance and specialist workers
- Total asset value of the Syncrude Project is approximately \$12 billion
- 100 millionth barrel produced in July 1982
- One billionth barrel produced in April 1998
- Two billion barrels produced in October 2009
- Current production capacity is 350,000 barrels per day
- Syncrude shipped 105.8 million barrels of Syncrude Sweet Blend (SSB) in 2008
- The Extraction complex is housed in a building about nine storeys high
- A workforce of more than 10,000 swarmed over the site during the peak construction periods in 1976 and 1977; 7,500 workers lived in the construction camps on site; the camp had three kitchens which served up to 27,000 meals a day
- Over 248,000 cubic metres of concrete, 853 kilometres of piping and 2,920 kilometres of wire and cable were used in the construction of the original plant site. Nearly 450,000 tonnes of materials, equipment, vessels and plant components traveled the highway to the construction site
- The initial cost of the Syncrude project was \$2.3 billion, making it one of the largest single construction projects in Canadian history
- The Utilities plant produces enough electricity each day to supply a city of 300,000 people
- It takes three days at peak pipeline rates for oil to travel from Fort McMurray to Edmonton
- Every 24 hours there is enough metal worn off the mining equipment, by abrasive oil sand, to make two full-size pick-up trucks
- Oil sands development is recognized as one of the top 10 engineering achievements in Canada

Website: www.syncrude.ca

