



The Sunrise oil sands field: what is it and how will it be developed?

BP and Husky have announced plans to invest billions of dollars to expand North American energy supply and enhance North American energy security. They have agreed to develop an integrated North America oil sands solution with each owning 50 per cent of two independent joint ventures, formed from equally valued assets.

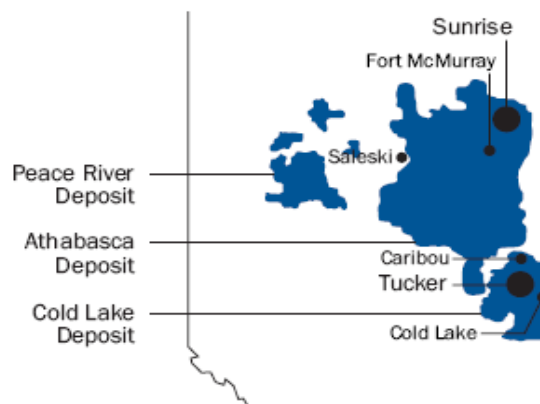
Husky will contribute its Sunrise in-situ oil sand asset to an upstream partnership, and BP will contribute its Toledo, Ohio refinery to a downstream partnership.

The huge potential of Sunrise is the ideal entry point for BP into Canadian oil sands. The JV also demonstrates BP's commitment to investing in Canada and helping to develop Canada's global position in oil sands. Below are details about the Sunrise field.

The Sunrise oil sands field is expected to be sanctioned in 2008 with first production of bitumen in 2012, and building to 200,000 barrels of oil a day (bpd) by the end of the next decade with a 40-year production plateau. Joint investment up to 2012 is estimated at around \$3 billion.

The field has been fully delineated by the drilling of 650 appraisal wells. Front end engineering is well advanced with completion expected in early 2008.

The Sunrise field is located 60 kilometres northeast of Fort McMurray, Alberta, and is part of the province's extensive deposits of oil sands, which are one of the world's two largest sources of bitumen; the other is in Venezuela. Oil sands are found in three places in Alberta - the Athabasca, Peace River and Cold Lake regions - and cover a total of nearly 140,200* square



kilometres.

Oil sands are deposits of bitumen, heavy viscous oil that must be treated to convert it into an upgraded crude oil before it can be used by refineries to produce gasoline and diesel fuels. Bitumen makes up about 10-12 % of the actual oil sands found in Alberta. The remainder is 80-85 % mineral matter, including sand and clays, and 4-6 % water.

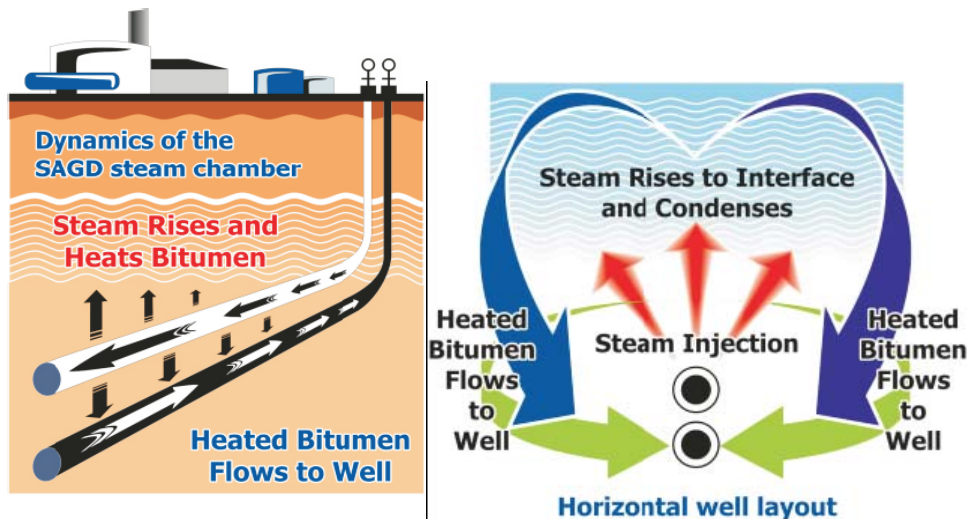
Bitumen is so heavy and viscous that it will not flow unless heated or diluted with lighter hydrocarbons. At room temperature, it is much like molasses. Bitumen is a tar-like mixture of petroleum hydrocarbons with a density greater than 960 kilograms per cubic metre; light crude oil, has a density as low as 793 kilograms per cubic metre

Bitumen requires dilution with lighter hydrocarbons to make it transportable by pipelines. While conventional crude oil flows naturally or is pumped from the ground, oil sands must be mined or recovered in situ.

With the McMurray Formation occurring at depths of 100 to 250 metres, the bitumen will be recovered using an in-situ process rather than surface mining. Due to resource evaluations and economic analyses, Husky has selected a steam assisted gravity drainage (SAGD) recovery process as the most technically and economically viable approach.

SAGD uses horizontal well pairs. A horizontal well, equipped as the bitumen producer, is located near the bottom of the reservoir. Steam is injected into a second horizontal well placed about five metres above and running parallel to the producer. Both wells initially inject steam prior to any production, but steam is continuously injected into the reservoir through the upper well. A steam chamber forms, heating the bitumen enabling it to flow.

The bitumen and condensed steam, under the influence of gravity, drain to the lower horizontal well. These fluids are produced through the wellbore to the surface. The steam chamber grows as more steam is injected and more bitumen is heated and then flows to the lower well. Natural gas or pumps may be used to assist in lifting the produced fluid in the wellbore to the surface.



This development will incorporate multi-well production pads and horizontal wells, with centralized steam generation, bitumen treating and produced water recycling facilities. The bitumen will be exported to Hardisty, Alberta, where it will be transported via existing pipelines for refining. Sunrise will continue to be operated by Husky.