



# Oil Sands

A strategic resource for Canada, North America and the global market

## Land Use and Reclamation

### 100 percent of land must be reclaimed

Oil sands development is subject to environmental standards that are among the most stringent in the world. The Government of Alberta requires that companies remediate and reclaim 100 percent of the land after the oil sands have been extracted.

Reclamation means that the area can be productive and sustain the equivalent vegetation and wildlife that existed prior to development. Oil sands companies must file a Conservation and Reclamation Plan as part of their initial project application, keep it current and post financial security bonds for reclamation. Governments ensure that all oil sands companies fulfil their legal obligation to reclaim the land.

Long before the landscape is touched by development, comprehensive assessments identify potential environmental impacts, such as those affecting land, air, water and biodiversity. Steps are then taken during the life of a project to minimize any negative effects.

In the oil sands area, the Government of Alberta has committed to conserving and protecting more than 2 million hectares (28 000 square kilometres) of habitat for native species as part of the 2011 Lower Athabasca Regional Plan.

### Oil sands mineable area is 0.2 of one percent of Canada's boreal forest

Canada's oil sands are the third largest proven deposit of crude oil in the world, with a reserve of 170 billion barrels.<sup>1</sup>

The oil sands are found in Western Canada, and are located within the boundaries of Canada's boreal forest, which stretches more than 5 000 kilometres from coast to coast and covers about 30 percent of the country's land mass. The total area of the oil sands that is accessible through surface mining represents 0.2 percent of Canada's boreal forest.



Syncrude - Gateway Hill

<sup>1</sup> Alberta Environment (2009).

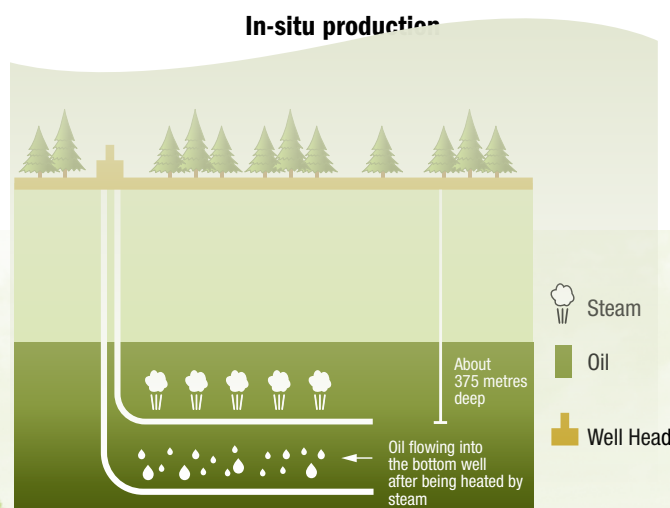
## Most future development will be drilled, not mined

Oil sands bitumen can be extracted by two methods: mining and in-situ.

Reserves near the surface can be accessed only through mining. In this process, the bitumen is dug up, mixed with water and separating agents and agitated to separate the bitumen from the sand and clay. Mining operations require the removal of all vegetation and top soil to access the raw oil sands. These removed materials are then stored for use later in reclamation.

Reserves too deep to mine require some form of drilling technology. Drilled production, also known as in-situ production, generally involves drilling wells and pumping steam underground to separate the bitumen from the sand and clays and then recovering the bitumen through the wells.

Eighty percent, or 136 billion barrels, can only be recovered through drilling, or in-situ technology, while the balance, 34 billion barrels, can be accessed through mining.<sup>2</sup>



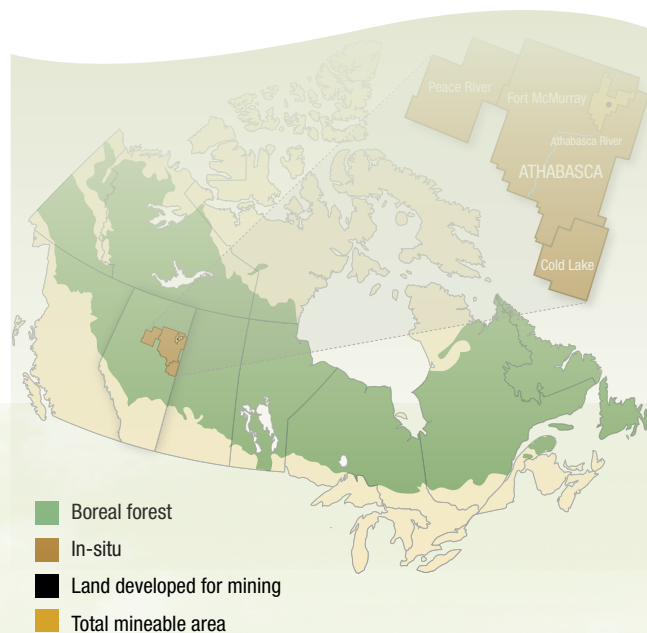
Source: Cenovus, adapted by Natural Resources Canada, 2010.

## In-situ land disturbance is one-seventh the size of similar-sized mining projects

Land impacts from in-situ projects are about one-seventh the size of a similar mining operation,<sup>3</sup> and no tailings ponds are produced. As a result, site reclamation occurs much more quickly and with less remediation required.

Similar to other types of surface mining, the life span of these oil sands projects is 40 to 60 years. Given that oil sands have only been mined since 1967, reclamation is just beginning and will take many years.

Since 1967, 663 square kilometres of land have been affected by mining activity. This area is less than half the area of New York or London and about the area of Chicago, Toronto or Madrid. Once mining is complete in these areas, all of the land will be reclaimed and returned to its prior form.



<sup>2</sup> Alberta Environment (2009): *Environmental Management of Alberta's Oil Sands*.

<sup>3</sup> The Pembina Institute (2010): *Mining vs. In-situ*.