

Death by a Thousand Cuts

AUGUST 2006



FACT SHEET

IMPACTS OF IN SITU OIL SANDS DEVELOPMENT ON ALBERTA'S BOREAL FOREST

Deep oil sands may transform 21% of Alberta

More than 80% of oil sands reserves are too deep to mine, and must be extracted with so-called in situ (or in place) techniques.

Deep oil sands cover a vast area of Alberta – approximately 138,000 km², which is 50 times the area of the surface mineable oil sands zone. This equals 21% of Alberta, or a land area approximately the size of Florida.

Deep oil sands extraction requires the development of a dense network of roads, pipelines, well pads and processing facilities across the boreal forest.

The type of oil found in the oil sands deposits, termed bitumen, is heavy and viscous and not easily extracted. The most common form of in situ extraction is called Steam Assisted Gravity Drain (SAGD). Using the SAGD process, two horizontal wells are placed near the bottom of the bitumen formation. The top horizontal well is used to inject high-pressure steam, which rises to form a high-temperature steam chamber above the well. Within the steam chamber the bitumen is

liquefied and then flows by gravity to the lower well where it is collected, along with the condensed water.

Deep oil sands extraction requires the development of a dense network of roads, pipelines, wellpads and

processing facilities across the boreal forest. A typical deep oil sands project will clear 8% of the forest in a lease. The forest is fragmented by an average of 3.2 km of roads, pipelines and other disturbances for every single square kilometre of forest. The surface disturbance associated with deep oil sands development is many times greater than the disturbance associated with conventional oil or gas fields, to which in situ is often compared.

Canadian Parks and Wilderness Society (CPAWS), Edmonton and the Pembina Institute projected what the future disturbance associated with deep oil sands development would look like if all the oil sands leases that have already been sold were developed using current industry practices. As a model of future deep oil sands development we used information from the OPTI-Nexen Long Lake Project Application.



FIGURE 1:
The 3,000 km² of mining leases (pink in the map) are just the beginning. Deep oil sands extraction could affect up to 138,000 km² or 21% of Alberta.

SOURCE: RICK SCHNEIDER,
CANADIAN PARKS AND WILDERNESS SOCIETY

It's a matter of scale:

- Total area leased for oil sands mining: **3,000 km²** (an area 3.6 times the size of the City of New York)
- Area of mines developed so far, that can already be seen from space: **300 km²**
- Area of toxic tailings ponds in mining areas: **50 km²**
- Total area available for deep oil sands extraction: **138,000 km²** (an area the size of Florida)
- Area of deep oil sands leased so far: **35,680 km²** (an area the size of Vancouver Island)
- Amount of this land that will be cleared for deep oil sands extraction: 8.3% or **2,960 km²**
- Length of roads, pipelines and power lines: **9,472 km** for already leased deep oil sands areas
- Amount of boreal forest cleared if all deep oil sands are developed: **11,454 km²**
- Length of roads, pipelines and power lines if all deep oil sands leases are sold: **441,600 km**, or 11 times the circumference of the Earth
- Amount of Alberta developed for oil sands if all oil sands deposits are leased: **21%**

Deep oil sands development...



In situ impacts

As of July 2005, the total area leased for deep oil sands or in situ development in Alberta was 3,568,000 ha (35,680 km²), setting the wheels in motion for an industrial sacrifice zone the size of Vancouver Island.

Total clearing projected with the development of deep oil sands leases is expected to exceed the anticipated 300,000 hectares (3,000 km²) of disturbance created by oil sands mining.

Woodland caribou populations have declined by 50% in some ranges in northeastern Alberta as a result of cumulative developments (including deep oil sands developments) within their range. Numerous scientific studies predict that caribou will be wiped out in northeastern Alberta under proposed deep oil sands development plans.

Research in Alberta shows that many furbearing mammals and some forest birds decline as a result of industrial developments in the boreal forest. Regional-level declines in marten, fisher, lynx, black-throated green warblers, sapsuckers and brown creepers are predicted under these development plans.

could affect 50 times as much of boreal forest as oil sands mining

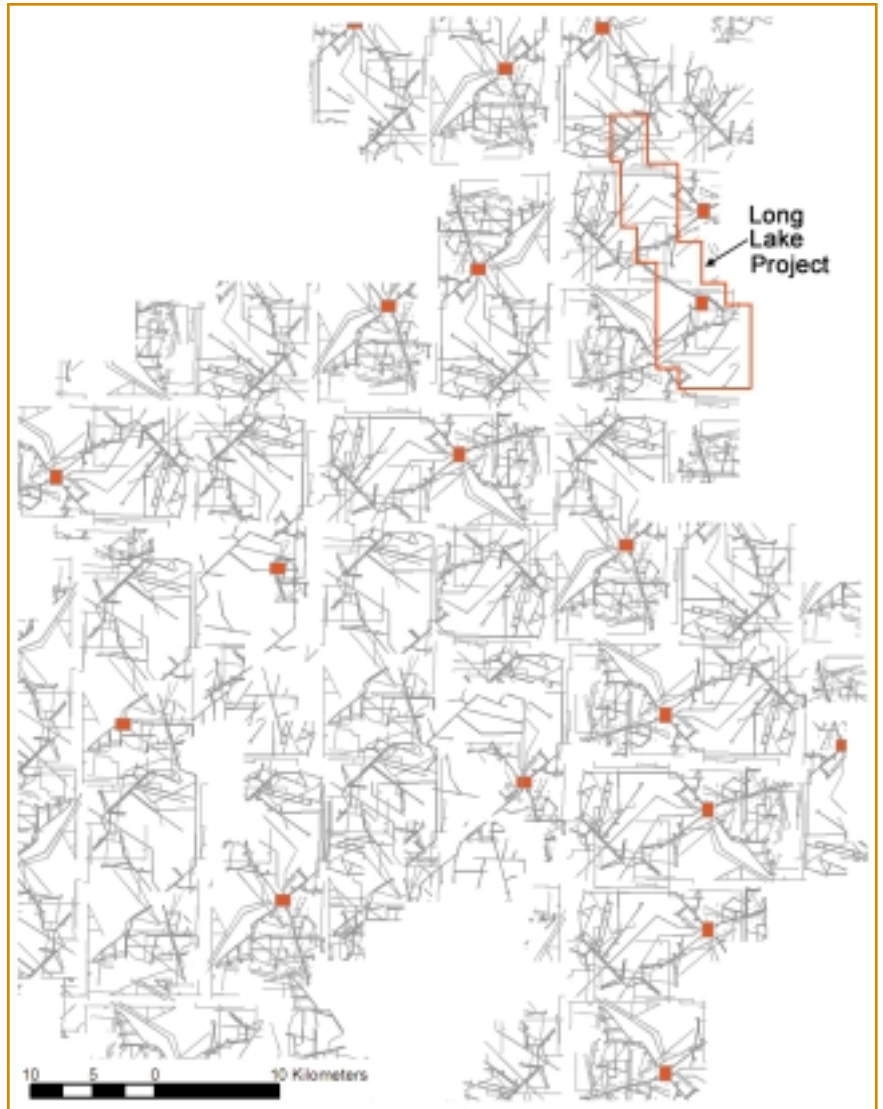
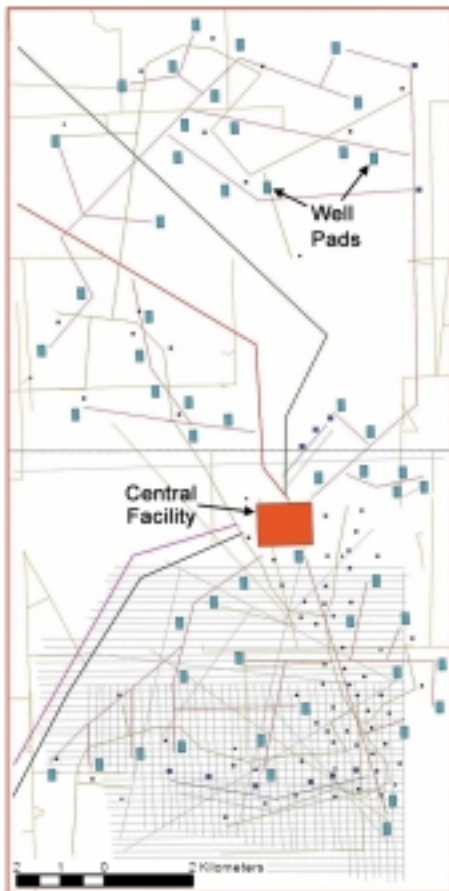


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FIGURE 2
(photo above):
Pipeline
gathering
system
in a SAGD
installation.

SOURCE:
PETRO-CANADA

▲
FIGURE 3
(photo on
page 2):
Forest clearing
for access
routes and
core holes
in a deep
oil sands
development.

SOURCE:
GOOGLE EARTH
© 2005 GOOGLE,
IMAGE © 2006
DIGITAL GLOBE



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FIGURE 4:
Projected SAGD disturbance footprint at medium scale (approximately 20% of the in situ region is shown). The location of the Long Lake Project is shown in red for reference.

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FIGURE 5:
Typical SAGD footprint based on project description in the OPTI-Nexen Long Lake Environmental Impact Assessment (EIA).

Summary of recommendations

The following recommendations by CPAWS and the Pembina Institute are essential to minimize the risk to the boreal forest posed by poorly managed deep oil sands development:

1. *Develop a regional plan* for the oil sands region that describes the landscape objectives that will be met through the oil sands lease allocation and regulatory approval processes.
2. *Suspend new lease sales and project approvals until the regional plan is in place.*
3. *Establish new interconnected protected areas* representative of the boreal region as a conservation offset measure.
4. *Establish quantitative limits on cumulative industrial disturbances* and precautionary standards for wildlife habitat, water use and release, air contaminants, and watershed integrity to ensure that boreal forest values are protected.
5. *Establish a Land Management Planning Standard* to guide the development of operating plans for all resource companies working in a given management area.
6. *Require all companies to implement “best practices”* to minimize environmental damage from in situ development.

SAGD OPERATION FROM THE COLD LAKE REGION OF ALBERTA

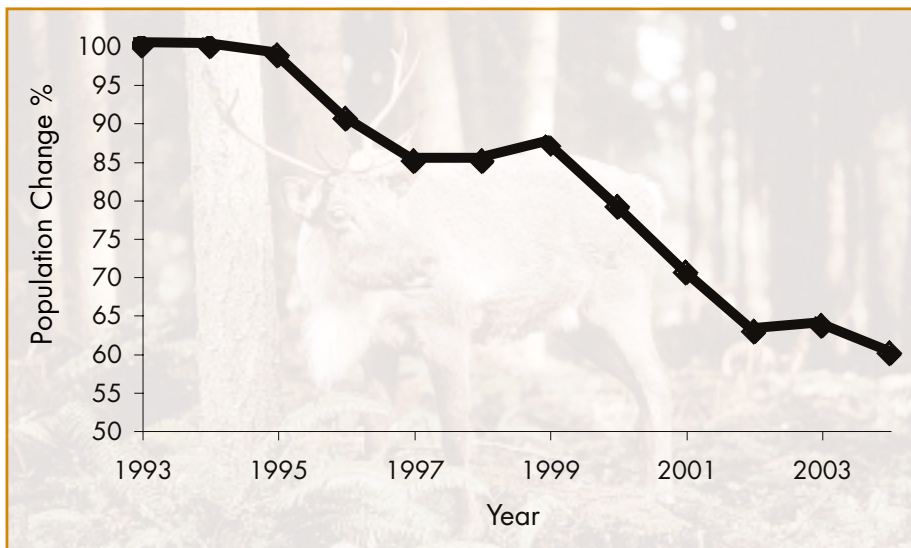
SOURCE: GOOGLE © 2005 & NAVTEQ © 2006

Want more information?

For more information and a complete list of recommendations, you can download our full report *Death by a Thousand Cuts: The Impacts of In Situ Oil Sands Development on Alberta's Boreal Forest*. It is available from www.oilsandswatch.org. There you will also find our report, *Oil Sands Fever*, photos, videos and other information and reports on oil sands.

This report was prepared by Rick Schneider of the Canadian Parks and Wilderness Society www.cpaws-edmonton.org and Simon Dyer of the Pembina Institute www.pembina.org.

FIGURE 6:
Population change for the East Side of the Athabasca caribou herd (Alberta Woodland Caribou Recovery Team).



 **CPAWS**
CANADIAN PARKS AND WILDERNESS SOCIETY

 **the PEMBINA**
institute