

Opening the Door for Oil Sands Expansion

THE ENBRIDGE OIL SANDS PIPELINE

The proposed Enbridge Northern Gateway Project would create a pipeline link between the Alberta oil sands and the British Columbia coast. The pipeline would allow the export of petroleum products from the oil sands to new markets in Asia by supertanker. To supply the new markets opened by Enbridge's pipeline, average daily oil sands output would increase by nearly 30% — with major environmental consequences.

The oil sands are already Canada's fastest growing source of greenhouse gas pollution. Oil sands expansion related to the proposed Enbridge pipeline would produce an additional 6.5 megatonnes of greenhouse gas emissions each year, equivalent to putting 1.6 million more cars on the road. It would also consume large quantities of water and natural gas, produce toxic tailings, and result in significant clearing and disturbance of Canada's boreal forest.



The proposed Enbridge pipeline would transport petroleum products from the oil sands in Alberta to an oil tanker port on the British Columbia coast. The project would lead to increased oil sands extraction at a time when the pace and scale of oil sands development is already exceeding industry's and government's ability to manage the environmental impacts. Photo: David Dodge, Pembina Institute

OIL SANDS GROWTH LINKED TO PIPELINE CAPACITY

Domestic demand for oil from the oil sands is not expected to increase significantly. Therefore, growth in oil sands production will be linked to pipeline capacity. The Enbridge Northern Gateway Project would consist of two parallel 1,200 kilometre pipelines, one to transport petroleum from the Alberta oil sands to the British Columbia coast, and the other to move petroleum condensate east from British Columbia to Alberta. The westbound export pipeline would transport 525,000 barrels of petroleum products each day. To fill the pipeline, an additional 367,500 barrels of oil would be produced daily.¹ New pipeline capacity facilitates new production: it's that simple.

Oil sands operations have major impacts on land, air and water. Current federal and provincial rules do not sufficiently address these environmental impacts. The Pembina Institute has called for a pause on new oil sands approvals until better rules are in place to protect the environment.

¹ For analysis purposes, the report assumes that the 525,000 barrels-per-day export pipeline will ship a diluted bitumen mixture of 30% condensate and 70% bitumen ($0.7 \times 525,000 = 367,500$). The pipeline may ship other petroleum products, such as synthetic crude oil, which would require more than 367,500 barrels of bitumen extraction.

Upstream Impacts: Adding Fuel to the Fire

Contributing to Climate Change

Production of synthetic crude oil from the oil sands produces three times more greenhouse gas pollution than conventional Canadian and U.S. oil production. Greenhouse gas emissions from the oil sands are expected to rise from 4% of Canada's emissions in 2006 to 12% in 2020, and to account for 44% of the total increase in Canada's emissions over that period.

The Enbridge oil sands pipeline would result in a 1% growth in Canada's overall emissions. Over a 40-year hypothetical project lifespan, 260 megatonnes of additional greenhouse gases would be emitted.

British Columbia has committed to reducing its greenhouse gas emissions. The additional emissions associated with the pipeline are equivalent to about 10% of British Columbia's 2007 greenhouse gas emissions — enough to potentially undermine any emission reductions achieved in the province.

Burning Gas to Make Oil

Large amounts of natural gas are used in the process of extracting oil from the oil sands. The expanded oil sands production needed to supply the Enbridge pipeline would require 74 billion cubic feet of natural gas per year, which is equivalent to 34% of British Columbia's annual natural gas consumption.

Upstream Facts

The Enbridge oil sands pipeline is expected to transport 525,000 barrels of petroleum products to the British Columbia coast every day. Over the course of a year, the resulting increase in oil sands production would:

- produce greenhouse gas pollution equivalent to the annual emissions of 1.6 million cars;
- consume the amount of natural gas used by 1.3 million households in Canada each year;
- disturb 11.5 square kilometres of forest — an area equivalent to 2,148 football fields;
- use the amount of water consumed annually by a city of 250,000, or about 200 million bathtubs of water;
- create enough toxic tailings to fill one and a half BC Place stadiums or 1,606 Olympic-sized swimming pools; and
- result in enough tailings leakage to fill 182 Olympic-size swimming pools.

Impacting the Athabasca River

Oil sands production also uses a lot of water. For every barrel of bitumen (a tar-like heavy oil) mined, between two and four barrels of fresh water are required. About 80% of this water is taken from the Athabasca River, with the remainder coming from groundwater and surface runoff. Current oil sands projects are licensed to divert more than 550 million cubic metres of freshwater from the Athabasca Basin each year.

Deep oil sands operations (another method of oil sands extraction) use about 0.6 to 0.9 barrels of groundwater to extract and upgrade a barrel of bitumen. There is growing concern about the cumulative impacts of these withdrawals.

An additional 200 million barrels of water would be required every year to meet the oil sands demand created by the Enbridge pipeline.



Oil sands operations use huge quantities of water from the Athabasca River. Increased oil sands development could result in long-term ecological impacts on the Athabasca River and watershed. Photo: David Dodge, CPAWS



Tailings ponds full of toxic liquid waste created by oil sands mining already cover 130 square kilometres of land. In fact, they are so large they can even be seen from space. Photo: David Dodge, Pembina Institute

Polluting Land and Water

Tailings are the toxic liquid waste products created by bitumen extraction in oil sands mines. Tailings contain many different toxic compounds, including naphthenic acids, phenolic compounds, ammonia-ammonium and metals. This toxic waste must be carefully managed on site in order to prevent the spread of environmental contamination.

Approximately one third of a barrel of liquid tailings is produced for each barrel of bitumen. Tailings ponds currently cover 130 square kilometres, and are growing by the day.

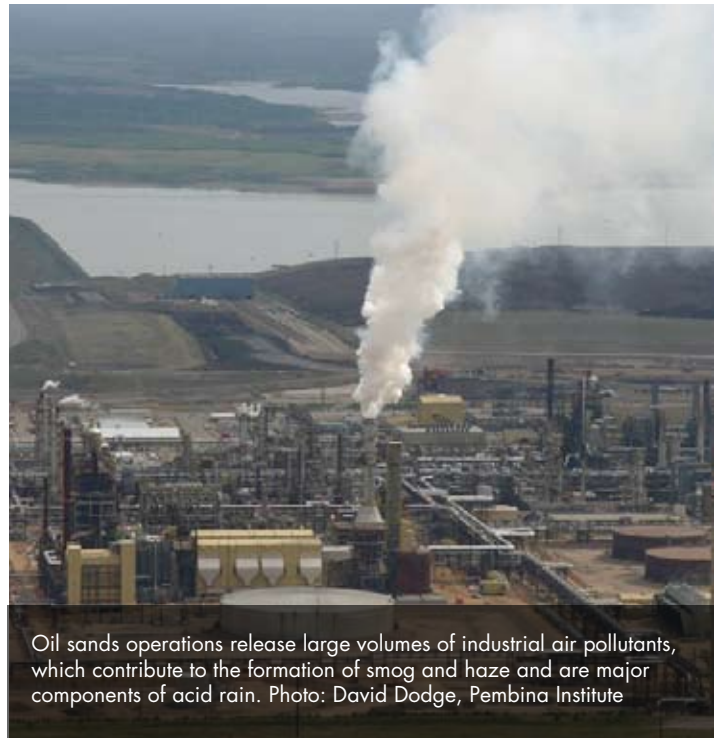
The bitumen produced to supply the Enbridge oil sands pipeline would create 70,000 barrels of tailings per day, or 25 million barrels per year.

Tailings ponds often leak into the surrounding environment. The additional tailings leaks resulting from the Enbridge pipeline would be an estimated 7,300 barrels per day.

Polluting the Air

Alberta ranks number one in Canada for releases of industrial air pollutants, including sulphur dioxide, nitrogen oxides, and particulate matter — all of which are emitted in large volumes by oil sands operations. Sulphur dioxide and nitrogen oxides contribute to the formation of smog and haze and are major components of acid rain. They can also have harmful effects on human health.

Increased oil sands activity will worsen Alberta's air pollution problem. Nitrous oxide emissions associated with the Enbridge pipeline would be an estimated 14,000 tonnes per year, equivalent to one quarter of Metropolitan Vancouver's nitrous oxide emissions for one year. Similarly, sulphur dioxide emissions would be an estimated 3,200 tonnes per year, equivalent to one third of Metropolitan Vancouver's yearly sulphur dioxide emissions.



Oil sands operations release large volumes of industrial air pollutants, which contribute to the formation of smog and haze and are major components of acid rain. Photo: David Dodge, Pembina Institute

Are we asking the right questions?

A federal Joint Review Panel will conduct the environmental assessment for the Enbridge oil sands pipelines. The panel will hold hearings on the project's potential environmental impacts. However, the proposed scope of the hearings does not include the impacts associated with increased oil sands production, or the impact the project will have on global warming pollution. All of the environmental issues associated with the Enbridge pipelines — including the impacts associated with increased oil sands production — should be evaluated before the project proceeds.

Razing the Boreal Forest

Much of the oil sands region is covered with boreal forest. The forest performs valuable ecological functions, such as storing fresh water in wetlands and lakes, storing carbon in trees, soil and peat, and providing habitat for animals such as migratory song birds, waterfowl, bears, wolves and caribou.

So far, the Government of Alberta has leased 79,000 square kilometres of land for oil sands development — an area twice the size of Vancouver Island — without prior environmental assessment or consultation with First Nations communities.

An estimated 12.5 square kilometres of boreal forest would have to be cleared and mined every year in order to supply the Enbridge pipeline. Over a hypothetical 40-year project lifespan, the area impacted would exceed the area of the City of Vancouver four times over.



Oil sands deposits underlay 142,000 square kilometres of northeastern Alberta — an area originally covered by boreal forest. The Government of Alberta has so far leased 79,000 square kilometres for oil sands development. Photo: David Dodge, CPAWS



Oil sands development reduces and fragments the boreal habitat available for animals such as the caribou, above. Threatened woodland caribou herds in northern Alberta are on the way to becoming extinct locally, largely as a result of the cumulative footprint of industrial development. Photo: Hilary Bell, Dreamstime.com

Recommendations

The Pembina Institute has recommended a pause on the approval of new oil sands projects until policies are in place to fully address the environmental impacts of oil sands development. Until these prior concerns about the environmental management of the oil sands are addressed, the Pembina Institute recommends that no further steps be taken to develop the Enbridge oil sands pipelines.

In addition, Pembina supports a moratorium on the transportation of oil from Alberta's oil sands across British Columbia until a public inquiry fully addresses concerns about the environmental impacts. The environmental assessment process currently proposed for the Enbridge oil sands pipelines fails to address some of the most potentially harmful environmental consequences of the project. Because communities along and at both ends of the pipeline route will be most impacted by its development, ensuring their support for the project before it proceeds is essential.

Want More Information?
For more information, including an explanation of the calculations used in this fact sheet, please read the full report, *Opening the Door for Oil Sands Expansion: The Hidden Environmental Impacts of the Enbridge Northern Gateway Pipeline*, available at bc.pembina.org and www.oilsandswatch.org.

