

# TAR SANDS FACTS

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By June 2009, tar sands mining operations had destroyed an area of the Boreal forest one and half times the size of Denver, Colorado.

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The Portland-Montreal pipeline flows underground through dozens of communities throughout New England and Central Canada.

## Going in Reverse: The Tar Sands Oil Threat to Central Canada and New England

Canadian pipeline company Enbridge Inc. appears to be reviving a previous plan, called Trailbreaker, which would transport tar sands oil through some of the most important natural and cultural landscapes in eastern Canada and Vermont, New Hampshire, and Maine. The Trailbreaker plan would reverse the direction of oil flowing through two major pipelines—Enbridge Line 9 and the Portland/Montreal Pipeline. But under the plan, the pipelines would not carry conventional oil, but Canadian tar sands oil—the dirtiest oil on the planet—along an approximately 750-mile route. The pipelines’ route would run east through Ontario and Quebec, and down to the New England seacoast, finally ending in Portland, Maine’s Casco Bay for export. Enbridge has taken the first step to implement this plan by recently filing a permit application with Canada’s National Energy Board.

The removal of tar sands oil from the ground is a destructive business. Large swaths of Alberta’s Boreal forest are destroyed, and a massive amount of energy creating carbon pollution is used to produce the heavy oil. Because of the corrosive qualities of tar sands oil, its transport poses unique risks that aging conventional oil pipeline systems, like Trailbreaker, are not equipped to handle. A spill along Trailbreaker’s corridor could harm rivers, lakes, and bays that are vital resources for millions of people in Canada and the United States, especially given that tar sands oil spills are more prevalent and potentially more damaging than conventional oil spills. One thing is certain—eastern Canada and New England do not need to bear the risks of tar sands pipelines so that the oil industry can gain access to a coast for export.

### TRAILBREAKER—A PIECEMEAL PIPELINE

A few years ago, the oil industry proposed the Trailbreaker tar sands pipeline, a project that would link the Midwestern pipeline system through Ontario and Quebec and across New England to Portland, Maine where tar sands would go on tankers to refineries in the Gulf Coast or overseas. That plan was eventually shelved and then in August of 2011, Enbridge filed a permit application with the Canadian National Energy Board for a project they call “Line 9 Reversal Phase I.”<sup>1</sup> The permit for this project seeks to reverse the flow direction of about one quarter of Line 9’s length—from Sarnia, Ontario, to the Westover Oil Terminal, which is located outside of Hamilton, Ontario. Although Enbridge has claimed this is a standalone project, the application appears to signal the rebirth of Trailbreaker.

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## The Plan to Pump Tar Sands Through Eastern Canada and New England



By dividing up the project into smaller components and calling it “Phase I,” Enbridge could be attempting to shield itself from the type of scrutiny faced by tar sands pipelines like TransCanada’s Keystone XL. Enbridge acknowledged in late 2011 that they were actively pursuing plans to bring tar sands to Ontario, Quebec, and New England.<sup>2</sup>

### THE TROUBLE WITH TAR SANDS

The oil in Alberta does not flow freely from the ground like the gushers portrayed in the movies. Instead, the extraction and processing of tar sands oil is one of the largest industrial operations in the world, relying on two processes—open-pit mining and in-situ drilling—that raze and fragment massive swaths of the Boreal forest. These processes use enough energy to make tar sands oil production the fastest-growing contributor to Canada’s carbon pollution.<sup>3</sup>

At the open-pit mines, the Boreal forest is cleared so that massive excavators and trucks can scoop up and remove the tar sands. At the in-situ drilling operations, the forest is fragmented and natural gas is burned to produce steam, which is injected via pipes into the ground to melt the subterranean tar sands. The oil gathers in wells and is pumped up to the surface for processing.

Destroying carbon-storing trees and wetlands on such a large scale contributes to climate change. Carbon pollution from tar sands extraction and upgrading are estimated to be three to five times higher per barrel than production of a barrel of conventional Canadian or U.S. crude. Tar sands extraction wipes out nesting habitat for millions of birds, such as the evening grosbeak and olive-sided flycatcher. Tar sands mining operations require between two to four barrels of fresh water for every barrel of oil produced. In addition, toxic tar sands tailings ponds now cover 170 square kilometers of Alberta, an area the size of Vancouver or Washington, D.C.

### SAFETY RISKS FROM TAR SANDS PIPELINES AND SPILLS

Tar sands oil or bitumen mined or drilled from the Alberta soil needs thinning to be transported in pipelines. After the oil-laden soil is removed, tar sands are blended with natural gas liquids or other light, volatile petroleum products that contain benzene, toluene, and xylene. The result—diluted bitumen—is a viscous, heavy crude oil that at high pressures can be pumped through pipelines.

Tar sands diluted bitumen has organic acid concentrations up to 20 times higher than conventional crude oil, and it contains 10 times more sulfur.<sup>4</sup> Diluted bitumen is also 40 to 70 times more viscous than conventional crude oil. As diluted bitumen is pumped through pipelines, its temperature increases, amplifying the corrosive qualities of an acidic oil that has abrasive materials such as quartz and silicates suspended in the mixture. In a sense, tar sands oil that flows through a pipeline is like fast, hot, and toxic liquid sandpaper.

Tar sands pipeline spills can and do occur, and there are indications that they are more prevalent than conventional oil spills. In recent years, the majority of tar sands oil not refined in Alberta has been piped south to refineries in the United States, especially to Midwestern pipelines, which have the longest history of transporting Canadian tar sands oil, and between 2007 and 2010, pipelines in North Dakota, Minnesota, Wisconsin, and Michigan spilled almost three times as much crude oil per mile of pipeline when compared to the U.S. national average.<sup>5</sup>

The damage can be more severe when an oil spill involves tar sands diluted bitumen. The natural gas condensate used to thin tar sands oil increases the chance of explosions if it comes into contact with high heat, sparks, static electricity, or lightning. Also, toxins that are present in the oil, such as benzene and n-hexane, can affect the human central nervous system.



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**A spill along the Trailbreaker pipeline route could harm a number of important natural resources areas in Ontario, Quebec, and northern New England.**

**In 2010, a rupture in an Enbridge Inc. pipeline near Marshall, Michigan resulted in the largest tar sands spill in U.S. history.**

Tar sands diluted bitumen spills can be especially destructive to bodies of water, where protracted and costly cleanup efforts are required. If a diluted bitumen spill occurs by a river, pond, lake, bay, or sea, the diluents will evaporate, leaving the heavier bitumen to sink. This means that cleanup efforts not only require booms to skim spilled oil from the water's surface, they also require dredges to recover sunken bitumen, potentially agitating toxic sediments that have already settled on the bottom.

A recent tar sands spill in Michigan shows how devastating a diluted bitumen spill can be. In the summer of 2010, more than 800,000 gallons gushed from an Enbridge pipeline in the southern part of the state. The oil contaminated a 30-mile stretch of the Kalamazoo River, which required extensive dredging and also led to widespread health problems in neighboring communities.

The risk of spills from Trailbreaker would be greater because of the age of the pipelines in question. Enbridge Line 9 was built in 1975, and one of the pipelines on the Portland/Montreal corridor was built in 1950.

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***A spill along Trailbreaker's corridor could harm rivers, lakes, and bays that are vital resources for millions of people in Canada and the United States.***

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## SPECIAL PLACES AT RISK

Along Trailbreaker's route, tar sands oil pipelines could put several special places at risk, including:

- **Grand River Basin**, a designated Canadian Heritage River, recognized for its natural and cultural attributes of national stature and as home to more than 215 species designated at-risk or endangered species.
- **Lake Ontario**, the last in the Great Lakes chain and an important resource to the millions of Canadians and Americans who live on or near its shores.
- **Saint Lawrence River**, the most important river in eastern Canada as it provides everything from half of Quebec's drinking water to a seasonal home for blue whales, the largest creatures on the planet.
- **Victory State Forest**, a unique northern Vermont habitat for moose and locally uncommon boreal birds.
- **Connecticut River**, a 400-mile waterway that drains one-third of New England's landscape and boasts important cultural and ecological histories.
- **Androscoggin River**, a popular waterway that flows through New Hampshire and across Maine, attracts whitewater kayakers and fly-fishermen, as well as black bears, moose, and bald eagles.
- **Sebago Lake**, home to a native species of landlocked Atlantic salmon and the major drinking water resource for greater Portland, Maine's largest metropolitan area.
- **Casco Bay**, a large, rich estuary near Portland, Maine that is home to a variety of coastal natural resources and a thriving marine economy.



**Toxic tailings ponds created by tar sands mining operations cover an area the size of Vancouver or Washington, D.C.**



**The Trailbreaker pipeline crosses the Saint Lawrence River, which provides drinking water for nearly 50 percent of Quebec's population.**

## THE NEED TO PROTECT PUBLIC SAFETY AND THE ENVIRONMENT

In the absence of specialized regulations, the rapid growth of tar sands oil pipeline development in Canada and the United States necessitates a close examination of any oil pipeline proposal. The following steps are required to protect public safety and the environment from the potentially dangerous impacts of tar sands oil pipelines:

- Canada's National Energy Board should consider Enbridge's Line 9 reversal permit application as part of a long-term plan to bring tar sands oil east from Alberta to Ontario, Quebec, and New England.
- Governments in Canada and the United States should complete more thorough reviews of plans to transport tar sands oil through eastern Canada and New England. Included in the reviews should be impacts on environmental and public health, and the effects of potential oil spills.
- Governments in Canada and the United States should evaluate the need for new safety regulations for tar sands pipelines.
- Eastern provinces like Quebec and Ontario and states in New England should devise long-range clean energy plans, including the adoption of a clean fuels standard, before committing to large-scale infrastructure projects that would increase oil consumption.
- Governments at all levels in both Canada and the United States should evaluate policies that would reduce oil demand.

1 National Energy Board Filing Receipt, Filing ID No. A30643, August 8, 2011, [https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/92263/706191/706437/706045/A2C0W8\\_-\\_Receipt.html?nodeid=706017&vernum=0](https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/92263/706191/706437/706045/A2C0W8_-_Receipt.html?nodeid=706017&vernum=0) (accessed April 10, 2012).

2 Brad Olson and Jeremy van Loon, "Enbridge Talking with Valero on East Coast Pipeline Reversal," *Bloomberg*, October 5, 2011, <http://www.bloomberg.com/news/2011-10-06/enbridge-talking-with-valero-on-east-coast-pipeline-reversal.html> (accessed April 17, 2012).

3 Mark Huot, "Oilsands and climate change," The Pembina Institute, September 2011, p. 1, <http://www.pembina.org/pub/2262> (accessed April 10, 2012).

4 Gareth Crandall, "Non-Conventional Oil Market Outlook," p. 4, Presentation to IEA Conference on Non-Conventional Oil, 2002.

5 North Dakota, Minnesota, Wisconsin, and Michigan have approximately 5,475 miles of crude pipeline, or about 10.9 percent of the U.S. total. U.S. Department of Transportation, PHMSA, State Mileage by Commodity Statistics, 2011, [http://primis.phmsa.dot.gov/comm/reports/safety/MI\\_detail1.html?nocache=8335#\\_OuterPanel\\_tab\\_4](http://primis.phmsa.dot.gov/comm/reports/safety/MI_detail1.html?nocache=8335#_OuterPanel_tab_4) (accessed April 10, 2012). Bureau of Transportation and Labor Statistics, Table 1-10: U.S. Oil and Gas Pipeline Mileage, 2009, [http://www.bts.gov/publications/national\\_transportation\\_statistics/html/table\\_01\\_10.html](http://www.bts.gov/publications/national_transportation_statistics/html/table_01_10.html) (accessed April 10, 2012). Meanwhile, between 2007 and 20010 crude pipelines in North Dakota, Minnesota, Wisconsin, and Michigan spilled 38,220 barrels of crude, or 30.3 percent of the 125,862 barrels of crude spilled in the United States.