

# TAR SANDS FACTS

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

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

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

The oil industry is pursuing a plan to transport tar sands oil through some of the most important natural and cultural landscapes in Central Canada, Vermont, New Hampshire, and Maine. Under the plan, Enbridge's Line 9 and ExxonMobil's Portland-Montreal pipeline would be reversed to send Canadian tar sands oil—some of the dirtiest oil on the planet—along an approximately 750-mile (1200 km) route. The pipeline would run east through Ontario and Quebec, and down to the New England seacoast, finally ending in Portland, Maine's Casco Bay from where tar sands oil could be sent anywhere in the world for refining. Enbridge has taken steps to implement this plan by filing permit applications with Canada's National Energy Board to reverse the flow of the pipeline and expand Line 9. Meanwhile, Portland-Montreal pipeline officials have been actively lobbying local government officials in New England to promote tar sands. But communities in New England, Ontario, and Quebec are fighting this risky tar sands pipeline and supporting clean energy solutions.

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 carbon-polluting energy is used to produce the heavy oil. Because of the properties of tar sands oil, its transport poses unique risks that aging conventional oil pipeline systems, such as Enbridge's Line 9 and the Portland-Montreal pipeline, are not equipped to handle. A spill along the pipeline 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—Central 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.

### A PIECEMEAL PIPELINE

In November 2012—several months after receiving a permit to reverse a section of its Line 9 pipeline—Enbridge applied for a National Energy Board permit to fully reverse and expand Line 9, which would enable it to send tar sands oil all the way to Montreal, Quebec.<sup>1</sup> Coupled with a reversal of the ExxonMobil majority-owned Portland-Montreal pipeline, this would allow oil companies to pipe tar sands to Portland, Maine, and then send it via tanker anywhere in the world for refining.<sup>2</sup>

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## The Plan to Pump Tar Sands through Central Canada and New England



By dividing up the project into smaller components, the pipeline companies have been attempting to shield themselves from the type of scrutiny faced by tar sands pipelines like TransCanada's Keystone XL and Enbridge's Northern Gateway. The Portland Pipe Line Corporation, the company operating the Portland-Montreal pipeline in the United States, claims to not have a project planned, but at the same time is actively lobbying government officials in Washington, D.C., and New England on tar sands.<sup>3</sup> In fact, the company has been actively pursuing permits needed to reverse the flow of the pipeline, including the construction of a new pumping station.<sup>4</sup> But communities in the pipeline states and provinces are not standing idly by. More than 50 towns in New England, Ontario, and Quebec have passed resolutions or laws expressing concerns about the risks associated with tar sands. Thousands of individuals have joined protests against the pipeline. And members of Congress, as well as senators, and governors have written to the U.S. Secretary of State indicating that a reversal of the Portland-Montreal pipeline for sending tar sands to Portland, Maine, should require a new federal Presidential Permit and thorough environmental review.<sup>5</sup>

### THE TROUBLE WITH TAR SANDS

Tar sands in Alberta does not flow freely from the ground like the oil gushers portrayed in the movies. Instead, the extraction and processing of tar sands 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>6</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 four times higher per barrel than production of a barrel of conventional Canadian or U.S. crude oil. 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 two to four barrels of fresh water for every barrel of oil produced. In addition, tar sands toxic-waste lakes (called tailings ponds) now cover 65 square miles of Alberta, an area the size of Washington, D.C., and significantly larger than Vancouver, British Columbia.

### SAFETY RISKS FROM TAR SANDS PIPELINES AND SPILLS

Bitumen, the toxic, almost-solid substance mined or drilled from Alberta's tar sands, 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 pipelines operate at higher temperatures than conventional pipelines and high temperature pipelines are more likely to spill due to external corrosion. Also, diluted bitumen is 40 times to 70 times more viscous than conventional crude oil.<sup>7</sup> Pumping thick diluted bitumen at high pressure through pipelines generates significant friction, which in turn increases the pipe's temperature. These higher temperatures can dramatically accelerate corrosive chemical reactions both inside and outside the pipe.<sup>8</sup>

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. A close look at pipeline incident data from states in the northern Midwest, which have seen the greatest volumes of tar sands diluted bitumen over the longest time period, is concerning. Between 2010 and 2012, pipelines in



A spill along the Exxon-Enbridge 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.

North Dakota, Minnesota, Wisconsin, and Michigan spilled 3.6 times as much crude oil per mile of pipeline when compared to the U.S. national average.<sup>9</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 diluted bitumen, such as benzene and n-hexane, can affect the human central nervous system.

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, but 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 showed 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. Further highlighting the risks of tar sands pipelines, in March 2013, ExxonMobil's Pegasus pipeline sent more than 200,000 gallons of tar sands gushing through people's yards and into local waterways in Mayflower, Arkansas. As with the Kalamazoo River spill, residents in Mayflower experienced constant headaches and coughs for months following the spill; neither spill had been fully cleaned up as of June 2013.

The Portland-Montreal pipeline and Enbridge Line 9 would operate under similarly risky conditions to the Pegasus Pipeline—as a very old, reversed pipeline carrying tar sands diluted bitumen through residential areas.

## SPECIAL PLACES AT RISK

Along the route of the Portland-Montreal pipeline and Enbridge Line 9, a tar sands oil spill 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 as at-risk or endangered.
- **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 and designated national blueway 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.
- **Crooked River**, which is one of the cleanest rivers in Maine and the main tributary for Sebago Lake, and which is crossed by the Portland-Montreal pipeline six times in Maine's Lakes Region.
- **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 Washington, D.C., and larger than Vancouver, BC.**



**Enbridge's Line 9 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:

- Governments in Canada and the United States should complete more thorough reviews of plans to transport tar sands oil through Central Canada and New England.
- The reversal of the Portland-Montreal pipeline, which will lead to the transport of tar sands oil, should require a new Presidential Permit from the U.S. State Department and the completion of an Environmental Impact Statement, as well as environmental reviews in Canada at the federal and provincial levels. Included in the reviews should be impacts on environmental and public health and the effects of potential oil spills.
- States, provinces, and municipalities should exercise all legal options to protect their local citizens from the project.
- Canada's National Energy Board should evaluate Enbridge's Line 9 reversal and capacity expansion permit 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 not put communities at risk of tar sands spills until adequate safety regulations for tar sands pipelines exist.
- 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, Enbridge Pipelines Inc., *Line 9B Reversal and Line 9 Capacity Expansion Project*, OH-002-2013, <http://www.neb-one.gc.ca/clf-nsi/rthnb/pplctnsbfrthnb/nbrdgl9brvrs/nbrdgl9brvrs-eng.html>.
- 2 Natural Resources Defense Council (NRDC) et al., *ExxonMobil's Plans to Bring Tar Sands Oil through the Northeast*, October 2012, <http://www.nrdc.org/documents/Exxontarsandspipeline.pdf>.
- 3 Bill Nemitz, "Lobbying for tar sands oil is pretty slick," *Portland Press Herald*, April 24, 2013, [http://www.pressherald.com/news/bill-nemitz-lobbying-for-tar-sands-oil-is-pretty-slick\\_2013-04-24.html](http://www.pressherald.com/news/bill-nemitz-lobbying-for-tar-sands-oil-is-pretty-slick_2013-04-24.html).
- 4 Natural Resources Council of Maine, NWF, and NRDC, *Northeast Tar Sands Pipeline Map*, <http://www.nrdc.org/documents/NETSpipeline.pdf>; See also the accompanying background: *Why the Northeast Tar Sands Pipeline Is Coming*, <http://www.nrdc.org/documents/WhyTarSandsPipelineIsComing.pdf>.
- 5 Chellie Pingree et al., Letter from 18 Senators and Members of Congress to Secretary regarding the Portland-Montreal pipeline, February 26, 2013, [http://pingree.house.gov/index.php?option=com\\_content&task=view&id=960&Itemid=24](http://pingree.house.gov/index.php?option=com_content&task=view&id=960&Itemid=24); Governor Hassan Calls on Federal Government to Protect New Hampshire from Potentially Dangerous Tar Sands Oil Pipeline, April 22, 2013, <http://www.governor.nh.gov/media/news/2013/pr-2013-04-22-tar-sands.htm>.
- 6 Mark Huot, *Oilsands and Climate Change*, The Pembina Institute, September 2011, p. 1, <http://www.pembina.org/pub/2262>.
- 7 NRDC, *Tar Sands Pipeline Safety Risks*, February 2011, <http://www.nrdc.org/energy/tarsandsafetyrisks.asp>.
- 8 A study of pipelines moving viscous heavy crudes at higher temperatures found that pipelines operating at temperatures above 100 degrees Fahrenheit spilled due to external corrosion up to 24 times more frequently as conventional pipelines; California State Fire Marshalls, *Pipeline Risk Assessment*, 1993, p. 68, <http://osfm.fire.ca.gov/pipeline/pdf/publication/pipelineriskassessment.pdf>.
- 9 North Dakota, Minnesota, Wisconsin, and Michigan have 6,416 miles of crude pipeline, or about 12.1 percent of the U.S. total; Pipeline and Hazardous Safety Materials Administration (PHMSA), State Mileage by Commodity Statistics, 2013, [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); Meanwhile, between 2010 and 2012, pipelines in North Dakota, Minnesota, Wisconsin, and Michigan spilled 27,911 barrels of crude in underground leaks, or 43.6 percent of the 63,987 barrels of crude spilled in the United States from 2010 to 2012; PHMSA, *Data and Statistics, Crude Pipelines 2010-2012*, <http://www.phmsa.dot.gov/pipeline/library/data-stats>.