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Extreme Fossil Fuels

Tar Sands

Fracking

Crude-by-Rail

International Energy Finance

Clean Energy Access

International Fossil Fuel Subsidies

### Resources

Reports

Online Tools

Blog Posts

### Media Center

### About

Team

Funders

Jobs

Contact

Annual Report

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# Transporting Tar Sands "As Dangerous" As Shale Oil

Andy Rowell, March 2, 2015

52



In the increasingly important and urgent debate about crude-by-rail safety in North America, much of the attention has been on Bakken light oil and its alarming propensity to explode.

But following a derailment and explosion in Ontario in February there is growing evidence that transporting tar sands oil is as inherently dangerous as carrying the volatile Bakken shale oil.

While the explosion in West Virginia got more attention last month, just two days before a derailment and fire in a remote corner of Ontario was perhaps more significant for what it revealed about an emerging trend in Canadian crude-by-rail.

A Canadian National Railways train carrying diluted bitumen (dilbit) from the tar sands in Alberta derailed in northern Ontario, with 29 of the 100 cars involved in the accident. Seven caught fire, spilling some 6,000 barrels of oil. Such was the intensity of the fire that it burnt for six days.

Last week, the rail trade magazine *Railway Age* published an investigation into the Ontario crash. And what they found is deeply disturbing. They call the Ontario crash by far the "more disturbing of the two mishaps."

The reason it is so disturbing is that up until now it has been assumed that transporting tar sands bitumen by rail is safer than the light gaseous crude coming from the Bakken because it is a heavier, denser, less volatile material which is far harder to ignite. This assumption would be right if it wasn't for the fact that very little tar sands crude is transported as pure bitumen.

The reality is that the vast majority of tar sands crude being loaded onto trains is loaded at two unit train terminals in Edmonton and Hardisty, Alberta hundreds of miles away from the tar sands fields. The reason these loading terminals are located where they are is that these two places are the meeting points for a network of pipelines bringing tar sands crude from northern Alberta. The major export pipelines are also loaded at these two points.

Therefore, the tar sands crude that arrives there has been diluted with pentane or natural gasoline, a very light hydrocarbon similar to that which is found to be so explosive in the Bakken crude, to enable it to flow in the pipelines. The dilbit is typically 72% bitumen and 28% diluent.

While it is possible to load undiluted bitumen onto a tank car using steam and heated tank cars to make the sticky bitumen flow, the reality is that this is only happening at a handful of small terminals

located close to tar sands production in Northern Alberta. But these terminals do not have the capacity to load multiple unit trains (trains of over 100 cars carrying one commodity from A to B) every day.

The terminals that do have that capacity require a steady and abundant flow of crude to keep the operation going and therefore these are located at the terminus of the multiple pipelines bringing tar sands crude from the fields. The result is that unit train terminals load pipeline specification dilbit and not raw or partially diluted bitumen.

This has huge implications for the safety of tar sands crude-by-rail and this became clear in northern Ontario last month.

**Put simply, the diluent in dilbit makes dilbit just as explosive as Bakken crude.**

The *Railway Age* article laid out the facts. Undiluted bitumen has a flash point of +166°C and so would not explode in Ontario's freezing -40°C weather, or in fact in most cases. Dilbit has a much lower flash point than raw bitumen. In fact it has an ignition point at -35°C, compared to -9°C for conventional light oil.

*Railway Age* makes the startling conclusion, "*The widespread belief that bitumen from Alberta's northern oil sands is far safer to transport by rail than Bakken crude is, for all intents and purposes, dead wrong.*"

The dilbit loaded at these terminals is travelling throughout the continent. Some is delivered to eastern Canada, some to the U.S. east coast and some to the U.S. Gulf Coast. It passes through thousands of communities, including through densely populated areas around Chicago, Philadelphia and elsewhere. It travels alongside the continent's great waterways and as with Bakken oil the possibility of catastrophe and pollution follow it wherever it goes.

Based on data from Genscape, we estimate that on average around 100,000 to 150,000 barrels of dilbit is loaded at terminals in Alberta every day. As it takes on average around nine days for a train to reach its destination, this means that at any given time there are

between 18 and 27 trains carrying dilbit through the continent loaded with some 900,000 to 1.4 million barrels of dilbit.

Together with the roughly 1 million barrels per day of light, tight crude oil loaded in the Bakken and elsewhere around the continent the threat is enormous.

Yet regulators have still not moved to guarantee the safety of communities in the path of these trains, some 19 months since 47 people were killed in Lac-Mégantic, Quebec and following dozens of subsequent incidents. ForestEthics has calculated that some 25 million Americans live within the blast-zone of crude oil trains and obviously million of Canadians can be added to that figure.

The U.S. regulator has proposed new rules for tank cars, speed limits and other safety features for handling crude-by-rail and these are currently being considered by the White House. Worryingly, the proposal included a scheme to move the oldest tank cars, the infamous DOT-111, to Alberta for carrying tar sands bitumen under the assumption that bitumen does not explode in the same way as Bakken crude.

This was meant to ease the 'burden' of removing DOT-111s from service and replacing them with new more robust tank cars. Clearly, this cannot be considered in light of the fact that dilbit is just as explosive as Bakken crude.

It is time for the both the U.S. and Canadian transport regulators to put public safety ahead of the profits of the oil and rail industries. Tar sands crude is no safer than Bakken on the rails. The fact is that in pipes or on the rails these crudes are dangerous and dirty.

The appalling level of capture by the industry displayed by the regulators makes the North American oil boom a train wreck. But it's not waiting to happen. It has already happened over and over.

See our crude-by-rail map and other resources here.