

# Volatile issue, volatile cargo

*The oil rolling through Oregon contains gases that greatly amplify its flammability*

By Rob Davis | The Oregonian  
Sunday, March 16, 2014

**C**rude oil moving on trains through Portland, Vancouver, Wash., and rural Columbia River towns has been more volatile than gasoline you put in your car.

Samples show the oil has been more likely to emit highly flammable gases than even the crude that blew up in sky-high fireballs and killed 47 people in Lac-Mégantic, Quebec last July.

Oil moving through Oregon has contained six times more propane – the same stuff in backyard gas grills – than comparable types of crude.

Despite the risks, the oil isn't required to go through simple steps to stabilize it when it's extracted from the ground. Producers can flare off the propane and other gases in it. But then they have less to sell and their profits suffer.

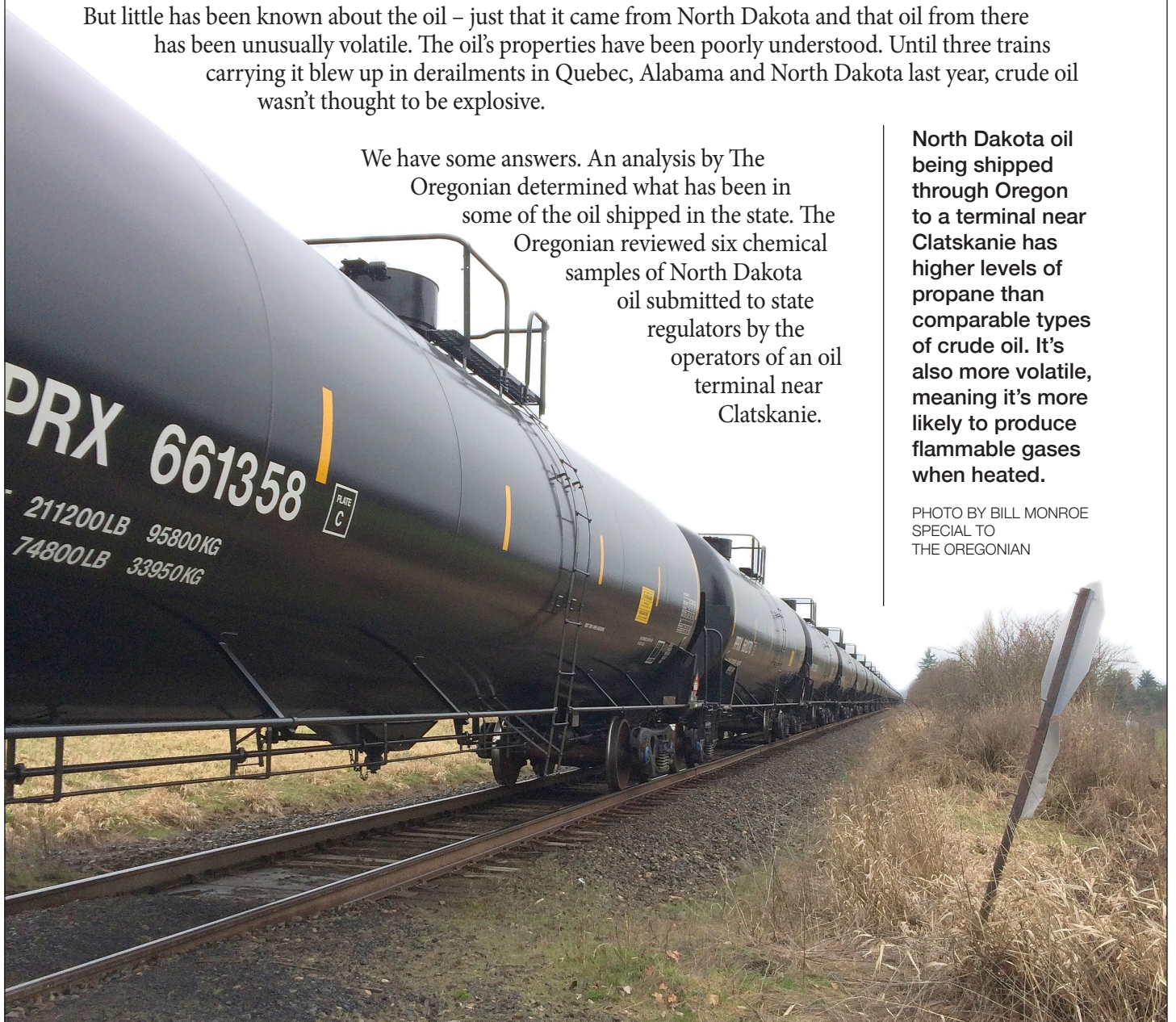
Since oil trains arrived in Oregon in late 2012, they've hauled more than 300 million gallons of North Dakota crude to a terminal near Clatskanie. They have sharply increased the amount of hazardous material moving on the state's rail system.

But little has been known about the oil – just that it came from North Dakota and that oil from there has been unusually volatile. The oil's properties have been poorly understood. Until three trains carrying it blew up in derailments in Quebec, Alabama and North Dakota last year, crude oil wasn't thought to be explosive.

We have some answers. An analysis by The Oregonian determined what has been in some of the oil shipped in the state. The Oregonian reviewed six chemical samples of North Dakota oil submitted to state regulators by the operators of an oil terminal near Clatskanie.

North Dakota oil being shipped through Oregon to a terminal near Clatskanie has higher levels of propane than comparable types of crude oil. It's also more volatile, meaning it's more likely to produce flammable gases when heated.

PHOTO BY BILL MONROE  
SPECIAL TO  
THE OREGONIAN



The tests are meant to be conservative examples of what gets unloaded at the terminal, the Columbia Pacific Bio-Refinery. They're part of an air pollution permit application pending before state environmental regulators.

The Oregonian found:

- The oil has been more volatile than dozens of other types of crude, reinforcing safety concerns about the substance. Crude with a higher volatility emits more flammable gas – and more pressure – when heated. Two samples were more volatile than any crude oil moved in the country's labyrinthine pipeline system.
- The samples all contained more flammable propane and butane than comparable types of crude. Two samples contained six times more flammable propane than crude oils that an oil quality expert said are similar.

The Oregonian's findings add to growing questions about whether oil from North Dakota is saturated with flammable gases that may be making it unnecessarily explosive.

Producers have a financial incentive to keep gases like propane and butane in the oil they ship, said Harry Giles, a former federal Department of Energy official who led the Strategic Petroleum Reserve's crude oil quality program.

Giles said he believes North Dakota producers are being prudent and responsible. But if they don't burn off the gases, it leaves them more oil to sell.

"It maximizes their profit and creates more volume," Giles said. "It's bulking up the crude. It's a Catch-22. You either flare it and lose a valuable component, or put it in crude oil and increase volatility."

A rail safety expert who reviewed the data for The Oregonian said the oil's volatility – its propensity to emit gas when heated – increases the chances of an accident and heightens risks to hundreds of homes along Oregon rail lines.

"It is a significantly more volatile mix that needs greater oversight," said Michael Eyer, a former Oregon rail safety inspector. "It burns bigger, faster, more quickly than other materials. We have a much greater potential of a serious incident."

Tank cars, which can carry 30,000 gallons of oil, are sealed and aren't supposed to release any gas during transit. As a safety measure, they're designed to vent gas if internal pressure reaches 75 pounds per square inch. The North Dakota oil moving through Oregon has produced 11.95 pounds per square inch of pressure at 100 degrees Fahrenheit.

That affords a large safety gap. But it depends on tank cars being loaded with the proper volume. Shippers can only fill a tank about 98 percent full. If tanks are overloaded, pressure builds up faster and increases the chance of a gas release.

If gas is vented and touches a spark, it could cause a devastating explosion, Eyer said.

"We are experimenting with the communities in which these things run," he said. "When something goes wrong, we are dealing with an unknown compound."

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# The Sunday Oregonian

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## Airliner course change called a deliberate act

Malaysia says the missing jet flew across part of Asia or over the ocean

**By Keith Boudler and Chris Buckley**  
New York Times News Service

**KUALA LUMPUR, Malaysia** — The search for Malaysia Airlines Flight 370 turned into a criminal investigation Saturday after Malaysia declared that the plane was deliberately diverted and then flown for as long as seven hours toward an unknown point far from its scheduled route of Kuala Lumpur to Beijing.

Prime Minister Najib Razak of Malaysia said he would seek the help of governments across a large expanse of Asia in the search for the Malaysia jet, which has been missing for a week and had 239 people on board.

Police were seen going to the home of the flight's pilot, Zohairi Ahmad Shah, in a gated compound near Kuala Lumpur, and the Malaysian news media reported that a search was made.

The police would say only that there would be a news conference Sunday.

Malaysian authorities released a map showing that the jet's satellite signal from the plane was sent from somewhere along one of two arcs spanning large distances across Asia.

A satellite orbiting 22,250 miles over the middle of the Indian Ocean received the transmission.

One arc runs from the southern border of Kazakhstan in central Asia to northern Thailand, passing over some hot spots of global insurgency and highly militarized areas.

The other arc runs from near Jakarta to the Indian Ocean, roughly 1,000 miles off the west coast of Australia.

## Volatile issue, volatile cargo

The oil rolling through Oregon contains gases that greatly amplify its flammability

**EXCLUSIVE** **By Rob Davis**  
rob@oregonian.com

Crude oil moving on trains through Portland, Vancouver and Eugene has five times more volatile gas than the same stuff in bulk tank gas trucks, samples show. The oil has been more likely to emit highly flammable gases than even the crude that flows in 47 high fire in both and killed 47 people in Lac-Mégantic, Quebec, last July.

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## Scientific research is a tycoon's game

By William J. Broad  
New York Times News Service

Last April, President Barack Obama assembled some of the nation's scientific dignitaries in the East Room of the White House. Telling that his grade in physics made him a dubious candidate for "scientist in chief," the goal of using technological innovation "to grow our economy" and "unleashed" "the next great American project": a \$100-million initiative to probe the mysteries of the human brain.

Along the way, he invoked the government's leading role in a history of scientific glories, from putting a man on the moon to creating the internet. The brain initiative, as he described it, would be in that grand tradition, an ambitious effort to keep cuts in federal funding for scientific research.

"We can't afford to miss these opportunities while the rest of the world races ahead," Obama said. "We have to seize them. I don't want the next job-creating discoveries to happen in China or India or Germany."

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North Dakota oil being shipped through Oregon to terminals near Coquille has higher levels of propane than comparable types of crude oil. It's also more volatile, meaning it's more likely to produce flammable gases when heated.

Propane Content	Volatility
North Dakota samples: 2.36%, 2.56%, 2.59%, 2.63%	11.95, 10.50, 10.30, 9.27, 11.94
Comparative crude: 0.35%, 0.36%, 0.39%	5.61, 5.61, 2.38

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The oil doesn't have to be so volatile. Companies shipping it from North Dakota can burn off flammable gases when oil is removed from the ground.

Global Partners LP, the Massachusetts company running the terminal near Clatskanie, told Oregon environmental officials that "some" producers stabilize the oil but "others may not."

Tom Keefe, Global's safety director, told The Oregonian that no tank car arriving at the terminal has had its pressure valve vent any gas. Pressures inside rail cars received there are "significantly below" the maximum pressure allowed, Keefe said.

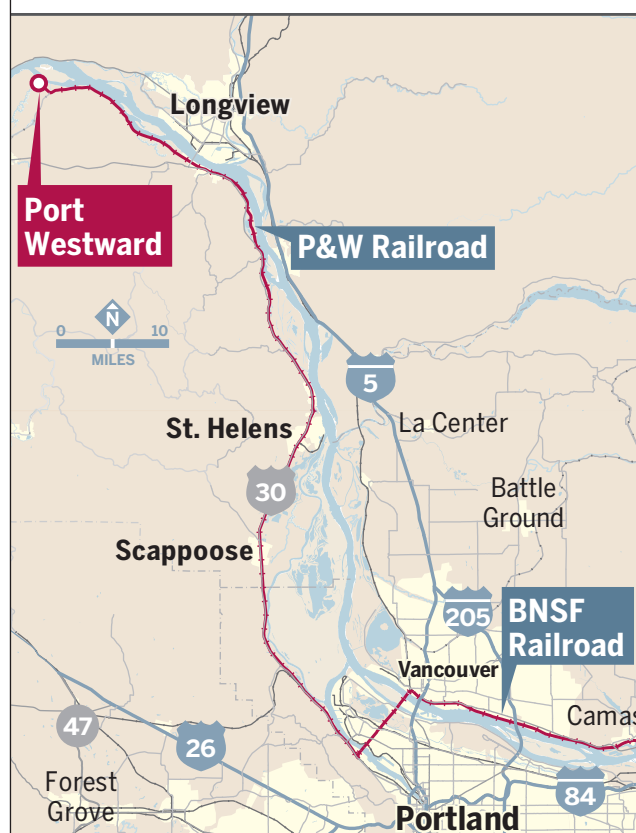
"There is an ongoing debate at the federal level about tank car standards," Keefe said, "and we support increased standards to improve rail safety of the products we receive at all of our facilities."

Regulators with the Oregon Department of Environmental Quality are deciding whether to grant an air pollution permit to Global Partners' terminal. David Monro, a DEQ air quality manager, said the agency can't require the company to stabilize the oil before it's hauled through the state. DEQ only oversees the pollution that's emitted at the terminal.

The Pipeline and Hazardous Materials Safety Administration, a federal agency responsible for oversight of crude oil train shipments, took steps in early February to require North Dakota oil producers to test their crude before they ship it.

"One of the things we've tried to emphasize in [North Dakota] is not to make assumptions about what you're pulling out of the ground," said Jeannie Shiffer, a PHMSA spokeswoman. "Before you put it in a tank car, we want to ensure rules are being followed."

PHMSA has not moved to limit the volatility of oil moved by rail.



**ONLINE:** To find out how oiltrains showed up in Oregon without the public knowing, why the number of trains will increase dramatically and other exclusive reporting by The Oregonian, go to [ORne.ws/oil-trains](http://ORne.ws/oil-trains).