

Is the Kinder Morgan pipeline expansion safe? Do the math!

Lesson 1 – The pipeline

There are 159 litres in a barrel of oil.* The Kinder Morgan pipeline expansion is designed to deliver 890,000 barrels a day**.

890,000 barrels x 159 litres = 141 million litres per day,

5.8 million litres per hour,

98,000 litres per minute.

The maximum velocity of diluted bitumen (dilbit) in the pipeline would be 2.9 metres (9.5 Feet) per second, which is over 10 km (6.5 miles) per hour. The diluted bitumen (dilbit) is propelled by 5000 horsepower pumps** along the pipeline. The pipeline will operate at a pressure of approximately 900 psi**.

If the pipe ruptures at 98,000 litres per minute and 900 pounds per square inch (psi) at a little less than 3 metres/second and close to 10 feet/second, the amount of dilbit released would be considerably more than “a spill”.

Lesson 2 – The tank farm

If expanded, the dangerous goods storage facility would contain **5 million barrels*** of explosive, toxic diluted bitumen.

5 million barrels x 159 litre per barrel = **795 million litres.**

A barrel of oil contains the equivalent energy of **1.46 tons of TNT***.

1.46 tons x 5 million barrels = **7.3 million tons of TNT.**

The tank farm is 1700 metres from Simon Fraser University and 600 metres from an elementary school.

What could possibly go wrong?

Sources:

* Engineer's Handbook - Google

** Kinder Morgan application to the National Energy Board



Lesson 3 – Diluted Bitumen



Bitumen is a mix of paraffins, naphthalenes, aromatic hydrocarbons plus nitrogen and sulphur compounds. It's mixed with gas condensate to become diluted bitumen. Dilbit contains approximately 30% diluents.

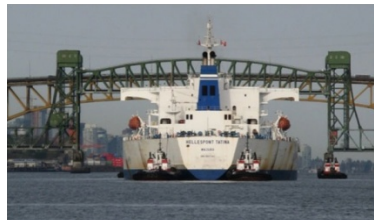
Dilbit is NOT conventional crude oil. The diluent used to liquify bitumen extracted from tar sands is **toxic**.

The Threshold Exposure Value (TLV), quantity that will cause **DEATH OR DAMAGE** to humans, is:

benzene = .5 ppm (parts per million)	n-hexane = 50 ppm
hydrogen sulphide = .1 ppm	butane = 50 ppm

A release of large concentrations of these toxic chemicals in a residential area would be more than “an incident”!

*** The chemical composition of dilbit and corresponding Threshold Exposure Limits source is the Material Safety Data Sheet (MSDS) generated by Cenovus Energy Ltd., a dilbit producer.



Lesson 4 – The tankers

A seven-fold increase in **tankers**, from **5 to 34 a month**, up to **408 a year**, would ensure the extinction of the remaining 76 Southern Resident orcas in the Salish Sea. The noise from larger vessels masks echolocation, making it difficult for the orcas to catch prey. Sonar can cause hemorrhaging, resulting in death.

Kinder Morgan's application to the NEB calls for the use of Aframax tankers, the largest tankers allowed in Vancouver's harbor. Carrying approximately **850,000** barrels, these tankers have only 20 minutes at high tide to negotiate safe passage under the Second Narrows Bridge in Burrard Inlet. The draught of a ship's hull is the vertical distance between the waterline and the bottom of the hull. ****

Filled with bitumen, the Aframax tankers are at an even greater risk of running aground.

Source: ****The Association of Retired Engineers