



Diluted Bitumen in Pipelines

What is bitumen? Bitumen is a thick, molasses-type product that is found in regions around the world, but more locally in the oil sands regions of northern Alberta, Canada. Sometimes, it's found near the surface mixed in with sand and other debris, while in other instances, it can be found deep in the ground under several layers of rock.

How is bitumen extracted and what is diluted bitumen? There are two ways to extract bitumen. The first involves using large mining trucks and shovels to scrape the surface of the ground and collect the oil found in the sand. This is called surface mining. Once collected, the mined material is processed to remove the sand and other debris.

The second method involves injecting steam deep into the ground. The steam heats up the bitumen and forms a mixture of bitumen and water, which then flows to the surface in the same way conventional oil does. This is called in-situ production. Once on the surface, the water is separated from the bitumen.



Figure 1: Image courtesy of Syncrude Canada Ltd.



Figure 2: Image courtesy of Syncrude Canada Ltd.

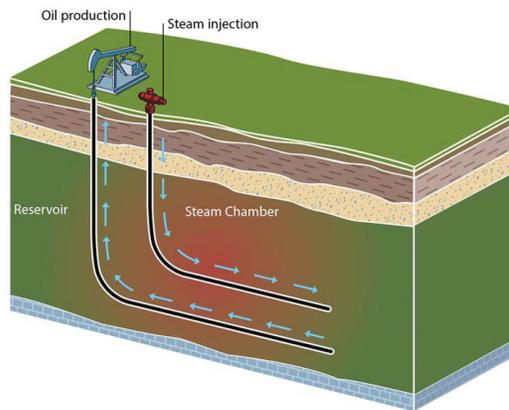
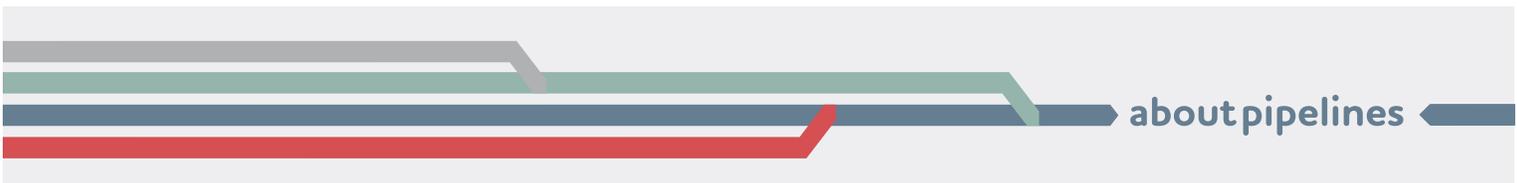


Figure 3: Image courtesy of the Centre for Energy

"For pipelines carrying diluted bitumen, the risk of corrosion is not any different than pipelines carrying conventional crude."

Ziad Saad
 Vice President,
 Safety & Sustainability
 Canadian Energy Pipeline
 Association

Following extraction, the bitumen can be processed locally into a suite of refined petroleum products including synthetic crude, which is similar to conventional light crude. Bitumen is too thick to flow in a pipeline at ground temperature, so it needs to be thinned with a very light petroleum product called diluent.



Diluent is typically either light crude, such as 'synthetic crude', or 'condensate', which is extracted from the ground along with natural gas. Synthetic crude and condensate on their own have been produced and transported by pipeline for decades.

Does diluted bitumen increase the risk of pipeline corrosion? No. Pipelines transporting diluted bitumen are not at any greater risk of corrosion than pipelines carrying other types of petroleum products, such as conventional crude. The only significant difference between diluted bitumen and conventional crude is that diluted bitumen carries diluent.¹ Neither the properties of diluent or bitumen carry any characteristics that would cause more corrosion.

There are two components in the diluted bitumen that have raised concern, namely acid and sulphur. These components exist in varying degrees in all crude types. If crude is heated to a temperature higher than 200 degrees Celsius, corrosion to pipelines transporting diluted bitumen may occur.² However, these pipelines don't operate anywhere near that temperature; they typically operate at much cooler temperatures. For more information on corrosion, please visit www.aboutpipelines.com.

How safe is it to transport diluted bitumen? Transporting diluted bitumen is as safe as transporting other types of crude oil. This is because there is virtually no difference between the two products. Our industry has been safely transporting diluted bitumen in pipelines for more than 30 years and conventional crude for more than 60 years.

What happens if there is a leak and diluted bitumen is spilled? Is it harder to clean up than conventional crude? No. Pipeline operators have developed and implemented emergency response plans and procedures tailored to the characteristics of the pipeline they operate, including the type of product it carries. However, in the event that diluted bitumen were to be spilled, the procedures for cleaning up the spill would be similar to cleaning up a conventional crude spill. Environmental and site-specific conditions will also determine the type of procedures and equipment used during the emergency. For more information on pipeline emergency response procedures, please visit www.aboutpipelines.com.

1 Alberta Innovates: Comparison of the Corrosivity of Dilbit and Conventional Crude, pg.iv

2 Alberta Innovates: Comparison of the Corrosivity of Dilbit and Conventional Crude, pg.iii

For more information on diluted bitumen in pipelines, please visit:

Canadian Energy Pipeline Association
www.aboutpipelines.com

Alberta Innovates
www.albertainnovates.ca

American Petroleum Institute:
Facts About Pipeline Safety and Canadian Crude
www.api.com

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