

# Effects of diluted bitumen on crude oil transmission pipelines

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Diluted bitumen has no greater likelihood of accidental pipeline release than other crude oils, says a new report from the National Research Council. The committee that wrote the report found that diluted bitumen has physical and chemical properties within the range of other crude oils and that no aspect of its transportation by pipeline would make it more likely than other crude oils to cause an accidental release. The committee was not asked to address whether the consequences of a diluted bitumen release differ from those of other crude oils.

Bitumen is a dense and viscous form of petroleum that will flow in [oil pipelines](#) only when it is diluted with lighter oils. Diluted bitumen has been imported from western Canada for more than 30 years and is transported through numerous pipelines in the United States. With bitumen imports from Canada's [oil sands](#) on the rise, Congress passed legislation in January 2012 calling upon the secretary of transportation to determine whether any increase in the risk of a release exists for pipelines transporting diluted bitumen. The U.S. [Department of Transportation](#) asked the Research Council to convene an expert committee to analyze one aspect of this risk: whether pipelines transporting diluted bitumen have a greater likelihood of release compared with pipelines transporting other crude oils.

The study committee reviewed [pipeline](#) incident statistics and reports of investigations; analyzed data on the chemical and physical properties of diluted bitumen; examined the technical literature; consulted experts in pipeline failure mechanisms such as corrosion and cracking; queried

[pipeline operators](#) on their operations and maintenance practices; and solicited comments from the public.

The committee did not find any causes of pipeline failure unique to the transport of diluted bitumen. In addition, it found no physical or chemical properties outside the range of other crude oils and no evidence that pipeline operators manage or maintain their systems any differently when transporting diluted bitumen compared with other heavy crude oils.

"Diluted bitumen has density and viscosity ranges that are comparable with those of other crude oils," said Mark Barteau, professor of chemical engineering at the University of Michigan and chair of the committee that wrote the report. "It moves through pipelines in a manner similar to other crude oils with respect to flow rate, pressure, and operating temperature. There's nothing extraordinary about pipeline shipments of diluted bitumen to make them more likely than other crude oils to cause releases."

The report also says that shipments of diluted bitumen do not contain higher concentrations of water, sediment, dissolved gases, or other agents that cause or exacerbate internal corrosion, including microbiologically influenced corrosion, and the organic acids in diluted bitumen are not corrosive to steel at pipeline operating temperatures. In addition, the committee found no properties in diluted bitumen that could make transmission pipelines more vulnerable to erosion, external corrosion and cracking, or damage from mechanical forces.

Provided by National Academy of Sciences

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