

## Wastewater Disposal in the Montney Play Fairway of NE British Columbia

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Flowback from hydraulic fracturing and subsequent hydrocarbon production brings water to the surface that contains spent frac fluids and saline formation fluids from deep reservoirs. These cannot be allowed to contaminate fresh surface water or shallow groundwater zones, so provincial regulations dictate safe disposal in deep formations far below potable groundwater.

As tight Montney gas and liquids production ramps up in northeastern British Columbia, operators have developed a variety of strategies to deal with flowback and produced waters. Recycling frac flowback fluids reduces consumption of potable surface and shallow groundwater, and also minimizes disposal volumes. Substantial deep disposal must still take place, however, particularly when drilling and completion schedules do not allow timely re-use of available flowback and produced fluids.

Deep disposal zone capacity varies greatly across the Montney play fairway. Over most of the Peace River Block and southward, porous and permeable Cretaceous sandstones offer huge, continuous aquifers. Abundant reservoir clays and distinctly different formation water chemistries pose make it difficult to minimize disposal formation damage and consequent lack of injectivity. In the middle Peace River Block and northward, Triassic reservoirs in the Halfway, Charlie Lake and Baldonnel feature common but less continuous disposal zone potential in both existing aquifers and depleted hydrocarbon pools. To the northwest, deep disposal zones are much more difficult to find, as Cretaceous sandstones have shaled out, while Mississippian and Triassic carbonates offer highly variable disposal zones that are difficult to map and characterize.

Future development of LNG exports and the associated production infrastructure dictates greatly accelerated Montney development in the 2020's. Industry operators and the BC Oil & Gas Commission must work closely together to identify and utilize appropriate deep wastewater disposal zones such that environmental risks are minimized.