



# Mineable oil sands facts

*Bitumen is a naturally occurring viscous mixture of hydrocarbons attached to sand and contains high levels of sulphur and nitrogen compounds. Bitumen typically makes up about 10% by weight of oil sands. Bitumen extraction is a process unique to the oil sands industry and refers to a process that separates the bitumen from the sand. Water extraction (the Clark Hot Water Extraction Process) is used by the mineable oil sands sector.*

## FACTS RELATED TO THE OIL SANDS MINING SECTOR

- Estimates of the oil contained in Alberta's oil sands range from 1.7 trillion to more than 2.5 trillion barrels of bitumen, representing one of the world's largest known sources of oil.
- Approximately 165 billion barrels of the oil in Alberta's oil sands are recoverable using existing technology. Of this total, approximately 133 billion barrels (80%) are buried deep in the ground (in situ oil) and are recoverable through sub-surface in situ recovery technology such as steam assisted gravity drainage (SAGD).
- Oil sands located within 75 metres of the surface are called mineable oil sands and are recoverable through open pit mining and truck and shovel methods. A typical oil sands mine has a 25- to 50-year lifespan.
- In 2015, oil sands mining accounted for 18 megatonnes (Mt) of greenhouse gas emissions, or 25% of the oil sands industry's total. If the emissions intensity of oil sands production does not significantly improve, the province of Alberta's 100 Mt emissions cap will constrain future oil sands production and the economic revenues generated by the oil sands industry.
- There are four mineable oil sands operators: Canadian Natural Resources Limited, Imperial Oil Ltd., Suncor Energy Inc., and Syncrude Canada Ltd. All commercial mineable oil sands operators use the Clark Hot Water Extraction (Clark) Process, developed by Dr. Karl Clark in the 1920s in collaboration with the Alberta Research Council.
- Wet tailings are a toxic by-product of the Clark Process, comprising water, sand, silt, fine clay particles, and various chemicals. Wet tailings are produced when the bitumen is separated from the sand during the Clark Process. These tailings are then sent to tailings ponds for storage.
- The production of a barrel of mined bitumen results in approximately 1.5 barrels of wet tailings. Using the National Energy Board's production forecasts, wet tailings production could total 2.55 million barrels per day, or slightly less than one billion barrels per year by 2040.
- The tailings ponds currently cover more than 175 square kilometres (and more than 220 square kilometres when berms, dykes, beaches and related infrastructure are included). Reclaiming this land is a process that spans many decades, and as annual production from mined oil sands increases, the tailings ponds will grow in size.
- Today, the mineable sector accounts for more than 42% of the 2.4 million barrels a day of oil sands production.
- Forecast estimates for oil sands production indicate the mineable sector will account for approximately 39% of the 3.7 million barrels a day of oil sands production in 2040.