



CANADA'S OIL & NATURAL GAS PRODUCERS

ENVIRONMENTAL INNOVATION - WATER



Canada's oil and natural gas industry recycles water and continues to look for ways to reduce fresh water use.

WATER USE

Using water responsibly and protecting water sources is a priority for the oil and natural gas industry. Both oil and natural gas operations require the use of water. In natural gas operations, water is used for well drilling, well completion, and hydraulic fracturing. Oil sands operators use water to generate steam for steam assisted gravity drainage (SAGD) operations. Warm water is used to separate bitumen from sand and clay in oil sands mining operations.

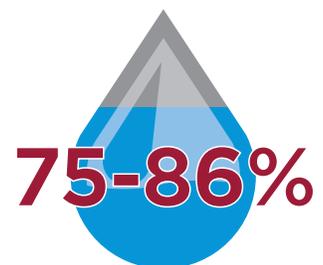
REGULATED

Water used for oil and natural gas production is licensed through provincial regulators. Water withdrawals are reported to and monitored by provincial regulators to protect the integrity of the water system, especially during low flow periods or drought conditions.

RECYCLING, REDUCING AND USING ALTERNATIVE WATER SOURCES

The industry is working to recycle and reduce water within operations as much as possible. Through the Petroleum Technology Alliance Canada (PTAC) and the BC Oil and Gas Research Innovation Society (BC OGRIS), conventional oil and natural gas producers have launched 70 water-related projects. From 2012 to 2018, members of Canada's Oil Sands Innovation Alliance (COSIA) spent \$273 million on technology development to accelerate the pace of improvement in water management in the oil sands. Currently, COSIA has about 95 active water projects. Since 2012, in situ oil sands operators have reduced their fresh water use intensity by 42 per cent and mining operators have reduced their net water use intensity from the Athabasca River by 18 per cent.

SAFEGUARDING THE QUALITY AND QUANTITY OF REGIONAL SURFACE WATER AND GROUNDWATER RESOURCES



OIL SANDS PRODUCERS RECYCLE 75-86% OF WATER USED.

Source: AER

Industry is also working to reduce fresh water use by using alternatives to fresh water sources including:

- **BRACKISH WATER** – Water extracted from slightly saline aquifers can be treated and used.
- **SALINE GROUNDWATER** – In some cases, treated water drawn from deep saline aquifers can be used in operations.
- **FLOWBACK** – Water injected during hydraulic fracturing that flows back out of a well can be treated and reused in subsequent wells.
- **MUNICIPAL WASTEWATER** – In some cases, municipal effluent can be treated and used in operations.
- **PRODUCED WATER** - Water naturally present in the reservoir that is recovered along with the hydrocarbon.

INDUSTRY IN ACTION

- **RECYCLING FRAC WATER:** Tourmaline Oil Corp. has tackled the challenge of fresh water use in hydraulic fracturing operations by utilizing technology and collaborating with regulators to improve and develop concepts around recycled fluid use. Tourmaline has over 120 km of dedicated water-line and 300,000 m³ of water storage, including the first two approved and successfully operated Engineered Containment Ponds in Alberta. This sizable produced water infrastructure has allowed the company to re-use more than 895,000 m³ of water in 2019, including 50,000 m³ of third-party fluid. With long-term goals of fresh water elimination, Tourmaline has achieved recent milestones of nearly 100 per cent recycled fluid in Northeast B.C. (NEBC) completion operations and more than 50 per cent in the Alberta Deep Basin.
- **MUNICIPAL WASTEWATER USE:** Shell Canada is continually seeking opportunities to reduce fresh water use in its oil and gas operations. Opportunities for reduction are sought through improvements to completion design as well as the use of alternative water sources and water reuse. In 2014, to support these objectives, Shell and the Town of Fox Creek signed an agreement to allow Shell use of the town's treated wastewater as an alternative water source in its operations. In return, Shell funded the engineering and design to upgrade the town's raw water facilities. To date, this alternative source of water has allowed Shell to replace the use of approximately 400,000 cubic metres of fresh water per year in their Fox Creek asset.
- **WATER TECHNOLOGY DEVELOPMENT CENTRE (WTDC):** The WTDC began operations in August 2019 at Suncor's Firebag site and is currently testing a number of technologies. Attached to an operating in situ facility, the WTDC allows allowing operators to run tests on fluids with the same characteristics, elevated temperatures and pressures that occur at real commercial operations. As a dedicated testing facility, the WTDC allows operators to test more technologies faster than ever before. This will speed up the development and implementation of new water treatment technologies and shorten the current eight-year timeframe required to field test technologies before they can be used in commercial applications.



FOR MORE INFORMATION:

COSIA cosia.ca CRIN cleanresourceinnovation.com PTAC ptac.org