

MANAGING PRODUCED WATER IN ATLANTIC CANADA'S OFFSHORE OIL AND NATURAL GAS INDUSTRY



Water is an integral part of oil and natural gas production. In Atlantic Canada's offshore, water that has been extracted from an oil and natural gas reservoir – or produced water – must be treated and disposed of in a manner that ensures the marine environment is protected.

PRODUCED WATER

Offshore oil and natural gas is found beneath the seabed, trapped within the rocks in deep underground accumulations called reservoirs. In most reservoirs, oil and natural gas collects above large volumes of water called formation water. Sometimes seawater is also pumped into the reservoir to maintain pressure and help the oil and natural gas to flow from the reservoir to a production platform or facility. Together, the formation water and injected seawater flows from the reservoir with the oil and natural gas resources during production. The water must then be separated from the oil and natural gas resources. The separated water is called produced water.

The amount of produced water extracted during production varies. Fields that produce natural gas and condensate produce little water in the first few years. Similarly, new oil fields also generally produce a very small amount of water with the oil extracted. As production depletes the reservoir, the amount of water being brought to the surface (both formation water and injected water) increases.

TREATMENT AND DISPOSAL OF PRODUCED WATER IN ATLANTIC CANADA'S OFFSHORE

Produced water is separated from the produced oil and natural gas and is treated as required by regulations. The process of separating produced water from oil and natural gas can involve several methods of treatment. Initially, fluids from the reservoir flow into separators, where oil and natural gas and water are separated by allowing the oil and natural gas to rise to the top of the fluid mixture. Secondary treatment may be required to remove any remaining oil, natural gas or solids. The secondary treatment methods used vary depending on the composition of the produced water, flow rates, and other factors that change from reservoir to reservoir. After produced water is treated as specified by regulations, it is discharged to the marine environment. The environmental risk from the discharge of produced water in the offshore is low, and operators and regulators strictly monitor produced water discharge.

The oil and natural gas industry is committed to minimizing the environmental effects of its operations.



REGULATING THE DISCHARGE OF PRODUCED WATER

The Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB), the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) and the National Energy Board (NEB) regulate the discharge of produced water for Canada's offshore oil and natural gas industry. The *Offshore Waste Treatment Guidelines* require operators to closely monitor the concentration of oil and natural gas in produced water, through laboratory analysis, to confirm that residual oil and natural gas content is within regulatory limits to ensure protection of the environment. Samples are taken on a regular basis and the laboratory results are reported to the applicable regulator.

IMPACT OF PRODUCED WATER ON THE ENVIRONMENT

The results of ongoing studies to date indicate that the environmental risk from the discharge of produced water is low and that effects should be limited to less than 500 metres from the discharge source.

Offshore operators are required to conduct environmental effects monitoring (EEM) studies in the area surrounding offshore installations. These studies include sampling and analysis of sediments, water and fish. To date, EEM programs submitted by Atlantic Canada offshore operators show minimal localized impacts within predicted levels approved during the environmental assessment process.



MINIMIZING AND MANAGING THE POTENTIAL EFFECTS OF PRODUCED WATER

While the environmental risk from produced water discharge is low, industry regularly monitors and tests to ensure that it is in compliance with current regulations related to discharging treated produced water. Besides complying with the regulations, industry funds research and development through the Environmental Studies Research Fund (esrfunds.org) and other research organizations, and also collaborates with government scientists to continue to learn more about produced water and find new ways to further minimize the environmental risk of produced water discharge. The oil and natural gas industry is committed to continuous improvement. Together with regulatory bodies, technical companies, research organizations and non-governmental organizations, operators are continuing to investigate new treatment technologies and other disposal methods to manage produced water discharge.

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FOR MORE INFORMATION:

Canada-Newfoundland and Labrador Offshore Petroleum Board
cnlopb.ca

Canada-Nova Scotia Offshore Petroleum Board
cnsopb.ns.ca

National Energy Board
neb-one.gc.ca

Atlantic Canada Offshore
atlanticcanadaoffshore.ca