

Produced water discharges from offshore oil and gas installations 2009-2019



Policy Issue: To prevent and eliminate pollution associated with the discharge of oil and other substances caused by discharges of produced water from offshore oil and gas installations.

Policy Objective: To achieve, by 2020, a reduction of oil in produced water discharged into the sea to a level which will adequately ensure that each of those discharges will present no harm to the marine environment, and a reduction in discharges of hazardous substances via produced water with the ultimate aim of achieving concentrations in the marine environment that are near background values for naturally occurring substances and close to zero for man-made synthetic substances.

Background

One of the most significant pressures to the marine environment from the offshore oil and gas industry is produced water which is a by-product of oil and/or gas production operations and includes formation water, condensation water and re-produced injection water. It is usually either discharged into the sea after treatment or is injected back into the reservoir from where it originated. Discharges of produced water represent the largest source of crude oil contamination to the marine environment from routine offshore oil and gas operations. Produced water discharges contain hydrocarbons, alkyl phenols, heavy metals, radionuclides, added chemicals, and other oil related substances. The quantity generated usually increases as fields mature.

Measures

OSPAR Recommendation 2001/1 (as amended) details requirements for the management of produced water from offshore installations and sets a performance standard of 30mg/l for dispersed oil in produced water which is the maximum monthly average concentration which can be discharged.

In 2012, OSPAR Recommendation 2012/5 (as amended) and associated guidelines for the implementation of a risk-based approach (RBA) to the management of produced water discharges from offshore installations were adopted. The purpose of the RBA is to assess the environmental risk posed by produced water discharges, naturally occurring hazardous components (e.g. alkyl phenols and PAHs) and added chemicals with discharged produced water, with the aim of defining appropriate measures to reduce the risk to levels, where it can be considered adequately controlled.

[OSPAR Recommendation 2001/1 for the Management of Produced Water from Offshore Installations. Consolidated text](#)

[OSPAR Recommendation 2012/5 for a risk-based approach to the Management of Produced Water Discharges from Offshore Installations. Consolidated text](#)

[The OSPAR Convention requires Contracting Parties to apply Best Available Techniques \(BAT\) and Best Environmental Practice \(BEP\) including, where appropriate, clean technology, in their efforts to prevent and eliminate marine pollution](#)

[Offshore Industry Committee pages](#)



Produced water discharges from offshore oil and gas installations 2009-2019



What has been achieved?

As can be seen in Figure 1, since 2009 there has been a 16% reduction in the quantity of dispersed oil discharged in produced water. The annual average dispersed oil content in produced water ranged from 12.4 mg/l to 14.1 mg/l during the 2009 – 2019 period, well below the current performance standard for dispersed oil of 30 mg/l for produced water discharged into the sea.

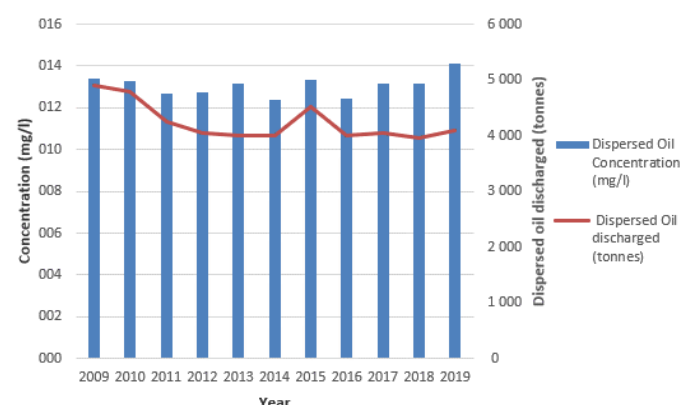


Figure 1: Dispersed oil discharges 2009 - 2019



Figure 2 shows that the total volume of produced and displaced water discharged has fallen 21% during the period 2009-2019, and there has been a 49% increase in the volume of produced water re-injected.

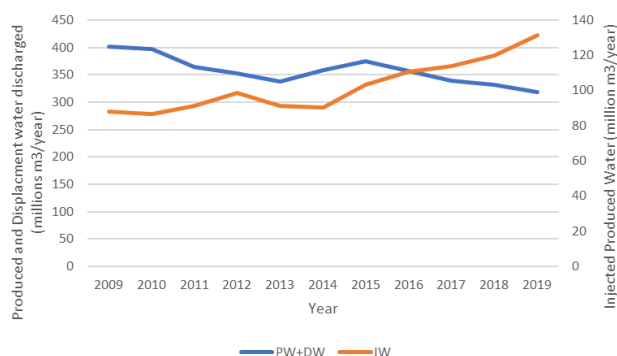


Figure 2: Total volume of produced water and displacement water discharged, and produced water re-injected. Displacement water is the seawater which is used for ballasting the storage tanks of the offshore installations

A main finding of the RBA is that some types of offshore chemicals are major contributors to the risk posed by produced water discharges.

To date, of the 231 installations still included within the RBA process across the OSPAR region, 216 have been assessed, with 125 installations (54%) determined to have their discharge adequately controlled, 91 installations (39%) requiring further action to be taken and the remainder still awaiting the outcome of an assessment.

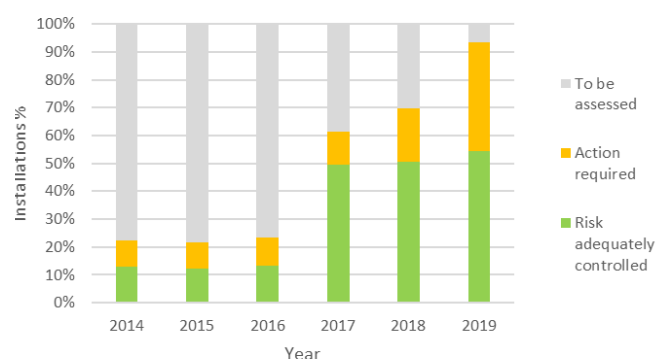


Figure 3: Progress with RBA

Future considerations

Improvements and developments in Best Available Technology (BAT) and Best Environmental Practice (BEP) have brought about reductions in the concentrations of dispersed oil in produced water. Continued improvements and developments will help to further reduce discharges of dispersed oil and other contaminants. However, as fields age, more produced water is generated through production operations, and it can be more challenging to reduce levels of oil discharged due to technical reasons. While the application of BAT/BEP is expected, it is often difficult to retrofit new technologies to older installations due to space limitations, produced water volumes to be handled and / or prohibitive costs.

The re-injection of produced water has reduced the discharge of associated oil and chemicals and increases in the use of re-injection would further reduce discharges.

Investigations of produced water discharges to date have not included possible effects of oil sheens originating from discharges of produced water. Assessing the extent and possible effects of oil sheens originating from discharges of produced water has been identified as a task that needs to be addressed in the coming years.

The RBA work will continue to refine the methods used. Linking the estimated risk levels to possible impacts in the receiving environment is a step that has not yet been addressed. As a next stage to RBA, a task has been identified to assess the environmental risk posed by the discharge of naturally occurring substances and added chemicals to identify and adopt measures to reduce the risk from produced water.