

**Section IX**

**ABSTRACTS OF POSTER PRESENTATIONS**

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# CLEANING ROCKS AND COASTAL STRUCTURES

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Cleaning rocks and concrete maritime structures is one of the final stages in restoring a coast after oil pollution. Washing with high pressure hot water is a well-known process, but is time-consuming and labor-intensive work, especially in the case of a weathered oil deposit. Using chemicals may increase the washing efficiency.

This study attempted to develop an experimental procedure to evaluate products' efficiency and the fate of displaced oil, to determine the most appropriate chemicals and the best way to use them, and to evaluate the ecological impacts of washing products. Both field and laboratory trials have been conducted since 1981. Field trials were done on a concrete test wall composed of 12 cells polluted with heavy fuel oil, after several weeks of weathering. The time needed to wash one cell was measured and the quality of cleaning was visually evaluated. The oil-water mixture was received at the bottom of the wall in a pond simulating a sandy beach. Samples were taken in both the water and the sand to evaluate the fate of displaced oil.

To compare techniques and products without making full-scale experiments, laboratory tests were established:

- an efficiency test based on low pressure washing of concrete probes
- the French dispersant approval test to evaluate the ability of displaced oil to be dispersed

- a sand column test for measuring penetration and retention of displaced oil in relation to up and down water movements
- a test for evaluating the ability of floating displaced oil to be recovered with sorbents

A specific toxicity test has also been developed. In this test, a mixture of oil, washing product, and fresh water mixed at a temperature of 80° C is poured in a tank in which shrimps are exposed.

The main conclusions of this study are the following:

- High pressure hot water is required when oil has weathered on the wall during about six weeks in sunny conditions and about three months in relatively cold and rainy conditions.
- Spraying pure products on oiled surfaces before cleaning with water is more efficient than on-line injection in the water.
- The optimal dosage of products is about 0.15 L/m<sup>2</sup> oiled surface (about one part of product for two parts of oil).
- Many chemicals, including petroleum solvents, are efficient compared to cleaning with water only. Those most emulsifying are the most adequate to prevent oil from being absorbed onto sand, but none is able to disperse displaced heavy oil in nonagitated water.
- The toxicity of washing products varies greatly and should be a criterion for agreement.