

PRINCIPLE

Left: Flooding on a pebble beach

Right: Flushing to refloat buried oil

The so-called 'flooding' technique is used to saturate coarse sediment, stones and boulders to help the oil out of the sediment. This technique is combined with flushing or washing operations to restrict the deep infiltration of oil due to the pressure of hoses and to improve drainage towards the lower end of a shingle bar.

Flushing is used for a number of different purposes:

- ✓ to remove a surface layer of thick accumulations on various hard surfaces (rocks, quays...)
- ✓ to dislodge clusters of oil trapped in cavities of rocks, boulders, riprap...
- ✓ to displace accumulations and effluents on the surface of the beach with water and channel them to a collection point.



CONDITIONS OF USE

FLOODING

- ✓ **Pollution:** heavy pollution, oil infiltrated inside the sediment
- ✓ **Pollutant:** fresh oil, low to moderate viscosity
- ✓ **Substrate:** coarse sediment, stones
- ✓ **Site:** particularly on narrow foreshores with moderate slope; for example a small shingle bar, rocky substrate, or the foot of a rocky cove.

FLUSHING

- ✓ **Pollution:** freshly deposited oil in thick accumulations, residual clusters and effluents
- ✓ **Substrate:** (displacement) fine sediments, wet to saturated with water; (dislodgement) rocks, boulders, stones
- ✓ **Site:** direct sea water supply available (possibly via channels) or access possible for machinery.

EQUIPMENT

Basic equipment:

- ✓ Transfer pump (high speed for flooding)

Extra equipment:

- ✓ Recovery: light containment boom, sorbents, shore-sealing boom, skimmer
- ✓ Perforated pipe (flooding), hoses.

PPE:

FLOODING: Overalls, oilskins, boots, gloves

FLUSHING: Overalls, oilskins, boots, gloves, protective helmet, goggles, mask. Users are exposed to a lot of dirt, from oil and effluent spray.



FLOODING

- ✓ Set up effluent recovery
- ✓ Use a flexible perforated pipe or hose laid longitudinally above the shore to be cleaned
- ✓ Supply it with seawater by a high speed pump
- ✓ Make sure the whole area to be cleaned is flooded before starting washing operations
- ✓ Recover the effluents produced.

FLUSHING

- ✓ Set up an effluent recovery system beforehand
- ✓ Adapt the pressure used to the nature of the substrate. The same goes for the spraying mode: flat nozzle or solid water jet
- ✓ Use a small spraying angle, especially on sediments, in order to limit erosion (thin layer of sediment) and deep burying of oil as far as possible
- ✓ Consider carrying out a flooding operation (shingle bar) in parallel
- ✓ Use hot water hoses in parallel especially on stones
- ✓ Rotate users (spraying/monitoring supply, pump and effluent recovery system). Operating a hose for an extended period of time is tiring.



IMPACT

FLOODING

- ✓ **Physical:** reworking of shingle bar to greater or lesser extent; subsequent regain of natural balance
- ✓ **Biological:** slight risk of vertical infiltration of oil into shingle bar; possible contamination of lower beach if effluents are not immediately caught at the foot of the bar.

FLUSHING

- ✓ **Physical:** can force the oil into the sediment (if spray is too powerful or misdirected); temporary disturbance
- ✓ **Biological:** can contaminate populations in the underlying foreshore if recovery is not carried out properly.



PERFORMANCE

FLOODING

Efficiency: varies considerably according to the site, pollutant, degree of pollution (a few tens to a few hundreds of m²/h for displacement on the beach, from 1 to 5 m²/h in the case of dislodgement).

Minimum workforce required: team of 10 people for 5 to 6 hoses.

Waste: pumpable waste with high oil content; possibly saturated sorbents.

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Flushing on riprap