App. 3 Case study: ERIKA oil spill, France, 1999

(Source of text: http://www.drire.gouv.fr/)

Recovered on over 400 km of coastline, the oil spill waste resulting from the ERIKA oil spill was composed of **emulsified fuel (10 %), of sands (80 %), and also seaweed and various oiled material (wood, plastic…)**. The waste was first stored in approximately **forty intermediate waste storage sites**, along the oiled shore and close to the clean-up sites.

After a few weeks, these sites were dismantled. Soil analysis proved that there was no secondary soil contamination.

Four long term storage sites (Total refinery: 55,000 tons, Frossay: 18,000 tons, Arceau 1: 73,000 tons, Arceau 2: 54,000 tons) were set up in the region of Basse-Loire to store all the waste from the intermediate waste storage sites, while waiting for a decision for the treatment and final disposal. The water-tightness of the sites was ensured by the installation of geo-textile membrane. The ground water was regularly analysed. The sites, managed by Total, were classified as "industrial installations" and were monitored by the Agency in charge of the industry.

A Protocol signed on 13 September 2000 between the State of France and the company Total transferred the responsibility of the oil spill waste treatment to Total, using all appropriate means, in accordance with rules and regulations related to the protection of the environment, and ensuring a complete waste tracking until the final disposal of the waste.

Total, within the framework of the Protocol, took over the management of the four long term storage sites and implemented a specific waste treatment plant, close to the refinery of Total in Donges.

The treatment of the waste in Donges started in April 2001. The waste treatment plant was a classified industrial installation and subject to the relevant rules and regulations, and closely monitored by the French Agency in charge of the industry. Objectives were assigned to Total regarding the treatment of the sands, the tracking of the washed sands and of the washing effluents.

The "Arrêté préfectoral" of 7 December 2000 defined the criteria to be met to be able to use the washed sands for Public Works:

- maximal hydrocarbon content: 2,500 mg/kg,
- use in working sites of a minimum quantity of 500 tons, outside of any sensitive area (water intake, wetland, etc.),
- implementation of a tracking system for all material treated.

The maximum hydrocarbon content was 5,000 mg/kg for storage in specialized landfill.

To ensure transparency and inform the public, a Local Monitoring and Information Commission was set up ("Arrêté préfectoral" of 20 July 2000) and meetings were regularly organized each year of the project.

Initiated in April 2001, the treatment of the waste was completed in May 2004. A total of 267,158 tons of waste were treated.

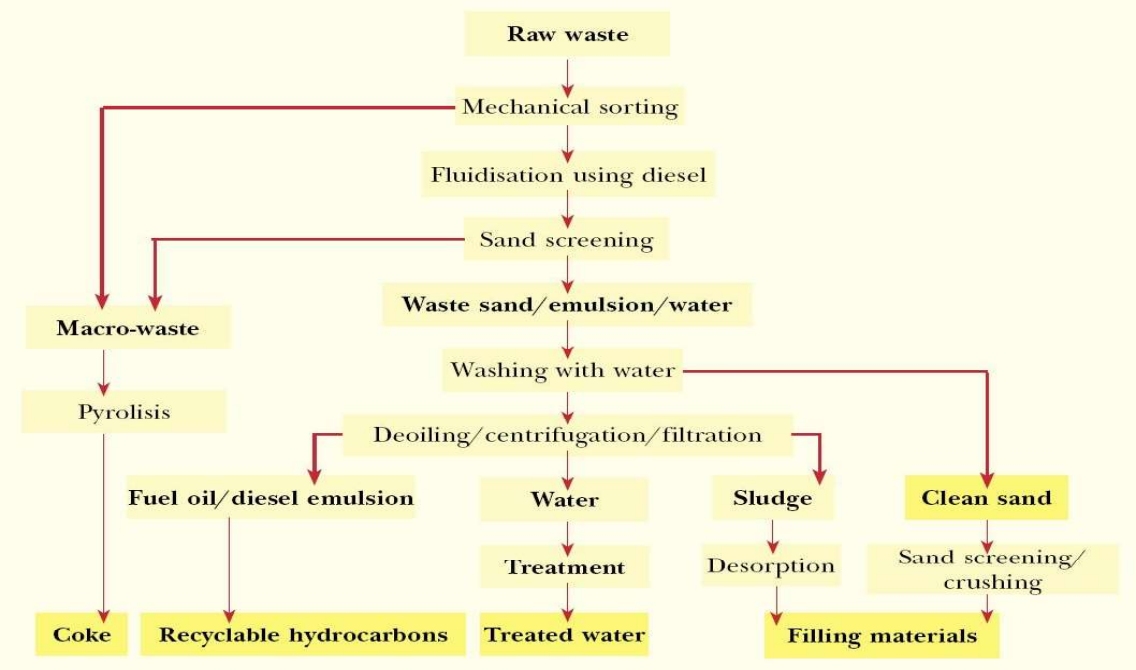

Figure 11 : Physico-chemical treatment procedure used to treat OSW from the ERIKA pollution

(Source: Cedre)

The treatment, using water and benzene, resulted in the production of:

- **200,838 tons of sediment** (mainly fine to coarse sand), which were disposed of in Public Works,
- **63,591 tons of mud** (mix of water and fine sediment having absorbed hydrocarbons). These mud were pre-treated on site (using quicklime and crushing) and:
  - 69 % were disposed of in cement kilns (France and Belgium) as raw material and energy source,
  - 25 % were stored in specialized centres in France,
  - 5 % were incinerated in specialized incinerators in France.
- **49,121 tons of fluidized fuel** (mix of recovered fuel and benzene), which were transferred to the refinery of Donges to recover and re-use the hydrocarbon products,
- **1,494 tons of emulsion** (mix of fuel and hydrocarbons), treated in a specialized centre in France,
- **371 tons of solid waste** (plastic, wood, sea weed etc.) incinerated in domestic waste incinerators in France,
- **155 tons of metal**, which were transferred to the usual metal waste stream.

The treatment implemented by Total allowed very good results for the cleaning of the sediments. The hydrocarbon content of the washed sediment was inferior to 500 mg/kg, which is considerably less than 2,500 mg/kg (French official limit in such cases).

The decommissioning of the storage and treatment plant were completed in May 2004. The different sites were controlled: There was no impact on the soil or ground water.

The overall cost of the waste treatment was 72,000,000 euros.