

Incident information sheet CONFLICT IN LEBANON 2006



Storage tank of the Jieh power plant after the bombings in
July 2006 ©LE FLOCH DEPOLLUTION

From 13 to 15 July 2006, the bombings in the south of Lebanon reach the power plant in Jieh (30 km south of Beirut). Part of the stored heavy fuel oil was burned. According to the Lebanese authorities, 10,000 to 15,000 tonnes of unburned oil spilled on the shoreline and drifted at sea due to south-western winds. The pollution quickly touched half of the 200 km of the Lebanese coastline. Various types of substrates were polluted: sand, pebbles, rocks, port infrastructure...

The oil spilled is similar to an IFO 150 (Intermediate Fuel Oil with a viscosity of 150 cSt at 50°C).

Characteristics	
Density at 15°C	0.9385
Cinematic viscosity at 50°C (cSt)	140
Flash Point (°C)	> 110
Pour Point (°C)	6
Sulphur (% mass)	1
Asphaltenes (% mass)	2.8
Vanadium V (ppm)	22



Continuous spill close to Tripoli in July 2006 ©MARINE NATIONALE



Thin slick at sea off Beirut in July 2006 ©MARINE NATIONALE

The potential impacts of pollution

In the short term (days to weeks), during the spread phase of the pollution, the potentially dominating effects are oiling and toxicity. They can last for a couple of weeks after the introduction of the pollutant into the environment. They mostly concern aquatic invertebrates with no or little mobility in the loose and/or rocky substrates: echinoderms, crustaceans, bivalvia, gastropods, and polychaete. These species are impacted differently depending on their sensitivity to oil. In the event of an acute toxicity phenomenon, groundings of dead shellfish or urchins can happen. In the water column, plankton can be impacted locally and transitively. This can impact eggs and larvae of fishes and crustaceans, in particular tuna eggs, with possible effect on the following year's population. On the mid and long term (weeks/months), the physical effect of oiling of the species in the foreshore, which leads to a detachment of shellfish, namely limpets, can be followed by a proliferation of green algae due to the diminution of consumption.

Regarding the coastal aquatic population, an oiling can lead to a local loss of the most vulnerable species, which will favour more opportunistic species and lead to an eventual disappearance of certain populations. These populations will only be re-

established with the gradual return of the species affected.

The risks for sea birds are moderated, seeing as migration season is over. Regarding mammals, data is insufficient to anticipate a significant impact. The presence of Mediterranean monk seals, a threatened species, is however noted in the region of the Palm islands. Four species of sea turtles, including the green sea turtle(a threatened species), reproduce on the Lebanese coasts: the reproduction sites are marked in the Tyr and Palm islands nature reserves. They face possible consequences of the oiling on beaches, which coincides with their nesting period: the eggs are laid between May and August and hatch 1 to 2 months later.

Regarding human activities, the presence of fuel on beaches and in coastal waters makes swimming and coastal leisure activities impossible. The risk of oiling nets and bringing back oiled products limits fishing activities near the shore. These activities were only picked up again once peace was established, life went back to normal and the sites were cleaned.

With a lack of precise information on the scale of the pollution and the weathering of the pollutant, it would be dangerous to make decisions outside of these general recommendations. The Mediterranean sea was not endangered, but this pollution was nonetheless important. It required months of hard work to clean. It was a costly and burdensome load on a country already facing war.



Waste storage ©CEDRE



Impact on the coastline, Amchit, September 2006 ©CEDRE

French support

As soon as Lebanese authorities reached out, France's Secrétariat Général de la Mer, one of the contracting parties of the Barcelona Convention and a co-founder of REMPEC, coordinated the technical support from the French Navy, the Ministry for Transport, the Ministry for the Environment, the Ministry for Foreign Affairs, and CEDRE. The intervention team from CEDRE was activated to provide technical information on the resources, techniques, and products available for pollution response.



Technical discussion with Lebanese volunteers, September 2006
©CEDRE

CEDRE played the role of general secretary for the group of experts, designated by REMPEC to draw up the international assistance action plan which was validated on 17 August in Piraeus. A member of CEDRE's management team left for Beirut on 21 August to set up a local international assistance coordination mission for REMPEC. Until 19 October, CEDRE permanently had 1 or specialists on the operation coordination committee, at the Lebanese Ministry of the Environment.

In Lebanon, CEDRE operators led a local coordination action of the international support and provided technical support.

Numerous visits on site (assessments, work monitoring) were organised. The conditions were harsh due to the destructions caused by the war and the limited logistical resources (transport, communication).

Pollution assessment all along the shoreline (aerial, marine, on land) helped evaluate its impact precisely. Recommendations were made in terms of crisis and response management (health and safety, closing beaches, environment, initial collection and clean-up, waste management...). These on-site visits helped define priorities regarding response and equipment needs.

A helicopter from the warship Jean Bart operated a first flyover of the polluted coastlines and waters on 20 August. This flyover highlighted the absence of high

concentrations of drifting oil and concentrations on shores in areas exposed to south winds and currents.

The Ministry for the Equipment and the French Navy sent, on 23 August, a set of equipment which arrived on 28 August with a team of 8 specialist in charge of training the Lebanese operators on this equipment. This team only started cleaning operations in the Byblos area with the support of Lebanese Navy personnel and formed volunteer teams for beach clean-ups. The response equipment was left on-site for the Lebanese authorities.

Support was also provided for the environmental organisation Bahr Loubnan, tasked with the mobilisation of volunteers for beach cleaning operations.

In total, the French support, including material and human resources, was estimated to 1 million Euros.



Implementation of a cleaning site, September 2006 ©CEDRE

Waste management

The amount of litter collected and stored was estimated to, in June 2008, 500 m³ of liquid waste and 3,120 m³ of semi-solid waste collected during these two cleaning operation steps.

International support

On 25 July 200, the Lebanese Ministry for the Environment asked for support, through the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC), to the contracting parties of the Barcelona Convention and other partners from the [Mediterranean Action Plan](#). On 27 July, the Ministry also asked for support in the form of experts and material to the European Commission which shared it with the member States. On 5 August, as pollution had spread to its coastline, Syria also asked the REMPEC for support.

At the request from REMPEC, CEDRE immediately transmitted information on the various possible response techniques for shoreline pollution and confirmed to the

secretary that an international group of experts was tasked with the elaboration of a contingency plan. The second week of August, European pollution specialists travelled on-site to assess the situation in Lebanon (European Commission) and in Syria (REMPEC).

The REMPEC also contacted the oceanographic centre in Cyprus to ask for behaviour and drift predictions of the oil. As with the [MOTHY](#) prediction model, activated by [Météo France](#) at the request of CEDRE, these previsions indicated a tendency for the pollution to drift toward the North while progressively polluting the coastline.

Multiple satellite pictures, treated by the oceanographic centre in Cyprus and by the [Joint Research Centre of the European Commission](#) confirmed this drift of the pollution towards the North. But they also seemed to show a higher presence of pollutants near the shores than the prediction models did.

The work of this group of experts was used as a baseline to the creation of an international support action plan, which was validated on 17 August in Piraeus (Greece) during a meeting between funding organisms and representatives from the countries of the area. This action plan was made up of 3 phases:

- A short-term phase for the coordination of financial and human (emergency specialists) resources to handle availability
- A medium-term phase for organised cleaning, joining physical and financial resources in a structured shoreline cleanup programme
- A long-term phase which integrated a detailed impact study as well as national and regional capacities reinforcement measures to respond to major pollution.



Depollution work site, Ramlet al Baida, September 2006 ©CEDRE

The risks

Despite the range of this pollution, it was neither the first large oil spill to happen in Eastern Mediterranean, nor was it the most important in this sea. It wasn't the worst oil spill caused by a war either. A set of reference events already existed to situate this pollution precisely, at least regarding the oil spill of the Gulf War (700,000 tonnes at least in 1991), the fire and explosion of the Irenes Serenade near Pylos (Greece) in 1980 and [Haven](#) near Genoa (Italy) in 1991 with respectively 40,000 tonnes and 133,000 tonnes of crude oil on board, as well as the spill of 10,000 m³ of crude oil from the oil tanker [Al Samidoun](#) in the Suez canal in 2004.

These reference points helped predict the heavy impacts locally which will require considerable effort and cleaning resources. But it did not endanger the balance of Eastern Mediterranean or one species in particular.

The pollution observed at sea did not arrive on a clean, untouched shoreline. The Lebanese coastline, highly urbanised, counts the largest cities of the country and numerous tourist beaches. Natural populations were already degraded. Two nature reserves should however be noted: a green turtle reproduction area at Tyr beach south of Jieh and a bird migration area at Palm Island, off the coast of Tripoli, a special Mediterranean protection area within the Barcelona Convention.

Emulsified slicks washed up on the shoreline, where they oiled the populations and the substrates in the area beaten by the swell and affected by the tides (the tidal range is from 10 to 40 cm in Lebanon). This area was mostly constituted of rocky substrate and also contained sand from the beach (15%). Part of the heavy emulsion created by the weathering of the fuel might sink in coastal areas by mixing with the suspended matter and sediment.

The ecosystems were in active phase at the time of the incident (breeding, development...). This could lead to medium- or long-term consequences locally such as the loss of an entire age-range.



Depollution work site, Ramlet al Baida, September 2006 ©CEDRE