

**LEBANON MARINE AND COASTAL OIL POLLUTION
INTERNATIONAL ASSISTANCE ACTION PLAN**

**PREPARED BY THE
EXPERTS WORKING GROUP FOR LEBANON**

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PART 1: SITUATION AND RESPONSE STRATEGY

1.1 SCOPE

The objective of the present action plan is to:

- i) provide immediate advice and technical assistance to the Government of Lebanon on an oil spill response strategy and appropriate oil spill response techniques;
- ii) assess the type of assistance and resources (equipment, manpower,...) needed to respond to the spill and elaborate a clean-up plan and follow-up international assistance programme; and
- iii) identify and mobilise the financial and in-kind available assistance and contributions needed to implement the assistance programme as outlined in the present plan.

In any major oil spill, as is the case with the current spill, a precise assessment of the cost of the response and clean-up operations requires good information based on an assessment of the extent of the pollution and a comprehensive knowledge of sensitive resources at risk. The collection of such data was initiated during the preparation of the present plan and is ongoing. An oil pollution incident is a dynamic event, which continues to evolve over the full course of the incident. Due to the conflict situation in Lebanon and the related security constraints, there has been a delay between the present work and the beginning of the actual clean-up operations, which is dependant on an array of factors including cessation of acts of war and improved security, access to funding, delivery of equipment, and additional coastline surveys, to name a few.

The proposal hereunder refers to the state and the knowledge available at the time of preparing this present document. It will continue to be modified and updated in light of successive surveys and meetings, taking into account the evolution of the spill and the efficiency of clean-up operations.

1.2 BACKGROUND INFORMATION

1.2.1 Pollution and clean-up

1.2.1.1. Pollution source and estimation of leakage

On 13 and 15 July 2006 the Jieh power utility, located 30 km south of Beirut and directly on the Lebanese coastline, was hit by bombs arising from the conflict. Some of the impacted storage tanks consequently caught fire. The fuel that was not consumed in the resulting fire, spilled into the Mediterranean Sea. The estimated amount of oil spilled ranges from 10,000 to 15,000 tonnes, taking into account that the actual quantity of oil not consumed in the fire, which ultimately spilled into the sea, remains unknown.

There were questions and concerns raised as to whether there may still be leakage from the site. According to the report of the European Commission's Marine Pollution Co-ordination and Assessment (MPCA) team of 11 August 2006, further to contact made with the manager of power plant, all the oil from the five main tanks already burned or leaked in mid July. However, he reported that there was still a 600-tonne service tank, which they were not able access that could still be leaking oil.

1.2.1.2. Oil slick drift

At the time of the spill and in the immediate aftermath, winds and surface sea currents ran from the SW to N-NE, causing the oil slicks to drift north, up to 150 km from the source causing significant impacts and oiling of the Lebanese coastline and some oiling of the Syrian coastline. The oil which reached Syria came ashore in two phases, the first arriving on 26 July 2006 impacting some 10-km of shoreline, with the second phase of oil reaching the Syrian coast on 2 August 2006.

Due to the conflict situation and resulting flight embargos, various satellite remote sensing images were instead used to make an initial assessment of the extent of the pollution. The Cyprus Oceanography Centre at the University of Cyprus used optical satellite images from MODIS, with a horizontal resolution of 250m. The Cyprus Oceanography Centre ran also the MEDSLIK-Mediterranean oil spill model¹, within the framework of the European Union MERSEA-Marine Environment and Security of the European areas, an activity of the GMES-Global Monitoring for Environment and Security. European Space Agency (ESA) delivered ENVISAT image analysis and SAR images to the European Commission Joint Research Centre (EC JRC). The satellite images, the oil spill model results and coastal observation confirmed that the oil slicks drifted towards the north, up to Jablah, Syria on 6 August.

During the course of the meeting in Athens² on 17 August 2006, the Ministry of Environment of Lebanon (MoE Lebanon) expressed concern regarding the possibility of oil still floating offshore, based on various reports they had received, and the quantity that this may represent. There is therefore a strong need for aerial surveys to validate satellite imagery information.

The University of Cyprus used optical satellite images from MODIS and the Cyprus Oceanography Centre ran the MEDSLIK model to make predictions on the trajectory of the oil. The European Space Agency (ESA) delivered ENVISAT image analysis and SAR images to the European Commission Joint Research Centre (EC JRC). These images, together with the modelling carried out, confirmed that the oil slicks drifted towards the north, up to Jablah (Syria) on 6 August 2006, as confirmed in the EC JRC report n° 4.

Fishermen in the area have indicated that they have observed some small patches of oil between the coast of Lebanon and Palm Islands, located 5 km off the coast of Tripoli³. MoE Lebanon have also received reports of at least one more significant slick of an undetermined size and quantity observed offshore by passing ships.

Given these reports, emphasis on the urgent need for aerial surveys of the area has been given, to confirm whether there are indeed additional offshore slicks that may come ashore and to validate the satellite imagery and modelling predictions made to date. To date, one overflight has been carried out by France, but more are needed.

Meteorological models have also forecasted a change in the direction of local currents at the end of August, with associated risks of further contamination and oiling of new sites due to re-mobilization of floating oil, currently trapped in protected areas such as marinas. As such, there is an urgent need for action to address these priority sites as identified by MoE Lebanon.

¹ This model integrated operationally with the CYCOFOS/ALERMO/MFS high resolution ocean forecasting system (www.oceanography.ucy.ac.cy/cycofos) and the SKIRON high frequency winds

² Co-ordination meeting on the response to the marine pollution incident in the Eastern Mediterranean, 17 August 2006, Piraeus, Greece

³ MPCA situation report n°4, 11 August 2006

1.2.1.3. Site surveys and results

Surveys conducted by MoE Lebanon carried out between 18 July and 3 August 2006 identified twenty-one impacted sites, representing a total length of 19.2 km of shoreline, broken down into four categories of shoreline types: sandy, rocky, gravel and pebbles. Additional information is expected from EU and UNEP experts to update the survey table elaborated by MoE Lebanon.

UNDP has mobilized funding for a team of 10 national experts to conduct surveys. The terms of reference for this national assessment mission have been prepared together with MoE Lebanon. The mission, was scheduled to begin on 8 August 2006, is to be carried out with the support of environmental experts mobilized through the Joint UNEP/OCHA Environment Unit's network of experts.

On 10 August 2006, following a survey of the Syrian coastline, Dr. Ezio Amato of ICRAM, the IMO/REMPEC expert mobilised within the framework of REMPEC's Mediterranean Assistance Unit and forming part of a joint IMO/REMPEC-UNEP/OCHA expert mission, reported that the level of pollution was light and that no immediate assistance for response appeared to be necessary at this stage. This was further confirmed by the delegation of Syria during the meeting in Athens on 17 August 2006.

The EU Monitoring and Information Centre (MIC) has had an expert team in Beirut since 9 August 2006 (hereinafter referred to as the "EU MIC team"). The team, which was made available to the MIC by Denmark, included both marine and coastal pollution experts and is tasked to assist local authorities in assessing the situation and the needs; to provide technical and scientific support; to contribute to the preparation of an off-shore and coastline operation and to train the staff in dealing with the pollution. These EU experts increased the number of visited sites from 20 to 30. On the basis of this information, CEDRE made a first estimate of the volume of oil in a number of confined sites and, based on this, identified the boom length needed to contain pollution in these areas, as outlined in Annex I.

1.2.1.4. Clean-up work undertaken

Preliminary clean-up operations have started at two priority sites, namely the Beirut Fisherman's Wharf and Jbeil (Byblos), by two local companies (Navy Group, a member of MOIG, and Yellow Tech, a private company with limited capacity for coastal clean-up)⁴.

A report from the Lebanese company, Navy Group, provides information on three polluted locations where the company is contributing to the clean-up efforts. These include Saint Antoine, Blue Beach and Roca-Marina. The work is reported to be very difficult and that some municipalities have already commenced operations using inappropriate means for clean-up and pollutant disposal.

Through the EU Civil Protection Mechanism, the Government of Norway has delivered oil spill equipment. The EU MIC experts currently in Lebanon have begun clean-up operations, together with a team of local staff whom they have trained on site, using the Norwegian equipment.

1.2.2 Pollutant characterization

⁴EC-MIC Sitrep of 7 August 2006

On basis of information transmitted by MoE Lebanon, the product involved is reported to be an intermediate fuel oil 150. Oil weathering models have provided the following expected behaviour of this product:

- approximately 20 % would have evaporated;
- approximately 80 % would be stranded on coastline; and
- 0.25 % could remain at sea. (i.e. approximately 40 tonnes of oil based on the estimated 15 000-tonne spill).

It is important to note that these are predictions only, based on limited available information, and a proper assessment is urgently needed to validate the information used to obtain the predictions outlined above, thus reconfirming the urgent need for aerial surveillance.

Observations by the EU MIC team indicate that, despite its long stay in the water, the oil is of relatively low viscosity, and thus still able to be pumped and/or skimmed⁵.

1.2.3 Shoreline sensitivity

Shoreline morphology

The Lebanese coastline can be classified into the following eleven morphological types:

1. Sandy beach;
2. Pebbles beach;
3. Rocky micro cliff behind narrow rocky terrace;
4. Micro cliff behind pebble beach;
5. Micro cliff behind sandy beach;
6. Double rocky terrace;
7. Cliff behind rocky terrace;
8. Cliff behind pebbles beach;
9. Cliff behind sandy beach;
10. Beach-rock; and
11. Rocky cliff.

For operational clean-up considerations, this classification will likely be further simplified at a later date.

There are some specific factors which are expected to hamper clean-up operations, amongst them:

1. the geological nature of the rocky shore (porous limestone);
2. the presence of copious floating debris; and
3. beaches exposed to wave action (difficult for recovery in water).

Shoreline sensitivity

There exists no oil pollution sensitivity atlas for the Lebanese coastline. However, MoE Lebanon has begun providing some information on sensitive resources (specific ecosystems, fisheries, amenity beaches, water intakes and other local priorities) in order to prioritize actions.

⁵ MPAC Sitrep, 9 August 2006

On 11 August 2006, MoE Lebanon indicated that the ecologically sensitive area of the Palm Islands archipelago, a nature reserve encompassing three islands located 5 km off the Tripoli coast, is contaminated. In addition, the Byblos port, which is a historical site, as well as Raouche Fishermen's Wharf, have been identified as a sensitive area by the MoE Lebanon.

1.3 RESPONSE STRATEGY

1.3.1. Phases and principles

The response strategy that follows is based on the best possible use of all international contributions provided thus far and those still to be obtained, which includes both financial and in-kind assistance, which has been organised, at the global level, under the co-ordination of IMO and UNEP/OCHA and, at the regional level, under the co-ordination of REMPEC, in close cooperation with EC MIC. This assistance (and offers of assistance) is being implemented according to the priorities established by MoE Lebanon and validated by the national and international experts.

This response has been divided into three successive phases:

- i) a short-term phase, which has already been initiated based on voluntary in-kind contributions of international and national institutions specialized in environmental oil pollution emergencies;
- ii) a medium-term phase, to begin as soon as specific financing is obtained, consisting of the implementation of the clean-up operations carried out within the framework of international assistance; and
- iii) a long-term phase, to start when bulk clean-up is completed, to assess the consequences of the spill and to improve preparedness of the national system from the lessons learned.

1.3.2. Short-term

1.3.2.1. Aerial survey

Considering the questions raised by the satellite images and the models, an aerial survey remains the main priority in order to properly assess the damage and the possibility of any free floating oil offshore.

Aerial surveillance does not require specialized equipments, such as sensors, and is best carried out by helicopter, which is considered more appropriate for coastline waters than a fixed-wing aircraft. It requires a qualified observer (for example, a specialist from ITOPF, French Customs, Italian Coast Guard, etc.), or possibly an Eastern Mediterranean participant who has specialized training in aerial surveys.

Issues:

- i) immediate mobilization of experts for assessment purposes; and
- ii) source of aircraft.

1.3.2.2. Technical support and advice

A permanent on-site advisory force comprised of two to three pollution response specialists is needed to participate in site surveys and to advise MoE Lebanon in the definition and implementation of day-to-day response strategy.

With the delivery of equipment and arrival of experts, co-ordination of incoming assistance and proper allocation of equipment and expertise and determination of where and how these resources are best used, based on identified requirements, is urgently needed.

Ideally, each donor providing equipment should also make available one or several specialists to demonstrate and train local staff in equipment use. In the absence of this, there is an urgent need to dispatch a team of two to four equipment handling specialists to assist and provide training on the use of this specialized equipment.

Issues:

- i) identify source(s) of equipment handling specialists and trainers; and
- ii) mobilisation of equipment specialists and trainers.

1.3.2.3. Training

The EU MIC experts have conducted training sessions for two teams of trainers who will be able to train ten responders.

In order to avoid added damage by inadequate or excessive shoreline cleaning, there is merit in carrying out an additional 3 to 4-day training session on shoreline clean-up for Lebanese staff identified as possible site operation supervisors.

Issues:

- 1) trainer and location for the training; and
- 2) financing for training.

1.3.2.4. Co-ordination arrangements, logistics and waste disposal

Levels of organisation defined:

- 1) Global co-ordination : IMO/UNEP /OCHA/EC;
- 2) Regional co-ordination : REMPEC; and
- 3) National co-ordination : MoE Lebanon co-ordination (needs, experts, site reports).

There may be a need to investigate the possibility of transporting oil pollution equipment on vessels carrying humanitarian aid to Lebanon. There is also a need to clarify issues related to the transport, disposal, storage and incineration of recovered oil waste and debris.

Another major need identified by MoE Lebanon, during the course of the Athens meeting, is mechanism for logistical support. MoE Lebanon further indicated that such a mechanism would be best located in a suitable location outside Lebanon, strategically selected for rapid deployment of such items, when required.

Information is presently lacking on ways to approach these matters.

Issues:

- 1) contracting of adequate staff;
- 2) financing and co-ordination of project logistics; and
- 3) waste disposal issues.

1.3.2.5. Pollutant characterisation and impact

Samples have been taken by experts, some of which having been dispatched to CEDRE in Brest, France for analysis. It appears necessary to conduct oil component analysis and PCB analysis, given that the oil originated from a power plant.

Issues:

- 1) dissemination or centralisation of analysis work (at CEDRE); and
- 2) financing.

1.3.2.6 Clean-up

Recovery of mobile oil in ports, confined areas, economic or social strategic amenities, and heavily polluted sites is a priority. Seven high priority sites have been identified by MoE Lebanon, with Byblos Port and Raouche Fishermen's Wharf categorized as primary priorities. Thirteen 'confined' sites are categorised as second priority (see Annex I).

1.3.3. Medium-term

The objective in the medium term is to implement the clean-up plan as outlined in Part 2. The priority objective of the plan is to recover mobile oil in ports, confined areas, economic or social strategic amenities and heavy polluted sites.

1.3.4. Long-term

The experience gained from the implementation of the short and medium-term phases should serve as a basis for the implementation of the long-term phase, which should include the following:

- i) a detailed impact assessment, based on internationally accepted standards, of the consequences of the oil spill;
- ii) strengthening of the national system in Lebanon for prevention of, preparedness for and response to marine pollution, including the development of relevant national legislation and the implementation of appropriate administrative arrangements, such as the designation of competent national authorities, definition of roles and responsibilities, and the establishment of a national emergency committee. This should include a national contingency plan and related regional, local, public and private sector plans, capacity building assessment of public and private oil spill response equipment and identification of related needs, development of sensitivity mapping and oil spill modelling capability; and
- iii) the development of bilateral/trilateral agreement amongst neighbouring countries for oil pollution preparedness and response, in accordance with Article 10 of the OPRC 90, Article 8 of the OPRC/HNS Protocol 2000 and Article 17 of the Prevention and Emergency Protocol to the Barcelona Convention.

PART 2: CLEAN-UP PLAN

2.1 GENERAL OBSERVATIONS

A draft National Oil Spill Response Plan was elaborated several years ago by the Lebanese authorities, with technical assistance provided by REMPEC. This draft plan established general responsibilities and priorities for response. However, it was not developed to the point of identifying detailed technical cleaning options and clean-up standards. As a consequence, detailed planning and clean-up standards would need to be established in the course of operations.

While there are a number of ways in which the response to a spill can be structured, it is essential that there is some kind of organisational framework within which the clean-up is conducted. The clean-up may be conducted using government resources and manpower, carried out by private contractors, or a combination of the two. In any event, there is a need to identify a government organisation to manage the response to the incident so that issues at a central government level, such as the distribution of incoming assets, e.g. Norwegian equipment, is optimised and resources are deployed to zones where they are most effectively utilized. Integrated management arrangements also have to reach to the local level. Local level input and the participation of municipal authorities, for example, is essential. The International Tank Owners Pollution Federation (ITOPF) proposed a strategy of dividing the affected shoreline into zones and the French POLMAR network provides one such model. A number of "Advance Command Posts" report to an area command, called the "Fixed Command Post". The Fixed Command Post then reports to a central government coordinating body. The best approach to be followed depends greatly on the actual administrative arrangements in Lebanon, since it is usually best to utilize existing management hierarchies rather than trying to build *ad hoc* organisational structures.

Even if contractors are used exclusively, co-ordination arrangements for the management of these contractors are necessary to ensure that a coherent approach is followed and priorities addressed. The contractors will need a government authority with whom to interface to direct their activities.

Furthermore, the management of the response to an oil spill usually develops from small beginnings and once structures have been developed to address effectively one or two priority sites, this organisational structure can be replicated to cover an increased number of sites. It is not usually possible to develop a plan at the outset of an incident which will adequately address all the issues that will arise as the response develops.

Due to acts of war, the main priorities stated by MoE Lebanon are:

- i) recovery of bulk and mobile oil in ports;
- ii) recovery of bulk oil from the shoreline north of Beirut;
- iii) protection, wherever possible, of uncontaminated sensitive areas;
- iv) cleaning of contaminated sensitive areas; and
- v) aerial survey and recovery of oil still at sea.

These priorities in the generation are fully endorsed by the Group of Experts. Three of these (i, ii, iii) will be specific sources in the generation of oily waste and debris, the handling and destination of which has to be established.

2.2 GENERIC TECHNICAL GUIDELINES

2.2.1. Timing of the response

Some difficulties will be encountered due to the unavoidable delay in implementing clean-up operations. These are identified as follows:

- i) According to information received by REMPEC, vacuum trucks are being successfully used in the two priority areas identified by MoE Lebanon. The observation that the oil appears to be mobile and could be pumped is unlikely to be valid for more than a few days. In addition, experience indicates that the use of the available equipment, which are wastewater septic pumps based on a centrifugal pumping systems, are only suitable for relatively low viscosity materials. Vacuum trucks should remain a viable option for a longer period, as the oil weathers, but it may soon become necessary to use heavy oil skimmers and pumps. It is important to recognize that the majority of the necessary resources to support the clean-up, such vacuum trucks, trucks, front end loaders, etc., will likely come from local or national sources.
- ii) Photographs suggest that through the use of short lengths of boom to contain and concentrate the oil trapped in the harbours, substantial quantities of oil could be recovered using vacuum trucks and pumps while the oil is still mobile. If sufficient resources are available it may also be possible to extend the technique to other areas where oil is pooled along the coast and in other ports and harbours. Given the estimates received of substantial quantities of pooled oil, it is recommended that the priorities are re-evaluated in the course of action to make recovery of this bulk and potentially mobile oil a priority, ahead of oil stranded on beaches which is much more likely to remain in place. On the other hand, if the mobile oil is not recovered and the cleaning of resort beaches is followed as a second priority, mobile oil is likely to move and re-contaminate areas which have already been cleaned.
- iii) The nature of the oil and the associated problems of conducting the clean-up will change markedly over time situation with time. For example some of the photographs already show emulsified oil and, with time, we can expect the oil to become much more viscous and also to mix into the sediment on sandy beaches. This point to a continually evolving scenario, demanding a move, for example, from vacuum trucks and pumps to mechanical grabs as the oil becomes more viscous.
- iv) A decision will need to be made on the temporary storage and disposal routes for oily waste and debris. The availability of some 9000 square metres of temporary storage is noted, but caution that the selected disposal routes will have a bearing on the nature and efficiency of the clean-up operations.

The priorities proposed hereunder are likely change over the course of implementation of the plan, depending on the points outlined above and also taking into account how the situation will continue to develop over time, based on factors such as changes in drifting of oil still at sea or site accessibility.

2.2.2 First priority

In agreement with MoE Lebanon, it is recommended that the focus for spill response is shore-based. The main concentrations of collectable oil are held in pockets along the coast and are readily accessible using a land-based approach. A month has elapsed since the first release and oil in the open sea will be becoming increasingly fragmented making mechanical recovery progressively less effective.

Type of operations	Means needed
1. Response techniques, information and training	Provision of technical manuals and training to national response staff.
2. a) Aerial survey	Plane or helicopter survey as soon as possible.
b) Site surveys	Oil pollution expert, logistics for transportation.
3. Response to offshore drifting oil slicks <u>after aerial means confirmation of presence and location</u>	Specialized vessels for oil recovery (due to oil nature, chemical dispersion) are not recommended. The use of vessels such as local fishing boats with booms, storage equipment and onshore means to collect oil are sufficient. If the oil, in any quantity, is sufficiently emulsified, fishing boats could be employed (as they were used in the PRESTIGE incident in both France and Spain) to recover oil from the sea surface manually using scoops and then deposited into large bags on the deck.
4. Protection of sensitive sites not already contaminated	Containment and strandable booms, with associated means (e.g. small craft for boom deployment, anchorage means, communication devices...).
5. Recovery of floating oil in ports and confined areas and pooled oil in any area	Local vacuum trucks, booms, skimmers and pumps, low pressure water pumps, hoses and adequate nozzles, storage and settling equipment, means to store and evacuate pollutant for treatment (in refinery).
6. Recovery of the bulk of oil on major amenity beaches or important tourist sites	Manual recovery: human resources, scoops, machinery to evacuate collected oil. Mechanical recovery: various machinery such as front end loaders, oleophilic rolls, screening machines (depending on the accessibility, nature of substrate and pollution degree). Both recovery means: temporary waste storage and means to transport waste to treatment facility(ies).

2.2.3 Second priority

Type of operations	Means needed
1. Recovery of stranded oil in sediments (sand, pebbles)	Low pressure water pumps, hoses and nozzles, booms, skimmers, storage and settling equipment to recover oil released if flushing needed and means for waste treatment. Machinery to push down oiled sediments into the surf zone if surf washing appropriate. In or ex-situ washing (e.g. cement mixers for pebbles washing with adequate containment and recovery devices).
2. a) Clean up of ports	High pressure flushing, with adequate containment and recovery devices.
b) Clean up boats	Cleaning products, rising means, waterproof washing platform, pump and storage tank for recovered oily waters.

3. Clean up of secondary tourist sites and amenity beaches	Same as for item 6 in first priority table.
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2.2.4 Third priority

Type of operations	Means needed
Final cleaning	High pressure flushing: pumps, hoses, skimmers, boom (containment and strandable), storage means. Assistance to or monitoring of natural restoration.

2.2.5. Comments

- i) Standard of clean-up to be achieved will be decided by the group during the course of operations.
- ii) It will be impossible to undertake cleaning of all polluted sites at the same time. On the basis of a 300-person workforce, a maximum of about 30 cleaning sites could be opened at the same time.
- iii) Personal protective equipment and means to protect non-polluted or sensitive areas from trampling are needed in all coastline operations.

2.3 WASTE STORAGE, TRANSPORT AND DISPOSAL

Solutions will be dependant on the type of wastes collected and it must be accepted that logistical problems may arise concerning the transport of waste to storage and treatment sites.

Possible treatment solutions to be considered are:

- i) burning in refinery, applicable to liquid waste (based on information received from MoE Lebanon).
- ii) use of lightly oiled sediment in road construction or other public works, eventually after neutralisation (e.g. quicklime treatment) and if quantities and locations are adequate with shore erosion considerations.
- iii) burning of protective clothing, and other oiled plastics and equipment, including sorbents.

2.4 NEEDS AND OFFERS FOR EQUIPMENT AND SERVICES

2.4.1 Needs assessments

Whereas it may be of importance to provide potential donors with full lists of equipment needs, experience from such incidents shows that actual needs are best established by technical experts on site.

MoE Lebanon and the MPCA Team have already identified some specific equipment needs, listed in the table below :

TYPE OF EQUIPMENT NEEDED	QUANTITY	AVAILABLE
Rubber boots	4000	2776 (SPAIN)
Gloves (pair)	4000	
Waders	4000	
Paper suits	4000	
Skimmers (incl. Pumps, hoses and power packs)	4	2 (SPAIN)1 (FRANCE)
Reservoir (storing facilities)	100	1 (FRANCE)
Hand tools for beach and rock cleaning (set)	500	60 (NORWAY)
Shovels	500	770 (SPAIN)
Booms (meter) with matching equipment	2500	500m (FRANCE)1500m (SPAIN)
Pumps (for handling recovered oil)	10	1 (FRANCE)
High pressure cleaners (for hot water)	20	4 (FRANCE)
Sand cleaning machines	2	
Rock cleaner	2	

2.4.2 Offers received

Following correspondence issued by REMPEC to all the Contracting Parties to the Barcelona Convention requesting assistance for the Government of the Republic of Lebanon, as of 24 August, the following replies were received

COUNTRY	RESPONSE	DATE
ALGERIA	YES – BY EMAIL – Algeria is awaiting recommendations from REMPEC to decide on what kind of assistance could be provided.	26 July 2006
CYPRUS	YES – BY FAX – Cyprus confirmed that its Government is ready to provide assistance to Lebanon; – Cyprus forwarded to REMPEC the list of equipment and products that can be made available, including relevant costs.	26 July 2006 11 August 2006
EGYPT	YES – BOTH BY EMAIL AND FAX – the Egyptian Environmental Affairs Agency (EEAA) offered its “full technical expertise support as soon as the situation permits” ; – EEAA stated that it has “ a fully equipped Tier 2 response centre situated in Sharm El Shiekh with the availability of the four Egyptian General Petroleum Corporation equipped Tier 2 response centres situated at Alexandria, Suez, Ras Garib and Hurghada and the services and expertise of the “Petro Environmental Services Company - PESCO” contracted by EEAA for the response and management of oil pollution incidents. PESCO is managing the “entire tier 2 Egyptian stockpiles”; – PESCO ready to provide 3 experts (1 co-ordinator, 1 on scene commander, 1 beach master) for a term of one month and shall meet all costs associated with the activities.	01 August 2006 23 August 2006

COUNTRY	RESPONSE	DATE
EC	<p>YES – BY EMAIL</p> <ul style="list-style-type: none"> – Assistance provided by activating the Monitoring and Information Centre operating within the framework of the EC’s Civil Protection Co-operation Mechanism (EC/MIC); – EC/MIC transmitted the call for assistance received by REMPEC to the countries participating in the Civil protection mechanism – EC/MIC activated the international charter on space and major disasters to obtain images of the area affected; – EC/MIC deployed two teams of experts to Beirut to assess the situation on site and assist in response operations; – Following a request of REMPEC, EMSA provided information on the status of the response vessel stationed in Malta; – Financial assistance for environmental restoration is under consideration. 	<p>25 July 2006</p> <p>17 August 2006</p>
FRANCE	<p>YES – BY FAX</p> <ul style="list-style-type: none"> – offered contribution, through CEDRE, to the necessary preparatory work required to define response strategies; – organized an aerial survey to identify oil slicks; – dispatched an expert from CEDRE to Lebanon to facilitate – co-ordination of clean-up operations on behalf of REMPEC; – dispatched pollution response equipment to Lebanon by sea; – 9 experts will reach Beirut on 27 August 2006 to train Lebanese responders on use of the equipment. 	<p>28 July 2006</p> <p>20 August 2006</p> <p>23 August 2006</p> <p>24 August 2006</p>
GREECE	<p>YES – depending on the oil spill development in the region BOTH BY EMAIL AND FAX</p> <ul style="list-style-type: none"> – originally (fax dated 1 August 2006), Greece was considering assistance to Lebanon once the hostilities in the area ceased; – taking into consideration the assistance offered to and accepted by the Government of Lebanon by Norway and Denmark, Greece stated that it would “offer new pollution means and equipment of approximately 110 cubic meters volume and current value of 166.000,00 EURO to the Government of Cyprus, provided that such offer will be needed, according the future development in the region and following an official request from the Government of Cyprus” (fax dated 11 August 2006). 	<p>01 August 2006</p> <p>11 August 2006</p>
ITALY	<p>YES – BY EMAIL</p> <ul style="list-style-type: none"> – offered naval means and clean-up equipment; – awaiting for instructions regarding modalities and timetable for sending above mentioned means and equipment; – a task force of 5 environment experts was dispatched to Lebanon between 21 and 23 August 2006. 	<p>14 August 2006</p> <p>23 August 2006</p>
MOROCCO	<p>YES – BY FAX</p> <ul style="list-style-type: none"> – Morocco will definitely assist Lebanon once the needs for necessary personnel and equipment are assessed; – The National Commission for the response to pollution met on 02 August to review all forms of assistance that Morocco, could make available; – In order to guide the National Commission, Morocco is awaiting information on the needs. 	<p>10 August 2006</p>

COUNTRY	RESPONSE	DATE
SPAIN	<p>YES – BY FAX</p> <ul style="list-style-type: none"> – assistance to be provided when situation safe; – assistance proposed in framework of the joint action of EU; – assistance made available in the form of 3 containers of equipment (booms, skimmers, etc.) from SASEMAR (The Spanish Maritime Safety Agency) and 1 container (boots, shovels, etc.) from AECI (Spanish International Co-operation Agency). Equipment will be dispatched when adequate transport is available. 	<p>28 July 2006</p> <p>18 August 2006</p>
SYRIA	<p>YES – BY FAX</p> <ul style="list-style-type: none"> – assistance can't take place immediately since Syrian authorities are in stand-by after the shorelines were affected by tar balls; however – will put their “capabilities at the disposal of the Lebanese Government as soon as the circumstances allow”. 	<p>30 July 2006</p>

Note:

- 1) Slovenia is providing expertise through the Ljubljana Faculty of Maritime Studies and Transportation to the Joint Research Centre of the European Commission.
- 2) Cyprus is providing forecasting models and remote sensing satellite pictures to REMPEC's Group of Experts through the Oceanography Centre of the University of Cyprus.

A large number of offers from service companies and contractors has also been received by REMPEC. Due to the large and continuously growing numbers of companies from around the world that have offered their assistance, this information is constantly being updated and has therefore not been included in the present plan. The list of offers is, however, being maintained and continuously updated by REMPEC.

PART 3: COST ESTIMATE

3.1 PRINCIPLES

At the present time, all members of the expert group are contributing in-kind, out of their own core financing. There is an urgent need to complement this by a first source of external financing. This raises the question of the expected costs associated with the clean-up operations as outlined in the present plan.

Clean-up operations supported with adequate equipment and manpower mobilization cannot wait for a precise assessment of overall clean-up costs. It is therefore proposed that:

- i) technical assistance and equipment needs be identified, as a first step for the short-term phase according to the priorities of the clean-up plan, and to seek immediate and firm commitments from donors; and
- ii) to globally assess the initial envelope of expected costs on the basis of previous spills of the same magnitude in the area, and to approach donors accordingly.

As a first step, part of this envelope has been submitted to the UN Flash Appeal with the remaining to be put forward as part of the National Emergency Recovery Plan for Lebanon

3.1.1. Short-term assistance

Whilst it is vital that the issue of funding is addressed, it should be noted that much can be achieved using local resources, starting small and later scaling up as appropriate. It is premature to speculate about final costs when the real issue now is simply to get an active response underway, which can be done with comparatively modest funding.

3.1.2. Global estimate of overall costs

MoE Lebanon has made a first estimate of overall costs in the range of USD 137 million to USD 205 million, based on model costs per tonne spilled. Such approach may be considered disputable. However, it can be compared with actual costs incurred in similar situations.

One example is the Haven incident which occurred in 1991 off the coast of Italy. The incident involved a cargo of 133 000 tonnes of oil that led to spillage at sea of between 10 000 and 20 000 tonnes of crude oil near the Genoa coast and resulted in the contamination of numerous areas of the Italian Liguria and French Provence coasts. Eighty million Euros were spent by Italian and French authorities on clean-up operations, 50 million of which were deemed compensable under IOPC Fund rules⁶. Another example is the Erika incident off the French Atlantic coast in 1999, spilling 20 000 tonnes of heavy fuel and generating response costs estimated by the French authorities at 140 million Euros.

In the present circumstances, the USD 137 to 205 million cost assessment of MoE Lebanon can be considered as an upper limit and the Euros 50 million compensated in the Haven incident can be considered as a minimum value. As a consequence, we propose that the search

⁶ Sources : IOPC Fund annual reports 1991 to 2004

for funding be based on an initial amount of Euros 50 million for 2006, with a possible additional funding requirement for 2007.

3.2. PRIORITY NEEDS

In-kind international and bilateral contributions and donations provided or committed at this stage are given in the table as follows:

Source	Delivery	Value
IMO/REMPEC	<p>Provided :</p> <p>General project co-ordination, fielding of expert in Syria</p> <p>Co-financing of an expert from Canada whom being seconded to REMPEC</p> <p>Expected: Continuous support and co-ordination of the current and future action for the clean-up operation and rehabilitation of the Lebanese coast lines</p>	Not stated
UNEP/OCHA	<p>Provided: Global project co-ordination in close cooperation with IMO, fielding of expert in Syria and Lebanon</p>	Not stated
UNDP/UNEP	<p>Provided : Environmental updates of potential impact, on-site assistance by local representative, financing of team of 10 national experts for sites surveys</p> <p>Expected: Commitment to provide US \$ 200 000 for spill response</p>	US \$ 200 000++
Norwegian Government	<p>Provided : Oil pollution response equipment</p>	Not stated
Canada	<p>Provided: An oil spill response expert is being seconded to REMPEC for a five week period to assist the Centre in the coordination of the spill –</p> <p>Expected: Financial and in-kind support is under consideration.</p>	Not stated
Germany	<p>Expected: Following a request from the Government of Lebanon, a fact finding team composed of three experts from the German Central Command for Maritime Emergencies (CCME) is expected to arrive in Lebanon on 26 August 2006</p>	Not stated
US Government	<p>Expected: The US Government has expressed its willingness to assist Lebanon by providing equipment, personnel and financial support</p>	Not stated
IUCN	<p>Provided: Experts on site to assist Lebanon in the response operations</p>	Not stated

ANNEX I - Sites visited and main priorities

List of sites impacted by the oil spill – Lebanon (10/08/2006) transmitted by MoE Lebanon - July 18, 2006 – August, 09 2006-08-14

Table completed with measurements of sites (on the basis of Google earth maps and hypothesis of volumes (CEDRE))

Main clean-up priorities

Site N°	Name	Coordinate N	Coordinate E	Type	Open/ confined	opening/ booms (m)	Length (km)	Area (m2)	Volume e=0,1m (m3)	Volume e=0,5m (m3)	MoE Priorities
1	Jyeh	33°38'58.07"	35°23'59.88"	Sandy/ <i>facilities</i>	Open		1,5				
2	Rmaileh	33°39'09.83"	35°24'53.17"	Sandy	Open		1,7				
3	Damour	33°42'01.91"	35°26'23.91"	Sandy	Open		4,4				
4	Ramleh Baida	33°52'14.45"	35°28'52.48"	Sandy	Open		1,4				
5	Movenpick	33°53'00.23"	35°28'21.19"	Rocky/ <i>harbour facilities</i>	Confined	27		14 000	1 400	7 000	
6	Sporting	33°53'35.02"	35°28'01.81"	Rocky	Confined	<15		750	75	375	
7	Raouche (fishermen)	33°53'12.85"	35°28'17.07"	Rocky	Confined	15		1400	140	700	
8	Long Beach	33°53'38.47"	35°28'01.48"	Rocky	Confined	70		5600	560	2 800	
9	Tabarja	34°01'06.61"	35°37'25.74"	Rocky	Open		0,5				
10	Byblos sandy beach	34°06'04.89"	35°39'02.46"	Sandy	Open		1,7				
11	Byblos port	34°07'17.96"	35°38'36.12"	Rocky/ <i>harbour facilities</i>	Confined	28		5500	550	2 750	
12	Byblos sur mer (marina)	34°07'21.20"	35°38'31.57"	Rocky	<i>Confined/ open</i>	40		1000	100	500	
13	Byblos gravel beach	34°07'23.50"	35°38'34.90"	Gravel	Open		0,7				
14	Batroun	34°13'41.40"	35°39'19.09"	Sandy	Open		2,5				
15	Batroun bay	34°15'08.22"	35°39'25.12"	Pebbles	Confined	250m		22 000	2 200	11 000	

Site N°	Name	Coordinate N	Coordinate E	Type	Open/ confined	opening/ booms (m)	Length (km)	Area (m2)	Volume e=0,1m (m3)	Volume e=0,5m (m3)	MoE Priorities
16	Heri (Rocca Marina)	34°18'26.98"	35°42'00.66"	Rocks/sea walls	Open/ Confined	undefined		10000	1 000	5 000	
17	Saint Antoine	34°18'18.82"	35°42'06.93"	Sandy/Sea walls /rocky	Open /Confined	50		1000	100	500	
18	Blue Beach	34°18'22.52"	35°42'36.17"	Sandy	Open		0,7				
19	Chekka	34°18'41.34"	35°42'56.00"	Sandy	Open		1,7				
20	Ras El Sakhr & Mina Public Beach	34°??'47.25"	35°49'14.76"	Rocky	Open		undefined				
21	Ras Maska-Bahsas	34°25'10.16"	35°49'13.83"	Sandy	Open		1				
22	Al Zreira (Borders of Kfarabida)	34°14'38.68"	35°39'37.19"	Rocky+pebbles/sandy	Open		0,2				
23	Sawari Beach	34°14'48.86"	35°39'31.61"	Sandy	Confined	50		3500	350	1 750	
24	Saint Stephano Beach	34°14'53.30"	35°39'28.81"	Rocky	Confined	23		3000	300	1 500	
25	Aqualand	34°14'55.81"	35°39'29.08"	Rocky	Confined	27		500	50	250	
26	National Center for Marine Sciences	34°15'04.37"	35°39'23.41"	Rocky/sand	Open		0,2				
27	Phoenician Wall	34°15'10.89"	35°39'21.58"	Rocky	Open		0,5				
28	Fishermen Wharf Batroun	34°15'27.68"	35°39'26.60"	Pebbles	Confined	40		6000	600	3 000	
29	Al Ghalaghili Beach	34°15'53.83"	35°39'31.12"	Rocky	Open		1				
30	Palm Island	34°27'43.31"	35°48'01.48"	Sandy	Open		undefined	undefined			
								Total	7425	37125	

ANNEX II – Timeline for implementation

2006	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
SHORT-TERM										
1. Aerial survey										
2. Technical support & advice										
3. Training										
4. Co-ordination set-up, logistics and waste disposal										
5. Pollutant characterisation										
6. Clean-up										
MEDIUM-TERM										
1. Recovery of mobile oil in ports, confined areas, economic or social strategic sites and heavy polluted sites										
2007 - 2008	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Jul
LONG-TERM										
1. a detailed impact assessment of the consequences of the spill, based on internationally accepted standards										
2. strengthening of the national system in Lebanon including: a. the development of relevant national legislation										

<ul style="list-style-type: none"> b. the implementation of appropriate administrative arrangements c. designation of competent national authorities d. definition of roles and responsibilities e. establishment of a national emergency committee f. a national contingency plan and related regional, local, public and private sector plans g. capacity building, including training h. assessment of public and private oil spill response equipment and identification of related needs, i. development of sensitivity mapping and oil spill modelling capability 										
<p>3. the development of bilateral/trilateral agreements amongst neighbouring countries for oil pollution preparedness and response</p>										

ANNEX III - List of Acronyms

CEDRE	Centre of Documentation, Research and Experimentation on Accidental Water Pollution
EC JRC	European Commission Directorate General Joint Research Centre
EC MIC	European Commission Monitoring and Information Centre
EEAA	Egyptian Environmental Affairs Agency
EMSA	European Maritime Safety Agency
ESA	European Space Agency
EU	European Union
ICRAM	Istituto Centrale per la Ricerca scientifica e tecnologica Applicata al Mare
IMO	International Maritime Organization
IOPC	International Oil Pollution Compensation Funds
ITOPF	International Tanker Owners Pollution Federation
MoE Lebanon	Ministry of Environment of Lebanon
MOIG	Mediterranean Oil Industry Group
MPCA	Marine Pollution Co-ordination and Assessment
OPRC/HNS	Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances
PESCO	Petro Environmental Services Company
REMPEC	Regional Marine Pollution Emergency Response Centre
UN OCHA	United Nations Office for the Co-ordination of Humanitarian Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNEP/MAP	United Nations Environment Programme / Mediterranean Action Plan