Progress report n°1 – EU-RESPIL – period covered: 01/02/2007 → 01/07/2007

***Grant agreement N°*07.030900/2006/448357/SUB/A3 –** "Response means to chemicals spilled at sea and environmental damage"**.**

Main milestones for the period covered:

- January 31, 2007 – First plenary kick-off meeting in Brussels for all projects supported by the commission within the marine pollution 2006 framework and civil protection. CEDRE is present on behalf of IRIS. A first presentation is made.
- Mars-April, 2007 – Implementation of the work related to task ID A.2 – Selection of chemicals and review of the corresponding existing data.
- April, 2007 – First video conference meeting between IRIS and CEFAS (UK). The meeting is about the subcontracted analytical work related to task ID A.3 and A.4.
- April, 2007 – Second video conference meeting between IRIS and UBO/LEMAR about work management in task ID A.4. "*In situ* validation using a pilot mesocosm study".
- April 23, 2007 – Second kick-off meeting in Brussel between IRIS and commission.
- April 23-June 05, 2007 – Technical implementation of the work related to task ID A.4. The work is carried out in the Bay of Brest (France) under supervision of CEDRE. UBO/LEMAR actively participates to the implementation

Summary of research activities during the period

1. Task ID A.2. Selection of chemicals and review of the corresponding existing data - In order to appraise the environmental state after a chemical spill, a first step includes selecting some chemicals substances posing a large risk to the marine environment. Risk is related to the probability of *occurrence* (based on the chemical substances frequency within the European Union Maritime Waters), *severity of the impact* (based on the chemical substance dangerousness and the quantity transported) and the *vulnerability* (based on the location sensitivity associated with the chemical behaviour. All of these parameters were taken into account for choosing the most appropriate chemicals for this task. Annexe 1 shows the selection of chemicals, together with some properties, retained for this project. The task is completed. It was done under the responsibility of Cedre and Emilie Sinet, a master student at IRIS.

2. Task ID A.3. Experimental study in laboratory-controlled conditions. No activity conducted yet in this task. This task is planed to start in autumn 2007. The conduction of the experiments will most likely end at the end of the year 2007. IRIS will be responsible.

3. Task ID A.4. *In situ* validation using a mesocosm study. Project partners at Cedre and UBO/LEMAR were involved in this task. LEMAR was in charge of running assays to detect contaminant-induced immuno-modulation in experimental mussels exposed in floating mesocosm cells operated by partner CEDRE. In addition, LEMAR has been in charge of processing samples to be further analysed by other partners.

Two trials of acute exposure to chemicals were performed with molecules selected in task ID A.2: ethyl benzene and iso-propyl benzene (=cumene). The mussels were caged for 5 days in the mesocosm cell (exposure) and the cage was thereafter transferred in the neighbourhood for 2 additional weeks (recovery). Samples were collected at T0, 3 days (T3), one week (T1W) and 3 weeks (T3W). After transfer in the laboratory (LEMAR), the mussels were immediately processed as described below:

Sub-sample#1 (n=15)

"blood" parameters
•Total hemocyte counts (UBO)
•Hemocyte mortality (partner UBO)
•Cell membrane alteration (CEDRE)
•Phagocytic activity (UBO)
•O2-dependent microbicidal mechanisms (UBO)
•Phenoloxidase activity (subcont. La Rochelle university)
Tissue observations
•Histopathology/Histochemistry (subcont. CEFAS, IRIS)
Endocrine effect
•Vtg-like proteins (to be subcont.)

Sub-sample#2 (n=15)

Physiology
•Condition Index (UBO)

Sub-sample#3 (n=5)

Chemical analyses (CEDRE)

Sub-sample#4 (n=5)

•Genetic identification (subcont. CEFAS)

hemolymph withdrawal from a mussel (photo UBO)

4. Task ID A.5. Dissemination of data and input to EU guidelines for chemical responses following spill. The relative lack of tools for aiding interpretation of pollutant effect biomarker data has been a major limiting factor in the adoption of biomarkers in EU guidelines. Presently, the need and demand from regulators for a broader diffusion of the ability to understand and interpret biomarkers responses in the shape of simple and effective tools are manifest. In the face of this pressure scientists already started to make efforts in this direction.

As part of this project, an attempt to review existing analytical tools for aiding interpretation of biomarker responses to pollution and to assess their applicability for data derived from RESPIL project has been made. This approach will be derived from the on-going PRAGMA project. Hence, the two projects will benefit clearly of each other. This task is conducted in two parts; a first section consists of a theoretical review and appraisal of some of the most recent analytical methods based mostly on scientific literature, and a second section consists of the trial of several of these reviewed methodologies with data obtained from existing monitoring surveys and data already obtained in the course of RESPIL and PRAGMA. The task is conducted presently by IRIS (part of Emilie Sinet Master Degree) but all partners involved will later contribute.

Ongoing and planned activities

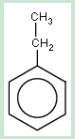
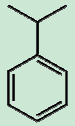
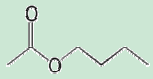
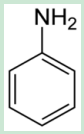
- Website page for RESPIL under creation (IRIS)– Should be opened in September 2007
- Laboratory analysis of cells and tissues from task ID A.4 mussels are in hand and results will be included in next progress report. Samples collected during task ID A.4 to be sent to IRIS and CEFAS for analyses (histochemistry/histopathology in tissues)
- Planning and discussions between partners for implementation of task ID A.3 at IRIS facility: inter-calibration exercise planned in September 2007 and technological transfer to partner IRIS for hemolymph processing.

Financial summary

IRIS received from the European Commission 88.892, 40 euros (60% of the amount granted by EC).

For the period reported, the total project eligible cost is 82.590,17 euros (see detailed per partner in attached documents).

Annexe 1 – Selection of chemicals made in RESPIL (Task ID A.2)

			GESAMP										
Nom	Chemical structure	SEBC Code	A	B	C	D	E	Mar-pol	Solubility g/100mL	Trafic Rank	Half-life in solution	BCF estimated from log kow	Acute Aquatic toxicity LC_{50}
Ethyl benzene		**FE**	0	**3**	1	I	XX	Y	**0,015**	**41**	Half-life in marine mesocosm (Wakeham et al., 1983): •Spring (8-16°C): **20 days** •Summer (20-22°C): **2.1 days** •Winter (3-7°C): **13 days**	**Low** in aquatic organisms. BCF: 2.16	•*Daphnia magna* (24 h): **2.2** mg/L •Mysid shrimp (96 h): 5.1 mg/L
Cumene		FE	T	**3**	1	I	X	Y	**0,0074**	80	Half-life in an aerobic freshwater sediment/water test system (Williams et al. 1993): **2.5 days**	**Slight potential** to bioaccumulate in fish. BCF: 356	•*Daphnia magna* (24 h): **4.8** mg/L •Mysid shrimp (96 h): 1.2 mg/L
n-Butyl acetate		**FED**	0	**2**	0	I	X	Y	**0,70**	68	Half-life at 20°C (HYDROWIN model US EPA, 2000):•at pH 9 **11,4 days** •at pH 8 **114 days** •at pH 7 **3,1 years**	**Unlikely** to be bioaccumulated. BCF for fish: 14	•*Daphnia magna* (24 h): **72,8** mg/L •Brine shrimp (24 h): 150 mg/L
Aniline		**FD**	0	**3**	2	II	XX	Y	**3,4**	**24**	**Short** half-life (i.e., up to a few weeks)	**Low** bioaccumulation potential	•*Daphnia pulex* (48 h): **0,1** mg/L