



## BIOREM

### Bioremediation of oil spills in Vietnam

## *BIOREM – The Project in brief*

**Title:** Development of guidelines, for the bioremediation of shorelines contaminated by marine oil spills, for Vietnam

### Introduction:

Vietnam, located in the Southeast Asian region, has about **3,400 km of coastline**, over 3,000 islands and more than 1,000,000 km<sup>2</sup> of exclusive economic sea zone, including approximately 700,000 km<sup>2</sup> of shelf area (to 200 m depth under the sea level).



**Vietnam is highly vulnerable to oil spills** as the activities of oil exploration and transport have expanded parallel with the economical development of the country since 1990. Vietnam has been identified as a medium priority market for the oil and gas sector. Vietnam's annual oil and gas production increased rapidly and reached 16.8 millions tons/a respectively 1.6 billion m<sup>3</sup>/a.

The aim of the project is to promote **effective and efficient oil spill response** and contingency planning specifically for Vietnam, in particular decision-making on and **implementation of bioremediation** of contaminated shorelines.



### The Asia Pro Eco Programme:



This Programme was dedicated to promote sustainable solutions to environmental problems in Asia. It was launched in 2002 as an initiative by the European Union (EU) to strengthen the environmental dialogue between Europe and Asia. This five-year programme, which has a total budget of EUR 31.5 million, aims to provide support to European and Asian organisations to enable them to share strategies, advanced technologies and know-how in addressing Asian environmental issues.

Please see: [http://europa.eu.int/comm/europeaid/projects/Asia\\_Pro\\_Eco/index\\_en.htm](http://europa.eu.int/comm/europeaid/projects/Asia_Pro_Eco/index_en.htm)

### Specific Objectives of the Project:

- 1) Development of guidelines:  
The specific objective of the project is to develop practical oriented guidelines, specifically for Vietnam, on decision-making and implementation of exsitu- and insitu bioremediation of contaminated shorelines. The guidelines will integrate all relevant aspects, incl. environmental, technical, economic, socio-cultural and legal framework conditions.
- 2) Development of training material:  
The resulting guidelines will be the basis for the development of a practice oriented training module on response to oil pollution and the application of bioremediation to marine oil spills in Vietnam. The results will be integrated into the curricula of the participating universities.



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#### 3) Workshop and Training course:

The guidelines will be presented to an interdisciplinary circle of Vietnamese decision-makers and stakeholders who are directly and indirectly involved in response to oil pollution, bioremediation and coastal zone management. The objective is to promote bioremediation as an option for secondary oil spill response and its implementation in contingency planning. A two-day training course will be carried out, to train professionals in understanding the scope and the application options of the guidelines.

#### 4) Dissemination:

The resulting guidelines and training material will be widely disseminated, e.g. free of charge worldwide via this project web-site ( [www.bioremediation.hs-bremen.de](http://www.bioremediation.hs-bremen.de) )

#### Overall objectives of the Project:

- 1) Promotion of environmental awareness and a cleaner Vietnam by contributing to effective and efficient response to oil pollution and contingency planning in Vietnam by providing guidelines and training.
- 2) Contribution to the promotion of bioremediation which is, in many cases, a cost-effective and environmentally sound treatment option for contaminated sand, soils or sediment.
- 3) Contribution to facilitating networking, collaboration and cooperation between stakeholders in Vietnam and at an international level with European experts, by the transfer and exchange of knowledge through networked experience within the field of response to oil pollution and bioremediation.
- 4) Contribution to the promotion of an integrated planning, integrated coastal zone management and integrated waste management by considering specific treatment and utilisation paths for waste (e.g. contaminated sand), as well as socio-economic, environmental and health and safety aspects, when deciding on how to deal with oil pollution waste.
- 5) Contribution to a further integration of international aspects into higher education, in particular in environmental (or related) degree courses. This will contribute to the qualification of young professionals facing an increasing globalisation in terms of markets and careers.

#### Target group:

The target group had been an interdisciplinary circle of decision-makers, stakeholders, authorities, operating units, scientists etc., from Vietnam, who are directly and indirectly involved in oil spill response or bioremediation.

The Guidelines are developed under particular consideration of the framework conditions in Vietnam, providing a wide range of background information for this country. **However the major parts of the Guidelines are applicable for oil spill response activities in every country of Southeast Asia.**



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Project Consortium: 8 institutions from Europe and Vietnam



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- **Petro Vietnam Drilling and Well Service Company**, S.R.Vietnam  
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### The Result:

- Introduction to oil in general, oil spills and oil spill responds
- Description of general conditions and oil related information on Vietnam
- Information about treatment options of oily sand, soil and sediment
- Decision tree to choose the option of oil spill response (see Figure 1)

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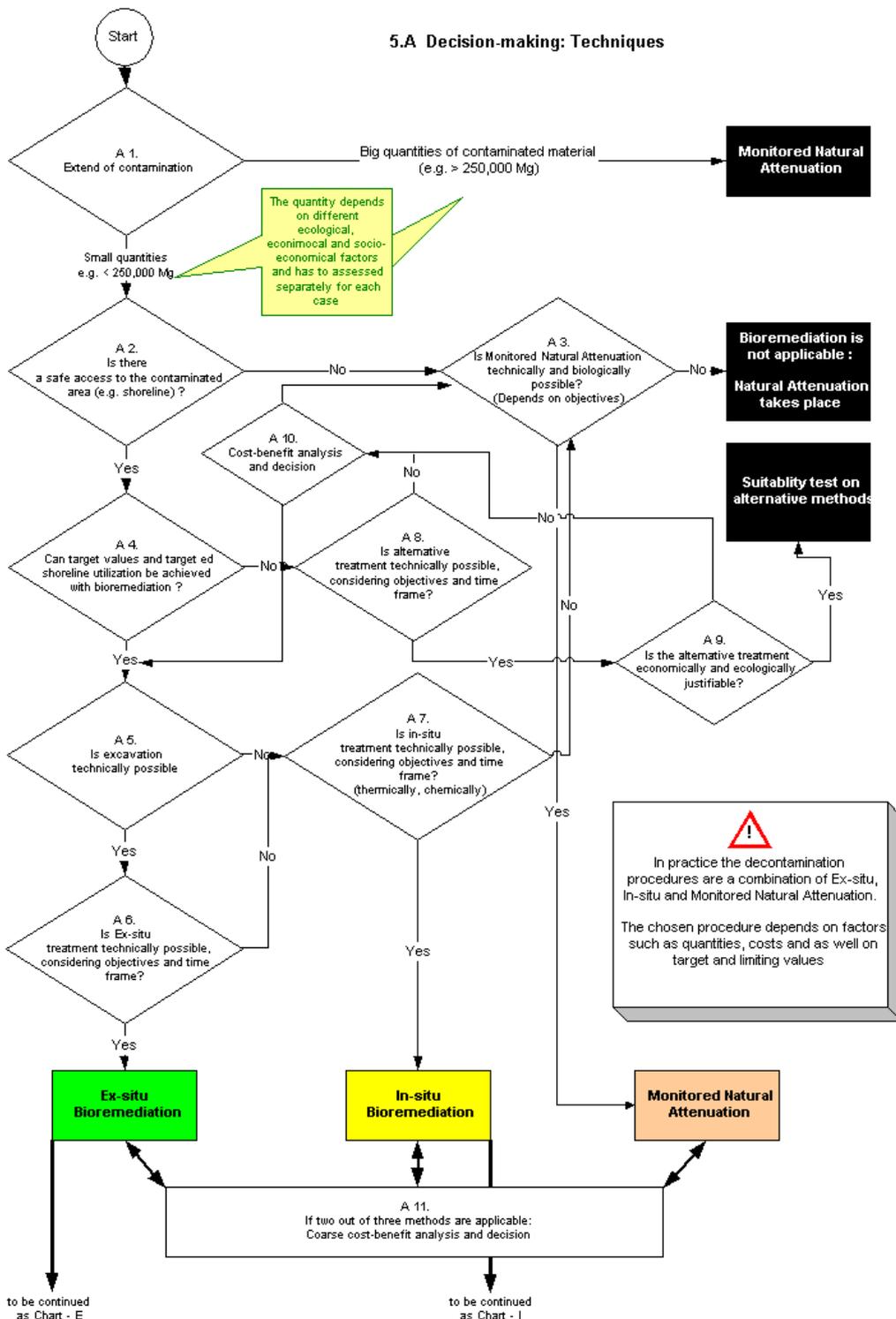


Figure 1: Partial decision tree to find an option for oil spill response

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