

**ENVIRONMENTAL RISK ASSESSMENT OF HYDROCARBON DIFFUSE EMISSIONS:
APPLICATION TO THE TARRAGONAS'S PORT MONOBUOY**

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Every port environment is special in their characteristics are determined by specific uses linked to different activities. Nevertheless, all of them have aspects in common: i) include water bodies classified as “heavily modified” according to the Water Framework Directive (WFD, 2000/60/CE), ii) bear an important number of urban and industrial contaminant sources produced either by ordinary activities or by accidents and, iii) endure contaminant events which reduces drastically the water quality.

Diffuse pollution, especially oil, is one of the most pervasive problems in port areas (loading and unloading of bulk, liquid fuel supply, navigation).

During lasts years, methodological proposals have emerged to assess risk in port areas (Darbra et al., 2004; Darbra et al., 2005; Peris Mora et al., 2005; Petrosillo et al., 2010; Grifoll et al., 2010). Many of these methods have qualitative approaches assuming certain subjectivity in the obtained results. Furthermore, risks analysis is a predictive tool which requires validation by studying of the real environmental effect. For this reason, it is necessary to analyze the response and status of biological communities potentially affected by studied sources.

Classification of contaminant events (by its dangerousness and quantity discharged material) is an important step to solve the data gap in order to perform and environmental risk assessment and mitigating the impact on the environment of activities developed in port areas. Moreover, characterization of contaminants events allows the application of specific numerical models for estimating the environmental risk of diffuse emissions. Finally, it is essential to know if the environment has recovered its initial conditions once a very dangerous contaminant event has occurred (Figure 1).

In this regard, it has been developed an Environmental Decision Support System (EDSS). The system is being applied to the Port of Tarragona, in the Mediterranean coast, with successful results. The system is based on a dynamic Web-based EDSS interface that allows the user interaction with a specific contaminant event data base and related library of documents. In addition, the contaminant event knowledge management is incorporated in the system through the use of Transact SQL and C# programming languages.

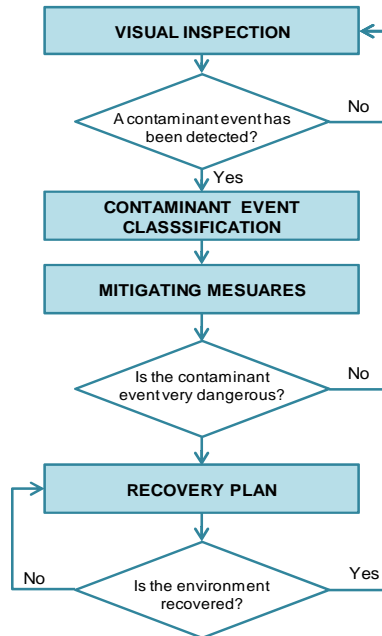


Figure 1. Methodological procedure to manage contaminant events in port areas.

The use of this information has led the application of specific numerical models for estimating the environmental risk of the Repsol monobuoy in the port of Tarragona.

This paper presents the results of the application of specific numerical models for estimating the environmental risk of the Repsol monobuoy in the port of Tarragona and, the analysis of the real impact in the environment by collecting samples and analyzing different physical, chemical and biological parameters.

The overall goal is to obtain a tool to assess the environmental risk of hydrocarbons diffuse sources based on the use of specific numerical models and validate it through the use of the real field data.

This will allow to distinguish the affected area of facilities or activities related with hydrocarbons within the port area and will enable port authorities: i) carrying out a proper management of the activities associated with these facilities in order to achieve their sustainable functionality; ii) planning and designing the facilities or building works based on probabilistic information obtained from validated models in the specific environment they occupy; and iii) applying predictive models to manage contaminant events.

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