Sustainable Soil Upgrading by Developing Cost Effective, Biogeochemical Remediation Approaches

FP7 Collaborative Project

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SEVENTH FRAMEWORK PROGRAMME

PRESS RELEASE

A promising breakthrough in soil remediation - the UPSOIL project findings

A shift in the land management concept from linear to land use cycling has been gaining priority across the EU Member States, especially in the context of the EU 2020 Strategy. At the same time, however, remediation of contaminated sites is still associated with large efforts and significant costs. Substantial improvement can be obtained by optimizing the three critical parameters that govern the efficiency of the cleanup processes: time, cost and sustainability - a new challenge for innovations in soil remediation.

This challenge has been taken by the project ***Sustainable Soil Upgrading by Developing Cost effective Biogeochemical Remediation Approaches*** (UPSOIL) - a collaborative research and development effort carried out by an international consortium composed of research and development units together with small and medium enterprises. The project is funded under the 7th Framework Programme of Research and Technology Development of the European Union. The goal of the UPSOIL project is to make a breakthrough in **in-situ (bio)chemical remediation for organic contaminants**, by developing **robust technologies for fast, cost-effective, integrated source zone and plume treatment** shall result in both allowable risk levels and maximal use of the natural soil rehabilitation potential at a longer term.

Our aim is to find out and demonstrate how to combine efficient decontamination with preserving the qualities and functions of soil, including biodiversity, at affordable costs. So far, the laboratory tests performed in the UPSOIL project have proven the soundness of our approach in attempting to couple biological and chemical remediation technologies, as well as associated techniques that we investigate such as improved injection system of reactants and development of coatings for chemical oxidants used in targeted injection. The results created an excellent starting point for trials of the approaches in upscale/field tests at the sites in Flanders (Belgium), Wegliniec (Poland) and Bruckl (Austria), which we initiated this year - says Nerea Otaegi Ariztimuño, the UPSOIL project coordinator.

A field test was performed in Flanders to demonstrate a newly developed injection system, which allows to inject reagents more efficiently in the contaminated areas of the subsurface. The novelty of the approach consists in combining the injection system with a measurement probe. The new injection system was successfully demonstrated and a patent application has been released. In parallel, the performance of an additional on-line monitoring system was tested and proven; its value for a wider application as a tool to control the remediation process will be further explored.

In combination with sound conceptual and mathematical modelling of the remediation process and its kinetics, on-line monitoring should aid the site operator in controlling the injection design and process, especially regarding volume and concentration of the injection fluid, stimulating the efficiency of the chemical reactions. Such decisions can lead to substantial cost savings and an increased effectiveness of the remediation process. The demonstrated approach seems particularly suitable for application at sites contaminated with chlorinated hydrocarbons.

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Since interaction with stakeholders plays a critical role in setting the UPSOIL activities into the context of practical applications, the results from field tests of the new injection system performed at the Flanders site were presented and discussed with the stakeholders at a workshop organised in Utrecht on the 19th of October 2011.

The interest shown by the stakeholders together with their feedback, give a clear indication of the application potential of UPSOIL technologies. Additionally, a clear message from the meeting was that the future work on smart in-situ remediation methods should focus even more on demonstration of the approaches.

It should be however indicated that the success in the market-uptake of the promising UPSOIL approaches does not rely solely on the scientific soundness of concepts or technical constraints. From a societal perspective, there is an urgent need for improved efficiency of administrative practices and a regulative climate that would better facilitate and stimulate the application of innovative, cost- efficient technologies. Only then their potential would be fully explored for the benefit of economy and the environment.

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Project fact sheet

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