



### **Summary description of project context and objectives**

HEISTT is a European collaborative project with the intention of creating an innovative system of injecting remedial chemicals into the subsurface for the purpose of treating contaminated groundwater. The proposed technology aims to develop a rapid and highly efficient method of application providing new cost efficiencies for this type of treatment and to provide a low barrier of entry for those wishing to apply it.

The idea for the HEISTT concept derives from the quick installation of multiple band drains which could similarly be deployed to include chemical treatment for the remediation of polluted groundwater plumes. Chemical treatment (such as oxidation and reduction technologies) is an established and successful remediation technology, nevertheless at individual sites it can become financially uncompetitive treatment option when specialist rig and relatively slow rates of drilling mean high installation costs. The HEISTT concept looks at providing proof of concept and early prototype for a unique rig which can be adapted to be mounted off a standard excavator arm, and rapidly installs chemical treatments into the subsurface. The increased installation rate, depth of hole and cost is anticipated to create savings enabling the technology to become both more widely accessible in terms of people able to use the technology and spectrum of sites which would become cost effective for treatment using the HEISTT system.

### **Description of work performed and main results**

At the beginning of the project a wide range literature view was carried to expand the scientific and engineering knowledge of the consortium and to pass on operational challenges from the SMEs to the Researchers. The literature review covered available technologies both within ultrasound and pile driving, including ultrasonic parameters, soil types, groundwater flow, along with the transport and fate of contaminants and remediation agents.

Understanding both groundwater flow and the degradation of the effectiveness of the remediation compound are key to the success of the project. For this reason, significant import has been given to the investigation and development of software modelling. A simple but powerful model, Visual

MODFLOW, one of the most complete and easy-to-use modelling environment for practical applications in 3 dimensional groundwater flow and contaminant transport simulations was selected for use due to its broad use within both construction and remediation industries.

A known contaminated site was chosen from literature to model for the project. Groundwater flow, contaminant transport and the physical removal of contaminant from the groundwater were studied under different scenarios based on soil types and characteristics. Different soil types were used to see the effects of transport, remediation, groundwater flow etc. As a result of this work it was concluded that every soil type and contamination can be modelled without problems and that the distance between injection wells can be determined in order to ensure that the treatment is applied to the contaminant zone efficiently and effectively. As the project moves into the field in year 3, the model will be further calibrated using the data gathered from trial sites.

#### **Expected final results and potential impacts**

It is anticipated that the proposed HEISTT system will represent a step change over existing in situ chemical deployment technologies with the potential to deliver:

- Order of magnitude improvement in speed of remediation treatment chemical installation
- Installation of 5 boreholes a day may be typical under conventional methods whilst up to 100 bore holes per day are proposed through the HEISTT system
- Reduced remedial treatment costs through more efficient use of treatment chemicals
- Simpler and safer installation of remedial treatment chemicals
- An increased rate of remediation through better distribution of treatment chemicals

**Project public website address:** [www.heistt.com](http://www.heistt.com)

**For further information please contact:**



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This basic flyer has been created to provide project partners with a basic hand out suitable for use at dissemination events and when attending conferences for research purposes. It is intended that the flyer will evolve with the project and a near market quality version will be available for the final dissemination effort.

## High Efficiency In Situ Treatment Technology

# HEISTT



**About**

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**The HEISTT Concept**

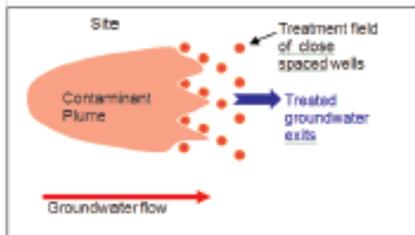
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**Project Aims**

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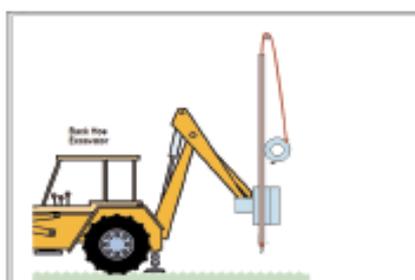
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- Simpler and safer installation of remedial treatment chemicals
- An increased rate of remediation through better distribution of treatment chemicals

*For more information please check the project website*



**Project Partners**

Belgium: The European Chemistry Industry Council (CEFIC); The European Committee of Environmental Technology Suppliers (EUCETSA). Estonia: Maves Ltd. France: Aftex Sarl; Sinaptec. Ireland: Regenesys UK Ltd. Italy: I.D.E.A. srl Tecnologie Ambientali. Romania: Technosam srl. Turkey: TUBITAK Marmara Research Centre - Project Coordinator. UK: UK Health and Environmental Research Institute (HERI); Contaminated Land: Applications in Real Environments (CL:AIRE); Dawson Construction Plant Ltd



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