

## DCEA - Department of Environmental Sciences and Engineering

### Coupling EK and nZVI for the remediation of contaminated soils

Center for Environmental and Sustainability Research  
Environmental assessment, monitoring and remediation  
Lab. 347 – Remediation Group



ELECTROACROSS



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## Objectives

The main research objective is to find out if coupling electrokinetics (EK) and zero valent iron nanoparticles (nZVI) can be an effective method for treating PCB contaminated soils. Therefore the scientific purpose of this project is to develop a deeper understanding of the mechanisms underlying the proposed technique, namely the electrokinetically enhanced transport of iron nanoparticles and the dechlorination of PCBs.

## Methodology

1. Study of the enhanced transport of zero valent iron nanoparticles under direct current in matrices with different porosities (model soils)
2. Coupling both remediation methods for PCBs dechlorination.
3. Numerical modeling of the processes involved.
4. Life Cycle Assessment of the remediation methods.

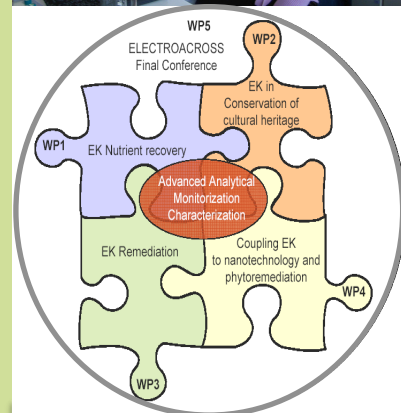
## Expected Results

Start and Completion Date: September 2011 to March 2014

Integrating both technologies, the role of direct electric current would be quite the opposite of the traditional one: instead of aiming at getting the contaminants out, it is used to get nZVI into the soil for *in-situ* transformation and subsequent destruction of the contaminants, namely PCBs dechlorination.

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ELECTROACROSS - “Electrokinetics across disciplines and continents: an integrated approach to finding new strategies to sustainable development



Partners in the ELECTROACROSS project



ELECTROACROSS visiting researcher at Lehigh University, USA (Sep 2011-Aug. 2012)