

**Abstract category**

EU Life as means for safeguarding and protecting environment and culture. Proposed by: Comin, Tolvanen  
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**Abstract presentation type**

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**Abstract title**

Using ISCO with perozone for the remediation of a cocktail of organic contaminants at an EX-rated industrial site in operation

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**Abstract text**

At an operational terminal a soil and groundwater contamination with chlorinated solvents, BTEX and volatile hydrocarbons is present. Given the different characteristics of the contaminants, remediation using traditional in-situ techniques would result in a time consuming and expensive process.

This project focuses on in-situ chemical oxidation (ISCO) as a cost and energy efficient and environmental advantageous remediation technology for in-situ remediation of complex contaminations in industrial and high risk areas.

Perozone, a mixture of hydrogen peroxide and ozone, is capable of oxidizing all types of organic contaminants. Since the presence of strong oxidants may cause major issues with regard to health and safety (H&S) on explosion sensitive (EX-rated) sites, the development of an extensive H&S plan and monitoring of H&S parameters during the remediation are of prime importance.

The remediation concept comprises an excavation of the source area outside the tank farm and ISCO by perozone of the plume area and the source area inside the tank farm. Process and H&S parameters and groundwater concentrations of the main constituents are monitored frequently.

So far one plume area has been treated successfully, regarding both H&S and the effectiveness of the ISCO. The treatment of the area around the former excavation is on-going. Significant ozone and VOC emissions have been measured and tests have been carried out to optimize the injection regime in order to minimize H&S issues. The remediation will probably be finished in 2016. The interim conclusion is that ISCO by perozone is a feasible remediation technology to treat a cocktail of organic contaminants in industrial and explosion sensitive areas. However a meticulous monitoring of process and H&S parameters is needed and injection regimes should be adjusted if pre-defined threshold values are exceeded.