

## Addressing Specific Thermal Aspects and Risks in Tendering In Situ Thermal Remediations

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**Background/Objectives.** In situ thermal remediation (ISTR) is a remediation technique that has become more and more widely used. It has its origin in the United States dating back to the 90s of the previous century. Several American suppliers of the technique made liaisons with European contractors to serve the European market which resulted in a number of closed remediations in several countries like Denmark, France, Luxembourg, The Netherlands and Belgium.

**Approach/Activities.** If an owner of an impacted site is planning to use ISTR for remediation, a tender procedure is usually started to get a competitive bid of a contractor. The performance of ISTR requires very specialized knowledge and experiences and problem owners or their consultant not easily take the responsibility and associated financial risks to make a detailed work specification as basis for a tender. So in most cases, the work is commissioned as a design and construct-like contract (lump sum turn-key contract).

Because of the design and construct character of the tender, the conditions under which the work must be designed have to be well-defined. Tendering of an ISTR requires special attention to thermal specific aspects such as heat, high electricity use, that are different from other in situ remediation techniques. Also financial risks associated with a thermal remediation work are highly specific and have to be allocated to either the commissioner or the contractor.

**Results/Lessons Learned.** Tauw has been involved in two closed ISTRs: one in France and one in The Netherlands. Another ISTR in Brazil is currently in operation and another, large, remediation in France is in preparation.

In our presentation we will focus on the way client and consultant manage risks specifically associated with in situ thermal remediation and on how financial risks and associated costs are allocated to the commissioner or contractor, using our experiences with the ISTR projects we prepared and supervised.