

Thermal desorption of VHOC Contaminated Soil and Vapor Management at Lucciana, France

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Abstract

As electricity consumption in Corsica experienced significant growth, the EDF group embarked on the renewal of its thermal power plants across the island to address escalating electricity demands. The demolition of the existing Lucciana power plant and the site remediation were pivotal steps in the construction of a modernized facility. Indeed, soil gas analysis have been conducted to assess the land quality and revealed the presence of Volatile Halogenated Organic Compounds (VHOC) contamination up to a depth of 11 meters at the aquifer's roof. The contamination necessitated treatment before proceeding with new construction.

In response to the VHOC pollution challenge, EDF's Lucciana power plant issued a call for tenders in 2020/2021 to remediate the soil at the upcoming facility. In 2022, Haemers Technologies, in collaboration with Englobe, implemented an In Situ Thermal Desorption (ISTD) strategy to remediate the two affected areas to a depth of 13 meters. Two distinct batches of treatment have been carried out.

The first batch, covering an area of 250 square meters, underwent treatment employing 33 Smart Burners™. For the second batch, spanning 400 square meters and with a contaminated zone between 5 and 13 meters, 51 remote flame Smart Burners™ were used to concentrate energy precisely on the impacted area.

In addition to the heating system, a Vapor Treatment Unit (VTU) was integrated into the setup. This VTU included a heat exchanger, condensate tank, three pumps, a knock-out, an extractor, and two activated carbon tanks. To ensure optimal treatment conditions, a water table lowering system was installed, ensuring that the water level remained below the heating zone. The thermal desorption

project was executed concurrently with a venting and sparging system, demonstrating the compatibility of both technologies.

Throughout the treatment process, rigorous monitoring encompassed gas emissions and consumption, ground temperature, and pressure to maintain precise control over the installation.

The project culminated in the successful treatment of 6,500 cubic meters of contaminated soil. For batch 1, the average concentration in soil gases was 142,000 $\mu\text{g}/\text{m}^3$ of VHOC, while batch 2 exhibited 708,520 $\mu\text{g}/\text{m}^3$ of VHOC. Each batch underwent a 70-day treatment regimen, with a 5-day period at the target temperature of 85°C, effectively reducing gas soil concentration below 15,000 $\mu\text{g}/\text{m}^3$. The project achieved its overarching objectives, with the cold point temperature reaching the desired 85°C and all remediation targets being met. sapiente delectus, ut aut reiciendis voluptatibus maiores alias consequatur aut perferendis doloribus asperiores repellat.

Keywords: VHOC, ISTD, Vapor Treatment, Soil heating

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x The speakers will deliver the talk in person in Ferrara (Italy).