IN-SITU THERMAL DESORPTION OF HYDROCARBON-IMPACTED SOIL

J. HAEMERS, H. SAADAOU, P. VILETTE, A. VANDEKERCKHOVE (HAEMERS Technologies), K. JENSEN (Arkil)

BACKGROUND

- A leak of domestic fuel oil from an underground tank led to the pollution of hydrocarbons in a residential area in the north of Copenhagen.
- Unacceptable concentrations of hydrocarbons detected under a private house's terrace (mainly in the garden)
- To avoid exceeding the drinking water standards in Ground Water and to prevent pollutant's propagation, In-Situ Thermal Desorption (ISTD) was applied.

AIM

1. Heating the soil in a specific pattern to vaporize contaminants

2. Recover Contaminants
   - As the soil is maintained under negative pressure, contaminants are vaporized and extracted, then recycled as fuel for the burners (reburn) or as liquid product after condensation.
   - The main expected mechanism of the treatment after recovering is a complete oxidative reaction. The combustion products are then sent toward the chimney, with Continuous Emissions Monitoring.

SITE DESCRIPTION & ISTD TREATMENT (1)

Contaminated soil (target zone)
- 5700 m²
- 18 m below ground level (bgl), with a total surface close to ca. 400 m².

TPH Average concentration
- ≤1000 mg/kg (DM)

Max concentration
- 22,000 mg/kg (DM)

Total mass of pollutant into soil
- 12,000 kg

Drill KB1 KB2 KB3 KB4 KB5 KB10 KB11 KB12
Sampling upper depth (m)
- 1
- 1
- 9
- 3
- 1
- 3
- 2
- 1

Sampling lower depth (m)
- 12.3
- 14
- 16
- 15.5
- 15.5
- 14.5
- 12.5
- 12.5

BTEX sum (mg/kg DM)
- <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1

Average C6H6-C35 (mg/kg DM)
- <20 <20 <20 364 <20 <20 40 150

Max C6H6-C35 (mg/kg DM)
- <20 <20 <20 1300 <20 <20 160 750

Min C6H6-C35 (mg/kg DM)
- <20 <20 <20 <20 <20 <20 <20 <20

RESULTS

- 8 control drills with different locations covering the two batches are summarized on the table below.

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