

Dear Reader,

SOIL AND GROUNDWATER REMEDIATION TECHNIQUES ARE NOT ALWAYS DIRECTLY APPLICABLE IN THE FIELD. OFTEN A LAB TEST AND/OR PILOT TEST IS CONDUCTED TO TEST THE FEASIBILITY OF A TECHNIQUE ON A SMALL SCALE AND TO DETERMINE THE DESIGN PARAMETERS FOR A FULL SCALE INSTALLATION. IN THIS NEWSLETTER, WE HIGHLIGHT 3 INNOVATIVE PROJECTS AT DIFFERENT STAGES OF A REMEDIATION PROCESS:

SODECON

SODECON is an innovative, knowledge-driven company specialized in soil and groundwater remediation providing consultants, project developers, companies and private persons with sustainable, economic solutions to their soil issues.



info@sodecon.be



1. LABORATORY TEST to examine the feasibility of soil heating on the biodegradation of mineral oil, butanol and methyl ethyl ketone.



2. PILOT TEST with injection of a carbon source and a tracer to investigate the biodegradation of very high concentrations of dichloropropane and the transport of injection substances in the soil.



3. FULL SCALE groundwater treatment for PFAS using an innovative adsorption material based on organoclay.

ENJOY READING!

HANS AND WOUTER



LABORATORY TEST

STIMULATION OF CONTAMINANT DEGRADATION BY APPLICATION OF HEAT

Sodecon conducted lab tests to evaluate whether microbial degradation of contaminants can be stimulated by applying heat. For this purpose, lab tests were performed on 2 different sites:

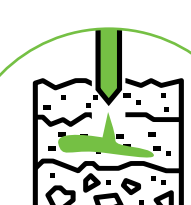
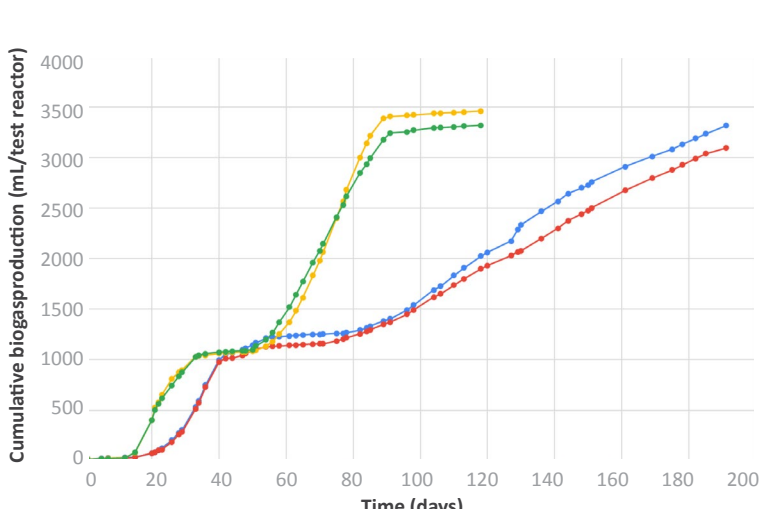
- soil contaminated with mineral oil
- soil and groundwater contaminated with butanol and methyl ethyl ketone.

Increasing the temperature to 25-30°C in fact greatly stimulates the methanogenic degradation of contaminants. The advantage is that only heat must be applied to the soil to stimulate these processes and no above-ground treatment plant is required. Heat also spreads more homogeneously in the soil than injection substances since the thermal conductivity of sand and clay do not differ that greatly



Lab tests were performed in which the volume of biogas formed by the degradation of the contaminant was collected. By monitoring this volume, an estimate of the biodegradation could be made. It was found that the decomposition of mineral oil could be accelerated by a factor of 3 and that the decomposition of butanol and methyl ethyl ketone could be accelerated by a factor of 2 to 5 by applying heat.

This technique is interesting for treating organic contaminants that are difficult to access by increasing soil temperature. Solar panels can be used to sustainably heat the soil.



PILOT TEST

PILOT TEST INJECTION OF CARBON SOURCE AND TRACER

To address a groundwater contamination with concentrations of 1,2-dichloropropane > 1 g/L, a pilot test was set up to verify the feasibility of reductive dechlorination as a remedial technology. During each injection event, a carbon source and tracers (bromide and fluorescein) are continuously injected at a depth of 21 m during 6 weeks. The tracer is then monitored in 18 monitoring wells around the injection well to monitor the distribution of the injection solution in groundwater. Injection flow rate and pressure are continuously monitored during the injection process and strategies to prevent biofouling are tested. One of the interesting observations is that the flow direction determined by tracers deviated 45° from the general groundwater gradient. To verify biodegradation of this challenging compound, analyses are being performed on degradation products, biogeochemical parameters, DNA and RNA of the microbial community and isotopes. Another injection event will start in September.



As shown in this picture fluorescein tracer is very useful to see and confirm arrival of the injection solution in a monitoring well during injection.

FULL SCALE APPLICATION OF AN INNOVATIVE ADSORBENT FOR TREATMENT OF DEWATERING WATER



FULL SCALE



Sodecon has used an innovative adsorption material, based on organoclay, for the treatment of dewatering water contaminated with PFAS for 2 projects in Edegem and Beveren.

- In Edegem, a treatment of 32 m³/h with adsorption on organoclay was provided for 9 months. Since chlorinated solvents were also present, a stripping tower was also installed. The purified groundwater was used to supplement the Fort V pool and is applied usefully in this way.
- For the purification in Beveren, a 20 m³/h water treatment plant was installed for 3 months for the treatment of PFAS in the scope of construction works.

The advantage of organoclay is that it can adsorb certain PFAS components better and that the reaction kinetics are faster than for activated carbon, so less adsorbent is needed. The most suitable type of adsorbent depends on site to site. At other sites, Sodecon also uses adsorbents and sometimes combinations are used. Sodecon has already conducted several lab tests with adsorbents to determine the most suitable adsorbent for a particular site.

First we need to know what's wrong, let's give you some fluorescein

TRACER TEST

Doctor Sodecon, I don't feel so good

hikiki... They'll NEVER find me here

Hidden pollution

COOL! I'm LIGHTING UP!

AHA! That's more clear!

WOW! Turn off the light!

