

# envytech

*Miljö & teknik*

Envytech Solutions AB  
Möndalsvägen 22 | 412 63 Göteborg | [envytech.se](http://envytech.se)

# Sustainable PFAS treatment technologies

Rembind – Stabilization agent for PFAScontaminated soil

Robin Axelson, Project Manager  
Envytech Solutions AB

# Stabilization of PFAS in Soil

## - isn't it like kicking the can down the road?

Every technology has a sweet spot, one will not fix all

Some examples of very suitable sites:

- Active sites where construction work needs to be carried out, large contaminated areas, airports, defence estates, industries...
- Soil going to landfill to stop it from leaching creating a point source
- Remote sites



# Stabilization of PFAS contaminated soil at an active fire fighting training site

## Swedish Defence Estate site

Active site in need of an  
installation of a new petroleum  
tank

But First...



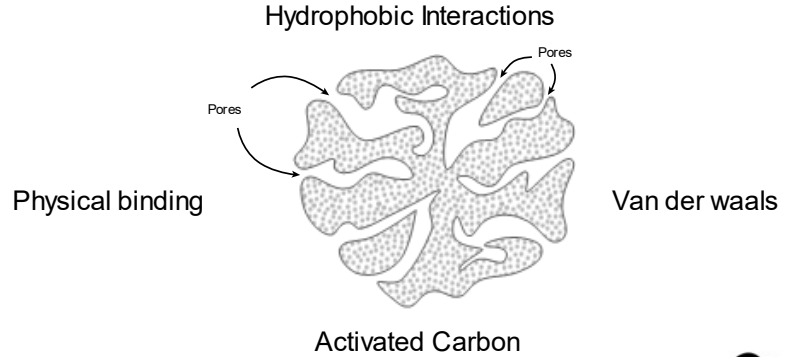
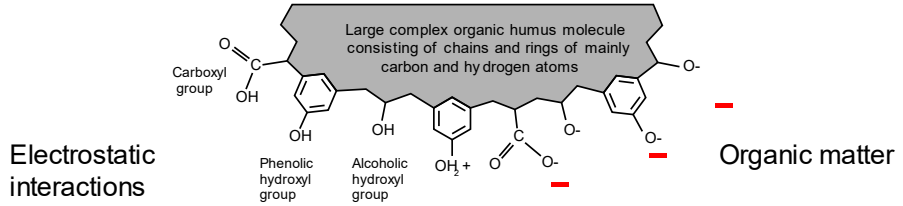
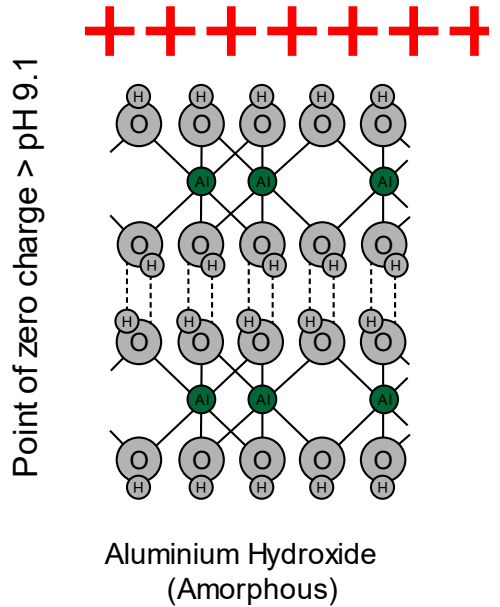
# What is Rembind and how does it work

## Activated carbon product for stabilization of PFAS contaminated soils

- Patented material containing activated carbon and aluminumhydroxide and more.
- Mixed with contaminated soil in 2 steps, 1st a more rough mix, then by the use of tumble mixers or shifting gear
- Provides a good possibility for contact between materials and Rembind – The recipe for succes when stabilizing soil.



# Rem bind – Stabilization of PFAS in Soil





# How we do on site stabilization



# Stabilization of PFAS contaminated soil at an active fire fighting training site

- Swedish Defence Estate site
- Active site in need of an installation of a new petroleum tank
- Active as in fire fighting is carried out weekly
- Area widely contaminated with PFAS
- A total of 1000 ton in need of treatment
  - 500 ton: 140-540 ug/kg
  - 500 ton: 500 -1100ug/kg



# Stabilization of PFAS contaminated soil at an active fire fighting training site

How construction and installation projects used to be carried out by Defence Estate:

- Area sampled and classified
- Soil being excavated to make room for new installations – soil labelled as waste by law, as you are NOT allowed to re deposit contaminated soil with levels above target criterias for the site
- Soil is loaded on trucks
- Trucks drive long distanses to find a place where PFAScontaminated soil is accepted (creating a new piont source as no landfills have treatment systems for PFASeachate)
- Clean soil has to be bought and transported to site
- Clean soil is used as fill in contaminated and active area.
- Clean soil is now PFAScontaminated .

Huge CO<sub>2</sub> footprint for no reason



# Stabilization of PFAS contaminated soil at an active fire fighting training site

How construction and installation projects are carried out NOW by Defence Estate:

- Area sampled and classified
  - Soil being excavated to make room for new installations – soil labelled as waste by law, as you are NOT allowed to re deposit contaminated soil with levels above target criterias for the site
  - Soil is mixed with Rembind on site – minimizing the leaching ability of the PFAS from the soil. Soil is now treated and is NOT a waste and can be re deposited
  - Soil is used as fill material
- 
- ➔ No long transports needed
  - ➔ No creation of new point source
  - ➔ No need to buy new soil or to transport it
  - ➔ Minimum CO<sub>2</sub> footprint

# Results

## Leachability in soils after stabilization

Substance	Suffix	Untreated (average concentration in leachate)	Treated soil Column test	Reduction in leaching abilities
		L/S=2.0	L/S=2.0	
6:2 FTS	ng/l	1300	<10,0	99,9%
PFBA	ng/l	220	<10,0	99,9%
PFBS	ng/l	120	<10,0	99,9%
PFDA	ng/l	<100	<10,0	99,9%
PFHpA	ng/l	270	<10,0	99,9%
PFHxA	ng/l	1200	23±7	91,4%
PFHxS	ng/l	500	<10,0	99,9%
PFNA	ng/l	<100	<10,0	99,9%
PFOA	ng/l	830	<10,0	99,9%
PFOS	ng/l	400 000	<10,0	99,9%
PFPeA	ng/l	480	<10,0	99,9%

# Contact

Robin Axelson

[Robin.axelson@envytech.se](mailto:Robin.axelson@envytech.se)

+46 704 04 99 86



And for more info, see [www.envytech.se](http://www.envytech.se) or our LinkedIn