

REMTECH  
Europe

**CYCLIC BIOREMEDIATION OF A HEAVILY IMPACTED XYLENE SITE –  
100% on-site biological treatment of soil, groundwater and soil vapor**  
*Michela De Camillis– GreenSoil Group*

**Remtech Europe – Soil Remediation  
19<sup>th</sup> September 2019**

Head office: IncubaThor – Thor Park 8300 – 3600 Genk

Contact: +32 89 39 59 29 – [info@greensoilgroup.com](mailto:info@greensoilgroup.com) – [www.greensoilgroup.com](http://www.greensoilgroup.com)

# Who is GreenSoil Group

Specialized, innovative and international general remediation contractor



# GreenSoil - Internationally



**The Netherlands**  
Office: Papendrecht

**Belgium**  
Office: Genk / Ghent

**Italy\***  
Office: Turin

**Brazil**  
Office: Sao Paulo

**Chile\***  
Office: Santiago

# Project: Full scale xylene remediation

Full-scale project	
Location	Belgium (Westerlo)
Contaminant type	Xylene in soil and groundwater
Remedial strategy	On-site landfarming of contaminated soil (unsaturated and smearing zone) In-situ enhanced aerobic degradation of the groundwater contamination
Type of contract	Risk Based
Project budget	1.500 – 2.000 k€

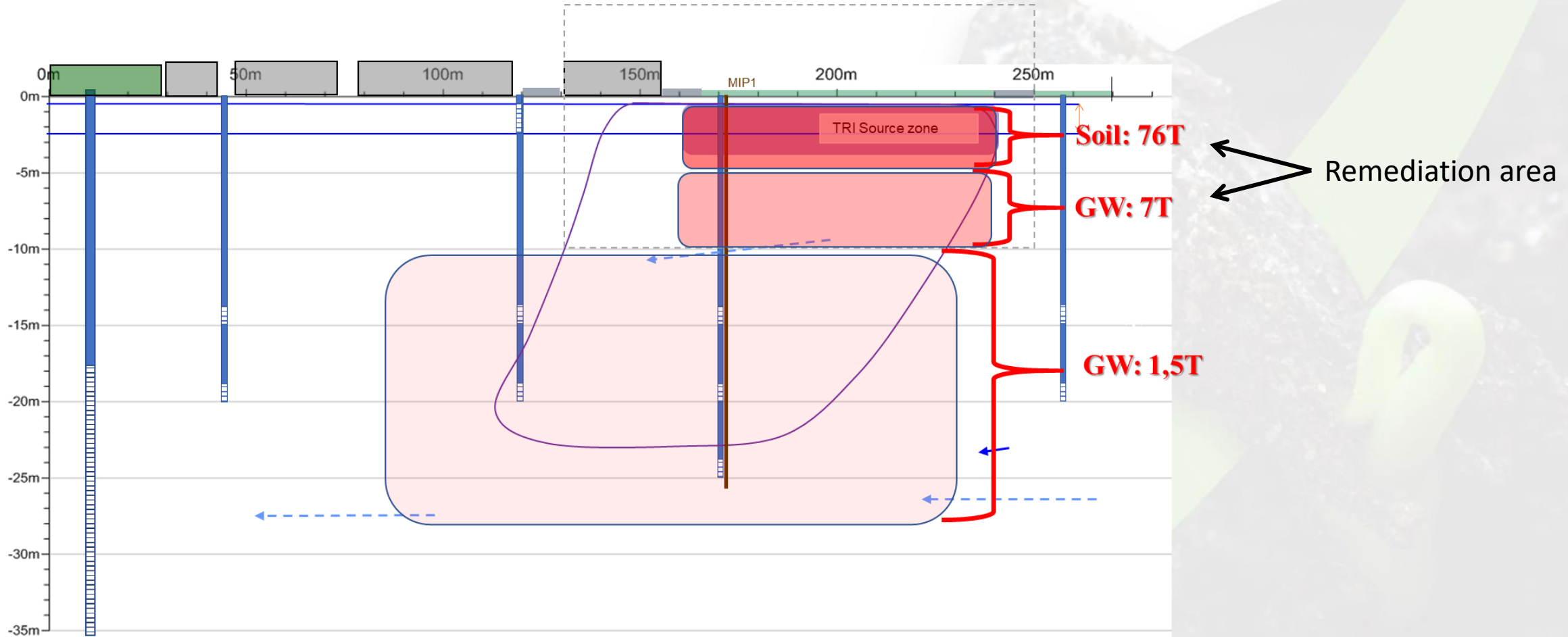
# Site history



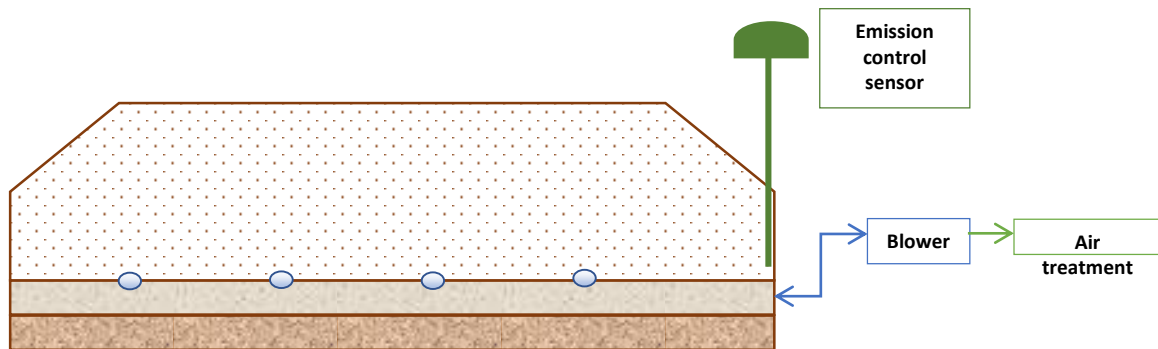
Agfa-Gevaert – fine chemicals



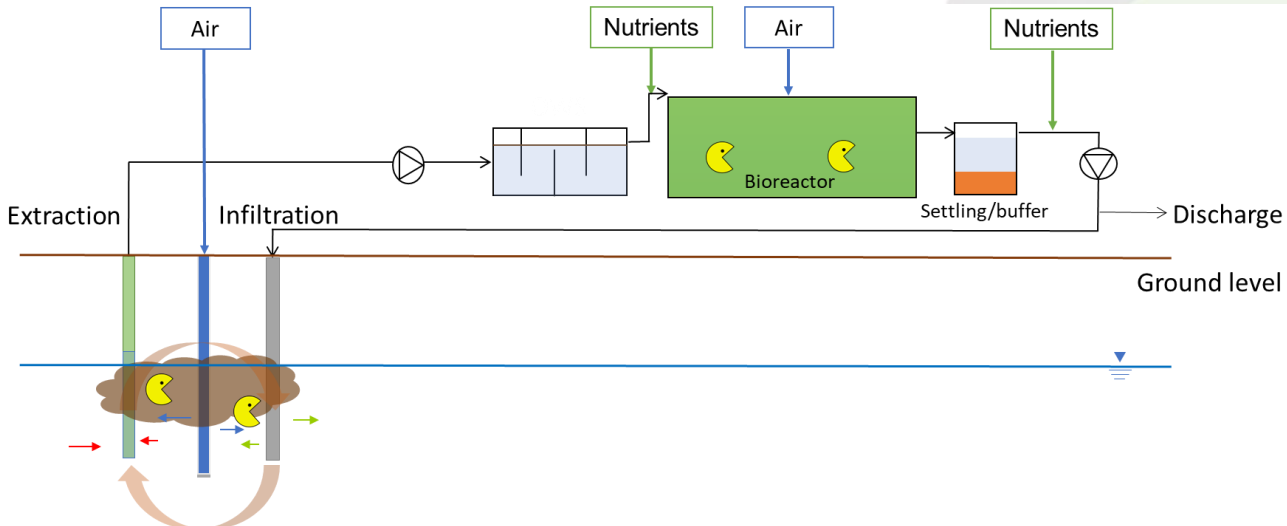
# Project background



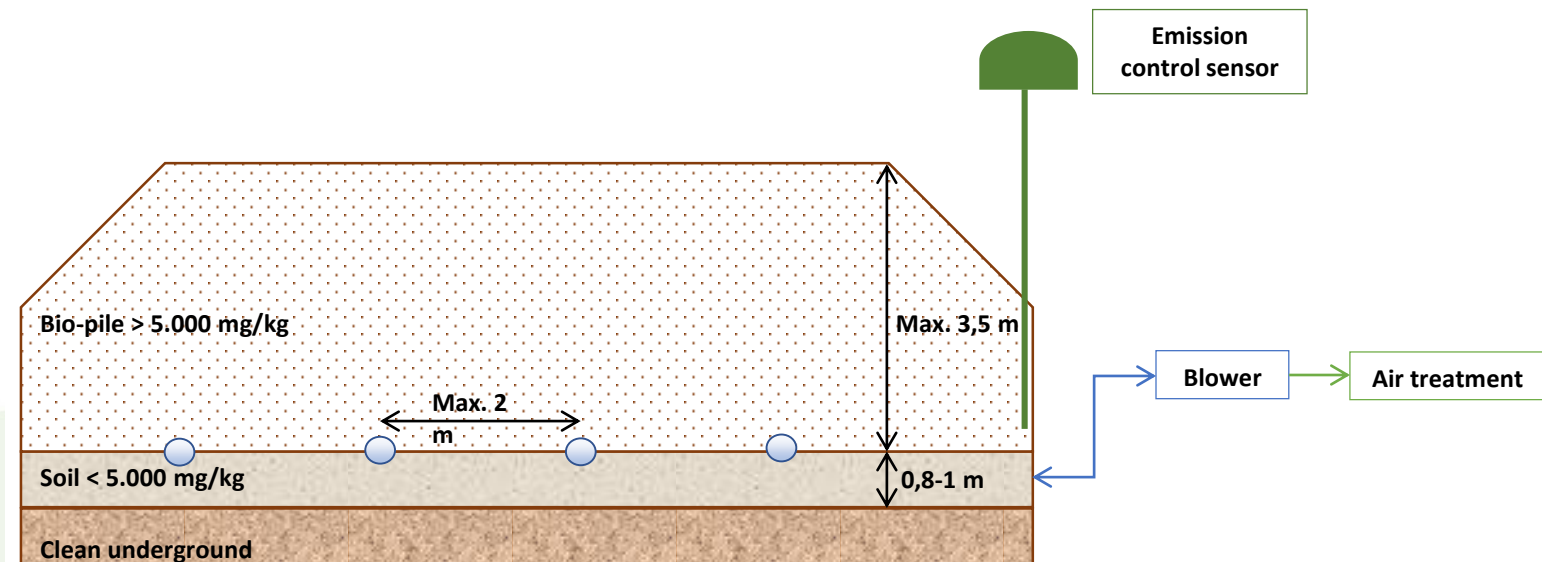
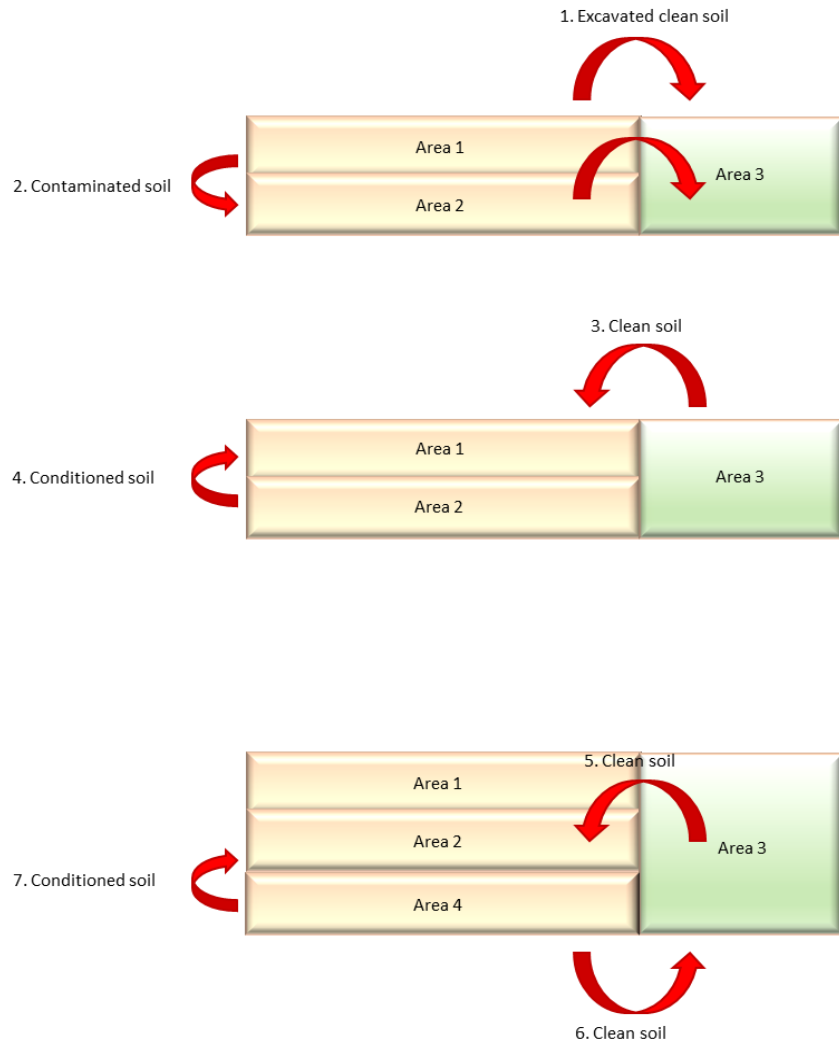
# Excavation and On-Site Landfarming (0-3,5 m-bg)



# In-situ Aerobic Groundwater Remediation (3,5-10 m-bg)



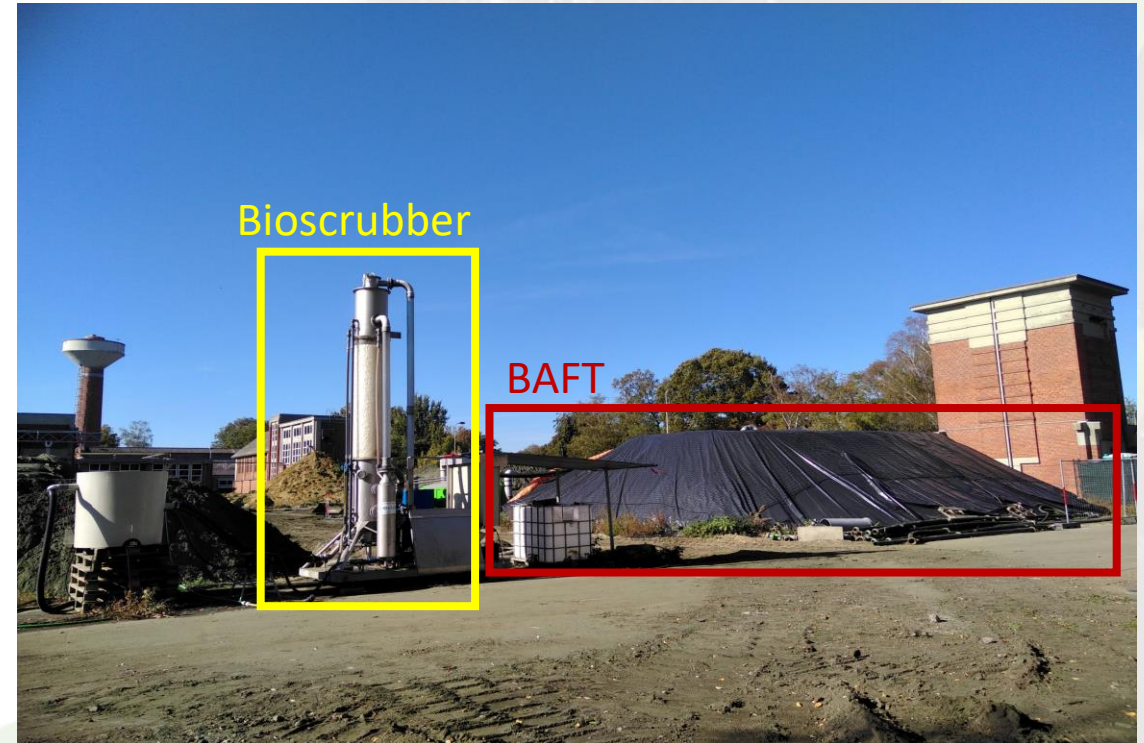
# Excavation and On-Site Landfarming (0-3,5 m)



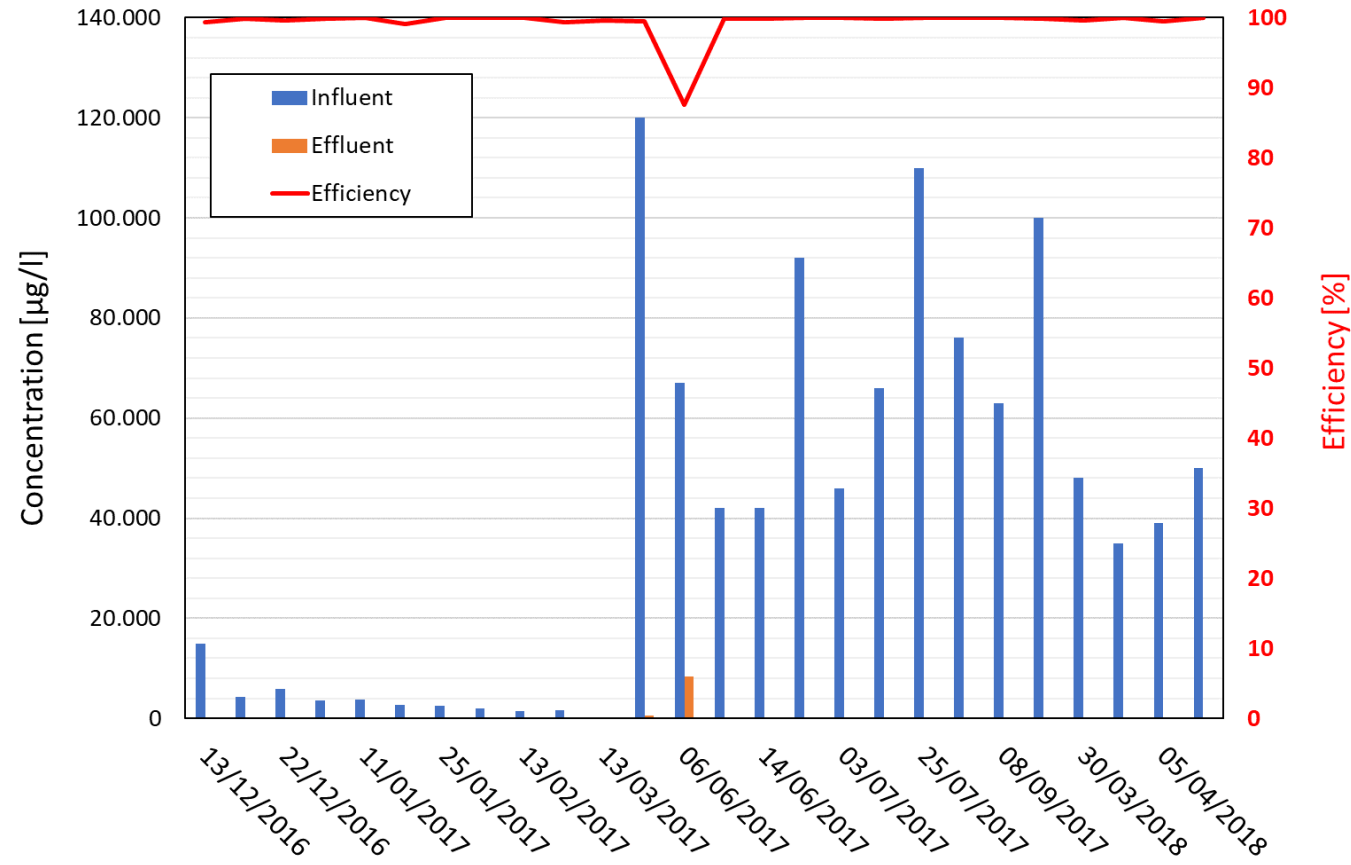


# Innovative Air Treatment Techniques

- BAT
  - Biological Air Treatment
  - Turned around clean biopile
- Bioscrubber
  - Column filled with carrier material

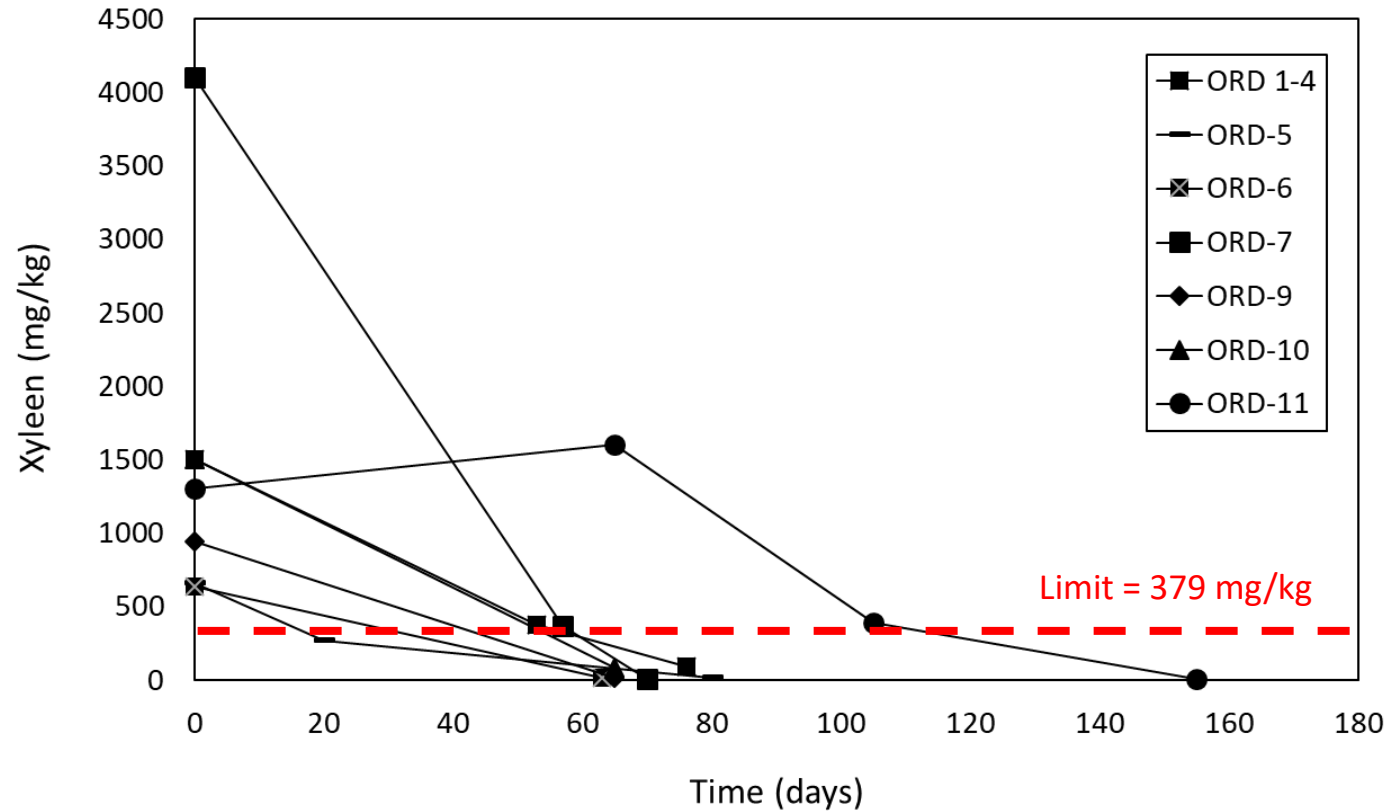


# Efficiency biological Water Treatment Unit

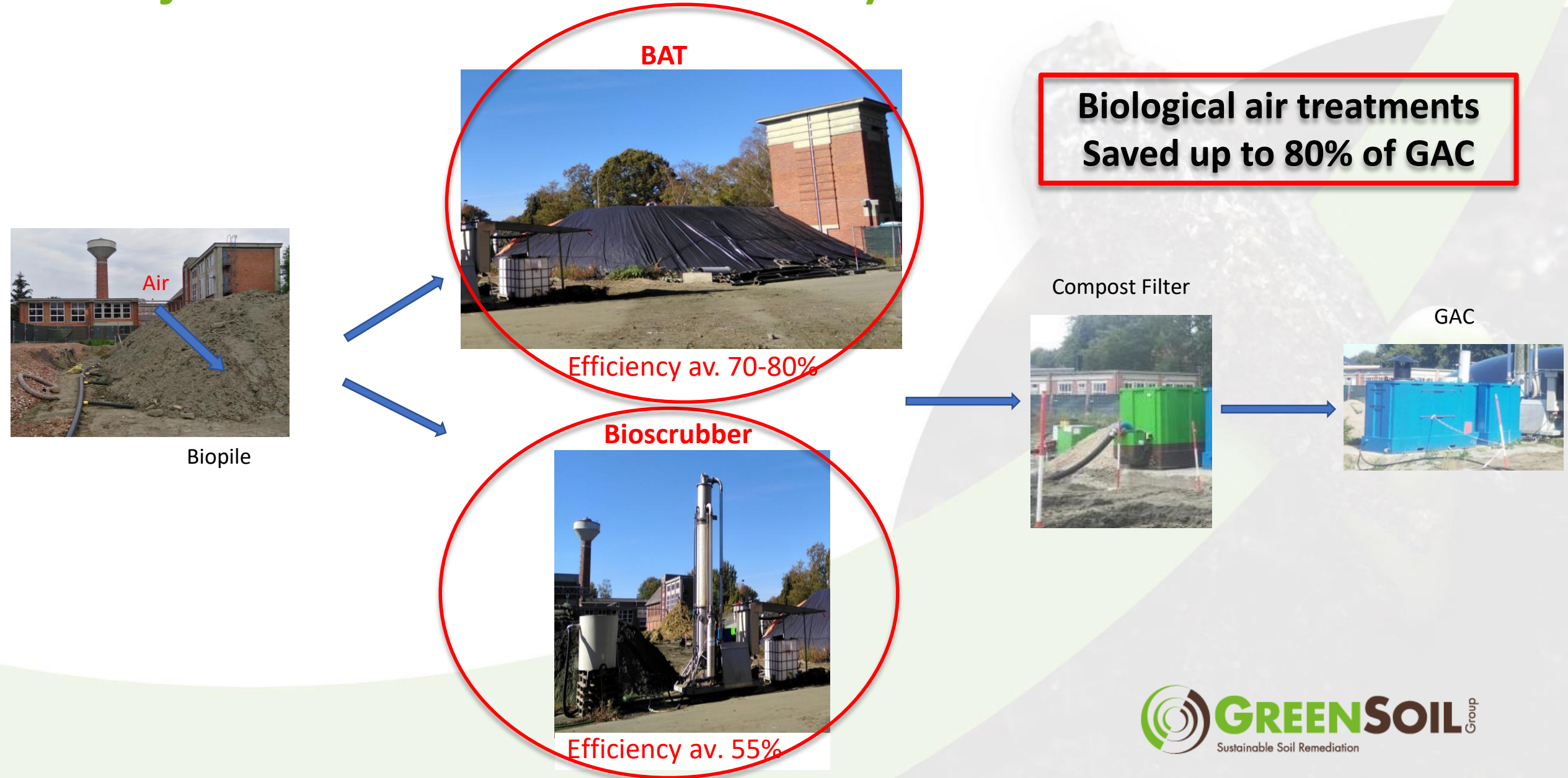


# Results biopiles

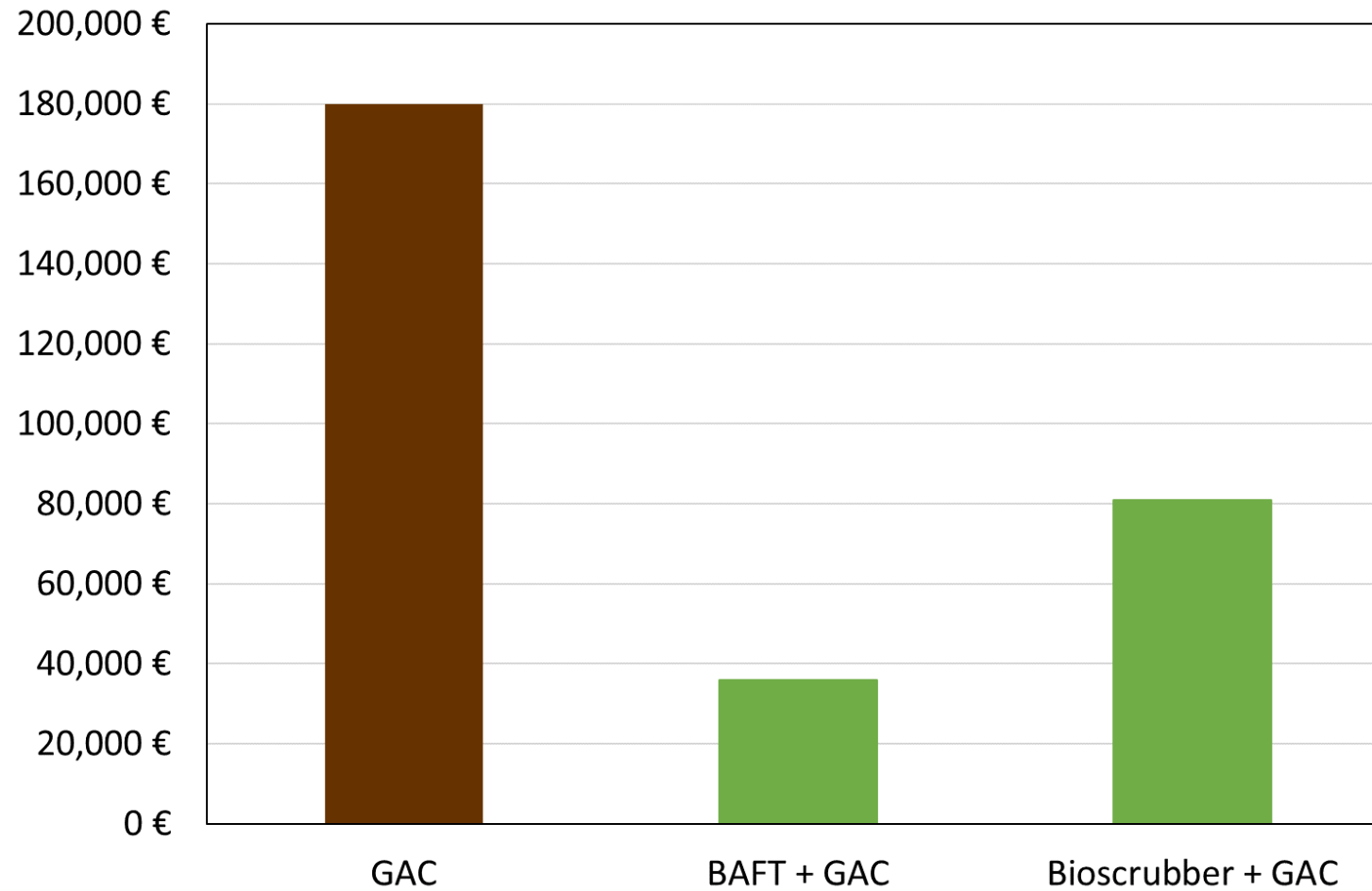
- Average time: 65-76 days
- Start concentrations not defining clean up time (BTEX!)
- ORD11 built in wet conditions
- Target limits achieved



# Project #3: air abatement systems



# Air Treatment Costs



# Conclusions

- Perfect example of circular bioremediation
- Innovation ↔ Sustainability ↔ Cost
- 99% contamination biodegraded (soil, water, air)
- No creation of waste (no soil left the site)
- Less transport movements (less waste disposal/bringing new GAC)
- We reduced up to 80% on AC usage



Contact and Questions  
[www.greensoilgroup.com](http://www.greensoilgroup.com)

**Martin Slooijer (Managing Director)**

[m.slooijer@greensoilgroup.com](mailto:m.slooijer@greensoilgroup.com)

**Michela De Camillis (Sales & Project Engineer)**

[m.decamillis@greensoilgroup.com](mailto:m.decamillis@greensoilgroup.com)