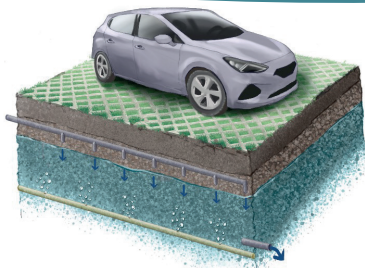


Belgium – RIETLAND – Phytoparking treating pre-treated wastewater



Jaurrieta, Lide; «Illustrations of nature-based solutions for urban water management», <https://doi.org/10.34810/data1745>, CORA. Repositori de Dades de Recerca, V1



DESCRIPTION

Pilot 3 is located in Ypres, Belgium, and treats wastewater in a septic tank followed by **Phytoparking** at an off-grid campsite. This is the ideal decentralized NBS treatment for urban environments as it requires no space and it performs much better than the Flemish standards (graph 1). The wastewater at the off-grid campsite of 105 PE was treated in a Phytoparking of 76m². Rietland designed a system for **reuse for toilet flushing and agriculture**. The Phytoparking can handle variations in loading, making it appropriate for a campsite with high and low seasons.



DESIGN AND TECHNICAL DETAILS

Build up: The Phytoparking consists of a 1.3m deep liner basin that is filled with expanded clay granulates (1m). There is no contact between groundwater and wastewater. On top of the substrate, a pressure-distributing layer and grass tiles are placed to support vehicles and other heavy objects.

Type of influent: Grey & Black domestic wastewater

Design Phytoparking

- Aerated Hybrid wetland of 44m² (grey) & 32m² (black) treats wastewater of 105 PE.
- Substrate = Expanded Clay Aggregates
- The treated grey water is reused for toilet flushing

New pollutants: Due to the alternation between oxygen-rich and oxygen-poor conditions, a rich mosaic of bacterial life is created. This also efficiently removes pathogens and substances that are difficult to degrade, such as Pharmaceuticals & insect repellents.

- High removal > 90% of TSS, BOD, TP & NH₄. High removal COD for black water (91.6%), and moderate for grey water (G:83.3%) **graph 1.** →
- Pathogens: Good removal e-coli (Grey: log 4.8 & Black: log 4.0)
- Organic Micropollutants: > 80% of the substances are removed > 80%

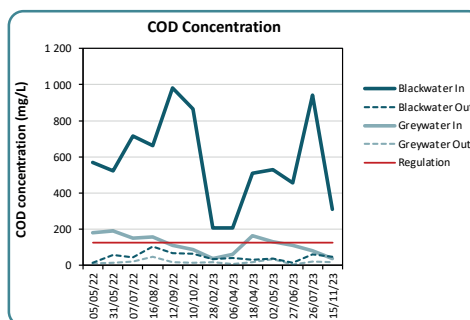


VERSATILE SYSTEM

→ **Robust System:** The Phytoparking is equipped with an intelligent controller that automatically adjusts the aeration to the amount of wastewater that is being treated. This further optimizes energy consumption and allows the Phytoparking to be used flexibly for varying loads and different types of wastewater.

→ **Types of wastewater:** Domestic wastewater and industrial wastewater such as food and beverage industry, organic chemistry, soil remediation projects and wastewater flows from the agricultural sector.

→ **Applications:** Residential areas, offices, hotels, campgrounds, hospitals, elderly homes, schools and businesses



Graph 1



CO-BENEFIT ANALYSIS

Advantages: Low operational costs, no skilled personal required, robust system, nice landscaping, does not add to urban heat island, does not require any space.

Reuse: According to the max. values for exposure, the **WHO** poses that the reclaimed water of the Phytoparking is no risk for daily and annual **toilet flushing** (tested for e-coli & Salmonella) and for irrigation of **lettuce for consumption** with treated grey water (tested for e-coli & Salmonella).

Effluent of the Phytoparking can be used for **agriculture** as reclaimed water quality class B according **EU 2020/741**.



COSTS

→ **OPEX low:** no sludge discharge, low energy consumption, only 1 annual maintenance

→ **CAPEX moderate:** approximately €70.000 for 10 parking spaces that treats wastewater of 140 PE. The return on investment can be 5 years depending on the discharge levy.

