

Influence of pH on the formation of organic colloids and the associated release of various elements from surface sludge deposits of vertical flow constructed wetlands.

Banc, C. *, Gautier, M. *, Blanc, D. *, Lupsea-Toader, M. *, Marsac, R.**, Gourdon, R. *

* Univ Lyon, INSA Lyon, DEEP (Déchets Eaux Environnement Pollutions), EA 7429, 69621 Villeurbanne Cedex, France.

** Univ Rennes, CNRS, Géosciences Rennes, UMR 6118, 35000 Rennes, France.

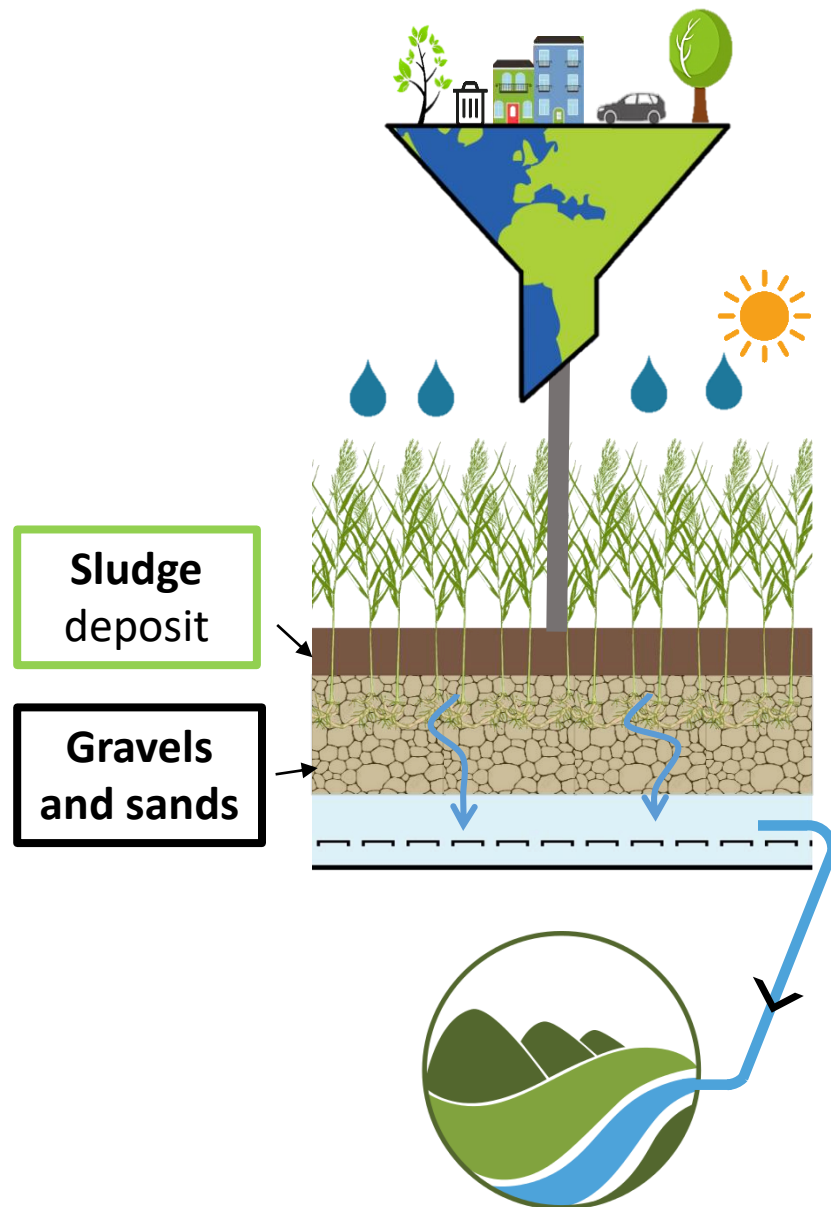
Phone: +33 (0)6 19 95 78 39 - E-mail: camille.banc@insa-lyon.fr

Context and objectives

Human activity
Wastewaters

Constructed wetlands
Buffer area

Natural systems
Surface and ground-waters

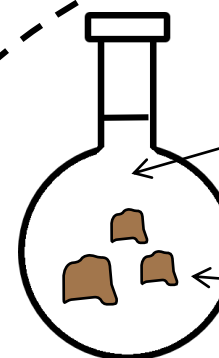


Sludge
deposit



- * Pollutant release?
- * Pollutant transport?
- * Pollutant bioavailability?

Methodology



Aqueous solution of
various pH from pH
2 to 12

Sludge deposit
samples

(Ultra)filtration of the leached solutions
with **0.45, 0.22 μm** and **30, 10, 3 kDa**.

+
OC content measurement, UV-Vis analysis
and ICP-MS

To go home results

1. Three main molecular size ranges are emitted from sludge deposit :

- Large organic colloids (30 kDa – 0.45 μm)
- Small organic colloids (3 kDa – 10 kDa)
- « Truly » dissolved organic compounds (< 3 kDa)

2. Major and trace elements speciation were sensible to pH conditions and released carrier phases :

- Elements located in the truly dissolved fraction : **As, Sb, P, S, Rb, V**
- Elements principally associated with large colloids : **Li, Mg, Ca, Sr, Ba, Mn, Cr**
- Elements associated to all size fractions : **Co, Ni, Zn, Cu, Cd**