

An integrated approach for the effective management of water pollution risks from emerging contaminants



Perfluorinated compounds
HOlistic ENvironmental
Interinstitutional eXperience

Phytodepuration as a nature-based solution for PFAS mitigation

10 March 2021

Preventing, Ensuring, Promoting

LIFE PHOENIX Project

lifephoenix.eu

COORDINATOR



PARTNERS



WITH THE CONTRIBUTION OF THE LIFE FINANCIAL INSTRUMENT OF THE EUROPEAN UNION
LIFE16ENV/IT/000488 - LIFE PHOENIX

Action B3

- Technological innovation and development
 - Irrigation Water
 - Phytodepuration



Action B3

- B3.1 - Realization of pilot plant for irrigation water for setting vegetable organism and techniques as tools for PFASs concentration mitigation
- B3.3 - Demonstration on a full-scale plant(wetland system)of PFASs concentration mitigation for irrigation water



Phytodepuration

Phytodepuration is a natural treatment technique that reproduces natural purification processes in a controlled environment. They are artificial little deep basins, often filled with inert material and fed with aquatic plants (macrophytes). These plants reproduce the natural purification processes typical of humid areas. (*Borin 2003*)



Phytodepuration Pilot wetland system

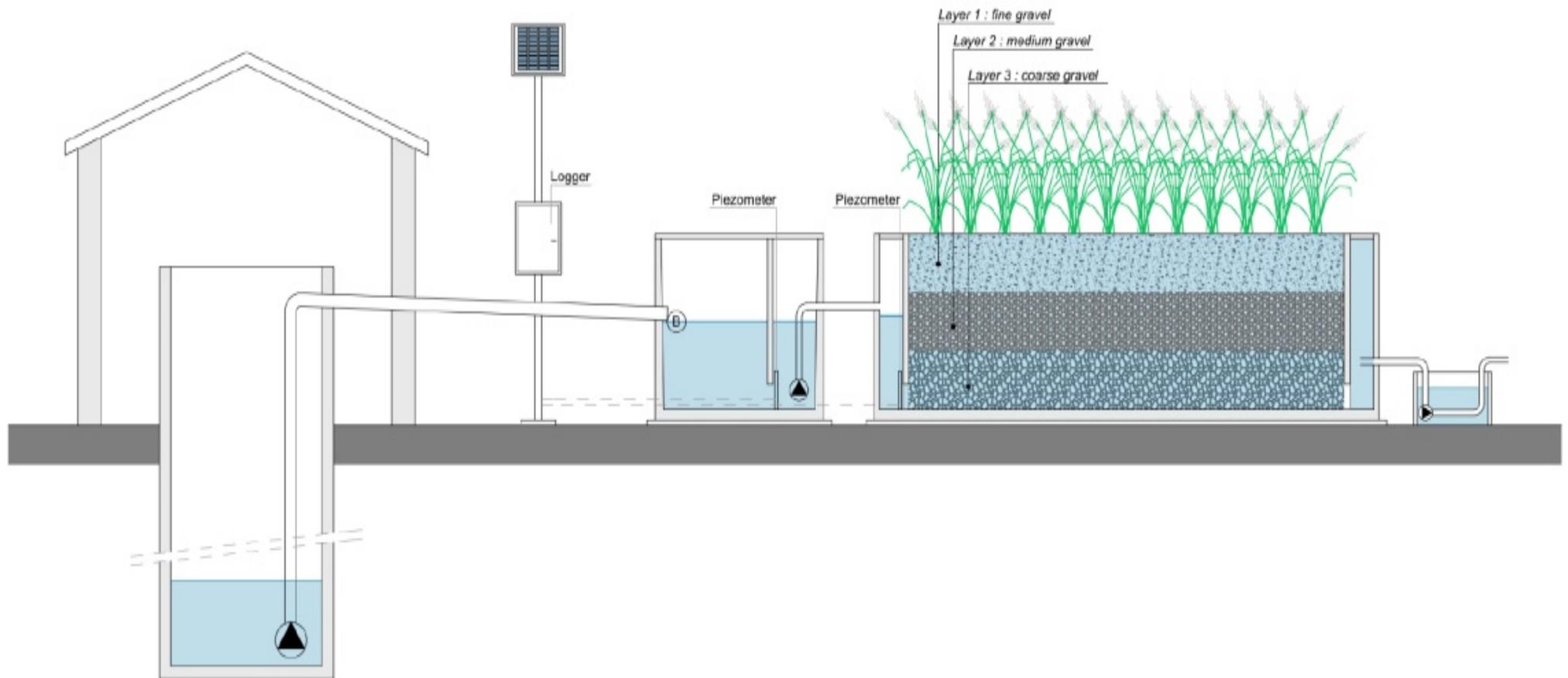


Phytodepuration Pilot wetland system

- Irrigation Water
 - B3.1 - Realization of pilot plant for irrigation water for setting vegetable organism and techniques as tools for PFASs concentration mitigation

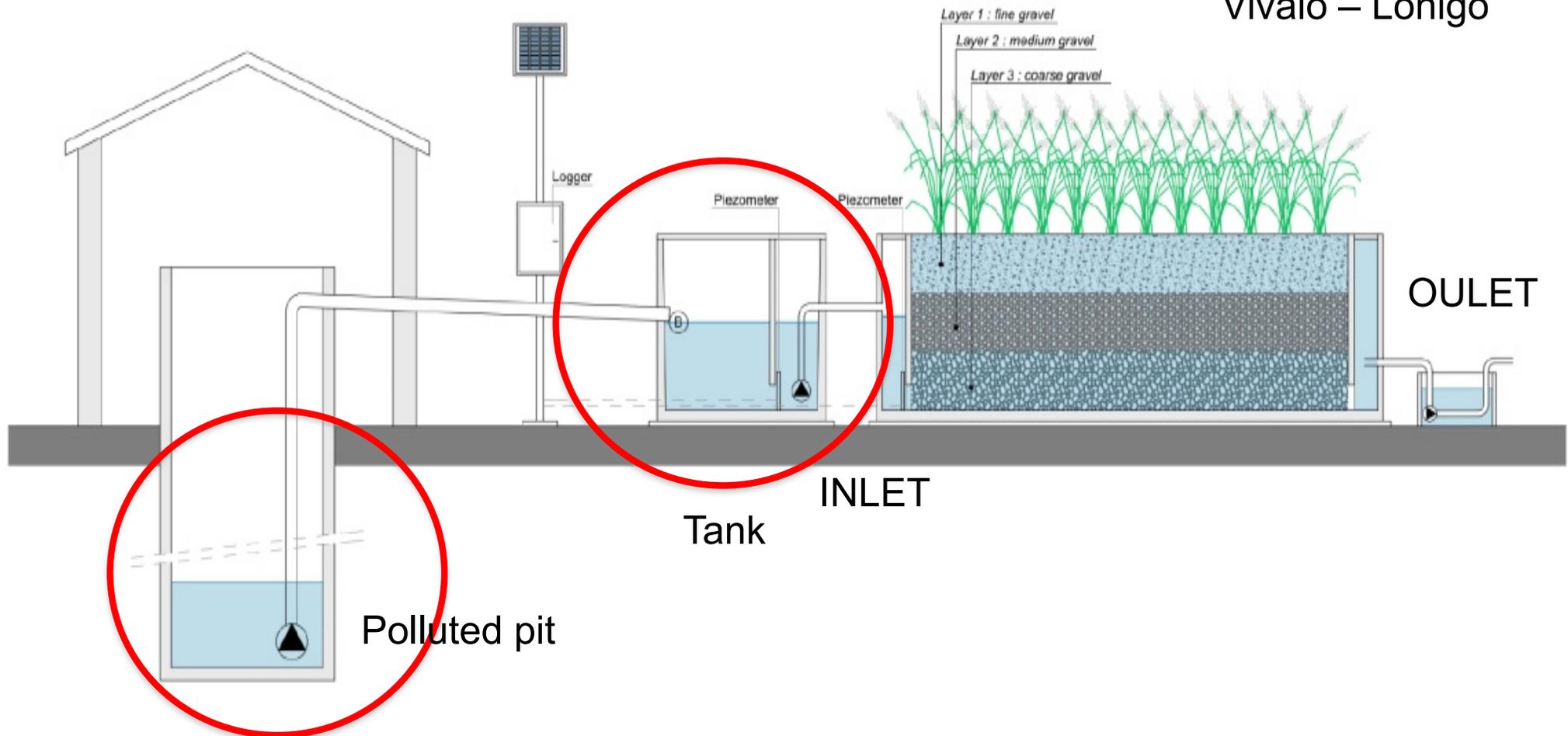


Phytodepuration Pilot wetland system

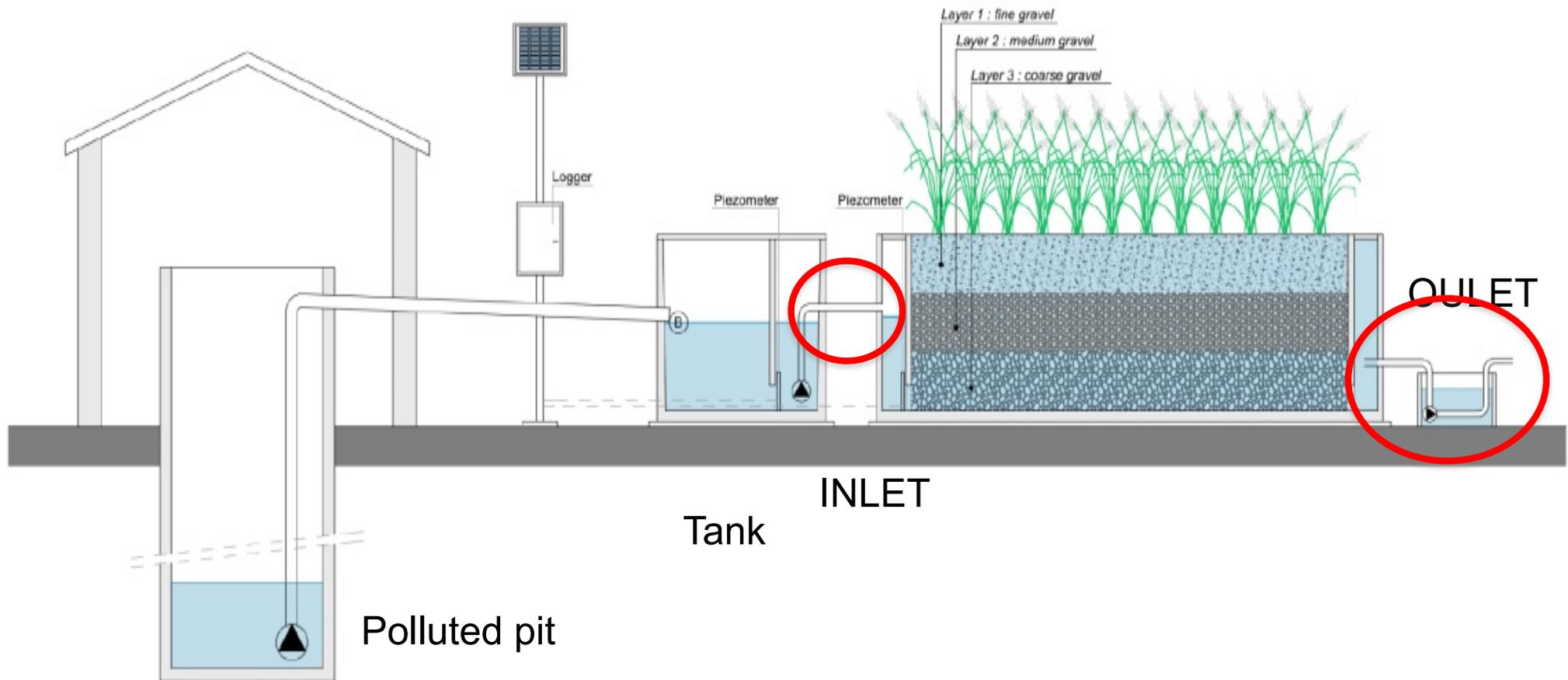


Phytodepuration Pilot wetland system

Vivaio – Lonigo



Phytodepuration Pilot wetland system

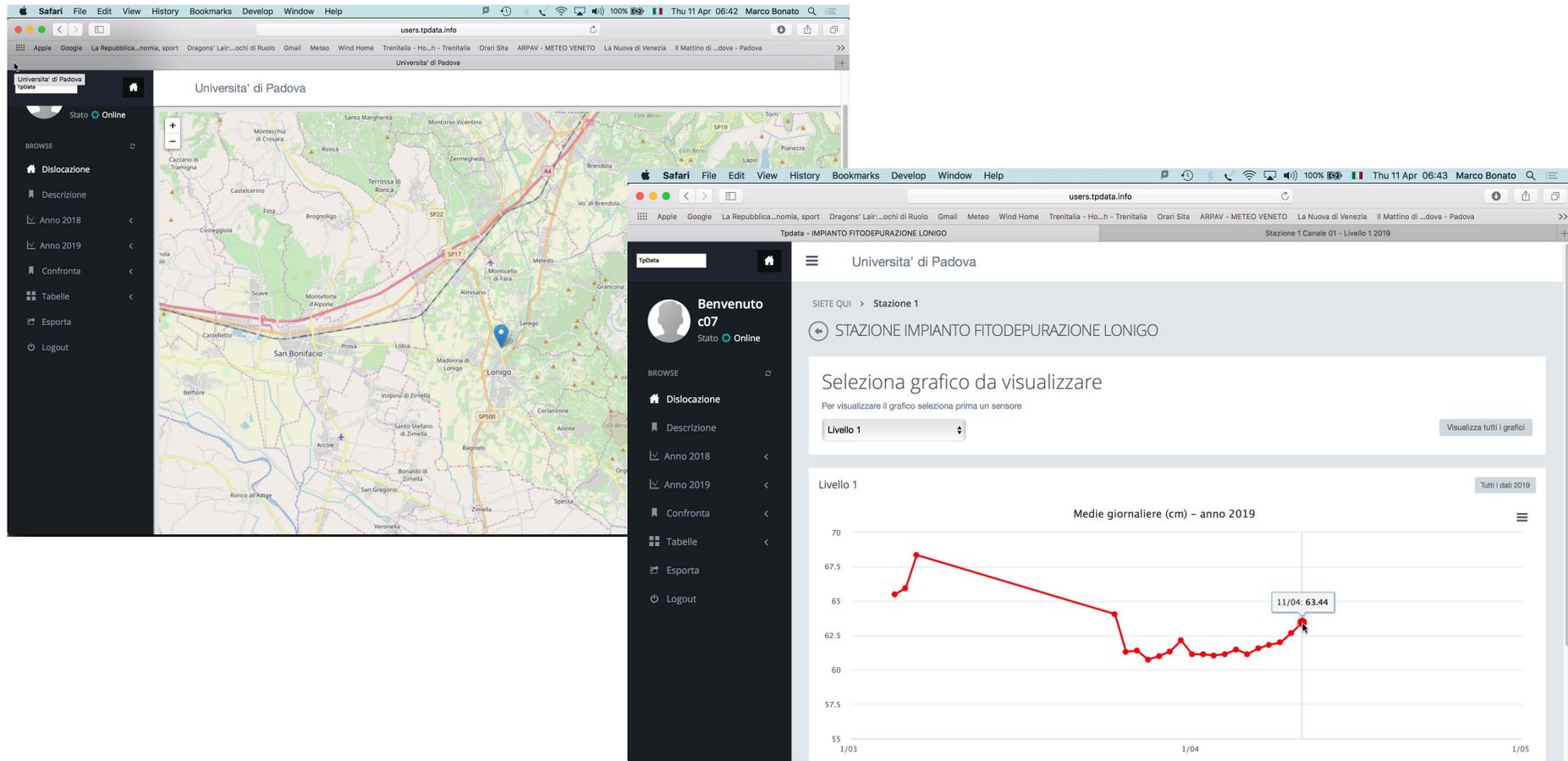


Phytodepuration Pilot wetland system

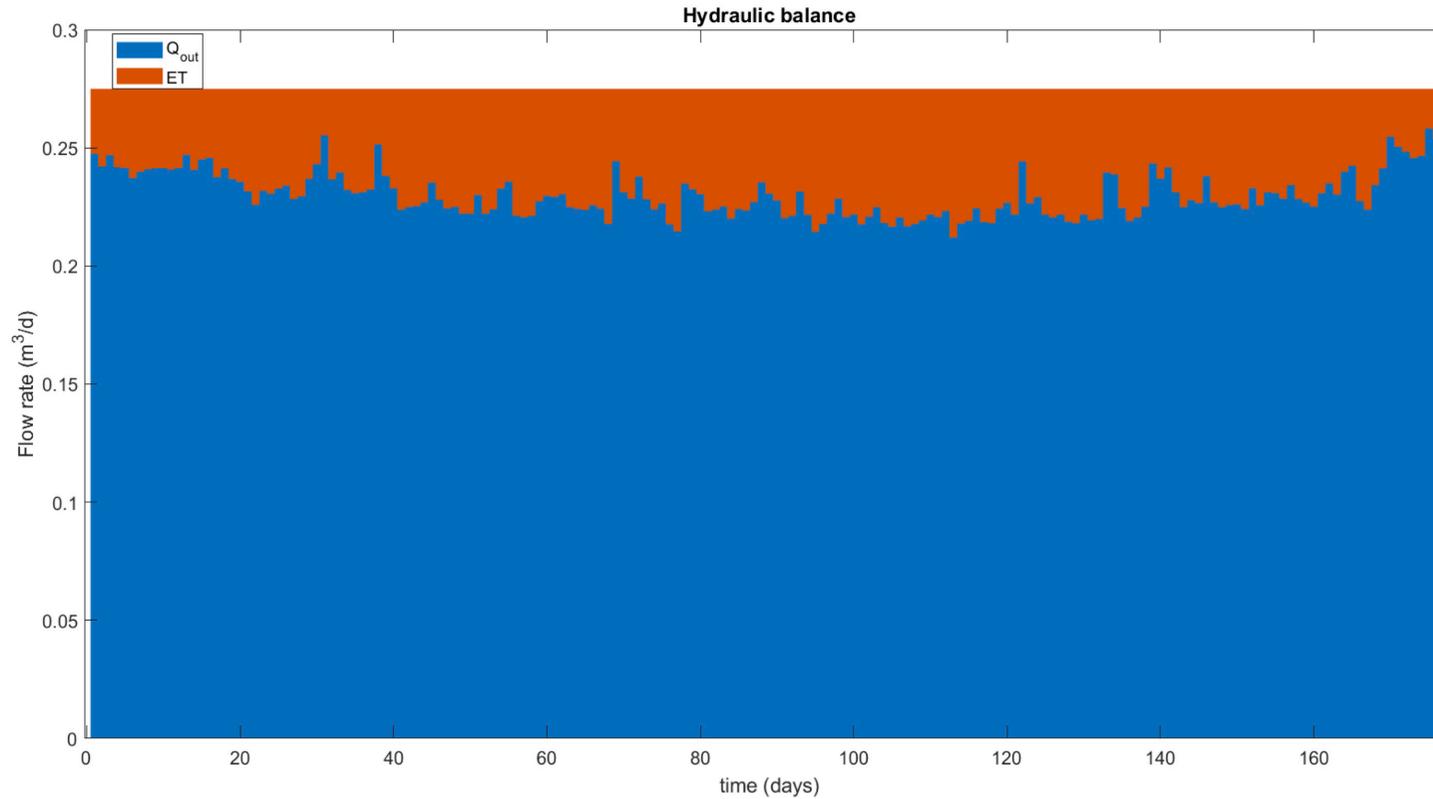


Phytodepuration Pilot wetland system

● Real time control



Phytodepuration test results



	Inlet	Outlet
Water Flows (l/d)	275	242
PFAS Load (ng/l)	1413500	1243880

	Daily (ng)	Season (mg)
PFAS adsorbed	169,620	30.53

Phytodepuration
Capacity
12%

Phytodepuration Pilot wetland system

- B3.3 - Demonstration on a full-scale plant(wetland system)of PFASs concentration mitigation for irrigation water
- First possible mitigation strategy



Monastiero
(Bevilacqua (VR))



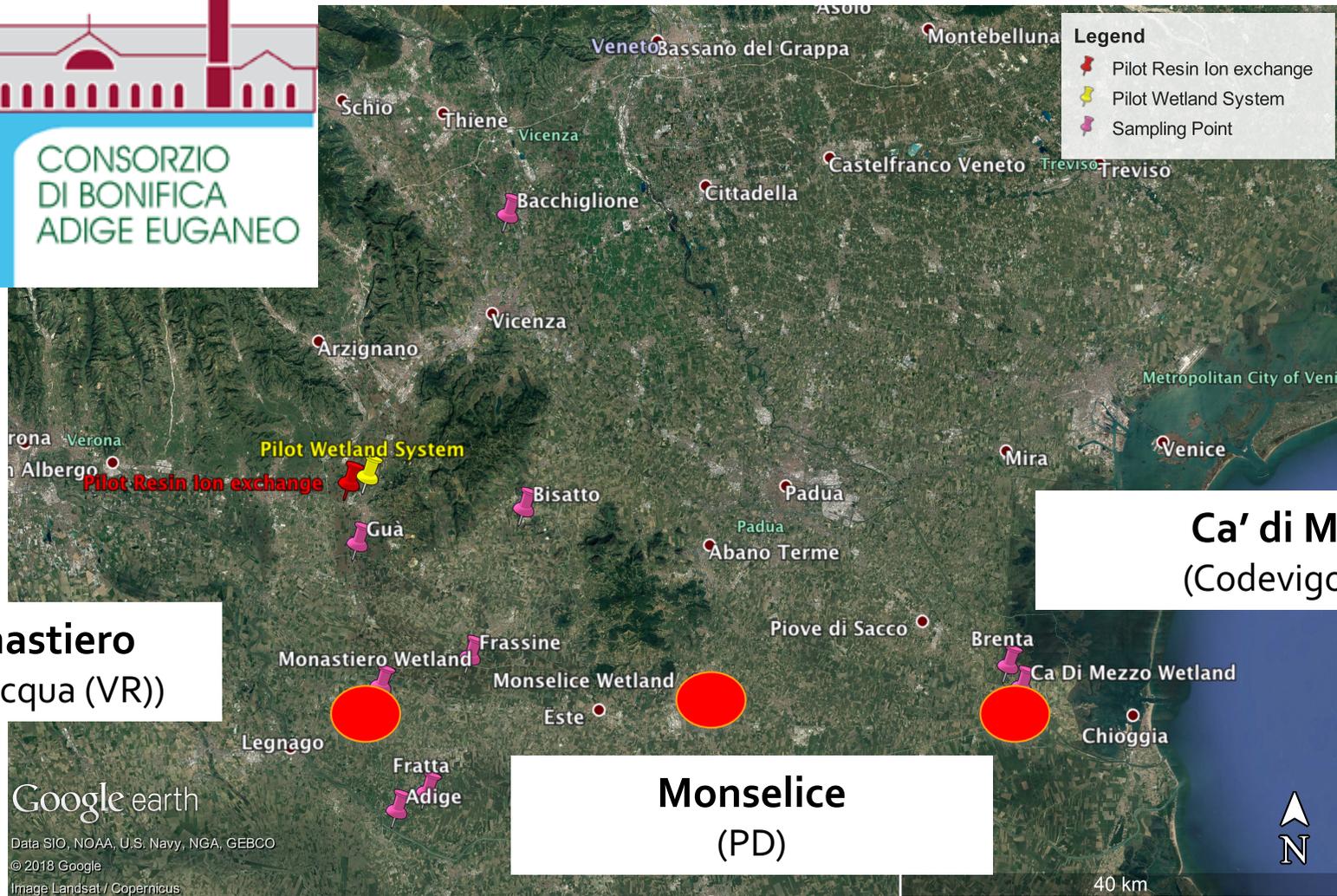
Monselice
(PD)



Ca' di Mezzo
(Codevigo (PD))

Phytodepuration

Upscale real size wetland area



Phytodepuration Wetland area test results



Monastiero
(Bevilacqua (VR))



Monselice
(PD)



Ca' di Mezzo
(Codevigo (PD))

	V in (m ³)	V out (m ³)	PFAS g IN	PFAS g OUT	PFAS Within wetland area (g)
Wetland Areas	5083344	4132194	697.1	143.3	553.8

**Mean
Abatement %**

59.8

Future Perspective for Phytoremediation

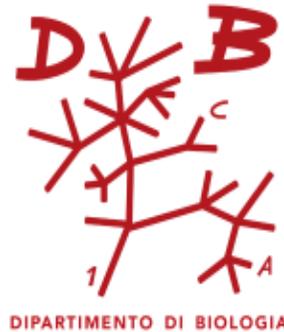
- Irrigation Water

- First possible mitigation for irrigation water
- Application on wetland area and/or small channels nets
- Veneto Region has one of the biggest capacity of phytodepuration in Italy (over 300 wetland area)
- We need new policy for mowing and waste management related to common reed mowing

Thank you for your attention



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