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FERTIWRACK – use of reed bed systems for integrated treatment of beach wrack for the production of soil conditioner/fertilizer,

Advantages of reed bed system:

- **simple** construction;
- **INTEGRATED DEWATERING AND STABILIZATION AND REJECT WATER TREATMENT IN CONTROL WAY**
- **natural** look;
- **VARIOUS PROCESSES OCCURRING SIMULTANEOUSLY IN A WIDE RANGE OF RED-OX POTENTIAL**
- **low** construction and exploitation costs;
- **low** dewatering cost;
- **lack necessity** of use additional chemicals;
- **natural** method (NBS);
- **low energy consumption.**



Common Reed (*Phragmites australis*)



Possibilities and obstacles of reed bed systems for integrated Beach Wrack CONVERSION

POSSIBILITIES:

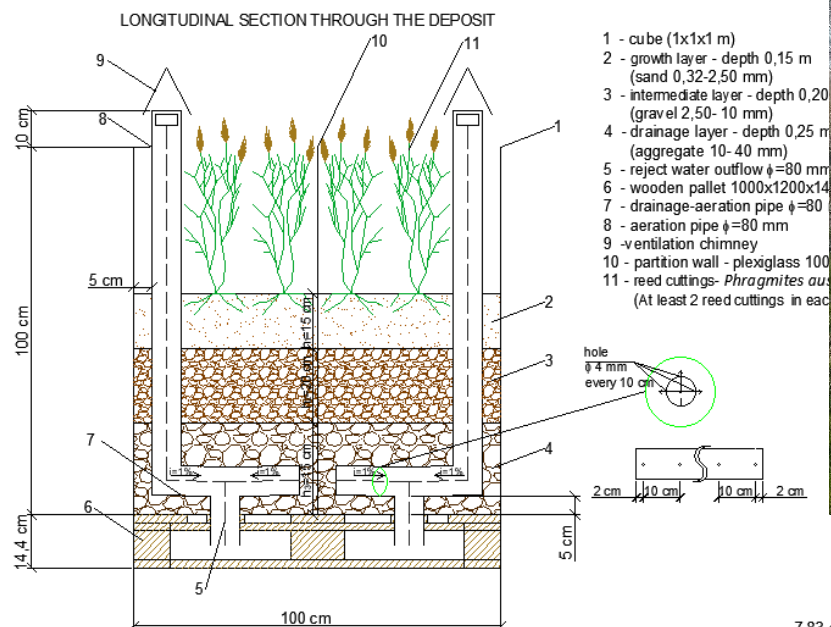
- use of macroalgae despite their seasonal occurrence and different composition as well as sand content;
- fertilizer production;
- integrated treatment with use of NBS in place of origin

objectives to be investigated:

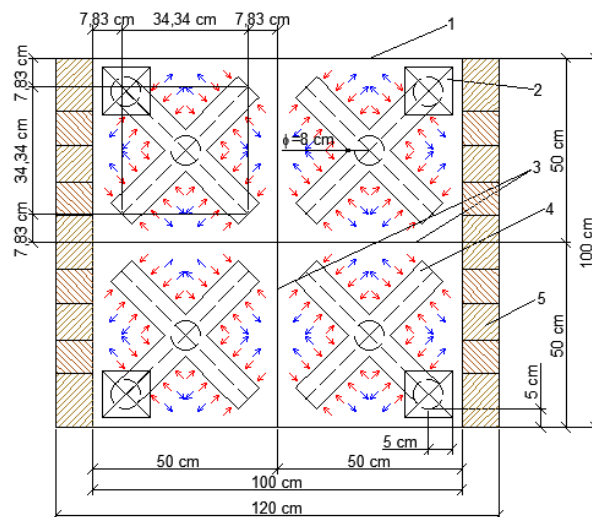
- location - close distance between macroalgae collection place and reed bed system;
- adequate space for the system construction means dose of macroalgae for m^2
- optimization of fertilizer production and ensuring low impact for the environment (possible no impact)

60 kg of d.m of beachwrack per m^2

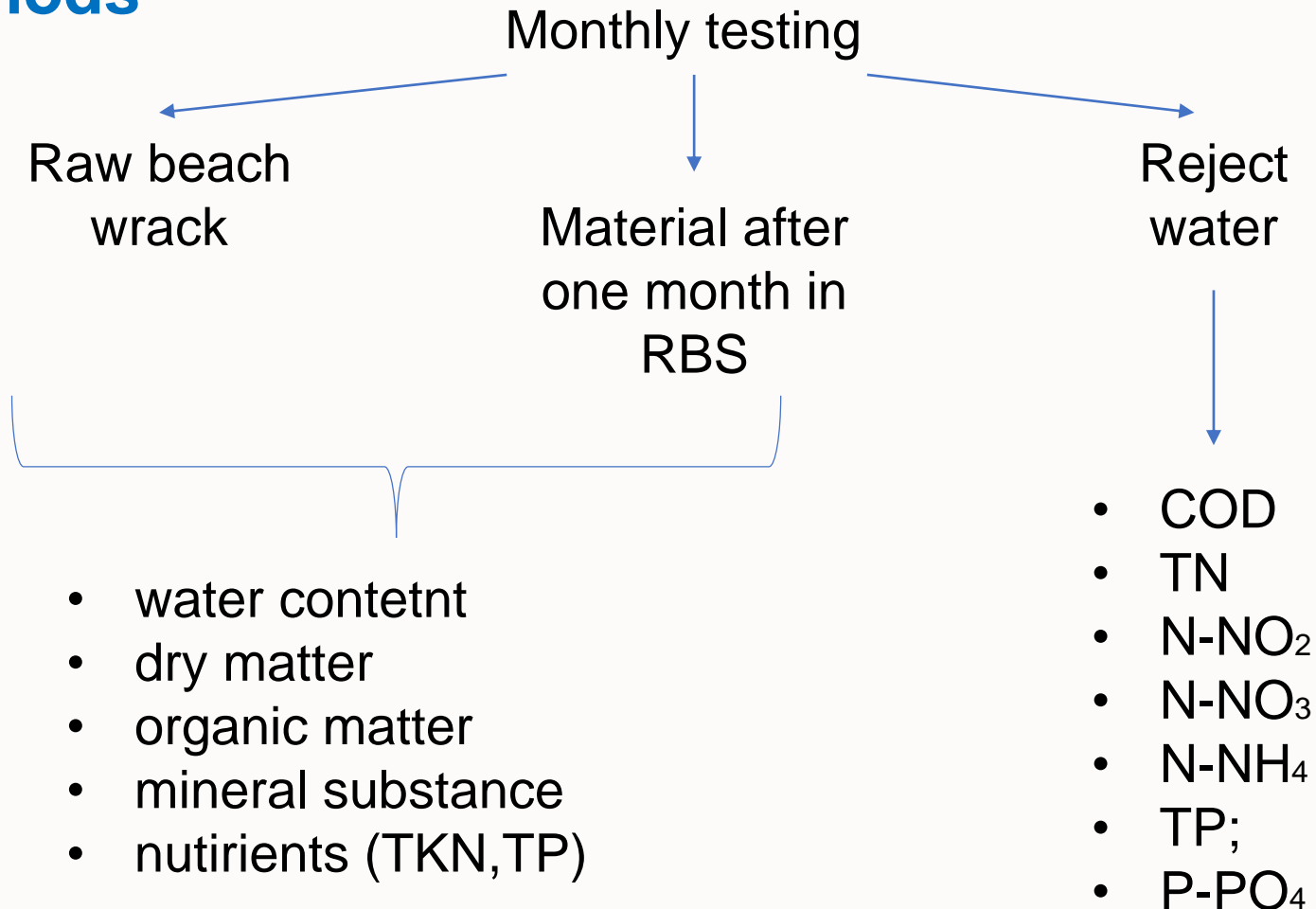
Technical specification views of pilot RBS plant



THROW OF DEPOSIT-
distribution of drainage-aeration pipes



- 1 - cube (1x1x1 m)
2 - ventilation chimney
3 - partition wall-plexiglass 1000x1000 mm
4 - drainage-aeration pipe $\phi=80$ mm i=1%
5 - wooden pallet 100x1200x14 mm
- reject water
→ O_2



And many more parameters to evaluate the **impact of this technology for the environment and quality of product** (e. g. HMs, PFASs, Microbial communities, Bisphenol A)

CONCLUSIONS:

→ Beach wrack can be treated by means of RBS as sewage sludge. Sewage sludge contains significant amounts of water and nutrients just like beach wrack.

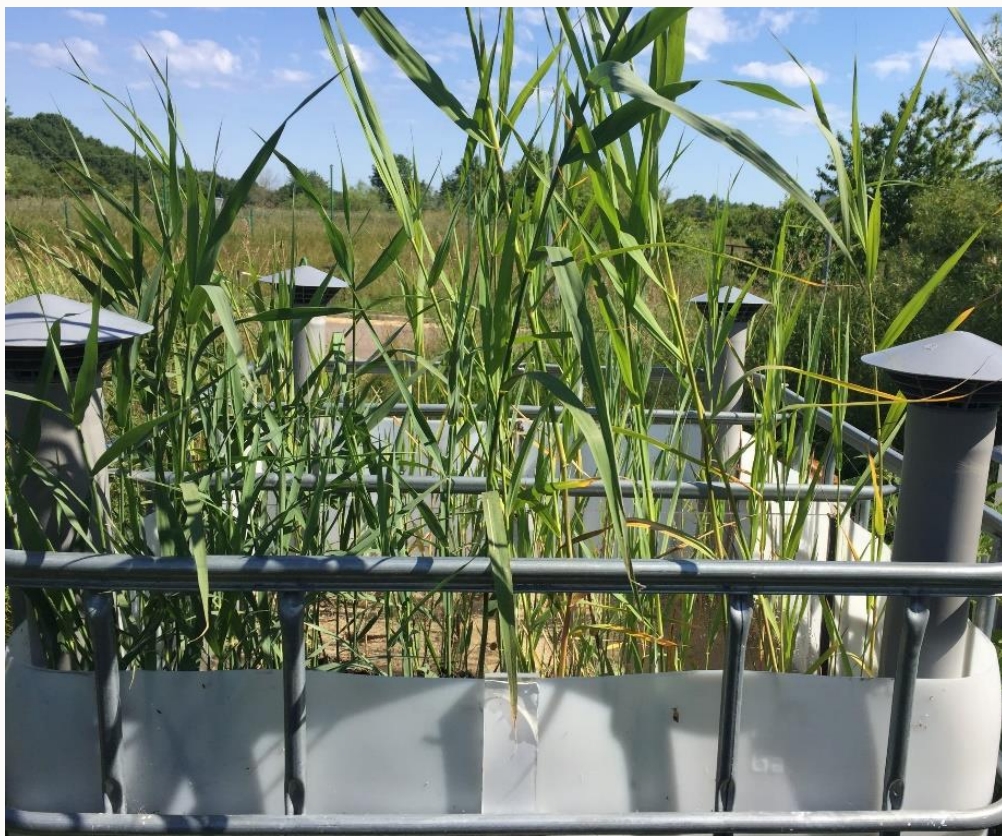
PARAMETERS				
SAMPLE	water content [%]	dry matter [%]	mineral substance [%]	organic matter [%]
Raw sewage sludge	99-93	1-7	42-26	58-74
Raw beach wrack	95.0	5.0	51.1	48.9

→ The reed bed system allow for significant dewatering and stabilization of sludge as well as dewatered the beach wrack material.

PARAMETERS				
SAMPLE	water content [%]	dry matter [%]	mineral substance [%]	organic matter [%]
Sewage sludge after treatment	86-58	14-42	41-52	59-48
Beach wrack after treatment	13.6	86.4	56.0	44.0

CONCLUSIONS:

→ Beach wrack material is a source of nutrients for reed and has a positive effect on its growth, which indicates good fertilizing properties.



Differences in the condition of reed fed with beach wrack material and not fed.

Thank You!



More during "Accelerating the transition to clean and healthy Baltic Sea" 9-10 June 2021.
event website: <https://www.bsrwater.eu/event/bsrwater-summer-conference>
registration page: <https://www.bsrwater.eu/content/bsrwater-summer-conference-registration>