Treatment of industrial wastewater and P recovery at municiplal WWTP

CHALLENGE

Doruchów commune (Poland) is the operator of a wastewater treatment plant (WWTP) which was built in year 2000. It treats mixed industrial and municipal wastewater. The daily treatment volume is 465 m³ out of which 65 m3 comes from meat processing industry. This has a significant impact on the WWTP's operation. In the incoming industrial wastewater the phosphorus content is 40 mg/L even though some pre-treatment is in place at the industrial facilities. WWTP's capacity is not sufficient and the content of phosphorus in its effluent is high. To be able to properly remove the phosphorus, the facilities need modernisation and numerous repairs.

For more info: Project BEST- Better Efficiency for Industrial Sewage Treatment www.bestbalticproject.eu

SOLUTION:

A new line for mechanical and biological treatment of industrial effluents for 1100 PE was built in the area of the municipal WWTP. It included a filter media for the removal of phosphorus from the effluent of the industrial wastewater biological treatment process. The new treatment line will be able to reduce the phosphorus content from 40 mg/L to less than 3 mg/L without the use of chemicals. The opening of the new line will result in significant improvement of the quality of wastewater discharged to the nearby Zalesianka stream that flows into the Prosna river, then into the Warta, and finally into the Odra river that reaches the Baltic Sea.

As part of the construction of the new mechanical and biological line for industrial wastewater treatment, the following facilities with a footprint area of 252.95 m² have been developed:

- delivered sewage disposal point
- equalisation tank
- biological reactor
- secondary sedimentation tank
- dolomite filter bed tanks with a pH correction station
- monitoring well
- dolomite filter media storage yard
- blower station

COST DESCRIPTION

- **The cost of construction works: 628 900 EUR**
- **The cost of project documentation: 14 000 EUR**
- **The cost of investor supervision: 14 000 EUR**

The investment was built in the BEST project and it was co-funded by European Regional Development Fund's Interreg Baltic Sea Region programme.

BEST Better Efficiency for Industrial Sewage Treatment

EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND

Interreg Baltic Sea Region

EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP

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P recovery

The filtration system is based on a unique and entirely innovative approach to the removal and recovery of phosphorus without the use of chemical agents. The filter media applied in the treatment process is in a form of highly porous calcium silicate rock material. A filter media called Rockfos® (with a particle size of 2–6 mm) has been used in the process. P present in wastewater is absorbed as it flows through the filter. This applied innovative technology has the potential to significantly reduce the use of chemicals for P precipitations, thus saving costs. Furthermore, P loaded filter media can be used as a fertilizer facilitating P recycling. In addition, this rock filter media with a high pH and content of calcium (Ca) and amorphous silica (Si), may be potential soil conditioners, which can be particularly beneficial for acid soils.

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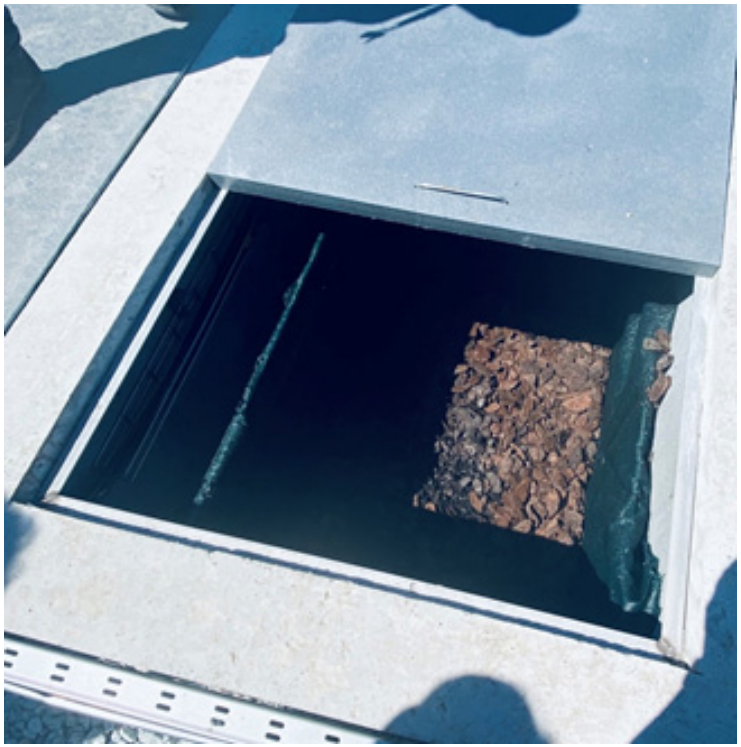
BENEFITS OF P–REMOVAL FILTER MEDIA

- high phosphorus removal efficiency - up to 90% of the P coming to the filter media
- low operating costs
- independence of the system from fluctuations in phosphorus concentration in the influent
- very simple operation
- additionally, heavy metals and pathogens removal
- lowering of BOD and COD



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