SMART-Plant

Scale-up of low-carbon footprint material recovery techniques in existing wastewater treatment plants

IEX

Ion Exchange for Ammonia and Phosphorus Removal and Recovery from Wastewater

Cranfield University has developed a tertiary nutrient removal and recovery technology based on ion exchange (IEX) processes. After secondary treatment, ammonia and phosphate are selectively removed from the wastewater with specific IEX media. The capacity of the IEX media is regularly restored by regeneration solutions, where the nutrients accumulate. With an ammonia stripper or a combined precipitation and filtration process, the nutrients are removed as products from the regenerants. Multiple use of the regenerants and high recovery rates are key aspects of the technology to ensure economic feasibility and sustainably. The recovered products are ammonia solution and calcium phosphate salts, which can be directly re-used in the chemical and fertilizer industries.

Within the SMART-Plant project, the IEX technology is demonstrated at Cranfield's wastewater treatment plant (UK) at a flow of 10 m^3/day. The challenge of this pilot-plant is to demonstrate its long-term operation with optimized regeneration, high nutrient removal and minimized losses of the IEX media.

WWW.SMART-PLANT.EU

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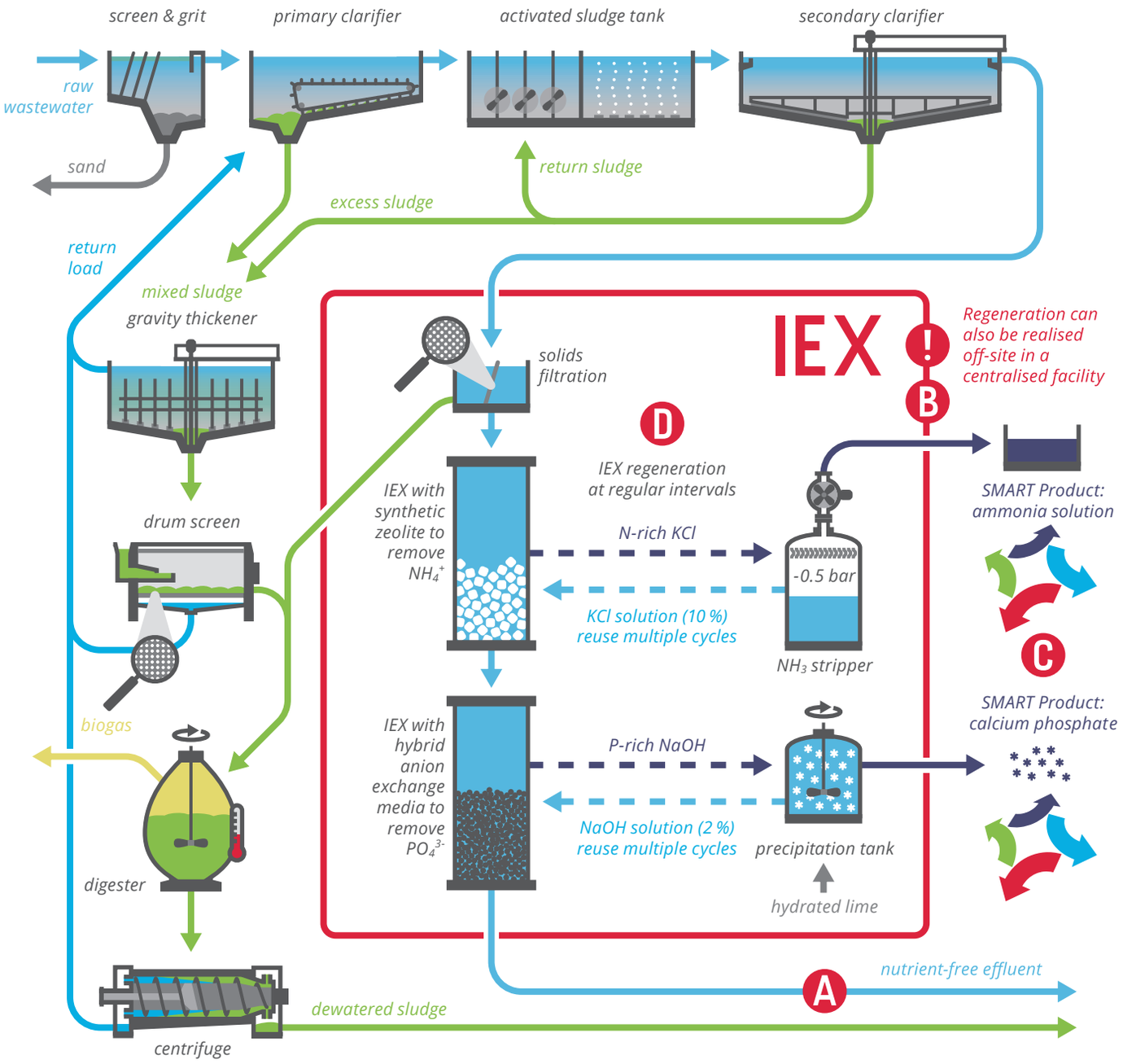

Unique Selling Points

A Achieves tight nutrient discharge limits by removing NH_4^+ and PO_4^{3-} to very low concentrations
(< 5 mg N/L and < 0.5 mg P/L)

B High recovery rates: up to 97 % of ammonia and 95 % of phosphorus

C High quality products which can be used in the chemical and fertilizer industry

D Multiple use and recovery of regenerants leading to an economic feasibility of the IEX technology in the wastewater industry

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Cranfield University

SEVERN TRENT WATER