



PIONEER_STP PROJECT



This project has received financing from the Era-NET Waterworks with co-financing from CDTI and the European Union Horizon 2020 Framework Programme for Research and Innovation

The Potential of Innovative Technologies to Improve Sustainability of Sewage Treatment Plants



Project Description

The Pioneer_STP project tackles the challenges relating to the re-use of wastewater from a holistic perspective. It integrates new concepts such as the recovery of resources and the optimising of the energy balance, stricter quality requirements that take into account emerging pollutants and the emission of greenhouse gases.

The project will assess the impact of the integration of four unitary solutions involving a total of nine innovative technologies currently developed at laboratory or pilot plant scale. All is designed to recover energy and nutrients. Each stage is notable for its environmental, economic and energy impacts in an overall strategy – to convert these wastewater treatment plants (WWTP) into factories of sustainable sub-products (energy, fertiliser and water for re-use).

Various scenarios will be studied including unitary technological solutions (UTS) with a multi-criteria analysis using a superstructure protocol. The new flow schemes for the treatment plants will be optimised with a dynamic plant-wide modelling (PWM) system.

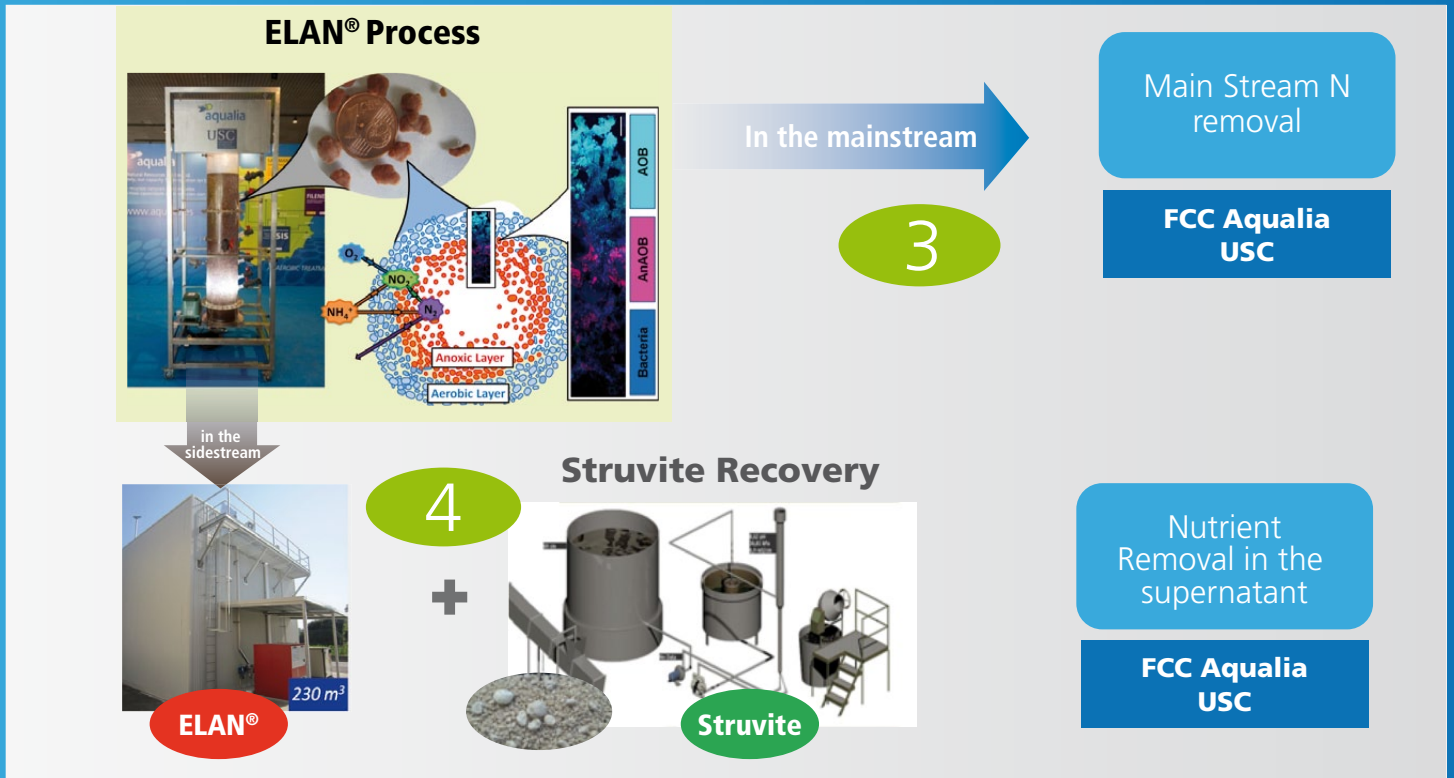
- UTS 1: Strategy for pre-concentration of organic matter in the water line.
- UTS 2: Optimising of the sludge line, maximising the recovery of energy by anaerobic digestion.
- UTS 3: Energy-efficient removal of nitrogen from the main water current.
- UTS 4: Recovery of nutrients from the anaerobic digestion centrate.



Location: Guillarei WWTP (Tui, Pontevedra, Spain)

Duration: From 1 May 2016 to 31 August 2018

Total Budget in Euro: 1,805,245.00 € **Aqualia:** 183,106.00 €



Unitary technological solutions 3 and 4 by Aqualia in the Pioneer_STP project

Aqualia is participating in two of the four unitary technological solutions.

UTS 3 Removal of nitrogen from the main water current, to reduce energy consumption and sludge production by modifying the already patented ELAN® process at ambient temperature (autotrophic denitrification - P201231912 / EP13151389.7) to adapt it to these new conditions.

UTS 4 Recovery of nutrients from the anaerobic digestion centrate. By

applying an ELAN® process followed by struvite precipitation, phosphorus is recovered in a product of commercial value as a fertiliser.

As well as the demonstration of new solutions, the life cycles of the product and the costs will be analysed as well as the environmental risks.

The results of the research will be transferred in a relatively short time to a real-scale treatment plant, giving an important added value.

For Aqualia, the collaboration with leading research centres in Europe means the development of advanced systems for recovering nutrients and energy from wastewater.

PROJECT PARTICIPANTS

- Universidad de Santiago de Compostela (leader, USC, Spain)
- Danmarks Tekniske Universitet (DTU, Denmark)
- Università degli Studi di Verona (UNIVR, Italy)
- Royal Institute of Technology (KTH, Sweden)
- FCC Aqualia (Spain)



UNIVERSITÀ di VERONA



DETAILS OF FUNDING

Funding: ERA-NET Cofund Waterworks, joint trans-national invitations 2014/2015.

Organism: European Union and the Industrial Technology Development Centre (CDTI).

Project: EXP - 00088170 / SERA-20151008

Grant: Subsidy of 40% of budget.

Funding Received
Aqualia: 73,242.00 €

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