



EIP-AGRI practice abstract

Short title:

Technology for P recovery as struvite starting from waste water with crystallization reactor

Summary:

The precipitation of struvite in the Madrid Sur WWTP is a problem when generating pipe obstructions, generally in the sludge line, downstream of the anaerobic digestion. Struvite is a crystal whose matrix is composed of magnesium, ammonium and phosphate, which is formed when these three ions are present in the solution above its saturation point. As a solution for this problem a Struvite Recovery System is implemented with a TRL level 9.

The Nutrient Recovery facility consists of 2 groups of feed pumps, a crystallizing reactor and its associated pumps, valves etc., a draining and drying product step, a product sorting and packaging step, a programmable logic controller (PLC) cabinet, an engine control center, a $MgCl_2$ and a NaOH storage tanks.

The draining of the dehydration and the clarification of the flotation are fed into the lower part of the reactor where they are diluted with recirculation and injected with $MgCl_2$ (32%) and NaOH (25%). Inside the reactor, the struvite precipitates in a controlled way in small hard granules. At the top of the reactor, an integrated clarifier retains the granules inside the reactor. The effluent is sent to a tank from where it is pumped to the primary decantation of the WWTP. Struvite particles are collected from the bottom of the reactor, washed, dried, sorted by size and packaged for shipment.

The system is designed to recover phosphate from a combined feed, in the range from 50 to 120 m^3/h maximum anaerobic digested sludge, dehydration overflows and flotation overflows.

The system is dimensioned to produce 2 t/day of the product ready to be commercialized.

For more information: https://nutriman.net/farmer-platform/technology/id_252