

Water & wastewater

How phosphorous can be extracted with a Quick Wash

Phosphorous is a valuable raw material for the production of many manufactured goods and an important resource needed to support both animal and crop production. It can be extracted from solid waste streams at both municipal wastewater treatment facilities and livestock farms, but unless treated correctly, it can become a pollutant. It is a problem being addressed by Renewable Nutrients at United States waste facilities.

The importance of phosphorous to life cannot be overestimated as it is a key element used in fertiliser. But it is a finite resource - demand is growing but supply is limited, meaning recovering it from

waste streams is becoming increasingly important.

"Extracting and recovering phosphorus from biosolids and animal manure solids has

risen to a level of paramount importance among both wastewater treatment plant operators as well as farmers," said Jay R. Snyder, environmental resource manager with Ephrata Borough in Pennsylvania.



Renewable Nutrients' Quick Wash mobile pilot.

Larry Sandeen, Renewable Nutrients' chief engineer facilitated the installation and operation of the Quick Wash phosphorus extraction and recovery mobile pilot plant which has been set up by Renewable Nutrients for testing at the Ephrata, Pennsylvania treatment facility Plant 1.

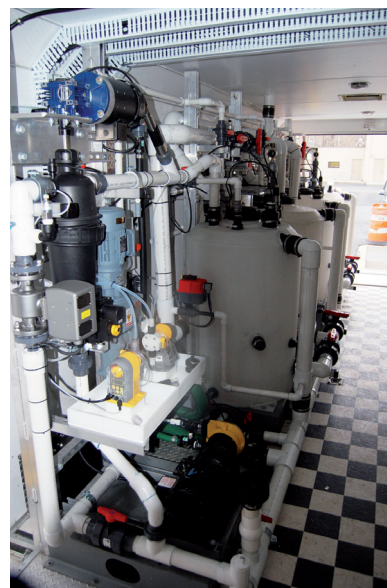
The purpose of the pilot is to prove the efficacy and efficiency of the Quick Wash process in extracting and recovering phosphorus from solid waste streams at both municipal waste water treatment facilities and farming operations with high densities of livestock.

Practical solution

"I'm extremely pleased with this debut of the Quick Wash technology. It represents the first industrial-scale deployment of



A view of the Quick Wash pilot plant.



The pilot system is designed to process solid waste at a rate of 5gpm.



A view of the ceramic membrane housing at separation stage 1.



A sample of the Calcium Phosphate which the Quick Wash process extracts from the solid waste stream.

a practical solution for extracting and recovering nearly 100% of the phosphorus present in biosolids," said Renewable Nutrients CEO Jeff Dawson.

"Our development partners, Synergistic Environmental Solutions, Keystone Engineering and Kershner Environmental Technologies, did a fantastic job of constructing a very presentable mobile unit as well as a high-tech operational platform, complete with state-of-the art automation software for running and monitoring the Quick Wash system."

Having completed its trial at the Ephrata plant, the mobile Quick Wash unit, which can be easily moved and transported between waste treatment facilities, is now

Renewable Nutrients

Renewable Nutrients is a private, North Carolina-based company that turns waste into sustainable and profitable resources. Through its exclusive license of the patented Quick Wash process, Renewable Nutrients allows waste treatment plants and farms to extract and recover phosphorus from human biosolids and manure solids. The remaining biosolids or manure solids, which contain crop-friendly ratios of nitrogen-to-phosphorus, can be land-applied, lessening the amount of waste taken to disposal sites and reducing or even eliminating the incidence of nutrient pollution from soil run-off. Municipalities and farms can sell the recovered phosphorus on the open market and engage in the trading or marketing of nutrient credits.

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on a three-month tour, where it will be operational at various waste treatment plants in Pennsylvania, North Carolina and Maryland, United States.

The Quick Wash system combines chemical treatment and membrane separation to produce a granular form of calcium phosphate and low or even



The on-board Quick Wash process control interface.



Larry Sandeen viewing the on-board SCADA automation system.

no-phosphorus biosolids. The calcium phosphate can be sold on the open market and the resultant solid material can be safely land applied or landfilled without fear of phosphorus soil saturation or run-off.

The Quick Wash technology could be a significant benefit to municipal wastewater treatment plants that need to remove phosphorus from their solids or final effluent. In addition to the benefits of phosphorus recovery, this process could replace costly side stream treatment of phosphorus-rich recycle flows from sludge dewatering processes.

Laboratory analysis

The mobile pilot has been fitted with a complete programmable logic controller and PC-based instrumentation and supervisory control and data acquisition (SCADA) system to continuously monitor and control the Quick Wash process. The data from the SCADA system is combined with both on-site and independent laboratory analysis to evaluate the performance of each pilot plant run.

The in-field pilot testing is a critical first phase in the development and implementation of a full scale system for municipal treatment facilities, while providing a platform to fully demonstrate both the process and economic benefits of phosphorus recovery. "The wastewater treatment sector realises that biosolids has levels of phosphorus higher than needed for good crop growth," said Bill Toffey, executive director of the Mid Atlantic Biosolids Association.

"The innovative technology that Renewable Nutrients is piloting may enable our treatment plants to produce a fertiliser for our farmer customers that is tailored to their crops and soils. I am eager to see the results of its performance in Ephrata and other test sites."

"I am confident we have created a practical system and solution for solving a phosphorus dilemma that waste treatment plants throughout the country and even the world have faced for many years," added Phil Schwartz, president of the Keystone Engineering Group. "I am pleased the pilot plant is operating as successfully as we had anticipated in our original design plans." ●

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