

CONVERT SLUDGE LIQUOR NITROGEN INTO A CROP FERTILISER

Wastewater treatment plants do a great job of converting wastewater into safe effluent and returning it to the water cycle. But at the same time, they don't recover several natural resources that could and should be put to better use.

Nitrogen is one such resource. As a vital nutrient in mineral fertilisers, it is crucial for agriculture being able to produce sufficient food for our needs. Today, however, the nitrogen removed from wastewater is simply released back into the air. It all goes to waste.

A MODERN, CIRCULAR SOLUTION

EasyMining's patented Aqua2™N technology now removes – depending on its concentration – 95% of the ammonium nitrogen from a plant's sludge liquor and converts it to concentrated liquid ammonium sulphate that is immediately available as a crop fertiliser. It's a modern, circular solution that also helps avoid setting off a eutrophication chain reaction in the surrounding ecosystem.

MEET COMING EMISSION AND DISCHARGE GOALS

By removing 95% of the nitrogen, Aqua2N reduces both the nitrogen load and the carbon footprint of traditional plants. Furthermore, the process emits no nitrous oxide, a greenhouse gas that is 300-fold more harmful than carbon dioxide.

Not only do such reductions increase overall plant capacity and efficiency, they also go a long way to helping operators live up to coming EU directives for urban wastewater treatment.

ADVANTAGES OF AQUA2™N

EasyMining's Aqua2N technology delivers across-the-board benefits spanning wastewater treatment plant operations to crop production, climate control and legislation.



Treatment plants remove – depending on the concentration – 95% of the ammonium nitrogen from sludge liquor and convert it into a valuable new commodity. This also lets operators increase overall capacity and improve efficiency.



More robust than biological processes. Increases the reliability of treatment plant operation.



The ammonium sulphate produced is an effective fertiliser that fulfils European Fertiliser Product Regulations. Its agronomic effect is comparable to current commercial ammonium sulphate.*



Reduces nitrous oxide emissions from the treatment plant by 15–30%. In addition, the ammonium sulphate generated has a much lower carbon footprint than that traditionally produced.



Aqua2N will help plant operators comply with current and future legislation such as the revised EU urban wastewater treatment directive.



EasyMining offers a turnkey solution including planning and design, construction, commissioning, and start-up.

**Data available on request.*



www.easymining.com



AQUA2™N

FROM WASTEWATER TO COMMERCIAL AMMONIUM SALT

The Aqua2™N process is developed and patented by EasyMining Sweden AB.

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WHAT IS AQUA2™N?

Aqua2N is a chemical process that removes ammonium nitrogen from liquid waste streams and converts it to concentrated liquid ammonium sulphate suitable for use as a crop fertiliser. Unlike traditional methods of producing nitrogen fertiliser, Aqua2N drastically cuts greenhouse gas emissions. Furthermore, it is simple to integrate and operate within conventional treatment plants.

WHERE DOES AQUA2™N FIT IN?

Aqua2N acts on liquid waste streams with high concentrations of ammonium nitrogen. Sludge liquor is especially suitable. Although this comprises only 0.5–1.5% of a plant's total liquid flow, it contains as much as 15–30% of the total nitrogen load. The process requires only standard chemicals and equipment.

HOW DOES AQUA2™N WORK?

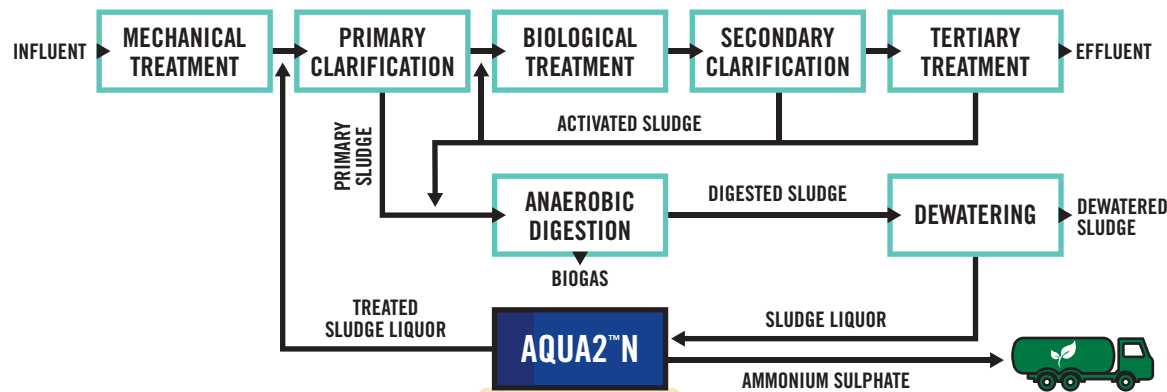
Aqua2N is a two-step chemical process followed by evaporation.

In step 1 – nitrogen removal – ammonium nitrogen is precipitated with magnesium phosphate, forming struvite. If needed, the pH of the incoming sludge liquor is adjusted with sodium hydroxide. Treated liquor is returned to the main wastewater flow.

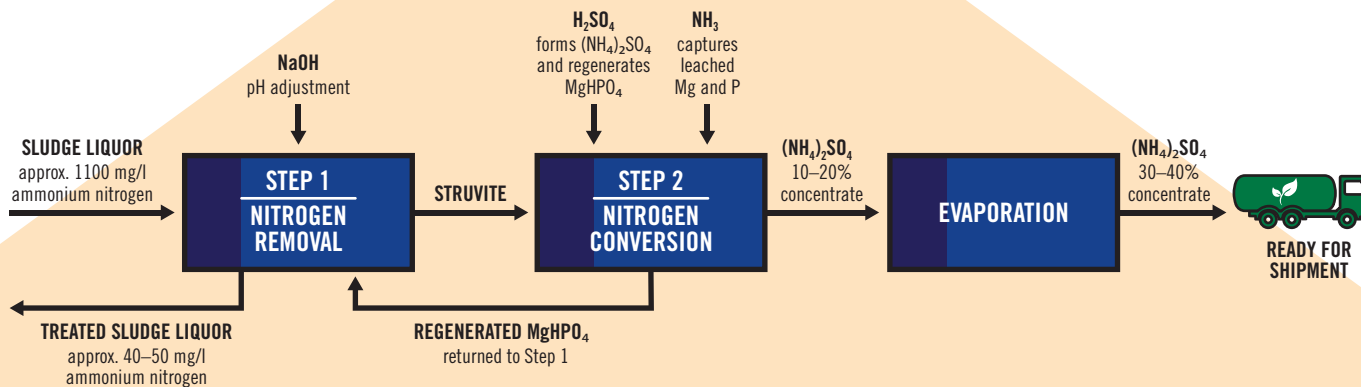
In step 2 – nitrogen conversion – sulphuric acid is added to break up the struvite, forming ammonium sulphate and regenerating the magnesium phosphate precipitant, which is returned to step one for reuse in removal. Added ammonia then removes leached magnesium and phosphate, which are also returned to the process.

Finally – the ammonium sulphate is **evaporated** to a 30–40% liquid concentrate usable as a fertiliser.

ACTS ON SLUDGE LIQUOR FLOWS GENERATED IN WASTEWATER TREATMENT



AQUA2™N – EFFECTIVE GENERATION OF LIQUID AMMONIUM SULPHATE



RESOURCES NEEDED:

Process chemicals

- H_2SO_4
- NaOH
- NH_3

Space requirements

For a 10 m³/h-plant:

- Plant building 18x11x9 m
- Tank farm 24x7.5 m (embankment)
- Customised according to site prerequisites

Make-up chemicals

- MgSO_4
- H_3PO_4

Utilities

- Water
- Energy
- Compressed air