

Success Story: P Recovery at Slough WWTP using Ostara Process

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Background – P Problems

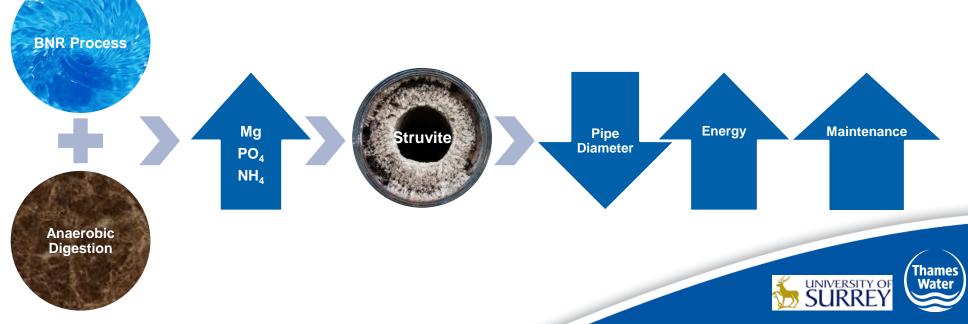
- Slough WWTP is a biological P removal site
- Since commissioning there has always been problems with struvite precipitation on pumps & pipes

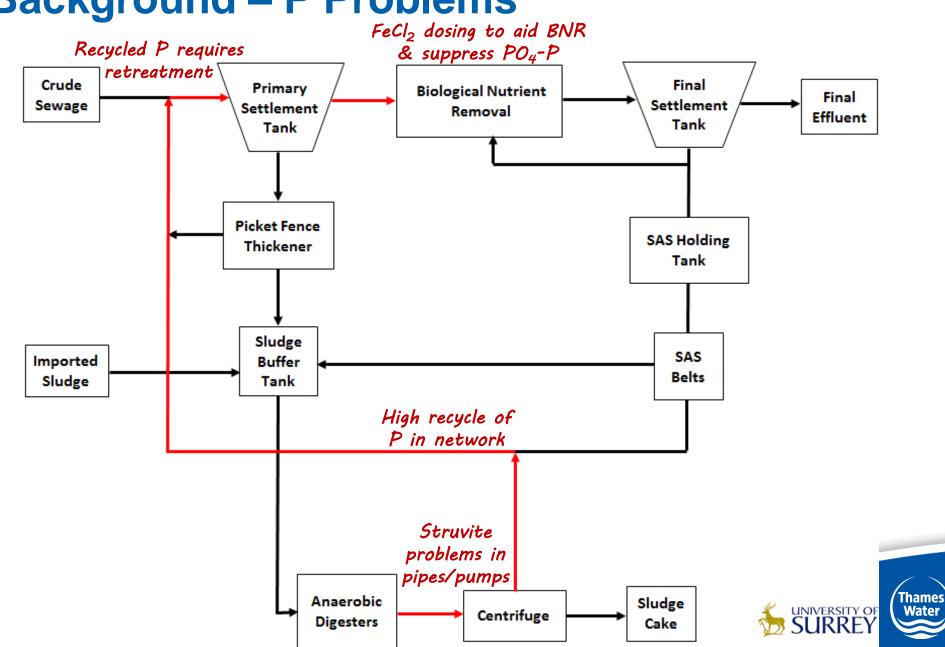


Centrate pipe









Background – P Problems

The Solution – P Recovery



15% total P
45% PO₄-P
removed from influent

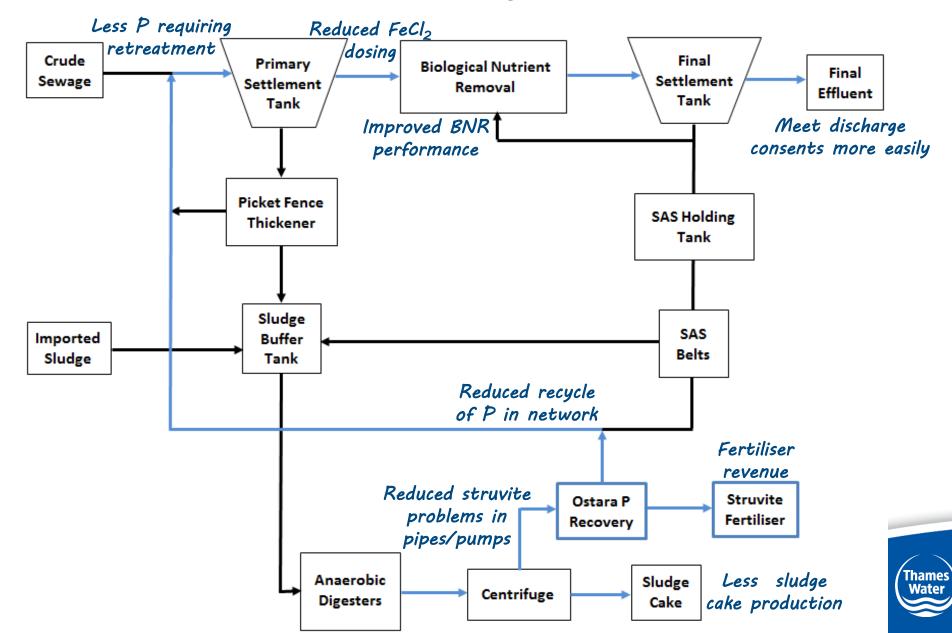




1/2 tonne/day struvite production



The Solution – P Recovery



The Benefits

- £££ 100K chemical savings by reducing FeCl₂ used to suppress struvite precipitation onsite
- Reduced struvite precipitation in pumps/pipes
- £££ 75K transport savings from reduction of sludge cake volume
- Increased options for application of sludge cake to land
- Improvement in BNR performance
- Reach final effluent discharge consents more easily
- £££ 31K operation & maintenance savings
- £££ 37K revenue from sale of struvite fertiliser
- First process of its kind in Europe TW seen as leaders in P recovery



Leaders of Full Scale P Recovery









theguardian





Come, friendly bombs, don't fall on Slough. It's doing good for humans now: Berkshire town to launch £2m nutrient-recovery reactor

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Lesson Learned

- Reduction of FeCl₂ solution dosing to improve recovery rate
 - Site managers worried about breaching final effluent discharge consents
 - Difficult to achieve continuous reduction of FeCl₂ solution dosing
 - Slow weaning of FeCl₂ solution to lowest allowable limit
- Struvite fouling of pumps/pipes
 - Initial design review needs to consider
 - pump type (centrifugal radial flow/positive displacement)
 - pipe work material (teflon coated is best, but expensive)
 - reducing turbulence (limit number of 90° bends)
 - inhibit/reduce pH levels in alkaline centrate (CO₂ works, but expensive)
 - Worsened when FeCl₂ dosing being reduced
 - Resulted in plant down time
- Upstream issues
 - All processes (especially centrifuge) upstream of P recovery must be working to ensure adequate flows to P recovery process
 - Solids transfer from centrifuge contaminating product
 - online monitoring to divert high solids streams before reaching process



Thank you!

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