

DynaSand® Oxy Filters in Year-Long Optimisation Trial at Watton Water Recycling Centre

Project profile

Objective

To demonstrate the ability of Hydro International's DynaSand® Oxy to remove ammonia and phosphorous from wastewater in a single stage.

Solution

Six DynaSand® Oxy filters were supplied. Primarily designed to optimise ammonia removal from treated effluent, the filters were also part of the national trial into more effective reduction of total phosphorus content from treated wastewaters.

Product performance capabilities

Feature	DynaSand® Oxy
Effluent TSS Removal	Down to 10 mg/l *
Effluent BOD Removal	Down to 10 mg/l *
Effluent Phosphorus Removal	Down to 0.2 mg/l **
Effluent Ammonia Removal	Down to 2 mg/l *
Effluent Nitrogen Removal	N/A
Maximum Flow-rate per filter	29 l/s

* effluent standards quoted to 95%ile

** annual average

Summary

Watton STW is a conventional percolating filter works with a population equivalent 13,900 in Norfolk. Anglian Water selected this site to evaluate the Hydro International, DynaSand® Oxy filter as part of the Chemicals Investigation Programme 2 (CIP2) scheme to reduce both phosphorus and ammonia in a single treatment stage.

Whilst phosphorus removal was the priority for the trial, it was agreed by the CIP2 technical working group that it would be beneficial to demonstrate whether nitrification could also be achieved in a single tertiary treatment stage. The DynaSand® filter, with chemical dosing, is already an accepted technology for maintaining very low effluent levels of phosphorus, with 0.1 to 0.2 mg/l being achieved as an annual average at multiple European sites.

The DynaSand® Oxy trial at the Watton plant consisted of six DynaSand® DS7000 (2 m diameter) Oxy filters, commissioned over the winter of 2015.

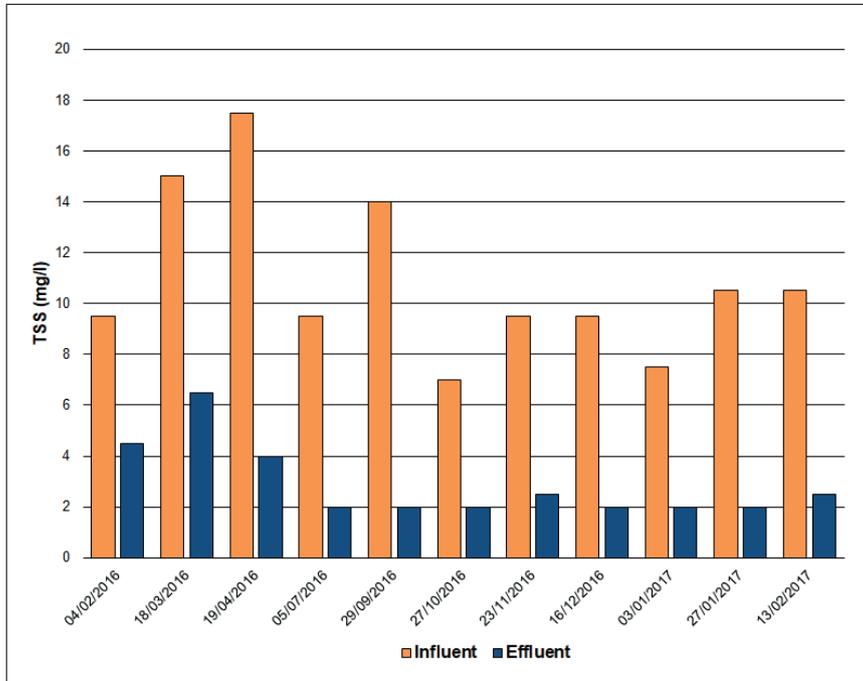
A full 13-month trial was performed from the beginning of February 2016 to the end of February 2017. The trial was commissioned by Steve Riley of Anglian Water. Ferric sulfate was dosed at the inlet to the filters via a static mixer at 5 mg/l Fe to precipitate phosphorus salts for removal. Changes to plant operation were minimised.

When the plant is operating optimally without other external factors causing an increase in the phosphorus load to the filters, the results demonstrate that an effluent total P concentration of 0.20 mg/l can be achieved.

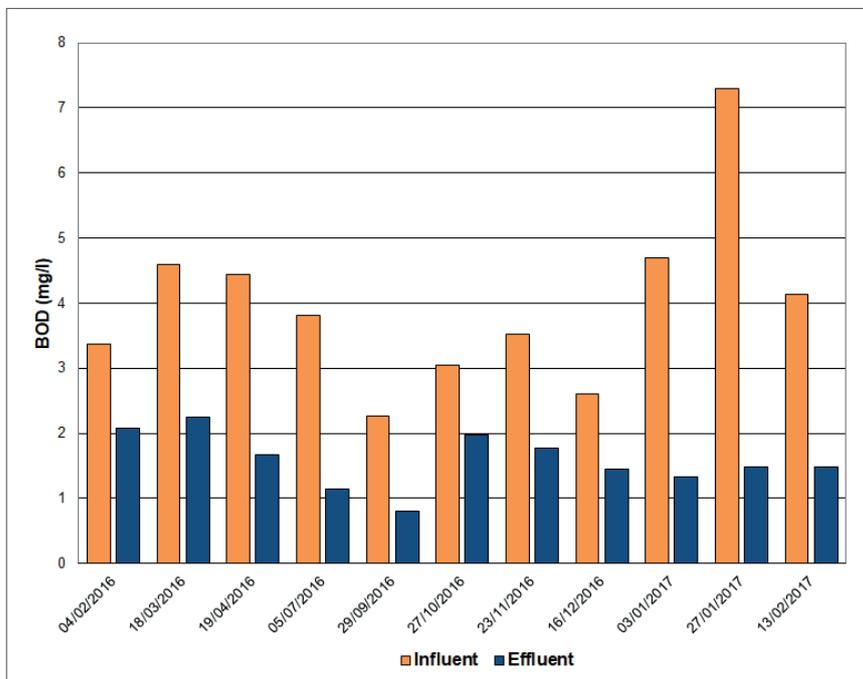


Detailed Analysis

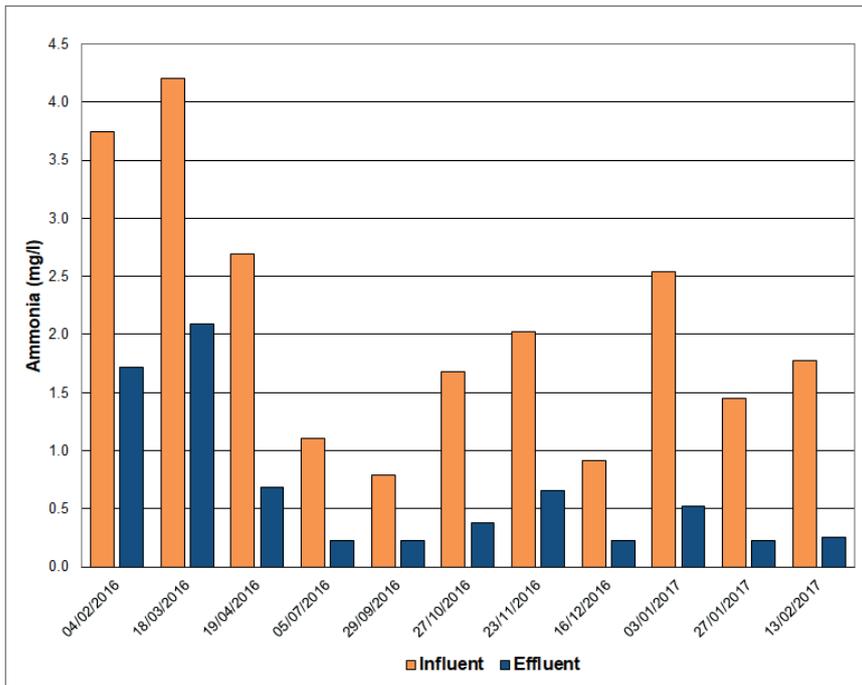
Data analysis was performed by Tina Popple of Anglian Water. The average effluent total P recorded during the trial was 0.30 mg/l, with 18 out of the 30 programme samples < 0.25 mg/l. The highest effluent total P concentration recorded was 0.72 mg/l. On 4 of the 15 sampling events effluent total P concentrations were higher than normal due to external factors, with concentrations between 0.42-0.72 mg/l. All other effluent samples were < 0.29 mg/l total P.



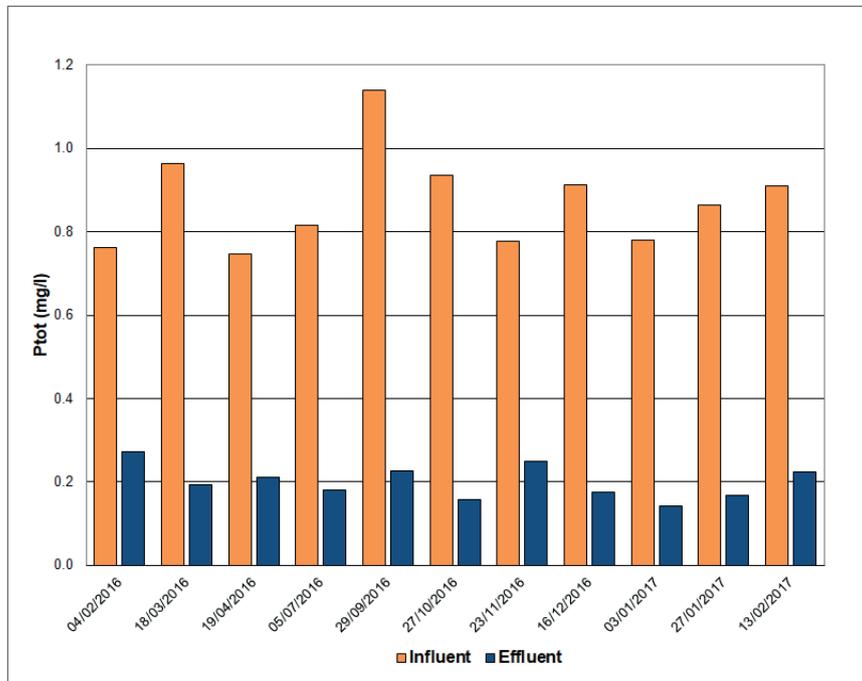
TSS removal over 13 month trial.



BOD removal over 13 month trial.



Ammonia removal over 13 month trial.



Total P removal over 13 month trial.

The trials demonstrated effective reductions of both phosphorus and ammonia to 0.2 mg/l and 0.7 mg/l respectively.

In conclusion the DynaSand® Oxy process successfully achieved low levels of both phosphorus and ammonium in the final effluent at Watton.

Learn more

To learn more about how the DynaSand® Oxy can help you to manage water more effectively, visit hydro-int.com, search **Hydro DynaSand Oxy** online or contact us:

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