

Newmore, United Kingdom

Water Treatment

THE CLIENT

Scottish Water is the sole provider of water and waste water services to around 5 million customers spread over an area of 79,000 square kilometres (over 30,000 square miles), a third of the area of Britain.

THE WORKS

Newmore WTW is located in the Scottish Highlands near the cruise Port of Invergordon and supplies 9 million litres of drinking water per day (MI/d). The raw water source for Newmore WTW is characterised by high colour particularly from the peaty soil in the catchment area. This can give rise to very rapid increases in raw water colour and natural organic matter, particularly following rainfall after a prolonged dry period.

TEMPORARY TREATMENT

Veolia Water Solutions & Technologies installed and operated a mobile Actiflo plant for a total of 3 months at the nearby Dornoch WTW site while essential maintenance was carried out on the single DAF/RGF stream. The Actiflo[®] delivered 1 MI/d of clarified water to temporary secondary filters and then into supply. These trials provided further confidence to Scottish Water who recognised the ability of Actiflo[®] to cope effectively with the type of water encountered in the catchment

PROJECT OVERVIEW

Veolia Water Solutions & Technologies provided the process design, construction, installation, testing and commissioning of 2 package unit Actiflo[®] High Rate Clarifiers. The project included the sand storage and transfer system, polymer make up and dosing system, coagulation and pH correction system, MCC and software for the process.

The purpose of the project was to increase the treatment capacity of the works while improving the process response to sudden high raw water colour events, often combined with a turbidity increase. Furthermore, due to its ability to start-up and achieve treatment requirements within minutes, Actiflo has proved to be more effective and versatile than the original clarifiers in dealing with the raw water variations.



THE ACTIFLO[®] PROCESS

The Actiflo[®] process is a patented compact clarification system that utilises microsand as a seed for floc formation. The resulting sand ballasted floc displays rapid settling characteristics that permit clarifier designs with high rise rates and short retention times. These designs result in system footprints that are between 5 and 20 times smaller than conventional clarification systems of a similar capacity. Actiflo[®] is ideally suited for difficult-to-treat waters, such as rapidly fluctuating water sources.

CONSTRUCTION

The Actiflo® clarifier was the process solution of choice by Scottish Water Solutions who awarded the main contract to Morrison Enpure Joint Venture. The clarification subcontract was awarded to Veolia Water Solutions & Technologies as part of the upgrade to Newmore WTW.

Two duty (assist-standby) treatment streams, each consisting of an Actiflo® package unit, are designed to treat a maximum flow of 9.4 MI/d, with one unit handling up to 7 ML/d.

Completion: Dec. 2009

FLOW DATA

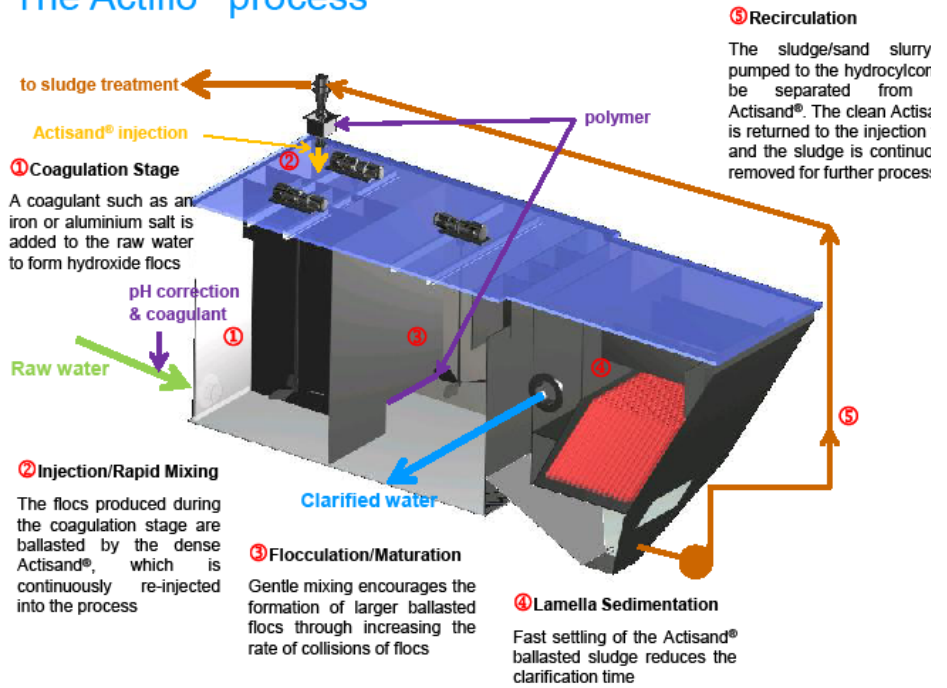
Minimum flow 3 MI/d
Average flow: 7 MI/d
Maximum flow: 9.4 MI/d

ACTIFLO® CLARIFIER CHARACTERISTICS

Number of streams 2
Lamella surface area
Per stream 7.1 m²
Max rise rate 41 m/h

DESCRIPTION OF ACTIFLO® PROCESS PLANT

The Actiflo® process



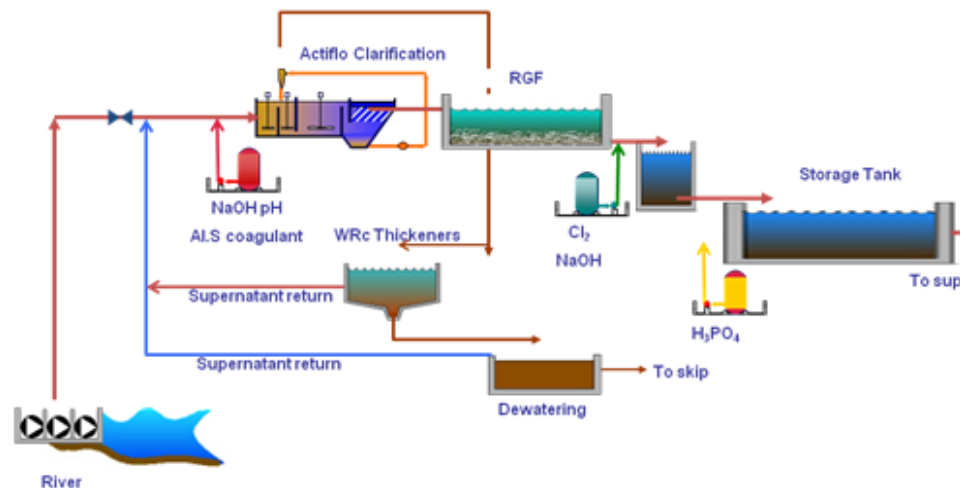
Influent Criteria (from river Glass) :

	Min	Av	Max	
Turbidity	0.1	1.7	50	NTU
True Colour	30	55	233	deg Hazen

Treated Effluent Consents : (95%ile spot samples)

Turbidity	< 2 NTU
True Colour	< 10 deg Hazen

NEWMORE WATER TREATMENT WORKS PROCESS FLOW DIAGRAM



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