

# Sligo Foxes Den Water Treatment Plant



CAW Ltd took over the Operations and Maintenance of the Water Treatment Plant at Foxes Den, Sligo, in November 2001 and became the first private company to be awarded a Water Treatment Operations and Maintenance Contract in the Irish Republic. This was followed in April 2016 by the awarding of a Design, Build and Operate Contract by Irish Water to CAW for the

upgrade of the existing Works to ensure that the production of 550 m<sup>3</sup>/h (11000m<sup>3</sup>/20-hour day) of treated water complies with the European Drinking Water Regulations and Drinking Water Regulations, S.I. NO. 122 of 2014 as well as Irish Water's own process and engineering standards. The Contract also includes for continued Operation and Maintenance of the Foxes Den Water Treatment Plant by CAW.

The raw water for the Foxes Den Water Treatment Plant is extracted from Lough Gill, 3 kilometres southeast of Sligo and pumped via a 500mm pipeline at a rate of approximately 550m<sup>3</sup>/hr to the main treatment works.

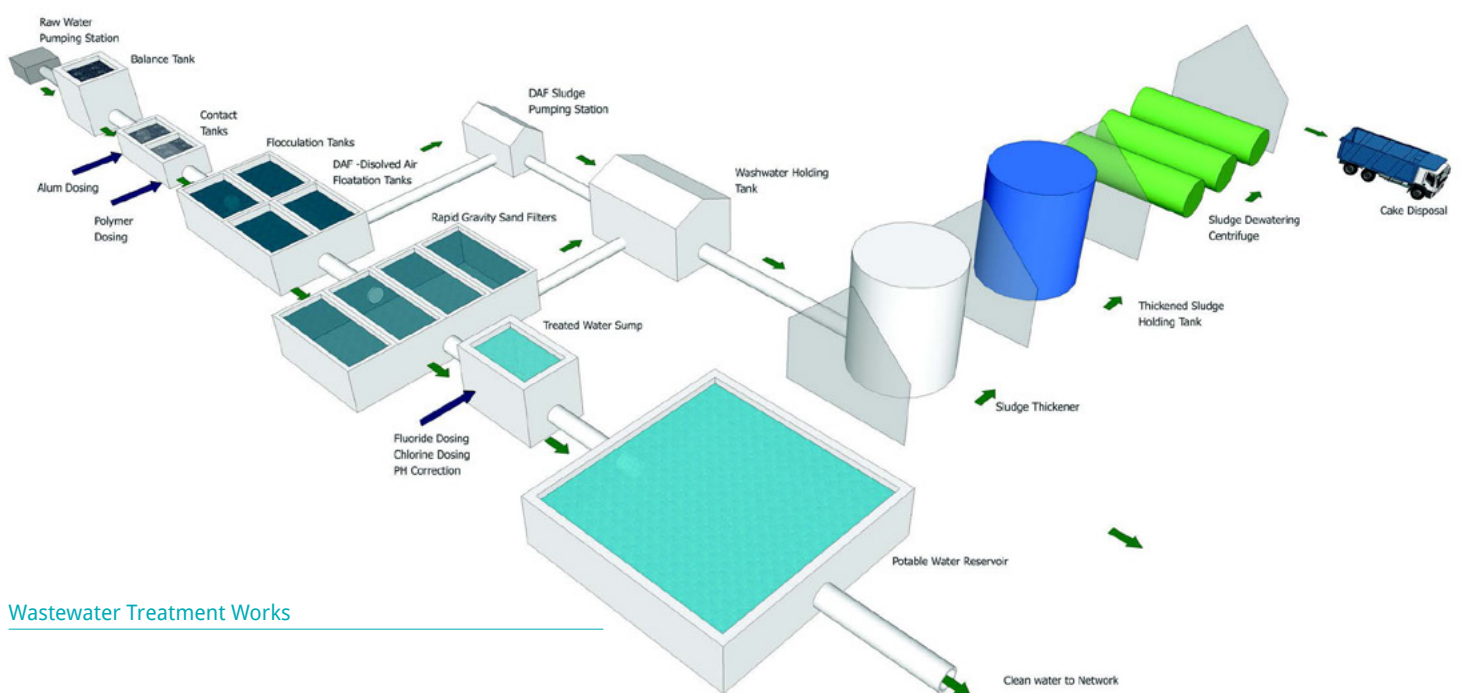
The state of the art water treatment plant delivers approximately 11 million litres of drinking water per day to the Sligo area. Initially the raw water is passed through a clarification stage of treatment comprising Coagulation /Flocculation/ Clarification, (CFC) During the Coagulation stage the water is dosed with alum and polyelectrolyte to accelerate the flocculation process. Following pre-dosing the water then flows to the Flocculation/ Clarification stage which comprises two parallel streams of treatment. In the Flocculation stage slow rotating paddle mixers gently stir the water to encourage the suspended micro-particles to form larger coagulated agglomerates rendering them easier to remove in the downstream Clarification and Filtration processes. From the Flocculation stage, the water passes to the Clarification Stage which is based of Dissolved Air Flotation, (DAF). In the DAF Stage, the coagulated suspended particles are floated to the surface by a continuous blanket of fine air bubbles released from the bottom of the Flotation Tank as a result

of the injection of an air saturated water stream. These particles are continuously removed from the surface of the water as a floated sludge by surface skimming mechanism. From the DAF stage, the clarified water is then passed through a rapid gravity filtration stage, comprising four rapid gravity dual media filters operated in parallel. The filtered water undergoes further conditioning before it enters into service. This conditioning includes a UV disinfection process, fluoridation, plumbosolvency control through the dosing of orthophosphoric acid final pH correction by doing caustic soda and a final stage of disinfection by chlorination before being passed to the treated water reservoirs. From the treated water reservoirs water is passed into supply distribution either directly or via pumped transfer to the service water reservoirs at Cains Hill in which case the water receives a secondary stage of chlorination. Washwater generated at the plant as a result of backwashing of the rapid gravity filters gravitates to a washwater holding tank where it is mixed with the floated sludge removed from the DAF stage before being sent to the sludge thickener. The thickened sludge is pumped to a sludge holding tank and then on to the sludge dewatering building. The

sludge is dewatered to produce a 18% DS cake using a decanter centrifuge and is then removed off site to a licensed landfill site. As part of Sligo County Council's (SCC) ongoing environmental protection policy the plant at Foxes Den is capable of recovering the supernatant water streams from the sludge treatment processes thus reducing the amount of raw water abstracted from Lough Gill.

The plant is manned by 3 local, CAW trained staff, with an advanced telemetry system remotely controlling the operation 24 hours a day. The Water Quality is required to meet the requirements of Article 7, Monitoring of Council Directive 98/83/EC. Water quality is measured with integrated instrumentation for pH, chlorine and aluminium. The plant is currently meeting these water standards and has made a considerable improvement on previous water quality.

Lough Gill is designated as an S3 water source and therefore in accordance with Irish Water's Pathogen Compliance Criteria a 5-log reduction or inactivation with respect to Cryptosporidium oocysts is required. This is achieved by a combination of physical removal using dual media rapid gravity filters and inactivation using a new UV irradiation process.



## Wastewater Treatment Works