Case Study

Invercannie Water Treatment Works

Client:
Scottish Water

Location:
Invercannie, Scotland

Project:
DAF De-sludge Scraper and Beach

At Invercannie Water Treatment Works (WTW) Colloide's work package as Mechanical and Electrical contractors was for the provision of 5 No. Dissolved Air Flotation (DAF) De-sludge Scraper assemblies for a new plant. This install was for Scottish Water with main contractor ESD.

These works are part of a substantial two-year £52 million revamp of the historical Aberdeenshire waterworks, which are more than 150 years old and once hailed a jewel in the crown of engineering success. Opened by Queen Victoria in 1866, the treatment works at Invercannie, Banchory, was designed to supply Aberdeen's drinking water and is still the main source for the region today.

In 1866 with a growing population of 75,000, the site had to supply 27 million litres of water every day. Today the Water Works supplies fresh, high-quality water to around 300,000 customers and will be able to deliver 63 million litres of drinking water a day after its refurbishment.

The Existing Works Consisted of:

The main components of the system

A raw water pumping station feeding two raw water reservoirs from which the raw water is passed to an inlet works consisting of screening, pH correction (lime) and coagulation (PACL).

The coagulated water is then filtered at an ultrafiltration membrane plant and the filtered water is pumped to a chlorine contact tank for disinfection (sodium hypochlorite), pH correction (lime) and chloramination, before passing to the 1924 aqueduct from where it gravitates to the supply zones, including Aberdeen. A treated water pumping station draws from the aqueduct within the WTW boundary and serves the Glendye supply zone. A further treated water pumping station is located 2km from the site boundary and draws from the aqueduct to serve the Laird's Cast supply zone. The membrane backwash water is treated by lamella clarifiers, WRc picket fence thickeners and a sludge press.

The current treatment process of ultrafiltration membranes was installed around 2008 and prior to this, the site consisted of a number of slow sand filters. The redundant slow sand filters will be utilised to provide the area to construct the new assets required under this project.

Scope of Work

The main components of the system

Colloide were tasked with the detailed design and production of drawings, data and calculations, supply and manufacture, delivery to site, offloading and installation of items which included:

- 5 No. DAF De-sludge Scraper assemblies. 9m wide
- rectangular concrete tank.
- Associated Electrical Works
- Factory Inspection
- All testing, dry and wet commission of the new DAF Desludge
- Scraper Assemblies.
- First fill of all required oils, fuels, chemicals, reagents etc.
- Provision of Operating and Maintenance Manuals.
- Provision of training to the Contractor and the Clients
- Operators and Maintenance Technicians.

The DAF Plant design had to be suitable for either continuous desludging or intermittent de-sludging of the plant.

Project Objectives

- Reduce turbidity and colour loading on the membranes and reduce the risk from cryptosporidium.
- Upgrade the works to treat an inlet flow of 70 Ml/day on a consistent basis.
- Reduce the risk of loss of water supply from plant shutdown, spate events or acute pollution events by provision of treated water storage at the works.