

## 8. Ballykelly WwTW – combining traditional processes and natural, eco-friendly wastewater treatment concepts with a treatment technologies trial facility



### Situation

Having removed the stormwater from the system in the town of Ballykelly, the raw sewage is representative of domestic sewage / sewage flows typical of Northern Ireland and is a suitable location to conduct trials.

In addition, this unique site has meant that NI Water has been able to combine state-of-the-art mechanical wastewater treatment processes with the natural, eco-friendly concepts of an Integrated Constructed Wetland (ICW) to deliver an exceptionally high-quality discharge.

### Action

The innovative solution delivered at Ballykelly includes a solar farm equipped with over 300 solar panels which will power the entire works during the summer months and be supplemented by the grid supply during the winter period.

The marrying of traditional and natural wastewater treatment processes at Ballykelly not only provides a robust long-term solution for the village, but also provides an area rich in biodiversity to enhance the local land and water environment.

Offering the best of both worlds, the more traditional, mechanical side of the WwTW includes an inlet works, activated sludge plant, final settlement tanks and return activated sludge pumping station. These processes are controlled by a state-of-the-art motor control centre (MCC) and powered using solar means. In a further sustainable move, the back-up generator provided for the works has been recycled from another NI Water site.

Once the wastewater has made its way through the mechanical processes, the effluent gravitates to the ICW where it is refined and polished to produce the highest quality discharge.

With a variety of native planting, the ICW creates a wide range of vegetative habitats for macroinvertebrates such as Mayfly and Stonefly to survive and for wild fowl to nest.

The Ballykelly WwTW site also includes a dedicated area for trialling wastewater treatment innovations to help enhance NI Water's process selection in the future. The facility includes access to raw sewerage entering the works, power and an area of hardstanding suitable for a containerised trial system to be installed. The custom designed facility provides NI water and suppliers the opportunity to test innovative new processes and equipment in a safe environment, as any outputs can be safely returned to the head of the main treatment works.

### Results

By integrating the ICW solution the site is enriched with biodiversity. In addition, the ICW has the potential to deliver on a substantial range of other ecosystem services, including flood attenuation, amenity and recreation.

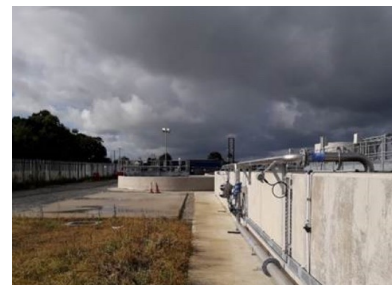
The use of the 'side stream' allows for pilot plant operation without interference with the main works. On treatment the post pilot plant discharge ultimately goes to the reed beds which 'polishes' the effluent before coastal discharge. This reduces the risk of pollution, even if there is a problem or failure in the pilot plant, hence protective of the environment.



Ballykelly WwTW, ICW and treatment technologies trial facility



Ballykelly Activated Sludge Process



Ballykelly trial facility - includes a hardstanding area for the trialling of containerised wastewater technology