

# LONG-TERM CASE STUDY

Scottish Water's Errol WwTP

**AERO-FAC®**  
BY GURNEY ENVIRONMENTAL



SHORE MOUNTED LOW-WEAR FAN BLOWERS

ERROL 2001



*Total capital cost recapture through green technology & dramatically lower OPEX.*

## 20 Years: No Sludge. Low Energy. Little Manpower or Maintenance. No CSOs. Full Compliance. No Odour.

The first Aero-Fac® wastewater treatment works in the UK was constructed in 2000 in Scotland at Errol near Dundee. A programme for the construction of the works and other local sewerage improvements was commissioned at the time by North of Scotland Water Authority (NoSWA).

### Choices That Impact Sustainability

The Errol treatment system incorporated what at the time were a number of highly unique “green” features, not the least of which is a self-digesting sludge process that requires no pre-screening, sedimentation tanks or clarifiers, no sludge removal, dewatering or conditioning, and best of all, no routine sludge disposal and the associated lorry traffic in and out of the works. All sludge is continuously self digested within the initial treatment stage.

Another feature of the Aero-Fac® treatment system is the very low operating cost. The system is unique in its use of a fully biological process along with constantly-operating wind-powered SERIES 3® aerators/mixers, plus a very special load-activated diffused air aeration system. Overall the system can

operate at about 65-85% less than typical activated sludge systems.

### Designed and Constructed by Partners NoSWA, Gurney Environmental and Montgomery Watson Projects (now Stantec)

The Errol works was designed as two stages of treatment carried out in two separate in-series, geomembrane lined earthen basins. Total energy requirements for the approximately 2,000 population works is about 11 kW net effective power. With the excellent winds available at Errol, the operating costs often go even lower.

### Meeting the Demands of Modern Treatment

The at the time new-to-the-UK Aero-Fac® principle of wastewater treatment held the promise of an end to the many concerns regarding sludge disposal methods, costs and regulations, as well as the dilemma of how to dramatically reduce the cost of providing wastewater treatment to the public and industry under the then AMP 3 programme. According to Nigel Morrison, a member of the NoSWA Project Team, “Each of those issues were critical in the decision by NoSWA to select Aero-Fac® in order to provide the highest quality treatment at the lowest possible cost to the public.”

According to Robert Dey of Scottish Water, “The [Aero-Fac®] system offered high process performance, but with low OPEX costs compared to a traditional plant, both in terms of operator attendance, maintenance and power usage, and in the fact the plant only needed sludge removal at intervals of several decades.

“In the 20 years since the plant was brought into service, it has indeed had both low maintenance costs, and low operator input. At the last testing it has been found to have very low sludge build up

and at this anniversary of its commissioning, there has had to be no consideration of emptying to remove sludge build-up. We have never had any odour complaints at Errol.

“In tandem, it has given consistent performance with a 100% record in terms of compliance with consent conditions. Another important element of the Aero-Fac® system was low energy costs and with the wind-driven SERIES 3 aerators augmenting the mains-powered blowers, it has reduced the potential energy costs. Although it was not such a high consideration 20 years ago, Errol also supports Scottish Water's moves to becoming carbon neutral.”

Dey went on to say, “The Aero-Fac® system also uses much less concrete than traditional forms of construction, with much of the material dug out to form the two ponds being re-used to form their wall structure. The aforementioned reduction in OPEX costs and the renewable energy element means that in both CAPEX and OPEX terms, the Aero-Fac® system accords with Scottish Water's carbon-neutral vision.

“Gurney-Environmental have since installed two further Aero-Fac® systems for Scottish Water and are currently in discussions re a number of projects at design stage.”

### Extremely Low Manpower and Maintenance, Superior Effluent for Water Re-use or Irrigation

One of the key benefits of the system has been the need for very little operator attention. Equipment maintenance is reduced to inspections of the SERIES 3® units every 3-4 months. By providing a superior, significantly more stabilised effluent, the Aero-Fac® system can provide irrigation quality water at an extraordinarily low cost. ►►

ERROL 2020

