

# Lochgoilhead WwTW

## £1.9m scheme to protect the environment

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**L**ochgoilhead, population equivalent, 494, is divided into two areas by the River Goil, which flows into the north end of Loch Goil. On the east side of the loch is the original village, which was served by a system of public sewers discharging into the loch through a macerator station close to the village centre. A small area of housing close to the primary school discharges to the River Goil and houses to the south of the village have numerous private outfalls discharging directly to the loch. On the west side is Drimsynie Estate, which is not currently connected to the public sewers. The coastal community was identified by Scottish Water as requiring new waste water collection and treatment facilities in order to comply with requirements of the Urban Waste Water Treatment (Scotland) Regulations 1994.



Lochgoilhead: WwTW for a beauty spot

*courtesy: Biwater Leslie JV & Scottish Water*

Scottish Environmental Protection Agency (SEPA) had defined the coastal waters at Lochgoilhead as:

- \* Shellfish Waters for 100m strip around the shores of Loch Goil;
- \* Recreational Waters in the immediate environment of the harbour and boat club.

Existing discharges did not meet the consents required for shoreline/recreational waters which were a maximum of 3 spills/year or meeting a 2000fc/100ml limit.

The chosen option was to treat only waste waters from Lochgoilhead Village and entailed the existing infrastructure being connected by a combination of new gravity sewers to two new pumping stations (SPS2 and TPS1). These pump stations operate in series and transfer the waste water to the new treatment works located beside Donich Water. The MBR (membrane biological reactor) Process was chosen as the main process element for the treatment works and the high quality effluent produced could then

be discharged through a new outfall directly into the fresh water convergence of the River Goil and Donich Water.

A small portion of the catchment is lifted into the existing sewer network via a satellite pumping station (SPS2), from where it will be pumped into the transfer pumping station (TPS1). The majority of waste water within the catchment gravitates directly to the transfer pumping station (TPS1), which is located within the car park at Lochgoilhead. These pumps have been designed to pass forward a rate of 3 DWF to the new WwTW.

Storm storage utilises the pump station chambers and also large pipe sections within the collection system just upstream of each pump station. Storage capacity has been based on a maximum of ten spills per year and any spill is designed to pass through a Combined Storm Overflow (CSO) utilising a self cleaning screen located in a separate chamber adjacent to each pumping station. Flow entering the treatment works enters a distribution chamber before splitting equally into two septic tanks. After the septic tanks the flows combine before passing through a *Copasac* chamber.

Flows then continue by gravity to two duty/standby 2mm brushed screens where rags etc are retained by the perforated sheet and brushed upwards and out of the flow into wheelie bins. This brushing action ensures the screen is regularly cleaned and eliminates the need for washwater.

The screened effluent discharges by gravity into an intermediate pumping station which houses two submersible pumps operating on a duty/standby basis. These pumps are intended to balance flows being passed forward to the aeration tank, which houses a fine bubble diffused aeration system. Process air is provided by two duty/assist variable speed blowers.

After the aerated biological process the flow passes to the MBR unit. This *Zeeweed* membrane biological reactor is a totally self contained unit incorporating two filtration trains plus associated blowers, chemical cleaning system and control gear. Effluent from the MBR flows to an outfall at the River Goil via a SEPA designated sampling chamber.

Sludge concentration in the filtration trains (membranes) is re-circulated to the aeration tank, but a proportion of the re-circulated sludge is diverted periodically into the septic tank distribution chamber.

Every three months the sludge produced at the septic tanks is tankered off site for further processing at a designated sludge facility and ultimate disposal.

The Lochgoilhead contract was valued at £1.9m and involved the design, construction, mechanical and electrical installation, commissioning and testing of all of the process. Contract conditions were the NEC Conditions of Contract (Option C – Target Cost Activity Schedule) with a 10% pain/gain share mechanism incorporated to add both incentives to *Bewater Leslie JV* and ensure final outturn certainty for the Client.

**Work began in April 2004 and an operational plant was handed over to the Client, on programme, in January 2005. ■**

**Note:** *The author of this article, Michael Pattison, was site manager for Bewater Leslie JV*



Lochgoilhead: Booster Set

*courtesy: Bewater Leslie JV & Scottish Water*



Lochgoilhead: Aeration tank

*courtesy: Bewater Leslie JV & Scottish Water*



Lochgoilhead: Transfer pump station

*courtesy: Bewater Leslie JV & Scottish Water*