

Bexhill & Hastings WwTW

historic setting for £100m environmental improvement project

by

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Hastings, the historic Sussex town, famous for the Battle of 1066, has been the setting for a 21st century £100 million environmental improvement project by Southern Water to deliver a wastewater treatment works and bathing water quality capable of meeting the highest European standards. Located on redundant agricultural land, between the two towns of Bexhill and Hastings, the new wastewater treatment and sludge recycling centre will serve a population equivalent of approximately 150,000 and deal with 37 million litres of wastewater every day.



Hastings & Bexhill WwTW (courtesy Southern Water)

First phase of construction consisting of a large scale storm water storage facility, was successfully commissioned in 2000. The second phase, involving construction of a new wastewater treatment works designed to meet the European Wastewater Treatment Directive, commenced work in August 2000. Following a successful construction period, commissioning of the works is on programme to be completed during Spring 2003. Completion of this project has heralded the end a six years environmental improvement programme which has overhauled the area's sewerage system.

Full secondary biological treatment has been provided for the first time, thus ending the release of only preliminary treated flows of wastewater from the existing long sea outfalls.

Full secondary biological treatment of wastewater flows of up to 922 l/s, designed to meet requirements of the new UWWTD, has been provided at the works. The projected flows for the 2015 design horizon are: 1050 l/s, meaning that the plant will have additional spare capacity to meet future demands.

An existing landfill waste disposal site is situated to the south east of the works. Special measures have been taken to prevent the entry of migrating gas to the works.

New treatment works

The new £32m wastewater treatment works was designed and built by a consortium of *OTVB* and *Morgan Est*. Civil design work was undertaken by *Mott MacDonald*.

The new treatment works receives flows up to 1.05 m³/s (90,720m³/d) from the Hastings and Bexhill catchment. Storm flows in excess of this, up to 1.7m³/s receive preliminary treatment only.

The new treatment facilities are positioned either side of an easement for a high pressure gas main supply. The main treatment building housing the inlet works, preliminary treatment, sludge handling facilities and administration area, together with sludge storage, sludge digestion and drying facilities are located to the west of the site. Primary and secondary treatment stages, together with final effluent pumping plant, are located to the east of the site.

Final effluent from the new site is transferred by pipeline, either by gravity discharge or by pumping when tide levels dictate, to the two existing long sea outfalls each approximately 3 kilometres long.

New treatment works includes:

- * screening & grit removal facilities;
- * lamella primary settlement tanks;

Wastewater Treatment & Sewerage

- * aeration tanks;
- * final settlement tanks;
- * sludge thickening plant;
- * sludge digestion plant;
- * sludge drying & recycling plant;
- * odour control plant (Detoxair™).

The site also features as one of Southern Water's key Regional Sludge Recycling Centres and will not only have the facility to treat sludge generated on site but also imported cake material and liquid sludge from other rural and urban treatment works.

The Sludge Recycling Centre constructed by *OTVB* and their sub-contractor *Andritz AG*, is expected to treat up to 13,750 tonnes of dry solids equivalent each year, with 6933 tonnes of imported cake being treated on site. Sludge is mixed and thickened before undergoing a digestive process. The resulting sludge, at 5% dry solids, is then further dewatered to 25% dry solids before being dried into sludge pellets of 92% dried solids. Sludge pellets are then bagged and stored on site before delivery to agricultural customers, who recycle it to land as an organic fertiliser that is virtually odourless.

By-products produced from the sludge treatment process are recycled as fuel for the process, thus providing further environmental benefits. Methane gas produced during the process is stored in a gas holder before being recycled back into the works to provide heat for the sludge digestion and drying processes.

Construction

Throughout the project's life cycle both the client and the contractors have worked alongside nature. A badger's sett, the presence of great crested newts and nesting site for herons has to be considered in planning the construction work. The creation of a new pond area and extensive tree planting scheme has ensured that wildlife would continue to flourish during completion of the projection.

Particular attention was also given to the nearby inhabitants of Bexhill and Hastings. In addition to the tree plantation scheme,

which comprehensively landscapes and screens the site from its neighbours, a state of the art odour control system has been constructed.

Every part of the works that could potentially result in an odour problem has been housed within buildings or sealed structures. Process buildings operate under a negative pressure system allowing air to be drawn into the building when access doors are opened, rather than foul air being released into the atmosphere. All air generated in either the buildings or covered structures is collected and passed through *OTVB's* single stage chemical scrubbing unit (*Detoxair™*), where it is rigorously treated before being discharged to atmosphere.

During the construction works an 'off-the-shelf' polystyrene and reinforced netting system was used to protect the tanks' steel reinforced concrete walls from clay bunding. This allowed good use of the excavated material from site and has the environmental benefit of material not having to be imported for backfilling of structures.

The construction phase also saw some of the wettest periods and floods in the area for many a year. However, a close working relationship between Southern Water and the *OTVB/Morgan Est Consortium* has ensure that the new treatment facilities have been provided in compliance with the Environment Agency's targets. This was achieved through the partnering ethos of the project being 'trickled down' through *OTVB's* main supply chain process contractor's *Andritz, Wheeler Engineering Services, DRB* and *Envirex*.

With the works fully complete, the two seaside towns will be among other key south coast tourist resorts to benefit from Southern Water's massive environmental improvement programme.■

Note: *The author of this article, Ian Black, is Project Engineer, OTVB.*
