

Yorkshire Water invest £14 million to achieve compliance & security of Bridlington supply

by
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Rising levels of pesticides and nitrates in borehole water supplies in the Bridlington area, has led Yorkshire Water to embark on a major Water Treatment Works rationalisation project to guarantee drinking water compliance and security of supply to 70,00 properties. The Bridlington area is supplied by five borehole sources, each of which have their own treatment works (Elmswell, Kilham, Burton Agnes, Haisthorpe and Bridlington). All five borehole sources exploit the Chalk aquifer and rising levels of pesticides and nitrates in the water supply are a widespread problem. Treatment at most sites is limited to simple disinfection.



New reservoir under construction

photo courtesy Yorkshire Water

Bridlington Service Reservoir (SR) is a 13 thousand cubic metre (tcm), single compartment tank, built in 1936. It receives water from the Bridlington and Haisthorpe boreholes and provides the only strategic storage for the town of Bridlington, where there are seasonal variations in demand due to the area being a popular tourist destination.

Bridlington SR cannot be taken out of service without prejudice to the water supply. As such, it has never been inspected for structural integrity, or been fully cleaned.

Rationalisation strategy

Levels of nitrate are rising at all five boreholes and failures have occurred within the Bridlington, Elmswell, and Burton Agnes supply zones. Pesticide failures have occurred at Bridlington (Chlorpyralid) and at Burton Agnes (Metazchlor). Nitrate levels at Haisthorpe are also rising but are lower than other sources in the area and are not expected to exceed quality standards before 2018.

The project, being carried out by *North Midland, Black & Veatch* (NMBV), in association with Arup, is classed as a WTW rationalisation strategy, abandoning five WTW's and constructing a new single 32 tcm works at Haisthorpe. This consists of a blending tank and a modular Granular Activated Carbon (GAC) plant.

All the borehole sources are being retained with the blending tank being used to dilute high nitrate water from Bridlington, Elmswell and Burton Agnes, with lower nitrate water from Haisthorpe and Kilham. The pesticides which are found at Bridlington and Burton Agnes are being removed with the GAC.

It should be noted that blending is only a short term solution - postponing the need for nitrate treatment until about 2018 - after which nitrate removal will be required using an Ion Exchange.

Raw water is being pumped to the new Haisthorpe site to be treated and blended, before being transferred back to the borehole sites and sent into supply. This involves laying of 47km of new pipelines.

Water Treatment and Supply

The enlarged Haisthorpe WTW will secure compliance with a consequent improvement in overall water quality. The project will give short to medium term resolution to the nitrate problems in the area, together with a degree of future proofing against other water quality deterioration.

Security of supply

The existing SR at Bridlington is the only strategic storage for the town and serves a population of 70,000 during the summer months.

Whilst the storage capacity is considered to be adequate, the tank is a single compartment, reinforced concrete structure which cannot be taken out of service for cleaning, or routine maintenance, without prejudice to the water supply feeding Bridlington. There are no operational rezoning options. Taking the SR out of service leaves the whole of Bridlington supplied directly from the borehole pumps, with the loss of supply a major concern.

Securing the water supplies to Bridlington involves the construction of a new 1.8 tcm reservoir, located inside an abandoned reservoir, built in 1872, on the same site. This solution enables the existing 13 tcm tank to be taken out of

service for cleaning, routine maintenance and repairs, in accordance with YW's reservoir guidelines.

Construction works commenced in December 2005, with Costain Mouchel Parkman (Costain-MP), removing the existing abandoned reservoir roof and constructing a new in-situ reinforced concrete single compartment reservoir in the same location. The size of the new tank is the minimum required to provide sufficient storage to the town of Bridlington when the existing reservoir is taken out of service in the future.

Conclusion

YW is investing £14 million in the Bridlington area to deal with the rising nitrate and pesticide levels in the local boreholes. The company is taking the opportunity to rationalise the WTW's by abandoning five works and constructing a single 32 tcm WTW at Hailsthorpe and securing water supplies to the town of Bridlington.

All construction work will be completed by 31st December 2006, to meet regulatory requirements.■

Note: The author of this article Lucy Ward, is Capital Solutions Manager, Yorkshire Water.
