

Editorial

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We are preparing to publish more papers on water treatment topics in a special issue based on the 2007 Cardiff water specialist meeting. We thought we would take this opportunity to open the discussion.

The current research on water treatment processes is, like other areas of water management, associated with climate change. There is for example general agreement that we need to get more storm water out of sewers. The Department for Environment, Food and Rural Affairs (Defra) research team (Defra 2008 consultation on surface water management) has estimated that climate change and further urbanisation could increase storm water volumes by nearly 200% by 2030. Our first paper in this issue includes data on the types and concentration of pollutants that will still occur in separated urban storm water. The paper suggests a design for reducing the footprint of wetland sustainable drainage systems (SuDS). We also recently published some similar results on various urban inputs into a local Loughborough brook, which have suggested how important the first storm flush and particle size distribution are on the total amount of metals mobilised in the receiving water.

Better use of storm water and water reuse are obvious solutions to some climate change induced water shortages and flooding. There is much interest in both direct and indirect use of wastewaters¹ and a good example was published in volume 158 of *Water Management*.

There are several large demonstrations of centralised dual supplies in Australia, Japan, USA and South Africa, which use effluent from upgraded municipal wastewater treatment plants. Provision of dual water services is mandated in buildings with floor areas greater than 3000 m² in Japan, some US states and German Leanders. The challenge is more on the economics than technology. The estimated cost of rainwater harvesting for lavatory flushing in the new 5000 m² Loughborough University civil engineering building was £75 000, so further encouragement will be needed for even sustainability inclined institutions to embrace storm water use.

Continued research and vigilance are also needed to measure the effects of persistent pollutants.

We have recently been part of the national programme working on trying to biodegrade endocrine disrupters in sewage

effluents. The synthetic steroids are active at the nanogramme per litre level. Removing these to below this concentration at the sewage works would require super oxidation or adsorption which could easily add a third to the cost of treatment. I recently read a paper from Switzerland,² which suggested that hospitals would have to be disconnected from the sewage system as their waste is too physiologically active, persistent and dangerous. This reminds us of the questions we have with nitrogen, phosphorus and pesticides: where is the best place to remove these pollutants?

Meeting new standards for newly emergent risks during water treatment has increased power consumption. About 60–70% of the running costs of a modern water works is spent on power. What is the best renewable? This debate rages in the *New Civil Engineer* magazine but water treatment specialists are entitled to a small smile based on the 100-year contribution that anaerobic digestion has made so far. Anaerobic digestion generates energy unobtrusively and hygienically from wastes, which would turn their nose up in other processes. Greater carbon capture in primary treatment together with additions of carbon rich food and biomass processing residues has become a major boost to developing more and better anaerobic equipment. At larger sewage works anaerobic digestion has always been responsible for processing over 70% of the total carbon input. In future more direct earlier capture in the treatment cycle for anaerobic digestion will reduce the current reliance on power and landfilling of biodegradable wastes. The only brake on applications is developing confidence in the sustainability benefits of the residues from well-controlled digestion. It was therefore with some disappointment that we learnt the European Commission was to postpone its publication of the soils directive, which would at least have been work in progress on the best available international opinion on sustainable soil management. This question of consent and governance brings us to another major issue, that of water services for the poor, covered in two articles in this issue of the journal. We are now all familiar with the statistic that 25–35% of the world's population do not have safe drinking water and unless new solutions are found, this will worsen as urbanisation proceeds. I am reminded of the international Brunel lectures given by John Banyard 'Water for the world—why is it so difficult?'³ which described the multiplicity of social, geographic economic and technical issues which have conspired to slow progress on the millennium development goals. New and innovative, community-based consent of the type described in

two other papers in *Water Management* will be needed. Just imagine the problems if there was no mains water in the house for just two weeks (as happened in Tewkesbury, UK, in 2007).

REFERENCES

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