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# US looks towards improving infrastructure resiliency

**T**he US government is currently in the early stages of considering a piece of legislation that would provide grants for a range of actions to help utilities adapt to changing hydrological conditions.

A Californian Democrat, Lois Capps, has introduced the Water Infrastructure Resiliency and Sustainability Act of 2011 with backing from the US Association of Metropolitan Water Agencies (AMWA).

The bill would authorise a new Environmental Protection Agency (EPA) programme offering competitive grant funding to help water systems adapt to the impacts of changing hydrological conditions, including those caused by climate change.

The new legislation, which is based on proposals originally introduced in the 111th

Congress, would involve the EPA establishing a grant programme in which water and wastewater systems would compete for matching funds to plan or implement water infrastructure projects made necessary by changing hydrological conditions.

The legislation would support modifying or relocating existing water system infrastructure; projects to preserve or improve water quality; investigating, designing or constructing groundwater remediation, recycled water or desalination facilities; increasing watershed protection, for instance by using 'green infrastructure'; development of renewable energy; and adopting and using advanced water treatment or water demand management techniques, among a long list of other water efficiency and flood risk reduction actions.

'AMWA has estimated that adapting to hydrological conditions brought about by climate change may cost US water and wastewater systems nearly \$1 trillion through 2050,' noted AMWA executive director Diane VanDe Hei. 'This bill's modest authorisation of \$50 million per year will help utilities begin addressing these needs today, while also creating thousands of jobs.'

The Bill is currently at committee stage – one of the first steps in the legislative process – having been referred to the Subcommittee on Water and Power in early August. Introduced bills and resolutions first go to committees that deliberate, investigate, and revise them before they go to general debate. The majority of bills and resolutions never make it past this stage. ●

## UK water companies attract large-scale investment

**T**he acquisition of the UK's Northumbrian Water by Hong Kong-based Cheung Kong Infrastructure Holdings (CKI) was coming to a close at the time of going to press, with CKI investing £2.4 billion (\$3.7 billion) in the utility.

CKI previously owned another UK water utility, Cambridge Water, which it sold to banking group HSBC in order to ease progress of its bid for Northumbrian Water.

Pensions investment consultancy Redington and investment bank Evolution Securities are reported to have joined up to find a UK pension fund, or consortium of funds, to buy Cambridge Water.

In a blog, Redington co-CEO Robert

Gardner says: 'This [the sale of Cambridge Water by CKI] presents a unique opportunity for a UK pension fund to acquire one of the UK's most efficient water companies. Cambridge Water provides essential fresh water services to over 300,000 people in Cambridgeshire.'

'Its activities are regulated by Ofwat and its prices may be increased in line with the agreed price review, based on a formula related to the retail price index, plus or minus a sum relating to its level of efficiency,' says Redington. 'Cambridge Water is permitted to earn a secure inflation linked return on its regulatory capital value of £64.64 million (\$102 million). At its March 2011 year-end, revenue was

approximately £20 million (\$32 million), with £7 million (\$11 million) in profits before tax.

'In sum, this is an ideal asset for a pension scheme looking for secure, long-dated inflation-linked cash flows, but with a significant real return above long-dated inflation-linked gilts. The attractiveness of Cambridge Water is that its small size of £74 million (\$117 million) makes it a palatable acquisition for one of the top 25 UK pension schemes by assets, as it will represent a capital investment of less than 1%. It's well run and has no external debt apart from its revolving credit facility to cover working capital.' ● See sector review, p27

## Veolia Environnement announces results and restructuring

**F**rench environmental services company Veolia Environnement SA recently announced its half-year results in tandem with an accelerated corporate restructuring that includes divestitures and a reduction in the areas in which the French water and wastewater giant works.

The company's statement cites 'difficulties in southern Europe, North Africa and the United States'. Its consolidated revenue grew 4.4% to €16.3 billion (\$22 billion) and its adjusted operating cashflow grew 2.3% to €1.7 billion (\$2.3 million). It notes that this figure was 'negatively impacted by operational difficulties within the US in the Marine Services business, in southern

Europe and to a lesser extent in North Africa, by a total amount of €97 million (\$133 million).'

Operating income was €252 million (\$345 million) against €1 billion (\$1.4 billion) the previous year, and negatively impacted by €686 million (\$940 million) of non-recurring write-downs, principally in Italy, Morocco and the US.

Veolia announced total asset writedowns of €800 million (\$1.2 billion) because of problems in its US, Italian and north African businesses. Adjusted net income was €188 million (\$258 million) compared to €263 million (\$360 million) in the first half of 2010.

On a different note, the company

reported a positive free cashflow of €155 million (\$212 million) against €133 million (\$182 million) in the first half of 2010 and a reduction in net financial debt by €454 million (\$623 million) to €14.8 billion (\$20 million). The company also reported a 'solid execution' of its asset divestment programme.

The company's accelerated restructuring aims include exiting transport activities in Morocco, environmental services in Egypt, Marine services in the US and Southern Europe, and achieving an increased geographic concentration of company operations with a presence in fewer than 40 countries by 2013 compared to 77 currently. ●

# Report focuses on large number of unreported breaches of drinking water safety

The US Government Accountability Office (GAO) has warned that states are not meeting their obligation to report health-related breaches in drinking water to the extent that US Environmental Protection Agency (EPA) audits uncovered 26% of health-related and 84% of monitoring violations went unreported.

The GAO noted in its report that 11 states had 20 outbreaks of illness associated with drinking water in 2005 and 2006, resulting in 612 illnesses and four deaths. The organisation warns that the report findings undermine the reliability of data collected under the Safe Drinking Water Act (SDWA).

For the report, the GAO was asked to gauge the quality of the state data EPA uses to determine compliance with the health and monitoring requirements of the Act and the status of enforcement efforts, the ways in which data quality could affect EPA's management of the drinking water programme, and the actions EPA and the states have been taking to improve data quality.

GAO analysed EPA audits of state data undertaken in 2007, 2008 and 2009, and canvassed EPA and state officials to obtain their views on factors that have affected data quality and steps that could improve it.

The GAO report concludes: 'The data states reported to EPA for measuring compliance with health and monitoring requirements of SDWA did not reliably reflect the number of health-based and monitoring violations that community water systems have committed or the status of enforcement actions.'

As well as the under-reporting of violations in general, according to EPA headquarters and regional officials GAO interviewed and surveyed, state-reported data also under-reported the percentage of water systems against which the states have taken enforcement actions. Survey respondents and other officials reported that various factors contribute to errors in reported data on violations and enforcement, including inadequate training, staffing and guidance, and insufficient funding to conduct those activities.

The GAO makes a number of recommendations to improve the situation, including:

- The EPA's administrator should resume data verification audits to routinely evaluate the quality of selected drinking water data on health-based and monitoring violations that the states provide
- The EPA's administrator should work with the states to establish a goal, or goals, for the completeness and accuracy of data on monitoring violations
- The EPA's administrator should consider whether the EPA's performance measures for community water systems could be formed to more clearly communicate the aggregate public health risk posed by these systems' non-compliance with the SDWA and progress in having those systems return to compliance in a timely manner
- The EPA's administrator should work with the EPA regions and states to assess progress in implementing the steps called for by a 2008 action plan and a 2009 memorandum from the Director of the Office of Ground Water and Drinking Water

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# US utility buys up smaller water providers

**Aquarion Water Company, the largest investor-owned water utility in New England, has bought dozens of water systems and several small companies in Connecticut over the last few months.**

Commentators see this as part of a wider industry consolidation that is taking out small operators that have insufficient capital to fund ongoing operational and capital expenditure costs and meet increasingly-tight regulatory standards, providing opportunities for larger utilities that can leverage economies of scale.

Since April, Connecticut-based Aquarion, which serves over 580,000 customers in 39 cities and towns, has announced plans to buy water systems serving a few thousand residents 'with the goal of

unifying fragmented operations' and preparing for future development.

The company most recently bought Meckauer Water Company, which serves just 49 customers in Bethel. Terms of the deal were not disclosed.

Bruce Silverstone, a spokesman for Aquarion in Bridgeport, said smaller water companies could not always meet standards set by the Department of Health. He noted: 'Not that they don't have good water, but it's increasingly difficult to continue meeting standards and do what's necessary.'

Other examples of recent purchases include Aqua America, which recently announced an agreement with American Water Works Company to purchase all of American Water's regulated operations in

Ohio and to simultaneously sell Aqua's regulated operations in New York to American Water. Both companies are now the largest investor-owned water utilities in each of the two respective states.

As a result of the transaction, which involves purchasing eight water systems and one wastewater system, Aqua will acquire an extra customer base in Ohio of around 57,280.

In a separate agreement, Aqua America agreed to sell its seven water systems, which serve around 50,520 customers in New York, to American Water's New York subsidiary, for approximately \$71 million. The move makes Long Island American Water the state's largest investor-owned water utility. ●

## Scottish Water ordered to provide full financial information on nine contracts

**A Freedom of Information (FOI) request by UK trade union UNISON Scotland has resulted in Scottish Water being ordered by the Scottish Information Commissioner to provide the public sector union with full financial information on nine of its major water and sewerage public finance initiative (PFI) contracts.**

The decision was made despite Scottish Water objecting that this would substantially prejudice the confidentiality of its commercial and industrial data. UNISON claims its FOI request suggests Scottish Water does not hold full business cases (FBCs) for the nine contracts in question. The union also disputes claims by the utility that it was not required to hold FBCs for its early PFIs.

UNISON's Scottish Organiser Dave Watson said it was 'scandalous' that either the projects had been approved without any FBCs that could be scrutinised to

examine claimed value for money issues, or that these key documents had been lost.

He added: 'Scottish Water says that FBCs were not required to be carried out for these early PFI projects, but the Scottish government's own website still to this day says that FBCs were published for two of the nine contracts and Scottish Water told MSPs (Members of the Scottish Parliament) that at least three existed, yet it has not been able to trace them.'

'We also asked the then Scottish Executive for these documents and they too said they were not held, but at that time we assumed at least that Scottish Water would have them. We will be pursuing the mystery of the missing or non-existent FBCs with the Scottish government again.'

'We expect MSPs will also be concerned to learn that they were led to believe in 2001 that FBCs were carried out when it

seems highly likely that these contracts were approved on the basis of minimal "back of an envelope" calculations, which is a disgrace.'

Mr Watson told *WUMI* that since the decision UNISON has put in further FOI requests to the Scottish Government to determine what the government itself does or does not hold. He said: 'The Scottish Government website said they had received the FBCs and it seems they did not so they have got some explaining to do. It's utterly bizarre that government officials should make decisions on multi-million pound contracts without a business case.'

The nine contracts, most of which run for 30 years, cost nearly £600 million (\$947 million) in capital expenditure and around £130 million (\$205 million) annually. UNISON has not yet received a response from Scottish Water. ●

## water utility management INTERNATIONAL

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Utility reform and achieving efficiency are central themes of the publication, encompassing topics such as benchmarking, investment

planning, consolidation, public / private sector roles, leadership, IT, and human resources. Other regular themes include financing, regulation, charging policies, procurement, corporate governance and customer issues.

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**Publishing**

## National command centre opened to coordinate US water utility disaster response

**In the aftermath of Hurricane Irene, United Water announced that it had opened a national command centre in Boise, Idaho, to coordinate the major US water company's response to the damage caused by high winds and flooding.**

United Water owns or operates water and wastewater utilities along the US' hard-hit east coast, from Georgia to New Hampshire.

United Water president Bob Iacullo explained in a statement at the time: 'The command center is located at our

United Water Idaho office in Boise. It is not in the storm path and the talented team of Boise professionals has a wealth of expertise to help coordinate and support response efforts which might be needed by our East coast operations.'

A number of municipal water and wastewater plants more generally along the eastern seaboard were reported to have been affected by the hurricane – several low-lying wastewater treatment plants were inundated, some sending raw wastewater into nearby water bodies, and

some water treatment works and pumping stations suffered power cuts that reduced or completely cut off supplies.

In his statement, Mr Iacullo noted that his company's priorities focused on ensuring the health and safety of employees, customers and clients while protecting critical infrastructure and the environment. He stressed that the United Water team would 'strive to maintain service and restore service in a timely manner should interruptions occur'. ●

## US water market sees significant bond activity

**The US water market appears to be busy with bond sales as investors look to safe investments during the ongoing financial crisis.**

The Indiana Finance Authority is leading five utility issuers selling about \$2.5 billion in bonds, despite yields on bonds backed by customer payments being at their lowest in almost a year.

The issue is being undertaken to facilitate the sale of Indianapolis' sewer system to CWA Authority, a non-profit public benefit corporation created by Citizens Energy. Officials are said to be eager to take advantage of current low borrowing costs.

The Louisville and Jefferson County

Metropolitan Sewer District in Kentucky also recently issued \$266.9 million of sewer bonds, and California's water department and the Indiana Finance Authority announced plans in August to sell more than \$2 billion of utility revenue bonds as municipal issuance appeared set to increase 42% to \$5.4 billion, according to Bloomberg data.

King County, Washington, which encompasses the city of Seattle, also sold \$403 million of revenue bonds to help re-fund debt and finance improvements to its sewer system.

Los Angeles' water agency, which serves four million people in the city, priced \$311.6 million of revenue bonds last

month. The California Department of Water Resources, which finances water infrastructure projects, was also reported to be planning to borrow \$1 billion of tax-exempt revenue debt.

Also recently the Bozeman City Commission approved rate increases for water and the extra taxpayer money will be used to build a new potable water treatment plant. At a meeting in August, the commission approved a bond to fund the new centre.

American Water Capital Corp, York Water and the Water Replenishment District of Southern California have all recently issued bonds for various purposes. ●

**LS See Analysis, p7**

### Pöyry wins wastewater disposal and management contract

Pöyry's Water & Environment business group has been awarded a contract for wastewater disposal and solid waste management for four provincial towns in Vietnam. The assignment, which is funded by the German KfW Development Bank and the Swiss State Secretariat for Economic Affairs (SECO) under the Program North II in Vietnam, has a value of €3.5 million (\$4.78 million).

### IADB provides funds for Venezuelan rural water and sanitation

The Inter-American Development Bank (IADB) has approved a \$100 million loan for Venezuela to improve or expand access to water and sanitation systems for some 11,000 households in up to 68

rural communities and small towns. The programme will have two components. The first will include measures to strengthen the capacity of local water and sanitation community organisations and service providers so that they can effectively contract and supervise infrastructure works and manage the services sustainably.

### Innovuze wins Kurdistan water network modelling contract

Innovuze has announced that following a competitive review, the General Directorate for Water and Sewerage of the Kurdistan regional government in Iraq has chosen to deploy multiple licenses of the company's InfoWater Suite, the Arc-GIS centric water supply and distribution

modelling, management and optimisation software. Within the framework of the water supply improvement project under the Ministry of Municipality and Tourism for the Kurdistan region, the software will be used to develop models of the water networks of the cities of Erbil, Duhok, Sulaymaniyah and Halabjah.

### EU provides water and sanitation grant to Montenegro

The European Union is providing a €5 million (\$7.1 million) grant to support water and sanitation projects in five municipalities in Montenegro. This grant from the Municipal Window of the Infrastructure Project Facility (IPF) will be teamed with a loan from the European Investment Bank (EIB) in the context of the Western Balkan Investment Framework (WBIF).

### Defence experts warn of cyber risk to infrastructure

Information experts BAE Systems Detica warned recently at the UK's Defence and Security Equipment International conference and exhibition that critical national infrastructure (CNI) will increasingly need to adopt high-security cyber approaches that until now have been the preserve of military and national security.

### Chile water utility stakes sold to US pension plan

The Chile government's CORFO development corporation has sold the majority of its stakes in the water utilities Essbio and Esval to the Ontario Teachers' Pension Plan (OTPP) for Ps260.6 billion (\$563.4 million). The pension fund now owns 89.6% of Essbio, up from 51.1%, and 94.2% of Esval, up from 69.8%.

## Protest group calls for Nevada pipeline support withdrawal

A protest group consisting of the US' Center for Biological Diversity, Great Basin Water Network and Nevada Conservation League has called on the Clark County Commission to withdraw its support for the Southern Nevada Water Authority's massive groundwater pipeline project. Rob Mrowka, a Nevada-based ecologist with the Center, said in a statement: 'Aside from being a financial boondoggle, the water authority's proposed pipeline would destroy Nevada's priceless natural heritage and huge swaths of rural communities. There are other, better options for addressing southern Nevada's long-term water needs.'

## US EPA to review municipal water source regulations

The US Environmental Protection Agency (EPA) has agreed to review regulations to protect municipal water sources across the country, following criticism by New York Mayor Michael Bloomberg of a \$1.6 billion federal mandate. New York is protesting a requirement to place a 90 acre concrete cover over the Hillview reservoir in Yonkers.

## Agreement reached for building of 50MGD desal plant

The city of Carlsbad and the San Diego County Water Authority have reached a tentative agreement to enable a long-planned 50MGD (190MLD) desalination plant due to be built by Poseidon Resources to move forward. Despite the progress, the plant faces a further legal challenge from Surfrider Foundation, which filed an appeal in early August against a decision upholding an 'open ocean' intake for the plant. Discussions between the city of Carlsbad and the Water Authority have been under way for some time. The Water Authority is looking at a water purchase agreement with Poseidon for desalinated water from the plant, but Carlsbad must first waive rights it enjoys under a pre-existing agreement with Poseidon.

## Brazil utility submits projects for national growth acceleration plan

Sanepar, Brazil's Paraná state water utility, has submitted R488mn (\$300 million) in water and sanitation projects to be considered within the small projects group in the second phase of the national growth acceleration plan. 47 wastewater collection and treatment projects and 54 potable water supply projects have been submitted by the utility to the national health foundation (Funasa), and 37 wastewater projects and 21 water projects have been submitted to the cities ministry.

# Suez Environnement announces strong results

**S**uez Environnement has announced results in line with its 2011 targets – revenue up 11.8% at €7 billion (\$9.6 billion) and an EBITDA (earnings before interest, tax, depreciation and amortization) of €1 billion (\$1.4 billion), up 18.3%.

Commenting on the results, CEO Jean-Louis Chaussade issued a statement, saying: 'In the first half of 2011, Suez Environnement posted strong results growth and solid performance with a double-digit growth in revenues and operating performance. Commercial activity remained sustained. Growth in Europe is driven by the profitable growth of the water activities and by a rise in the volumes of waste treated.'

'Addressing the heavy needs for environmental services, international growth is still strongly increasing. The Group's growth benefits from the

positive effects associated with the integration of Agbar and the acquisition, finalised early this year, of WSN in waste in Australia.'

The group was hit by a near-doubling of its income tax from €58 million (\$79 million) in 2010 to €92 million (\$126 million) in 2011, mainly because of the low tax rate in the first half year of 2010 in Spain on capital gains generated by the Agbar takeover.

Net investments rose to €770 million (\$1 billion) – in addition to acquiring WSN in Australia, the group invested in wastewater treatment plants in France, regulated water activities in the US and Chile and in energy-from-waste facilities, mainly in The Netherlands and the UK.

Suez also said it was making a big push in Spain, where it is the leading water utility after its recent acquisition of Agbar. ●

## AECOM announces range of contracts and new senior vice president

**G**lobal technical and management support services provider AECOM has announced several large projects recently, as well as the appointment of a new chief strategy officer and senior vice president for water in the Americas.

AECOM has entered into a joint venture with Parsons where the companies will be working on a \$150 million programme management contract awarded by the San Francisco Public Utilities Commission (SFPUC).

Under the contract, the joint venture will provide programme management services for SFPUC's \$7 billion Wastewater Enterprise Capital Improvement programme for multiple projects throughout San Francisco. The scope includes programme planning and administration, implementation, technical support, programme controls, and pre-construction management and planning up to the programme's completion in 2026.

AECOM has also announced that it has been awarded a design and construction management contract for the \$66 million Dugway West Interceptor Relief Sewer, a major connecting facility for almost all of the combined sewer overflow control projects in the Northeast Ohio Regional

Sewer District's Easterly service area. When complete in 2016, it will provide flow management to reduce the frequency and volume of overflows in the Dugway area and eliminate or consolidate several regulators to ease operation and maintenance.

Outside the US, AECOM announced earlier this year that it will be providing project management services for Jeddah in Saudi Arabia. The \$171 million project will see AECOM implement dams and other flood control barriers; construct drainage canals and stormwater reservoirs; resolve Jeddah's most vulnerable flood points; prepare comprehensive studies for undeveloped areas, including environmental plans for the entire Jeddah governorate; implement comprehensive infrastructure improvements to solve the sewerage problems in Jeddah; and establish a disaster-management centre for Makkah Province.

As well as this range of contracts, AECOM has also announced the appointment of Susan Leal, previously the general manager of SFPUC, to the position of chief strategy officer and senior vice president for water in the Americas. ●

**LS** See Analysis, p8

# Are green shoots appearing in the US water and wastewater market?

There has been a large amount of investment in US water and wastewater market bonds recently with utilities across the US selling bonds to gain funds, so is it a positive sign that the market is looking up again? **LIS STEDMAN** speaks to **CHRIS HESSENTHALER** to find out.

**I**nvestors recently have been showing a lot of interest in buying bonds in the US water and wastewater market, so does the recent flurry of activity mean that the market is picking up? If so, what elements of the market appear strong and which remain weak? Is an upturn likely, and is there a timescale?

In fact, according to Chris Hessenthaler, director of global ratings agency Fitch Ratings, the bond issues are more a sign of need than any indication that the market is beginning to recover. He notes: 'In general in the bond market for water and wastewater we've seen a pretty sizeable decline in issues. It's no different to other sectors of public finance, which are also down for this year.'

He notes that the low interest rates at the moment may be behind some recent additional bond issues, but that the seeming flurry of bonds is 'mainly refunding'. There is some issuance, but compared to a few years ago it remains at a lower level.'

He adds: 'I don't see any definitive sign of when issuance will return to its historical norms,' but observes that 'for infrastructure needs there comes a point where projects have to move forward, whether they are mandated by regulatory requirements or treatment capacity'.

Mr Hessenthaler notes that there has been a 'slight uptick' in refundings, but that the other drivers are environmental regulations, ageing infrastructure and capital needs. The downturn has had some effect – he observes that many cities have not been moving forward on planned rate increases to support the issuance of new debt, though this is not a primary driver.

The Build America Bonds – the special, low-interest bonds available under the American Recovery and Reinvestment Act – had 'a pretty sizeable influence', Mr Hessenthaler notes. 'There was a flurry of activity in the last quarter of 2010 – a lot of investors took advantage of the lower interest rate, which expired at the end of calendar 2010. It doesn't sound like they will come back.'

## Long-term financing

These bonds were taken up by some major

cities – Chicago, for instance, whose credit ranking was cut by Fitch Ratings twice in under three months, has borrowed \$487 million, including \$423 million in taxable Build America Bonds, to improve and expand the city's water system.

Some of the recent moves have been about consolidation – turning short-term debt into lower-interest bonds, for example. A case in point is the American Water Works Company, which announced in June that its financing subsidiary, American Water Capital Corp, had successfully closed an offering of \$26 million in tax-exempt water facility revenue bonds issued by Owen County in Kentucky.

The proceeds from the bond offering will be used to repay short-term debt accrued by the construction of a water treatment and transmission facility in Owen County, Kentucky, and to pay a portion of the remaining costs of acquisition, construction, installation and equipping of the water treatment and transmission facility as the work nears completion. This project is being built to ensure a long-term sustainable water supply for Central Kentucky.

City commissioner Chris Mehl is reported as saying of the Bozeman City bond that the city could not wait any longer as the existing treatment works was decades old and had been in use much longer than anticipated. He also quoted population increases and stricter regulations as further impetus for the bond issue.

Low interest rates and an urgent need to find new water sources lay behind the Water Replenishment District (WRD) of Southern California's recent bond issuance. This will pay for what the utility called 'vital water projects that will provide long-term future benefits to ratepayers throughout Southern California'. Both Fitch and Standard & Poor's gave the district their AA+ rating, indicating a very strong financial standing.

The bonds will also enable the WRD to implement its Water Independence Now, (WIN) Program – a group of projects intended to allow the district to gain independence from costly imported water and increase the reliability of its groundwater supply.

The programme will result in a self-sufficient groundwater supply that provides 40% of the water for four million people, 10% of the state's population, and reduce pressure on the fragile Delta and Colorado rivers. It is also intended to provide stable long-term water costs and to make the naturally-arid region viable for residents and businesses.

Bond funding under current low interest rates will also enable WRD to include funding for improvements to the District's Safe Drinking Water Program and Regional Groundwater Monitoring Program, both of which play a major role in the viability of our groundwater supplies.

Refinancing is on the minds of utilities around the world. Back in the UK, Southern Water and Thames Water were reported earlier this year to be looking to raise an aggregate of £650 million (\$1030 million) in the bond market to refinance existing debt on their holding companies, which are owned by investment funds.

Of course, many US utilities may be mindful of last year's Ceres report, which warned that water scarcity in the west and south east posed risks to municipal bonds. At the time, Ceres president Mindy Lubber said: 'If water supplies run short, utility revenues fall, which means less money to pay off their bonds. This risk scenario is a distinct possibility for utilities in water-stressed regions and bond investors should be worried about it.'

This general gloom has caused local press to note, for instance, that Kansas City is failing to fix leaks on water mains, with a wider impression of reluctance to raise already high taxes any further in a number of municipalities including Royse city, Texas, which voted against taking on additional debt; Marquette, Michigan, which has sharply reduced its bond issuance; and Concord, New Hampshire, which has also reduced the size of its bond issuance – the list is long. With bonds remaining the main way in which infrastructure projects are financed at city level in the US, it appears that the bubble has well and truly burst on infrastructure finance for the time being. ●

# Whole system approach focus from new consultancy chief

Global technical and management support services provider AECOM has appointed a new senior vice president and chief strategy officer for water in the Americas, **SUSAN LEAL**, who is strongly focused on providing personalised whole system strategies for utilities. **LIS STEDMAN** speaks with her about what she sees as AECOM's role in equipping clients for existing and future challenges.

**S**usan Leal, has a long track record in the utility business that stands her in good stead in what will be a challenging role with one of the world's biggest technical and management support services providers.

She notes that her role involves 'looking at client capacity and needs. I think that is extremely important when trying to come up with an implementation strategy, whether it be a climate change strategy or building a wastewater treatment system, it is extremely important to look at this – what are the client's needs.'

She explains that while sometimes this may seem as straightforward as a client wanting to have a wastewater treatment plant rehabilitated, looking beyond the simple answers is critical. 'It is very important not to look just at whether the client needs a digester, for instance, but to look at their overall needs – for instance, are they also dealing with a collection system that may be impacted by sea level rise? In many ways, you have to look at the strategy. That is part of what my job is, looking at client needs for complex problems, confronting not only the issue as they see it now but in the future.'

She notes that flexibility in offering solutions is key: 'It is very important to understand from the outset that one size does not fit all – to go in, for example, with a mindset that this client just wants their digester rehabilitated. In North America there are many overwhelmed or ageing wastewater systems and what they need is not for us to try to offer a "cookie cutter" solution. We are definitely not offering solutions off the rack.'

Ms Leal observes that a range of issues confront clients in large metropolitan areas, including their geography, the types of industry in the area, and their level of population growth. She notes: 'I have wonderful support – very smart people throughout the world that bring their talents

to fulfill the needs of our clients.'

She notes that 'there may be many lessons we have learned in San Francisco or Orange County that may not work for Houston. I think it is very important not to approach this by saying that two clients are similarly sized so need the same things – the important thing is looking at a client and their needs and not trying to equate one metropolitan area with another.'

## Utility challenges in North America

In terms of the areas she is focusing on, she says: 'I am personally looking at North America, that is my purview. There are going to be a lot of interesting things going on. The interesting thing is that even in tough economic times there are issues surrounding wastewater and there is only so long that you can ignore them.'

Much of the infrastructure passed when the Clean Water Act and Safe Drinking Water Act were passed in the 1970s is now at the end of its life and facing tough challenges, she adds. 'This is especially true in the major metropolitan areas, which I'm focusing on. It's not just issues in the west with climate change – in the east we are seeing storm surges. We are now dealing with the unavoidable consequences of not having kept up with our infrastructure.'

She observes that 'part of my work is not just about rehabilitation but building for the 21st century'. Given the possibly climate change-related challenges the country faces – such as the sustained high temperatures in Texas and the issues that has caused – she notes: 'I want to take the very deep and diverse talents of AECOM and put them to work. What is wonderful is that we are not just bringing in talent from North America but from round the world.'

For instance, AECOM has some of the leading experts in biosolids processing and nutrient removal, and has scientists assisting FEMA (Federal Emergency

Susan Leal



Management Agency) in making assessments of sea level and coastal intrusion in the San Francisco Bay area. The company's collection system experts have also been involved in some interesting projects – AECOM was the lead on a project in Boston to install ultra-modern digesters.

AECOM is also involved in the upgrade of the Washington, DC collection system. 'We have the traditional engineering horsepower and through the companies we have acquired over the years we have environmental engineering expertise,' Ms Leal notes. 'If you are a municipality you get the best value for your dollar from a company that can offer you a diversity of people to bring to the problem rather than having to hire several companies. AECOM can be a true partner, helping to resolve a range of problems and get best value.'

In terms of what she herself brings, Ms Leal says: 'I bring a different viewpoint. When I am talking to someone from a utility or a political figure that has oversight over utilities, I can understand where they are coming from because I have had to grapple with those problems.'

She concludes: 'I took over at a utility coming off a nine-year rate freeze and had to convince the residents to accept a multi-year rate increase – and they did.' The San Francisco Public Utility Commission not only provides water and wastewater services but also power, and she notes that as a result of this background she has an understanding of the problems of running a utility and implementing upgrades, as well as the public finance side of such work. 'Whatever problem a client is tackling we would often not advocate a quick fix – there is often a complexity of problems to deal with and not just for the short-term, but for the long-term.' ●

# Colombian utility success in finance diversification: *the case of Bogota*

The Colombian utility Empresa de Acueducto y Alcantarillado de Bogota (EAAB) is the country's largest water utility and has gone from bankruptcy to a successful AAA credit rated business following the implementation of performance indicators and improved debt management. Here, **VIVIAN CASTRO-WOOLDRIDGE** and **JOSE GARCIA LARRARTE** explain how EAAB managed to turn its finances around.

**City centre of Bogota. Credit: EAAB.**



## Executive summary

Empresa de Acueducto y Alcantarillado de Bogota (EAAB) is Colombia's largest water and wastewater utility, serving around 8.6 million people. Over the past 18 years, EAAB has gone from bankruptcy to a business with an AAA credit rating. This was achieved through changes in consumer habits, changes in the tariff regime, improved debt risk management and debt diversification.

EAAB went bankrupt because of below-cost tariffs, a mismatch between revenues and expenses, poor maintenance of its assets, and high cost of finance related to a high percentage of debt in foreign denominations. In the early '90s, EAAB chose to undertake major reforms and refinance its debt, entering into a \$250 million World Bank loan agreement, used to build two treatment plants and a major distribution tunnel, and expand service coverage in the city of Bogota's formal areas to 100%.

From this point, EAAB has continued to put in place mechanisms to improve its performance, from reducing non-revenue water to incorporating private sector elements such as outsourcing customer services and

revenue collection. In 1999, EAAB sought to diversify its sources of finance by issuing its first bond, and in 2006 issued its first debt sale of COP 250,000 million (approximately US\$120 million) of securities to refinance its existing obligations. The bonds have allowed repayment of loans in foreign currencies, thereby reducing costs of debt.

As well as reform taking place within EAAB, the Colombian water sector has also evolved, with a regulator being put in place and a six-tier tariff structure based on income. The banking sector also evolved to become more robust, with improved financial legislation and a revamp of the supervisory framework. This has allowed EAAB to tender amongst commercial banks, providing lower interest costs and greater flexibility in debt management.

EAAB has developed its business performance and debt management over the past two decades to improve both its services to customers, and its balance sheet, through using a range of sources of finance, moving all of its debt into pesos, reducing operating costs, and improving customer service and revenue collection.

**C**olombia's Empresa de Acueducto y Alcantarillado de Bogota (EAAB) is the country's largest water utility in terms of population served, sales and asset value. It is a public company owned by the municipality, obtaining its current status as a decentralized, autonomous agency in 1954. Since bankruptcy in 1992, various events have influenced the company's financial trajectory, including marked changes in consumer habits (1997), changes in the tariff regime (1999), improved ability to manage debt risk (2004-2009) and debt diversification (1999-2010). Alongside this, EAAB's ability to access capital markets has been facilitated by its overall AAA credit rating since 2009 and the AAA rating of its bonds in 2011.

Bogota's municipal water company was founded in 1888, acquired by the municipality in 1914, and given its current status as a decentralized, autonomous agency by the city council in 1955. In 1993 through Decree 1421, EAAB became a commercial and industrial enterprise owned by the District of Bogota. The Government of Colombia (GoC) also established a legal framework in 1991 that separates service provision from policy, thus allowing private sector participation.

EAAB provides water, sewerage and storm drainage services to the city of Bogota and also sells bulk water to ten smaller municipalities. EAAB's key functions include the sourcing, storage, treatment and distribution of potable water. The company is also responsible for stormwater drainage and the operation of the Salitre wastewater treatment plant, which empties into the Bogota River. EAAB has a 100 percent coverage rate for water and a 99 percent coverage rate for sewerage in the city's formal estates.

In 18 years, EAAB has transformed itself from a bankrupt utility into a world-class, bankable utility with AAA credit ratings (Table 1). Following the 1990s financial crisis, the central government intervened and the company signed an agreement for emergency assistance that was tied to performance targets and institutional restructuring measures.

EAAB has since put in place the mechanisms to transform itself into a financially viable utility and attract highly qualified staff and private capital. The company was able to implement an

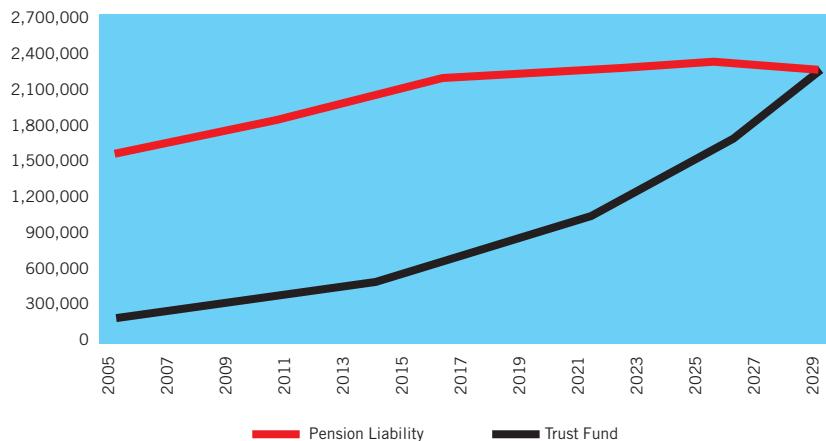


Figure 1: Pension trust fund projections (2005-2029)

investment programme between 1996 and 2003, amounting to about US\$1 billion due to a tariff increase, its improved operational efficiency and its new ability to attract capital.

The company has also introduced a few elements of private sector participation. For example, since 2003, EAAB has outsourced customer services to private firms. These firms are responsible for billing and revenue collection, and the operation and maintenance of small diameter networks. The service contracts with private firms have resulted in significant improvements in customer service and revenue collection. However, EAAB still faces some performance risks due to its exposure to political cycles – and related risk of management, policy and programme changes with each new mayor. A new governance declaration signed in January 2009 should help minimize this risk.

A second major risk facing the EAAB is related to the uncertainty surrounding the tariff review methodology, which may be modified every five years. The sector regulator, Comisión de Regulación de Agua Potable y Saneamiento Básico (CRA), is responsible for reviewing the tariff methodology and setting the tariffs. According to Law 99 of August 1993, the city must transfer 15% of the property tax to the Corporación Autónoma Regional (CAR) and CAR must use at least 50% of these funds for environmental improvements in the municipality.

## Operating environment

EAAB serves about 19% (8.6 million) of Colombia's population (44 million). The city of Bogota has a population of more than 7.5 million (DANE 2011). About half of the city's 2.2 million households are homeowners and the average consumption is 103 litres per person per day. Approximately 7% of the city population lives below the national poverty line (DANE-SDP, Bogotá Quality of Life Survey 2007) and the unemployment rate was 10.1% in 2010 (DANE 2011).

The city's inflation was moderate at 3.25% over the year 2010; and 2.71% for the first semester of 2011 (DANE 2011). Prudent macroeconomic policies and structural reforms have permitted the economy to recover steadily from the 1999 financial crisis, which led to an unemployment rate of 20 percent.

The health of the local financial sector has important implications for the growth of EAAB. Overall, Colombia's financial sector is relatively stable and resistant to adverse shocks since the government has improved financial legislation and revamped the supervisory framework (BMI 2009, IMF 2005). The situation has improved significantly since the 1998-1999 crisis that led to a decline in economic activity, an increase in interest rates (already high) and reduced the liquidity and solvency of many institutions (IMF 2005). Non-performing loan ratios have remained low (2.8% at end-June 2011) and the financial system's

Table 1: Key milestones

1991	Decentralization policies adopted in Colombia
1993	Pension reforms establish a fully funded, privately administered pension system
1994	Public Service Delivery Law passed that leads to improved sector regulation
1999	Strengthening of financial sector following economic crisis
2005	Constitutional reform for pension schemes

**Table 2: Service coverage 2003-2010**

	<b>Unit</b>	<b>Dec-03</b>	<b>Dec-10</b>
Pop. served - water	million	6.65	7.34
Pop. served - sewerage	million	6.24	7.28
No. connections – water	million	1.41	1.83
No. connections – sewerage	million	1.32	1.77
Residential coverage - water	%	100	100
Residential coverage - sewerage	%	93.9	99.19
Total water production	M.m <sup>3</sup>	456.45	467.28
Water billed	M.m <sup>3</sup>	283.22	290.05
Average consumption / billed customer (residential only)	m <sup>3</sup> /month	13.6	10.39

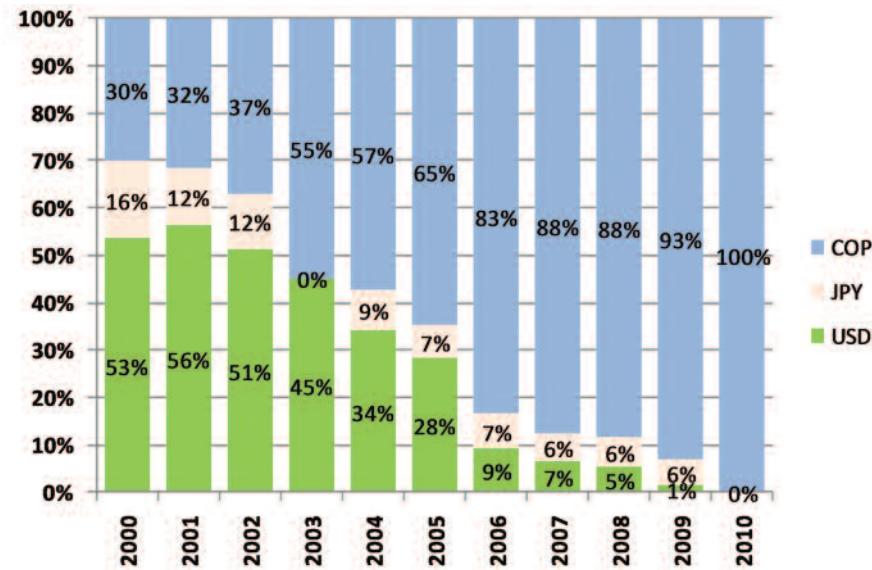
assets were worth US\$380 billion at end-June 2011, with an annual real growth rate of 14.09%.

## Internal environment

### Major events

EAAB went bankrupt in 1992 due to

scenarios and combinations thereof: business as usual; adoption of major institutional reforms; debt refinancing with the help of the national government and a government loan of US\$147 million payable over 12 years; and a World Bank loan of US\$250 million to finance

**Figure 2: Currency of debt portfolio (2000-2010)**

below-cost tariffs, a mismatch between revenues and expenses, poor maintenance of its assets, and high cost of finance (related to a high percentage of debt in foreign denominations). In late 1993, the company developed a financial viability model based on net cash flows. The company tested the following four

the Sante Fe Investment Programme. The company opted to implement major reforms and refinance its debt – and was able to then secure a World Bank loan in the amount of US\$250 million. Its new status as a commercial and industrial enterprise also lent it increased budgetary autonomy and it ended the year 1993

**Table 3: EAAB domestic tariffs (Dec-10)**

Strata	Fixed cost/month		Lifeline tariff/m <sup>3</sup>		Higher consumption blocks/m <sup>3</sup>	
	COP	USD	COP	USD	COP	USD
1	1952	1.00	663	0.34	2210	1.13
2	3904	2.00	1326	0.68	2210	1.13
3	5595	2.87	1901	0.97	2210	1.13
4	6506	3.34	2210	1.13	2210	1.13
5	14,574	7.47	3404	1.75	3404	1.75
6	17,827	9.14	3625	1.86	3625	1.86

\* Based on exchange rate of US\$1 to COP 1950.

with a budget surplus equivalent to US\$13 million.

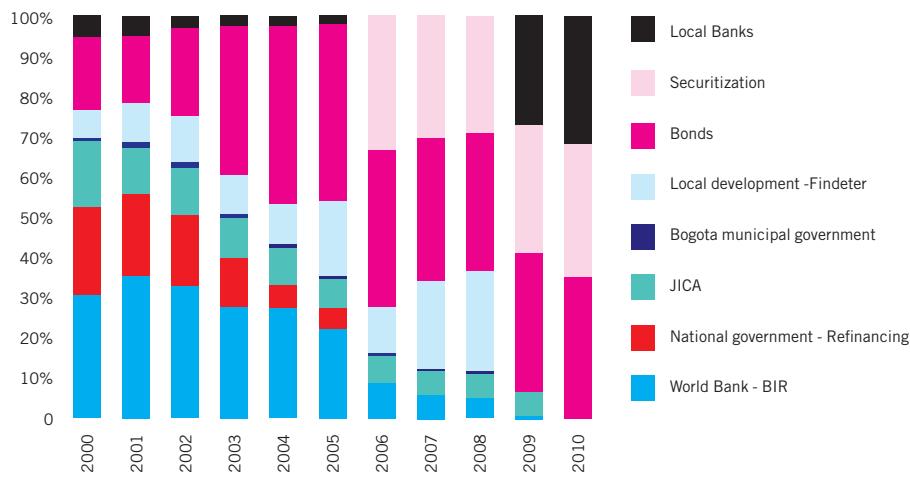
In 1997 the company experienced a water shortage due to a problem with one of its major water transportation tunnels. In response, the then mayor Antanas Mockus led a water conservation campaign that led to a lasting change in consumer habits and the adoption of household water saving devices, including more efficient toilets and taps. However, this event exposed the company's vulnerability and in response it developed a large investment project to secure its water supply – and for which it needed to secure finance. The major investment project included the reinforcement of the tunnel's walls, construction of an additional tunnel, network rehabilitation and a concession contract for the Tibitoc water plant.

### Technical and commercial performance

EAAB's 1996–2003 investment programme enabled the company to increase coverage to two million people. Today, EAAB's coverage rate is 100% for water; 99.19% for sewerage; and 98% for stormwater drainage in the formal estates (Table 2). The company has six treatment plants, only uses about 60% of its production capacity at the moment, and services are provided 24 hours a day. EAAB has established a sophisticated planning department and modern management information system, and has had an electronic control centre for monitoring the entire system since 2003. The company has ISO certification for several of its processes, including water intake, distribution and treatment (ISO 9001–2000) and construction supervision (ISO 9002/94). In the last six years the company has made a concerted effort to reduce non-revenue water (NRW) through conservation campaigns and the outsourcing of revenue collection. Domestic<sup>1</sup> consumption patterns have reduced from 13.6m<sup>3</sup> per month per account in 2003 to 10.39m<sup>3</sup> per month in 2010 due to tariff increases and conservation campaigns. The rate of NRW was 37% in FY10.

### Financial performance and planning

The regulator enforces socioeconomic strata as a basis for geographically-differentiated tariffs. Every municipality in Colombia is divided into six socio-economic classes. Class 1 represents the lowest-income group and Class 6 represents the highest-income group.

**Figure 3: Debt instruments used by EAAB (2000-2010)****Table 4: EAAB non-domestic tariffs (Dec-10)**

Customer type	Fixed cost/month		Tariff/m <sup>3</sup>	
	COP	USD	COP	USD
Industrial	8458	4.34	3050	1.56
Commercial	9760	5.00	3315	1.70
Government	6506	3.34	2210	1.13
Special	6506	3.34	2210	1.13

**Table 5: Summary of debt (includes securitizations)**

Source	Original Amount (COP'000, 000)	Balance as of Dec 2008 (COP'000, 000)	Balance as of Dec 2010 (COP'000, 000)	Balance as of Dec 2010 USD'000, 000)	Tenure (years)	Interest Rate (%)
<b>Original debt currency: Colombian Pesos</b>						
Bonds B1	20,000	20,000			10	DTF+3.4
Bonds D2 Emission III	70,000	70,000	70,000	37	10	IPC+8.99
Bonds D2 Emission IV	90,000	90,000	90,000	47	10	IPC+8.2
Bonds D2 Emission V	110,000	110,000	110,000	57	12	IPC+8.1
FINDETER (59 local banks)	220,000	217,963		-	12	DTF+6.8
BBVA Colombia	100,000		100,000	52	12	DTF+3.5
Banco Popular	109,600		109,600	57	12	DTF+3.6
Banco Santander	36,400		36,400	19	12	IPC+4.5
<b>Total (COP)</b>	<b>507,963</b>	<b>516,000</b>	<b>270</b>			
<b>Original debt currency: USD</b>						
	(USD '000, 000)	COP				
District Capital (Bogota)	3	2033		20	2	
IRD (World Bank)	145	44,015		17	5.52	
<b>Total (COP)</b>		<b>46,048</b>				
<b>Original debt currency: Japanese Yen</b>						
	(JPY '000, 000)	COP				
District Capital (Bogota)	8375	53,291		20	4.75%	
<b>Total foreign debt</b>		<b>99,339</b>				
<b>Sub total debt (COP)</b>	<b>0</b>	<b>607,302</b>	<b>516,000</b>	<b>270</b>		
Securitization		250,000	250,000	131		IPC+5
<b>Total financial liabilities</b>		<b>857,302</b>	<b>766,000</b>	<b>400</b>		

Class 6 residents pay four times as much as Class 1 residents per cubic metre of water (see Table 2). EAAB uses an increasing block tariff with a lifeline rate for domestic customers. Domestic customers located in the first three strata pay a lower tariff for the first 40m<sup>3</sup> of water (or 20m<sup>3</sup> per month since customers are billed every two months). Commercial, industrial and government consumers are charged a flat tariff per m<sup>3</sup> (see Tables 3 and 4).

EAAB has a detailed investment plan covering the period 2004–2015. This Master Plan for Water and Sewerage helps to maintain continuity, even with management changes that may arise from political cycles. EAAB covers all operating costs for water supply and wastewater collection, and a quarter of its investment costs through its cash flow from tariffs, including its expensive wastewater interceptors. The company's current large undertaking is related to environmental sustainability and includes the clean-up of the Bogota River and protection of wetlands.

The ratio of liabilities to assets is balanced at 41% (2010) compared to 68% in 1995. Its debt service to revenue ratio has also strengthened from 33% (1995) to 11% (2010), including securitized income. The company has projected its financial figures until 2020. It plans to increase EBITDA (earnings before interest, taxes, depreciation, and amortization) by 80% between 2010 and 2020 and EBITDA / interest payments from 6.41% (2009) to 16.46% (2018).

The company has sufficient cash flow for debt service and capital investments with December 2010 EBITDA (last 12 months) at COP 543,361 million (approximately US\$304 million). For the period from January to December 2010 the cash from operations was COP 595,037 million (US\$333 million); the cash used for investments was COP 404,761 million (\$226 million); and the free cash flow (FCF) was COP 17,793 million (US\$10 million).

However, EAAB's unitary cost has increased due to preventative maintenance costs on the sewer system to minimize the impact of climate change, and the company is limited in its ability to significantly reduce staff costs. In 2003 the company did implement a voluntary retirement and early retirement programme to compensate for the use of private firms for customer services, but the company also has an agreement

**Table 6: Summary of outstanding bond obligations**

	Series	Value ('000,000 COP)	Redemption schedule	Length	Rate	Effective rate
1999 bonds	B1	20,000	Dec-09	Ten years	DTF+3.4%	7.51%
3rd Issue	D-2	70,000	Dec-12	Ten years	IPC+8.99%	10.99%
4th Issue	D-3	60,600	Feb-13	Ten years	IPC+8.20%	10.20%
4th Issue	D-4	2894	Feb-13	Ten years	IPC+8.00%	10.00%
4th Issue	D-5	26,506	Feb-13	Ten years	IPC+8.20%	10.20%
5th Issue	D-6	71,465	Sept-13	Ten years	IPC+8.10%	10.10%
5th Issue	D-7	38,535	Sept-13	Ten years	IPC+7.40%	9.40%
TOTAL		290,000				

\*DTF=4.11% \*\*IPC=2%

with a union limiting reductions in personnel costs.

In 1993, EAAB created a pension fund with a start-up deposit of COP 2495 million (US\$1.4 million). EAAB deposits COP 5000 million (US\$2.7 million) on an annual basis and the current balance is COP 400,000 million (US\$222 million). The trust fund is managed by Fiduciaria Popular. Figure 1 illustrates that by 2029, the trust fund will be sufficiently capitalized to meet pension obligations.

In 1997, EAAB hired a credit rating firm to evaluate its performance. The unpublished score was A- based primarily on the risks related to low domestic savings at that time and the high ratio of foreign debt in its portfolio.

In 2000, nearly 70% of the EAAB's debt was in foreign currency. While the transition of its debt from foreign currency to pesos began in 1999, the 2003 and 2004 bond issues contributed significantly to an overall shift to pesos – and the complete shift to pesos was finally achieved in 2010 with the reimbursement of a Japanese International Cooperation Agency (JICA) loan (Figure 2).

In 2002 the company began to discuss its optimal debt-equity structure and has decided to maintain its ratio of debt to total assets at a minimum of 59%. On average, 80% of the company's annual investments are funded through cash flow from operations and 20% through debt. The trend in the company's debt portfolio has been increasingly towards the local bond market and commercial loans.

### Creditworthiness checklist

EAAB's credit ratings take into account its technical and financial performance, external risks and ability to maintain moderate financial indicators. EAAB's latest AAA ratings are founded on its strong financial performance, including a prudent debt ratio and high levels of cash flow. In addition, the ratings take into consideration its natural monopoly in the water sector, the stable and regulated tariff (which covers partial investment costs) and its ability to implement large investment programmes. The regulator has not provided explicit guidance on whether the tariff should cover all or a percentage of the capital costs. However, the fact that investment costs may be included in the tariff is favourable to EAAB's credit rating. The rating agencies also compare EAAB's performance to other, similar water utilities. This 'peer ranking' exercise helps to provide a greater context for understanding the performance of water utilities.

A major weakness mentioned in the rating reports is the company's high pension liability, which it is taking measures to reduce. The company's vulnerability to management changes arising from political cycles is also mentioned as a major weakness. However, balanced with the above mentioned strengths and management practices, the agencies have taken a longer-term view of the company's operations and ability to manage debt.

### Entry into the capital markets

The year 1993 was a significant turning point for EAAB and was the critical milestone that enabled the company to put in place the major performance improvement plans that have taken the company to where it is today. In 1993, the company filed bankruptcy. Its finances and operations were in a severe crisis – revenue collection, coverage, and overall performance indicators were poor. The water sector was not yet regulated nor

was there an adequate tariff structure in place. The local banking sector was shallow and did not offer appropriate products for the banking sector. At that time, two years was considered a long-term loan. In any case, EAAB was unlikely at this time to qualify for commercial finance.

During this time of crisis, both the World Bank and the Inter-American Development Bank offered investment packages to the company. EAAB decided to go with the World Bank's US\$250 million package to build two treatment plants and a major distribution tunnel, and expand coverage to 100% in the city's formal areas. This transaction with the World Bank was the first non-governmental debt incurred by EAAB and crucially, was accompanied with a strategy to increase the tariff and improve revenue collection, among other performance improvements.

Today, the landscape is vastly different from 1993 (Figure 3). EAAB is a high-performing services provider with a strategic growth vision and cost-recovery structure indexed to inflation. There is more competition in the local banking sector and more liquidity in the market. The transition did not happen overnight and there are various internal and external factors that contributed to EAAB's transformation into a bankable utility – and a mature, local banking sector with the capacity to respond.

### Enabling environment

Various government initiatives, including regulation, have helped improve the financial viability of Colombia's water utilities. In 2002, the GoC enacted the Ministry of Finance's Decree 610 requiring all utilities to have a credit rating as a prerequisite to incurring debt.

According to Law 216 of 2003, tariffs are revised every five years by the regulator, CRA. The law enabled a nation-wide tariff revision in 2003 with the first aim to improve the quality of

**Table 7: Securitization transaction (2006)**

Subseries	Amount ('000,000 COP)	Rate
TAB 2016	100,000	IPC+4.95%
TAB 2017	50,000	IPC+5.09%
TAB 2018	100,000	IPC+4.94%
Total	250,000	

**Table 8: Financial summary for EAAB (Fiscal Year Ending Dec. 30, COP'000)**

Income statement	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Total revenues	987,449	1,103,731	1,170,553	1,212,395	1,238,719
Cost of goods sold	448,478	498,807	511,170	568,573	597,198
Operating expense	281,938	334,855	427,274	472,480	486,649
EBIT	257,032	270,069	232,109	171,342	154,872
Net income	184,588	155,068	234,673	245,177	206,551
Balance Sheet					
Cash and equivalents	742,704	650,376	763,995	675,322	640,102
Total assets	6,433,749	6,937,404	7,643,888	8,016,302	8,323,888
Current liabilities	232,338	262,885	242,216	233,226	193,241
Debt	479,727	554,207	566,510	517,648	516,000
Total long-term liabilities	2,501,803	2,688,266	2,905,740	3,070,188	3,246,298
Shareholder's equity	3,699,608	3,986,254	4,495,932	4,712,888	4,884,349
Retained earnings	1,086,752	1,241,820	1,476,494	1,721,670	1,922,589
Cash flow					
EBITDA	460,809	537,661	580,393	545,805	543,361
Working capital	978,957	925,040	1,027,177	955,578	1,005,386
Tax	90,067	32,322	28,002	22,367	0
Cash flow from operations	259,791	559,256	450,254	595,036	595,037
Capital expenditures	247,795	497,583	431,274	538,298	404,761
Proceeds from net debt	(382,348)	73,910	39,277	(75,718)	(17,793)
Financial sustainability					
Revenue growth (%)	2	12	6	4	2
EBITDA / revenues (%)	47	49	50	45	44
Collection period	37	39	44	44	45
Debt-to-capitalization (%)	68	67	65	65	66
Return on assets (%)	3	2	3	3	3
Cash return on capital invested(%)	7	14	10	13	12

services provision. In 2008, CRA again revised the tariff methodology to now include all costs incurred by the utilities, including finance costs (i.e. interest). CRA is again reviewing the methodology for the next tariff revision in 2012. The tariff is automatically indexed to inflation. In practice, EAAB updates its tariffs whenever inflation accumulates to three percent in order to avoid a monthly adjustment. The increase in tariff was accompanied by measures to improve the company's financial equilibrium and overall financial health.

#### *Experience with syndicated, commercial bank loans*

Realizing the limitations of the local banking sector and the need for more appropriate financial instruments in the water sector, in 1997 GoC capitalized the state-owned bank, Financiera de Desarrollo Territorial (FINDETER), to invest in the water sector through a syndicated loan facility. FINDETER uses the facility to lend to second-tier banks, which then on-lent to EAAB. In total, the facility provided EAAB with COP 220,000 million (approximately US\$112.4 million) in loans with a 12-year payment period, including a three-year grace period. The nine participating banks

were Bancolombia, Granahorrar, Colpatria, Banco Ganadero, Banco de Credito, Megabanco, Banco Union, Bancafe and Banco Agrario. The banks had access to an EAAB account they could draw from in case of nonpayment (similar to securitization except that EAAB's name remained on the bank account) (see Table 5).

#### *Experience with bond markets*

EAAB issued its first bond in 1999 (Table 6). The rationale for going to the bond market was its more competitive finance rate vis-a-vis the local banking sector. In addition, EAAB could index the coupon rate to inflation. Since the company's tariffs are also indexed to inflation, the risk of a mismatch between cash flow and payments would be minimal. Over a ten-year period, the company is more comfortable with a rate that is indexed to inflation rather than a fixed-rate. The principal is paid back at the maturity date and the interest is paid either monthly, quarterly or annually, depending on market demands. The company has staggered the maturity dates of its bonds so that it does not incur cash flow payment problems (see redemption schedule in Table 7). Pension funds purchased the majority of the bonds. To date, the

company has seven outstanding bond issues with maturity dates staggered from December 2009 to September 2013. The first bond was issued at DTF+3.4% and has gone as high as IPC+8.99% during times of financial crisis. The economy is more stable now, which shows in the company's securitizations issued at a rate of 4-5% in 2006.

#### *Experience with securitization*

In October 2006, EAAB issued its first debt sale of COP 250,000 million (approximately US\$120 million) of securities to refinance its existing obligations. The so-called 'TAB' notes were rated AAA by BRC Investor Services and were sold in three bullet tranches with ten, 11 and 12 year maturities. Corficolombiana was the structuring agent for the future flow securitization. EAAB sold COP 100 billion (US\$43.5 million) of notes maturing in 2016 at a yield of 4.95% over Colombian inflation (IPC), COP 50 billion in 2017 bonds with a yield of IPC +5.09%, and COP 100 billion of notes due in 2018 at IPC +4.94%. Demand was extremely strong, reaching COP 660 billion, and came chiefly from financial services companies (40.7%) and pension funds (40.1%). The securitization was structured with the

revenue of the company's largest clients. These accounts were transferred into the name of the investor.

#### *Experience with unsyndicated, commercial bank loans*

In 2009, EAAB went directly to the local banks for capital they could use to make early payments on the outstanding syndicated loans. In effect, EAAB borrowed to refinance its existing loans that had much higher interest rates than the new loans. Ten banks competed for the business and in November 2009 EAAB closed a deal with two local banks, Banco BBVA and Banco Popular. FINDETER was not involved in the transaction and this is the company's first commercial, unsyndicated loan. Direct access to local bank finance has resulted in a savings in administration costs, since EAAB now only deals with two banks rather than 40 banks. In addition, the local banking sector has evolved and now offers significantly more competitive rates and longer tenures than it did even five years ago. EAAB estimates that this transaction will save the company approximately COP 30,000 million (US\$16 million) over the life of the credit.

On 4 November 2010, EAAB organized an 'auction' where it invited all Colombian commercial banks to compete for EAAB business. Together, the six competing banks offered a total of COP 879,600 million (approx. US\$492.6 million). BBVA and Banco Popular offered the most competitive rates and terms including a 12-year repayment period with a three-year grace period. These newest lines of credit have allowed EAAB to improve the conditions of its existing loans with these two banks – and to repay its JICA loan in Yen – which means that all of its loans are now in local currency.

#### **Lessons**

EAAB ensures that it is able to honour its debt service. This implies a strong risk management system, including measures

to reduce technical vulnerabilities and closely monitor the regulator's actions and consumers' behaviour. It also prides itself on having transparent accounting records (Table 8) and achieving the highest possible credit rating.

EAAB's experiences with different financial instruments over the last decade have revealed important lessons, which it now applies to its debt management programme. Key to managing its debt responsibly is reducing its currency risk. EAAB has improved its financial profile by having a greater proportion of local currency-denominated liabilities on its balance sheet. Its debt portfolio is currently 100% Colombian pesos compared to 5% in 1998. It no longer seeks loans in foreign currency and where possible has tried to prepay outstanding foreign currency debt. EAAB also used a currency swap to repay its World Bank and JICA obligations in foreign exchange and roll them over into local currency debt but the unforeseen financial crisis lowered the peso and actually increased the cost of this transaction. The lesson from the experience was to only use short-term currency swaps of less than three years.

The company is also better at managing the timing of its debt maturities – and staggering these to avoid a concentration of payments; and ensuring that its tariffs are matched to the inflation rate. Another strategy to manage its debt portfolio is to reduce the related administrative costs. The company's experience with development banks has been a high level of transaction costs. The development banks served an important purpose when EAAB was in crisis and could not secure funding from other sources. However, development banks like the World Bank ask for central government approvals that can take more than two years, since congress must approve the transaction. Today, EAAB has more options and the bond and commercial bank market transactions are quicker and more flexible. With the commercial banks, EAAB has the option to renegotiate its payment schedule or

prepay the obligation – an option that World Bank loans do not offer. Another strategy the EAAB used to reduce the cost of finance locally was to borrow from two commercial banks and use this finance to prepay obligations on 40 smaller loans with higher interest rates. This transaction also helped the company extend the average duration of its debt portfolio.

EAAB has a strong capacity to make its interest payments on time but has been affected by exchange rate issues. It has learned to hedge these risks and as the local banking sector and securities markets evolve, the company should have access to sustainable sources of local finance. ●

#### **Note**

'Household size in Bogota averages 4.7 people.'

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# *Going with the franchising flow: improving watsan services in South Africa*

In an effort to improve the cleaning and maintenance of water and sanitation infrastructure in South Africa, an innovative franchising approach is being piloted at 400 schools, improving not only sanitation facilities, but also health and safety, as well proving employment opportunities. **KEVIN WALL** and **JAY BHAGWAN** discuss the franchising approach used and the success of its deployment.

**P**artnerships, using the basic principles of franchising, could address many challenges in the operation and / or maintenance of water services. Franchising provides appropriate training to people at services sites, and also offers backup of off-site skills, with incentives for finding people with the appropriate skills required. The innovative franchising partnership concept is being piloted with considerable success in South Africa. Under the guidance of a franchisor, trainee franchisees are well advanced with initial cleaning and the routine maintenance of the sanitation facilities at 400 schools in the Eastern Cape.

The rapid rate of construction and commissioning of new water services infrastructure has severely challenged the public sector institutions in South Africa that are responsible for operating and maintaining this infrastructure. The quality of the operation and maintenance of water services infrastructure in South Africa varies greatly between areas. As a result, the quality of tap water, sanitation, treatment works effluent, and other water products and services varies greatly. This no different in other parts of the developing world and thus innovative approaches are required. Even if all existing water services institutions were coping with the demand, there would be valid reasons to investigate alternative institutional models to establish whether alternatives could be more cost-effective, allow existing role players to focus on their other responsibilities, and offer a range of other advantages, including greater local economic development.

The WRC (Water Research Commission) commissioned a scoping study completed in 2005 (Wall 2005), to explore the application of franchising principles, which enables the consistent quality of products and services such as food and petrol, and which if correctly implemented, could help to ensure

consistent and satisfactory quality of water services. Adapting these principles would truly be a case of connecting different (i.e. previously

unrelated) concepts, and creating something extraordinary, innovative and completely new. The study found that franchising partnerships could



**The first group of successful franchisees.**  
Credit: Wayne Birkholtz - Impilo Yabantu.

## Executive summary

The rapid rate of construction and commissioning of new water infrastructure in South Africa has severely challenged the ability of public sector institutions to keep these well maintained, resulting in large differences in the quality of water and sanitation services in the country.

Looking for a solution to this, the Water Research Commission (WRC) commissioned a scoping study in 2005 to explore the application of franchising principles, to ensure a constant high quality of services. This study found that franchising could address the lack of higher-level expertise often identified as key to improving service, as well as support the development of local micro-enterprises.

Based on this study, a pilot project was begun in 2009 at 400 schools in the Butterworth Education District, undertaken by a partnership between The Department of Education (DoE) of the Eastern Cape provincial government, Irish Aid, CSIR (Council for Scientific and Industrial Research), WRC, and utility Amanz'abantu Services (Pty) Ltd. Local people were invited to become franchisees, who were then trained and given basic equipment to clean and maintain the sanitation facilities of the schools. Before and after photographs are taken for the school principals to sign off the work, and reports on the condition of the facilities are sent to DoE to develop the relationship between the schools, franchisees, and government.

Due to the success of the first round of maintenance, the franchisees have also undertaken maintenance of rainwater harvesting systems in the schools, and the DoE has suggested increasing the pilot area to 1000 schools. Eventually the franchisees will move from a subcontract agreement to a franchise agreement, working directly for DoE.

The main issues arising from the pilot include the need for constant attention to the billing and payment process so franchisees receive the funds due, the need for replacement of broken facilities, and the need for a long-term and strong partnership with the government, however the pilot has shown strong potential for this concept to be expanded to other water services activities, such as meter reading and domestic plumbing. Other municipalities in the area have seen the success of this pilot and are now investigating how the principles of franchisees and / or franchisor can be adapted and adopted to provide services to these municipalities.

alleviate and address many challenges in the management of water services. Simultaneously, franchising would support the development of local micro-enterprises and broad-based black economic empowerment, all within the public sector service delivery environment. Worldwide, there is limited experience of the application of the franchising approach water services infrastructure operation and maintenance, although some existing partnerships share general characteristics of the franchise approach.

### **The potential of water services O&M franchising partnerships**

The concept of franchising partnerships is an attractive option for a number of reasons, in particular because it would address the lack of higher-level expertise often been identified as a key to improvement of service, especially in the more remote areas (DWA 2009, DWA 2010). The essence of water services franchising partnerships is the creation of a pool of appropriate expertise upon which the water services authorities can draw, a restructuring of the local responsibility for operating the services, and the creation of a two-way obligation – an obligation to call for assistance from the pool, and an obligation to respond rapidly to that call. All of this combined with incentive structures will ensure that it will happen.

In brief:

- On most days at the (say) treatment works, nothing out of the ordinary would happen. Franchisee staff, who are appropriately skilled, are able to cope.
- When major maintenance or upgrading is needed, or when there is a breakdown, those staff know who to call at the franchisor in order to bring the higher level of skills needed.
- Staff would know that the franchisor will be obliged to help, because there would be a binding contract and a shared reputation.
- It would be a two-way obligation – an obligation on the franchisee to ask for assistance, and an obligation on the franchisor to provide such assistance.
- Costs of the higher skills levels, which are needed only intermittently, would be spread across many sites – thus the cost per site is low.

Franchisee water service providers, who depend for their livelihood on the success of their business, would have a strong

incentive to perform.

The franchisees would be micro-enterprises. The franchisors would be any institutions, private sector, parastatals or non-governmental organisations that have the required expertise, are willing to provide the service, and would not have a conflict of interest in providing the service.

There are already many potential sites for water services franchising partnerships, as much water services infrastructure currently already in place is not being operated and maintained properly (DWA 2009, DWA 2010). Many of these sites fall under the jurisdiction of or are owned by water services authorities, but other sites belong to other public sector institutions such as schools and clinics. Assistance from the franchisor would be of particular value for areas away from the major urban centres. Few rural municipalities in South Africa can, for example, afford to employ competent qualified staff, and this leads to periodic unreliability of supply and frequent non-compliance with national standards relating to, for example, the quality of effluent from wastewater treatment works.

In summary, these partnerships are a means of:

- Assisting infrastructure owners by providing expertise in water services infrastructure operations and maintenance that would very seldom be found outside the metropoles and larger urban areas
- Creating and supporting small locally-based and efficient service provider solutions

Franchising partnerships can offer significant potential for improvement in public sector water services' operational quality and reliability.

Water services operation and maintenance tasks with apparent potential for franchising include leak detection, borehole management, management of municipal treatment works, management of treatment package plants, meter reading, pit-emptying services, laboratory services, data management, demand and pressure control management, and site and property management. CSIR (Council for Scientific and Industrial Research) has modelled some of the selected elements of the water services value chain that are suitable for small business as the components can be systematised readily (WRC 2010). This modelling has drawn on first-hand knowledge of operating such elements in

contexts as close as possible to franchising. It has also drawn on the understanding of the small number of franchises already active in the water services sector, and on the understanding of the large number of franchises in other fields. A substantial body of documentation of value to water services authorities, potential franchisors and potential franchisees is soon to be published (WRC 2010).

Whereas a business based on a single element of the water services delivery value chain might not be viable, a water services franchisee could build have a viable business by offering several water-related services, thereby achieving dual objectives, viz: economy of scale; and less dependence on one or a limited number of clients.

### **The pilot**

By 2008, development work had been taken to the point where the concept of franchising partnerships for the operation and maintenance of water services infrastructure had been thoroughly described, including guidelines on where and how it could work. The research team anticipated that where the environment was favourable, potential franchisors would seize the opportunity and would do the detailed modelling to suit their abilities and the circumstances under which the concept could be applied.

It was also realised that pilot projects would be necessary. Only through piloting would unanticipated challenges be identified – and overcome. While some public sector officials, when approached by members of the research team, said they would not consider franchising partnerships, others said it would be easier to convince their principals (municipal councilors in the case of municipalities) once a successful pilot had been completed.

### **Preparation for the pilot**

A few large water services providers had shown interest in franchising partnerships. Amanz' abantu Services (Pty) Ltd, a provider based in East London, South Africa, with a network covering the whole Eastern Cape, extrapolated the franchising concept into its well-established and appropriate expertise, and its track record of working successfully with rural and developing communities. It set up a subsidiary, Impilo Yabantu Services (Pty) Ltd, to be a franchisor, and started assessing the potential market, approaching selected owners of public sector

infrastructure in the province.

Contrary to our expectations that the public sector entity willing to pioneer a franchising partnership pilot would be a municipality, it was the Department of Education (DoE) of the Eastern Cape provincial government that was first to prove receptive. Its officials responsible for infrastructure indicated great interest in a pilot that would see franchisees doing routine cleaning and maintenance of school toilet facilities.

Early in 2009, a memorandum of understanding was signed between five parties: the DoE, Irish Aid, CSIR, WRC, and Amanz'abantu. In this memorandum it was inter alia stated that:

- DoE wished to utilise small, locally-based enterprises, in partnership with an established provincially-based service provider, to provide identified maintenance services for its facilities
- Research indicated that the franchising model would offer public authorities 'a contractual mechanism for improved efficiency, flexibility and accelerated resource mobilisation'
- Amanz'abantu would contract with DoE to set up and run a pilot programme based on the principles of franchising partnerships, for maintenance of school sanitation facilities in the Butterworth Education District
- Impilo Yabantu would perform the role of the franchisor
- From its budgets normally allocated for this, DoE would provide the funding for maintenance of the facilities
- WRC and CSIR, funded by Irish Aid, would provide policy, technical and other assistance necessary to facilitate the pilot programme. This would include drafting the terms of reference, formulating contractual documentation, monitoring progress and disseminating results with a view to replication in other areas.

The team had come to realise that the first pilots could be negotiated with infrastructure owners least resistant to change because:

- They had already realized that they were unable to operate and maintain their infrastructure
- Existing public sector jobs would not be threatened

There was general consensus that most schools in the Eastern Cape, and especially the rural schools in that province, are



**Servicing of a latrine. Credit: Wayne Birkholz - Impilo Yabantu.**

unable to operate and maintain this infrastructure – and that a prime reason in many cases was that no staff members had taken responsibility for the infrastructure.

### School toilets and access to education

The built infrastructure of many South African schools leaves a lot to be desired. While it is unacceptable that some schools have lacked facilities from the outset, it is even less acceptable that so much of the infrastructure provided has been neglected.

When water supply, sanitation and hand-washing facilities are insufficient or non-existent, schools more readily become places where diseases are transmitted. Interventions at schools lead not only to safer learning environments, but are investments – when one teaches a child, one teaches the whole community (Note 2). Improved sanitation and water facilities, hygiene education and the promotion of hand-washing inevitably lead to less sickness and improved school attendance. This is true not only in terms of fewer days absent from schools, but also increased classroom time each day.

### Progress with the pilot

A franchising partnerships model for the routine maintenance of water services infrastructure is being tested and evaluated at some 400 schools in the Butterworth Education District. Throughout, the Amanz'abantu and Impilo Yabantu team have worked closely with DoE managers.

The pilot commenced in May 2009 by exploring the practicalities of managing the process and the allocation of tasks. Advertisements called for interested parties to respond, on condition that they were resident in the Butterworth area. This was stipulated for two reasons: the work would be done by local people from the communities concerned; and travelling time and cost to Butterworth and to the schools that they would be servicing would be minimised. Distinct areas, determined by accessibility and scope, were identified within the Butterworth District. An area was allocated to each

franchisee who had to have its home base within that service area.

Prospective franchisees were screened and shortlisted ones interviewed. Those selected received initial training in East London during the first week of June. The trainee franchisees then met with DoE Butterworth District staff and school principals to plan programme schedules and agree on work orders.

Impilo Yabantu also trained an in-house team to be the back-up should a franchisee withdraw, and to provide the franchisor with benchmark costs.

Five franchisees would have been sufficient for regular servicing of the school sanitation facilities in the Butterworth District, but, based on the assumption that a few might withdraw, eight were trained. Many of the trainee franchisees are in business on their own for the first time.

Impilo Yabantu set up an office and stores in Butterworth, and the cleaning and maintenance of school sanitation facilities started at the end of June 2009. Each trainee franchisee was supplied with basic cleaning equipment and protective clothing, a light delivery vehicle clearly sporting the Impilo Yabantu logo, and a digital camera. The purpose of the camera is to take photographs before and after the maintenance service; based on these photographs and sign-off of the works order by the school principal, trainee franchisees are paid. Spot check visits to randomly selected schools are also undertaken by the franchisor.

A key component of the service provided by the trainee franchisee is that of inspection and reporting on the serviceability and suitability of the facilities. Reports are submitted to the district managers of DoE following each visit, and repair and maintenance lists agreed on for the following visit. In this manner, ongoing service relationships are developed between the trainee franchisees, the school principals and DoE's district managers.

By mid-2010 the toilet facilities of most of the 400 schools in the Butterworth District had benefited from a first round of maintenance, and a second round had started. The schools' work was then put on hold for a few months due to DoE suffering its own version of the global financial crisis. Fortunately, alternative work was found for the franchisees in the meantime. At the time of writing, the funding is again flowing, in sufficient quantity for the franchisees to undertake routine

maintenance of not only the toilets, but also the water infrastructure (generally rainwater harvesting) at the schools.

The business decision has been taken that because, even after a year of operation, revenue streams are not yet firmly established, potential further work opportunities are still being explored, and training is incomplete, the trainee franchisees should still operate as subcontractors managed by Amanz'abantu. When Amanz'abantu and Impilo Yabantu are confident that the trainee franchisees no longer need the comfort and safety net of a subcontract arrangement, the switch will take place to a franchising arrangement, with the franchisees being appointed directly by DoE for the small contracts. Once fully-fledged franchisees, they will be expected to manage their own interactions with DoE, in particular monthly meetings with DoE district officials and ensuring that the school principals are satisfied with the results.

Potential total turnover of the five Butterworth District franchisees is estimated at R4 million (\$543,000) per annum. This is estimated on the minimum work needed for school sanitation, and assuming schools are visited on a six or seven week cycle. If a school requests them to do additional work (e.g. add solid waste removal or water infrastructure maintenance), or if they start working for other clients, their turnovers will increase accordingly.

The trainee franchisees are billing the schools (or DoE on the schools' behalf) each time they do cleaning and maintenance. All the development costs, including developing the concept and the training schemes, giving training and preparing operations manuals are being funded by Irish Aid and by in-kind contributions of Amanz'abantu and CSIR.

The trainee franchisees have taken loans to fund the capital outlay for vehicles and equipment. Because the banks prefer lending to franchisees than to stand-alone businesses, the franchisees have had no difficulty in obtaining loans. Franchisees will pay loans off from their income over the next few years. Due to the burden of the start-up costs, trainee franchisees are not expected to make net surpluses until the second or third year.

Initially, Impilo Yabantu is receiving the works orders directly from DoE and then instructs the trainee franchisees to perform the work. In effect, each order is a small contract (for the preliminary round

of maintenance, each order is between R2000 and R5000 (\$271-\$678)).

Impilo Yabantu continues to provide structured learning in the form of on the job specific skills training and mentoring, and also skills and business training as needed. It is also responsible for quality assurance.

Progress with cleaner sanitation facilities in the schools that form part of the pilot project is evident. The franchising partnership concept, as applied in the Eastern Cape schools pilot, is greatly improving the state of sanitation and hygiene at the schools it has reached. The emphasis is on the quality and reliability of the service delivered, and the viability of the franchisor and franchisees.

The state of the sanitation facilities at the pilot schools has improved so much that the Department has requested the programme to be rolled out to a further three education districts, totaling 1000 schools.

It is envisaged that once the system is working smoothly, franchisees will be able to offer their services to clinics, other public buildings, and to the private sector.

Furthermore, the programme is establishing and supporting locally-based small enterprises (mostly women-headed) for the provision of appropriate and locally-based service solutions. It is creating jobs and entrepreneurial opportunities, and upskilling rural people through facilitating workplace learning, in addition to improving school sanitation facilities.

### **Issues emerging from the pilot experience**

Apart from the need for constant attention to the billing and payment processes and to cash flow, a number of issues are emerging, which must in due course be addressed.

In the short term, the biggest issue is the need to address water facilities and solid waste disposal at the schools:

- Many of the schools have no solid waste facilities, and inevitably trash ends up in the toilets
- Most of the schools are not on a reticulated water supply system, and thus reliant on rainwater harvesting. When the schools were built, gutters were in place to collect roof water and channel it to storage tanks. The gutters at many schools are, however now broken – therefore no collection, and no water in the tank.
- The tanks are in many instances broken or fouled, with taps often broken or

missing. Many children have to bring water to school.

- The technical option of a dry sanitation system for rural schools and clinics may not be the most appropriate choice because of the large numbers of users. The pits fill up very fast requiring very frequent emptying.
- There must be a long-term and strong partnership with government, since public institutions are mainly responsible for water services delivery in the developing world.

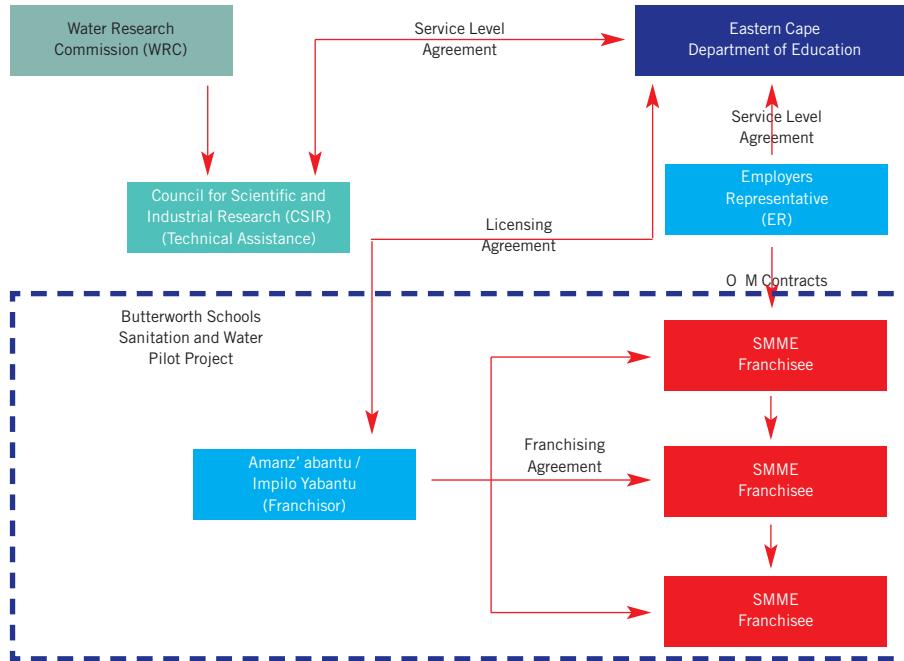
### **Lessons learned**

The principal lessons learned from progress with the pilot so far are:

- Task-specific concept development (for example the specifics of the business model, the training programme and the operations manuals) can be done only by a franchisor that know the details of performance of that task, based on first-hand experience in the same or a similar community
- Potential franchisees must be chosen on the basis of willingness to work hard and to commit to the business principles
- More potential franchisees must be chosen for training than will be needed to undertake the work – attrition during the training period will reduce numbers
- Because the water service is an essential service, provision must be made in the franchising agreement for prompt replacement of non-performing franchisees
- Cash flow problems will quickly put any small enterprise out of business. Careful attention must be paid to resolving any procedural issues around the payment process and ensuring prompt payment of invoices submitted by the franchisees
- To facilitate rapid and dissension-free agreement that the work has been performed according to contract and that payment can be authorised, tasks must be as standardised as possible, and assigned standard prices
- The concept can be extended and applied to other areas of the water services business
- Potential to create local skills and capacity, as was local job creation

### **Conclusion**

The franchising partnerships concept, as it is being applied in the Eastern Cape pilot, is very promising in terms of the quality and reliability of service delivered and the



**Figure 1: Butterworth pilot programme organizational structure**

viability of the franchisor and franchisees, and has the potential to be expanded to other water services activities, such as meter reading, domestic plumbing, etc. An important element is that it can create and institutionalise local jobs and economy. This pilot is benefiting from an extraordinary amount of management attention from Amanz'abantu, Impilo Yabantu, CSIR and WRC, made possible by the Irish Aid funding. This attention manifests in many ways, not least in the assistance given to trainee franchisees for ensuring that the processing of payments to them is running smoothly, and in the bridging finance they have received from Amanz'abantu.

This service delivery success, of formally establishing small scale local service providers is being noticed by municipalities in the area that have responsibilities for water services facilities at household level, with the result that exploration has begun in the broader water services supply chain of how the principles of franchisees and / or franchisor can be adapted and adopted to provide services to these municipalities. ●

## Notes

**Note 1:** Franchising is a way of accelerating the development of a business, based on proven, existing methodology. The franchise system firstly correlates and systematises the business, and facilitates the setting up of the business, supporting and ensuring business discipline thereafter. The principles of franchising partnerships in the generic sense can be summarised as follows:

- Franchising is robust and able to ensure consistent quality products and services.

- Franchisors are obliged to provide the franchisees with specialist expertise and other forms of assistance.
- The success of franchises is based on replication of prior success, efficient logistics and a skilled and capacitated workforce.
- Small business franchises businesses are relatively easy to establish.
- Accept the quality control of the franchisor – thereby assuring higher quality and greater efficiencies.

The cardinal elements of a franchise can be summarised as:

- Identifying components of the value chain that are simple enough to systematise
- Discovering good practices
- Systematising the identified component(s)
- Selecting franchisors and franchisees
- Identifying the financial and other risks to both franchisors and franchisees, and as far as practically possible, reducing those risks
- Providing start-up help, including initial training
- Preparing operations manuals
- Conducting ongoing research and development for the product or service and of the market dynamics
- Continued support, training, control and discipline of the ongoing business

The key is the incentive, to franchisor as well as franchisee, to improve efficiency, provide improved service reliability and quality control – thereby providing the assurance that service quality will be consistent.

**Note 2:** 'Schools need safe water and separate, clean sanitation facilities. .... Health education curricula are undermined if children are unable to practice what they learn about drinking safe water or washing their hands.' (UNICEF 2005, page 12).

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  - WRC 1610/3/10: *Modelling of selected water services operational elements*.
  - WRC 1610/4/10: *Institutional review for the application of franchising*.
  - WRC 1610/5/10: *Establishing criteria for the selection of water service franchisors, partnerships and franchisees*.
  - WRC 1610/6/10: *Business analysis case study: schools sanitation O&M*.
  - WRC TTT432/09 (1610): *Going with the franchising flow: An exploration of franchising partnerships for the operation and maintenance of water services infrastructure*.

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# Leading projects show contracting innovation

Innovative approaches to contracting are being used around the world to deliver benefits in different aspects of the water sector, in both the construction and operation of infrastructure. Here, *WUMI* presents some of the current leading examples, with case studies from Queensland and South Australia in Australia, and California and Arizona in the USA, along with an example of how one of the sector's major players, Veolia, is working to deliver advanced treatment to an industrial client in the USA.

## *South Australia's Allwater venture delivers an operating contract alternative*

Australian utility SA Water has looked to move on from the previous model under which it contracted out operation of its water and wastewater systems. Here, **LIS STEDMAN** looks at the success to date of its contract with the Allwater joint venture, where the utility remains involved in the operation of its system.

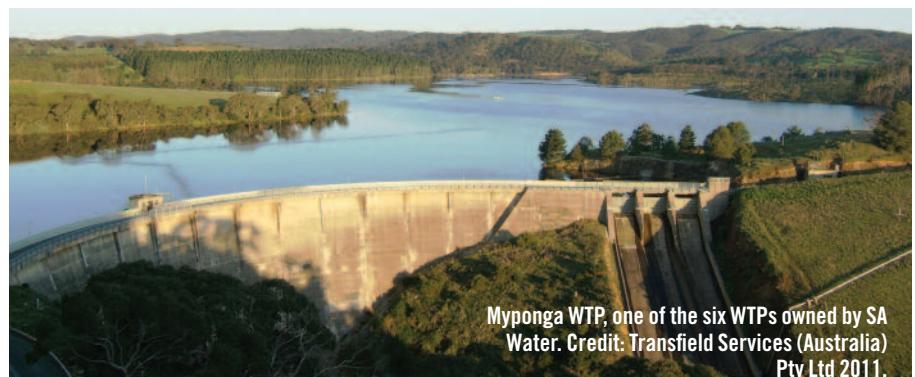
**Suez Environnement and Degrémont sealed their recent run of success in Australia by winning the contract to operate Adelaide's water and wastewater systems – a major coup for the company, and one that again can be attributed to advanced approaches to client relations.**

Project general manager Jerome Bailly notes: 'Adelaide is in South Australia – the driest state of the driest continent. Water is extremely important.'

SA Water (South Australia Water) is the client on the project, which had been undertaken previously by United Water. The contract involves operating the entire water system – six potable water treatment plants, 16,000km of potable water network and wastewater network, six wastewater treatment plants, and the reuse system.

'SA Water's main concern was that it wanted to be more involved in the operation, more transparent,' Mr Bailly explains. 'They wanted to move from a master-slave contract to a new model.' In March 2010 SA Water launched a tender with two phases of prequalification. For this, Suez Environnement, group company Degrémont and local contractor Transfield Services formed a joint venture under the Allwater name, finding themselves in competition with an Acciona-led consortium, MetroAqua, once the bidders were winnowed down to two prospective candidates in July 2010.

Mr Bailly notes: 'United Water did a



**Myponga WTP**, one of the six WTPs owned by SA Water. Credit: Transfield Services (Australia) Pty Ltd 2011.

good job, but it was more about the model. Also the relationship between the client and contractor was not working very well, so SA Water wanted to change.'

### **A challenging bid process**

There was a six-month period in which Allwater and the Acciona consortium were both in competition, and during which SA Water held numerous workshops (several times a week, for both consortia). Allwater developed an action plan, 'Efficiency through innovation', whose goal was to improve service quality at all its facilities while reducing operating costs.

'Team management was very important,' Mr Bailly notes. 'This involved individual assessment of people, profiling, tests, interviews and many workshops to show the team could work together.' For instance, one crisis management workshop simulated a scenario in which an excavator cut through the IT and communications systems for a local airport. SA Water was

an integral part of the workshops.

'It was a very interesting process, and very different to the one we know, generally speaking, in Europe. It was real life interaction with the client.' At the end of December the company made its bid, and in February 2011 it was awarded the contract. With the United Water contract ending at the beginning of July this left a relatively short time frame to prepare. 'In March we were in Adelaide, and in April, May and June we were preparing the contract. In July we took over,' Mr Bailly recalls.

'During the transition we built a team of nearly 350 people. We hired most of the incumbent workforce and a Suez Environnement management team. We hired local people, bought new vehicles, introduced a new operational structure, a new IT system, a new logo and offices.'

### **Operation underway**

Since 1 July Allwater has been operating the water treatment works, the water

network, the wastewater network and plants and the recycling system. 'We are fully in charge, and there have been no major incidents, which is a success of the transition,' Mr Bailly says. 'From our point of view it is a success.'

He estimates that it will take a further three months to stabilise operations so everything is working smoothly, everyone understands their responsibilities and operations are optimised. The company is looking at a number of efficiencies including reducing the potable water network pressure to cut leakage.

The contract is an O&M (operation and maintenance) type (with a twist) in which SA Water is responsible for funding investment. SA Water is also both client and partner, Mr Bailly explains. 'I have in my team people hired by SA Water, for instance the person who does the financial reporting and the person responsible for the KPIs (key performance indicators). The fact we are working every day

with people from the client means we are obliged to be completely transparent.'

The project is also a direct cost contract in which all expenditure is reimbursed within a mechanism that encompasses the KPIs and a 'stick and carrot' incentive scheme. 'If we deliver good service we get a financial incentive, if bad, we get financial pain,' Mr Bailly says. 'If we are more efficient, we share the gain. The first priority is to do the work properly, and then to be efficient and progressively reduce the budget.'

He adds: 'It is very different to being a subcontractor, agreeing a price then making a margin on work you do not do. If we do not do work, we spend less and get less money. If we spend more but do an excellent job, we can earn more. First we need to do the job correctly to meet the KPIs and optimise the budget. Everything is shared with the client. If we are over budget, the joint venture pays

part and the client pays part. It is a very smart model.'

Mr Bailly notes: 'I think it is a very interesting model for clients – for municipalities, or water corporations that want to have the advantages of a private company such as efficient technologies and risk sharing, but want to keep control and know what is going on. It is a good compromise between direct operation by a municipality and a full concession contract by an operator.'

It is, however, a model currently mainly used in Australia and New Zealand, though he sees potential for application in Europe. 'The drawback is that the bid costs are huge,' he adds. 'The process took six months – we had a team of 20 to 30 located in Adelaide because we had workshops every two or three days. Both teams had exactly the same workshops so SA Water was able to assess the differences and commitment of each team.' ●

## Progressive design-build procurement model brings collaboration for Stockton, California

Engineering firm CDM is currently working with the City of Stockton, US, to design and build a new water treatment plant under a highly collaborative design-build-procurement model. **LIS STEDMAN** outlines the project and discusses how this innovative model is proving to be highly successful.

**US engineering and consultancy firm CDM won the Stockton Delta water supply project under an innovative 'progressive' design-build procurement (DBP) model that offers owners a great deal of flexibility and collaboration in the permitting / design process.**

The City of Stockton, inland from San Francisco, USA, currently obtains approximately 20% of its water supply from groundwater wells. However, population growth and climate change mean the water level in the wells is dropping and remaining surface supplies are contractual in nature, making them subject to both environmental and market conditions. Therefore, with a need to secure a supplemental, long-term reliable water source, the city turned to the Sacramento-San Joaquin Delta. They issued a request for proposals to design and build a 30MGD (114MLD) treatment plant (ozone treatment and ultrafiltration membranes), rising to an ultimate 160MGD (606MLD) capacity along with an intake and pump station and 12 miles (19km) of raw water pipeline, six miles (9.6km) of treated

water pipeline and seven microtunnels.

The 'progressive model' involves extremely close collaboration with the client and an evolving cost process that has enabled an ongoing drive to reduce costs – money that was returned to the city. The process involved an initial proposal that included the project approach and lump sum prices for Stage 1 engineering, Stage 2 engineering, and Stage 2 construction management.

The collaborative Stage 1 then involved cost optimisation through, for example, revising the pipeline alignment and modifying the design of the ozone treatment system. The Stage 2 proposal included a lump sum price for construction and a lengthy commissioning process. There were also 16 major subcontractor packages including the tunnels, electrical work, pipeline installation and SCADA (Supervisory Control and Data Acquisition) programming. The costing process was completely transparent to the client, with CDM submitting nine binders with its entire project cost information inside.

### Opt-out option for the city

Built into the successful and evolving 'progressive' DB model is an owner's 'off ramp'. CDM's Paul Meyerhofer explains that this point was when CDM had finished 65% of the design, and submitted a lump sum cost for the rest. 'The off ramp was there in case the city was unhappy with our services or thought the cost estimate was too high or it wanted to go down a more traditional route, or if there were permitting issues. It was simply a way to give the city a means of deciding to stop the DBP process. It was a simple thing, just saying if we couldn't mutually agree to a lump sum cost CDM would complete the design.' The city would at that point have reverted to a traditional design-bid-build model.

However, the project so far appears to be a considerable success, largely due to the extremely cooperative style of the contract. Mr Meyerhofer notes: 'I've been in the business 40 years and it is certainly the most collaborative project I've been involved in.'

He notes that often in a traditional procurement model once the contract



**Work taking place at the Stockton site. Credit: CDM.**

moves into the construction phase there can be contention between the engineer, owner and general contractor. 'In this case there is very little chance of that – there are really just the two entities.' Both the design and construction processes are collaborative, he says, even down to the selection and negotiation of prices with subcontractors. 'The city is involved in the process – it is very transparent. They understand everything that goes into the price decision process.'

Financing was provided by the city through multiple water revenue bond issues, including a series of federally taxable fixed rate Build America Bonds made available through the American Recovery and Reinvestment Act (ARRA). Through an interest rate subsidy funded by the ARRA, the city was able to realise

significant savings, totaling approximately \$40 million over the life of the debt.

### Risk allocation

The risk allocation was determined during the design-build procurement stage. Mr Meyerhofer says: 'The client and the prospective design-builders had a number of meetings to talk through what the risks and uncertainties were, and who should own the risk – what was under the control of the design-builders and which the city had most control over.'

For instance, there were a number of permits that the city had to procure for diverting water from the Sacramento-San Joaquin Delta that affected the timing and cost of the project, so it was agreed any delay associated with this process would be a cause for additional cost reimbursement, he explains. There are also performance requirements for production quantity and quality of water from the plant, and the contract is set up such that if the quality of the raw water is beyond certain limits these requirements are relaxed.

'If you don't have the ability to discuss risk with the owner prior to signing the contract, and the contract doesn't clearly state the risk and its limits, it can be a

source of contention,' Mr Meyerhofer says.

Mr Meyerhofer says he believes the progressive design-build model 'brought costs down dramatically. That is why it is a model we like to use. It costs less than some of the more traditional procurement routes, it is all very transparent, the risks were fairly shared, it was just a case of the city and CDM having a very collaborative process and being very transparent to each other. When there is a lack of collaboration as a contractor there is a temptation to put a fair amount of money in the bid to cover risks and uncertainties.'

Currently the scheme is around 86% complete and the plant is scheduled for commission in April 2012. The schedule now calls for water to be delivered to the city from 1 May 2012, ahead of schedule despite environmental restrictions.

Certainly, looking at the pricings compared to unit prices for similar contracts, the Stockton costs also look extremely good – the water treatment plant construction cost is \$2.9 million per MGD compared to an average \$3 to \$4 million per MGD. The final commissioning stage will begin in April 2012 and last until February 2013, with final completion scheduled for March 2013. ●

## *Industrial example of advanced water and wastewater treatment delivery using a design-build-operate contract*

Using a design-build-operate contract, Veolia company NA Water Systems worked with ThyssenKrupp Stainless USA and ThyssenKrupp Steel USA to provide water and wastewater treatment for a range of processes and wastes at a new carbon steel facility in Alabama, US.

**T**hyssenKrupp Stainless USA and ThyssenKrupp Steel USA were created in 2007 to build and operate new, technologically advanced carbon steel and stainless steel processing facilities in Alabama. The investment in this complex, which was completed in 2010, has allowed ThyssenKrupp to expand its 200-year-old business.

Production began in July 2010 at the new 3700 acre (1480ha) processing complex near Mobile, Alabama. The new carbon steel facility has an annual manufacturing design capacity of 4.3 million metric tons of products. The stainless steel plant is designed to an initial operating capacity of 1 million metric tons of products annually.

One of the many highlights of the new state-of-the-art complex is its advanced water and wastewater treatment. Due to

the significant quantities of water required and the company's emphasis towards sustainability and resource recycling, high quality process water and stringent wastewater treatment were critical in system design.

The treatment systems were designed and built by NA Water Systems, a Veolia Water Solutions & Technologies company. Veolia Water North America operates the systems under a long-term operations contract. The project represents a culmination of more than two years of teamwork between ThyssenKrupp, Veolia Water Solutions & Technologies, local contractors RJ Baggett and Gulf Electric, and Crowder Construction.

There were a number of advantages for ThyssenKrupp Stainless USA and ThyssenKrupp Steel USA to using the design-build-operate procurement method for the production complex's

water and wastewater systems. Early contractor involvement, for example, enabled construction engineering considerations to be incorporated into the design phase. It also allowed for fast-tracking of the design and construct portions of the project.

Another advantage is the guarantee. Veolia Water North America is contracted to provide services for operation, maintenance, chemicals and sludge disposal for the treatment facilities serving the complex. By transferring the responsibility for optimal operation of water and wastewater treatment to Veolia under a fixed fee arrangement, the operator's performance guarantee is thus structured as a long-term warranty.

### Systems overview

The three major water and wastewater treatment systems serving the complex



**ThysennKrupp facility water treatment plant.**

**Credit:** Veolia.

include: an industrial supply water treatment system that treats water from the Tombigbee River; a two-stage biological treatment system that treats sanitary wastewater from within the production facilities as well as industrial wastewater with concentrations of organic loadings; and a physical / chemical metals polishing treatment system that processes effluent from the two-stage biological treatment system and inorganic industrial wastewater that has been pretreated at various production areas within the mills.

NA Water Systems completed the design-build project with value-added engineering, on schedule and under the budget originally projected. Through its design, Veolia's ACTIFLO, TURBOMIX, AnoxKaldnes Moving Bed Biofilm Reactor (MBBR) and other technologies enable the treatment processes at the state-of-the-art complex to produce high quality water within a very small footprint.

In the new complex's 14.4MGD (54.7MLD) capacity water supply treatment system, Tombigbee river intake water is filtered through a passive screen to prevent aquatic life entrainment and then solids are removed via coagulation, flocculation and ballasted settling in four

ACTIFLO Turbo systems before storage and distribution to the mill. ACTIFLO Turbo is a high-rate flocculation and settling process that utilizes microsand as a seed for floc formation. The microsand also acts as a ballast within the floc.

The 5.8MGD (22MLD) capacity wastewater treatment facility consists of both biological treatment and physical-chemical treatment systems. The biological treatment system primarily relies on a conventional activated sludge process, with some waste streams pretreated in an AnoxKaldnes moving bed bioreactor (MBBR) for organics removal. Effluent from the biological treatment system is then treated in the physical-chemical treatment system.

Mill wastewater treated in the complex's physical / chemical metals polishing system includes effluent from the biological treatment processes, contact cooling water blowdown, acidic wastewater from pickling operations as well as neutralized, pretreated wastewater from pickling operations. The physical / chemical system includes five main unit operations:

chemical and hydraulic equalisation of waste streams, chemical reduction of hexavalent chromium to trivalent chromium, chemical addition and pH adjustment in a TURBOMIX reactor to reduce metals solubility via precipitation and adsorption; oxidation via aeration to treat unreacted sulphide and reduce residual iron solubility, and ACTIFLO clarification to separate the non-dissolved metals and other particulate matter from the treated wastewater.

The steel industry overall is a significant water user. Applications in the industry typically involve high heat, critical non-contact cooling, high suspended solids, oil and grease contamination, and complicated cascading. At its new Alabama complex, ThysennKrupp is demonstrating its commitment to water resource recycling and sustainability while utilizing the latest technologies to safeguard the environment and provide sufficient water supply and flexibility for future growth. ●

**Article provided by Veolia.**



## ***Creative contracting delivers results for Unitywater in Queensland***

At the end of last year, Phase II of Australia's Murrumba Downs wastewater treatment plant in Queensland was completed by an alliance between Unitywater, John Holland Group and MWH. STACEY MCCRYSTAL looks at this successful alliance project.

**I**n 2007, Pine Water, now part of Unitywater (the operator serving Moreton Bay and the Sunshine Coast in Queensland), initiated the Murrumba Alliance to deliver more than \$200 million in new and

upgraded infrastructure. The team, which included construction contracting specialist John Holland Group and wet infrastructure engineering firm MWH, first undertook design and construction

of an Advanced Water Treatment Plant (AWTP) to comply with Queensland's emergency drought legislation. The AWTP was delivered well ahead of schedule and under budget.

Building upon the success of that effort, the Alliance embarked upon significant upgrades to, and refurbishment of, the Murrumba Downs wastewater treatment plant, which also included provision of an onsite odour management facility. The existing plant – which had been delivered under a design and construct contract a decade earlier – was overloaded and would reach its design capacity in 2010, with substantial increases in sewage loads expected over the next 15 years.

The scope of work included the design, construction, augmentation, and commissioning of new and existing process units to increase the capacity of the facility from 13.2MLD to 30.8MLD to meet the demands of a growing population within Brisbane's Northern Growth Corridor. In addition, the upgrade works also improved the plant's nutrient removal capability, reducing the median effluent total nitrogen and total phosphorus concentrations to less than 3mg/l and 1mg/l respectively, thus reducing the pollutant load to the nearby receiving waters.

**Building a sound organisational structure**  
The Murrumba Alliance was Unitywater's first experience with alliance contracting. By working as a unified team, and in large part thanks to the consistency and oversight of its leadership, the Murrumba Alliance was able to ensure the highest quality of service. Each organisation had a role to fill: Unitywater as owner / client, John Holland as principal contractor, and MWH as lead design firm.

An Alliance Leadership Group (ALG), including one person from each organisation, was formed to provide executive-level oversight of all Alliance activities. Likewise, the Alliance programme management team (APMT) included John Holland's Alliance manager, as well as Unitywater and MWH's project managers and MWH's technical leaders. These teams helped monitor performance and resolve issues in the early stages to ensure they did not intensify or interfere with project delivery.

Both teams were consistently staffed with the same key individuals from the initiation of the Alliance, providing a solid foundation and a sense of stability throughout the contract. In addition, thorough review processes were established in the form of technical review meetings, which allowed review and endorsement by all Alliance partners of all designs throughout the project. The

review meetings were chaired by key members of both the design and construction team, and attended by all relevant alliance members, enabling continuity between the design, construction and operations processes.

### Consistency of leadership

Because one of the key constraints with major projects that run for a long time is the ability to keep the same staff members on the project for many years, the Alliance's consistent leadership is a significant accomplishment. MWH and John Holland made a commitment to Unitywater that key staff would not be changed throughout the course of the project. The Alliance manager, design manager, construction managers, process coordinator and other key individuals on the team were kept on board through the life of the project, helping to eliminate the negative impacts that can occur when someone leaves and ensuring retention of knowledge around key decisions made during the concept design, target outturn cost (TOC), detailed design, construction and commissioning phases.

Following completion of the plant, two engineers from MWH stayed on board in a support role to Unitywater operators. They were onsite on a weekly basis to help with process optimisation and training. This ongoing support, which lasted for six months, helped Unitywater achieve stability in the treatment plant operations, reduce operational expenditure by optimising chemical dose rates, and provided the Unitywater operations staff with a higher level of confidence in operating the upgraded wastewater treatment facility.

Together, the Alliance appreciated the higher operational complexity of the treatment plant due to the increased number of process units required to achieve the performance objectives. As such, an additional training period was undertaken, which provided the Unitywater operations staff with key process training for each discrete area of the treatment facility. These training sessions outlined the intended operation of each process area and allowed a forum for the Unitywater operations staff to ask questions and troubleshoot any operational issues.

As part of the commissioning and operations support process, a set of operations and maintenance manuals were produced, including training videos. These manuals provide a valuable



**Aerial shot of the Murrumba Downs wastewater treatment plant. Credit: MWH.**

resource to the Unitywater operations staff for the ongoing operations of the plant. They were developed with the aim such that any new Unitywater staff member, with no prior history of the treatment plant or upgrade project, could effectively understand and operate the treatment plant.

Because of the ongoing relationship with Unitywater through the operations support phase, during the January 2011 floods across South East Queensland, MWH provided daily site support to Unitywater and helped with restabilising the Murrumba Downs treatment plant process after it was affected by the flooding.

Throughout the process, the Murrumba Alliance's mission remained clear – 'in these exceptional times, we will deliver a sustainable water resource that will enable the community to grow and prosper'. Phase I of the Murrumba Downs wastewater treatment plant project was delivered without any operational interruptions and was handed over in December 2009, five weeks before its contracted delivery date. This success was achieved despite six weeks of lost time due to wet weather, and allowed Unitywater to be confident that the anticipated peak flows and loads during the summer season would be well within the new plant's capabilities.

In addition, Phase II of the project was handed over in December 2010. This success was achieved despite lower than expected flows within the Murrumba Downs catchment area, which resulted in the eventual decommissioning of Bioreactor 1 to reduce overall operational expenditure. The once-outdated plant is now outperforming all odour and effluent quality targets. Furthermore, the experience introduced Unitywater to alliance contracting, which has now become an important tool in its project delivery toolkit. ●

### About the author

**Stacey McCrystal** is a Project Manager at MWH, Australia.

## State-of-the-art wastewater treatment for Arizona

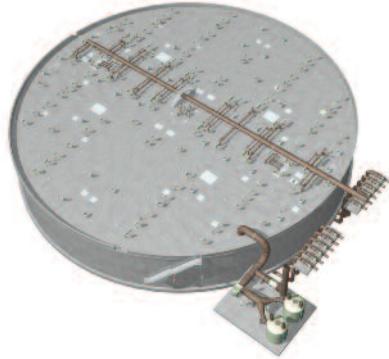
As part of an overall plan to improve wastewater treatment across Arizona's Pima County, the county entered into a design-build-operate with engineering group CH2M HILL with the stipulation that a five-stage nutrient removal process would be used to produce high quality produced water. **LIS STEDMAN** reports on the bidding process.

**The Pima County Regional Wastewater Reclamation Department (RWRD) and international engineering group CH2M HILL have begun work on a new wastewater reclamation facility that will treat 32 million gallons (141 MLD) of wastewater on a new water reclamation campus that replaces an outdated 1950s wastewater treatment plant.**

The new plant, in the Tucson, Arizona area, US, is part of a county-wide regional optimisation master plan (ROMP) to upgrade wastewater treatment operations. Scheduled for completion in mid 2014, the facility will use the latest wastewater treatment technology to produce high quality effluent capable of meeting new permit requirements and will feature state-of-the-art odour control. CH2M HILL will design, build and then operate (DBO) the 32MGD facility for 20 years.

CH2M HILL Senior Vice President of the company's Water Business Group, Mark Alpert, explains that the existing plant, also in the Tucson, Arizona area, in conjunction with a second plant operated by the county, needed to be upgraded to meet new, more stringent effluent standards. CH2M HILL won the \$172 million DBO in December 2010.

'For the Roger Road WWTP upgrade, the county chose to go to the marketplace with a performance-based competition with some restraints. One treatment process was permissible and acceptable for P (phosphorus) removal. How the rest of the plant was developed was up to the plant operator,' Mr Alpert explains.



**Artist's impression of the 32MGD wastewater treatment facility in Tucson, US. Credit: CH2M HILL**

### Competing approaches

A competing team was led by a joint venture of Epcor Canada and United Water (an LLC), which offered an Epcor design-build and joint operation model. The second competing team, led by American Water, included Black and Veatch and McCarthy Construction, with American Water being identified as the operator – the same team composition that succeeded in winning the contract for the Lake Pleasant WTP in Phoenix, Arizona, which was completed some eight years ago.

Mr Alpert notes: 'We do design-build and operations and have a strong record as a DBO firm so we didn't have partners, just a variety of team subcontractors. There were requirements to hire local firms, and we have a local firm that will deliver a big chunk of the construction. Epcor and United Water had a clear division of responsibility as they don't deliver standalone DBO.' The latter, he notes, 'is a very competitive model'.

Mr Alpert notes: 'There were three really good teams in the competition. After the shortlist was announced, the county explained what the request for proposals (RFP) would encompass and the constraints on the one element – the secondary treatment process. Subsequent to that meeting the American Water team withdrew from the competition.'

From then on, he says, it was a 'match race' between the two teams, competing on all aspects of the project. The county, he observes, had hoped for a greater field of competitors. Apart from the process restraints around the secondary treatment process (the county stipulated that a five-stage Bardenpho enhanced nutrient removal process would be used) the teams had freedom for the rest of the plant to create significant innovation, providing they had competitive offerings and gave performance guarantees.

'Both teams had what we call in the US proprietary meetings – the county met with both teams in a confidential setting to explore topics such as technical, commercial, operational and staffing aspects, and the risk appetite. There was a minimum of six or seven meetings with each

team, then under Arizona law a draft contract was issued with the RFP and then a final contract for both teams. Each team had the opportunity to provide feedback on concerns and issues. He notes: 'The county then had some questions and clarifications for both teams and fortunately selected ours.' The contract was signed and soon afterwards ground was broken.

### Risk allocation

In terms of the risk allocation, Mr Alpert notes: 'We have done quite a few DBO contracts and we understand the risk profile. We were aiming to satisfy ourselves that the risk allocation between the county and ourselves was acceptable and we proceeded accordingly. On a DBO project, it is very difficult to see changes in the initial cost you establish – that is a big risk that each team has to understand.'

He adds: 'There are some approaches to address escalation of costs, a baseline O&M (operations and maintenance) cost, repair, and replacement, and we agreed with the county in the financial offer [of] how we would meet costs over time. There is a lot of risk around the cost structure of the O&M and repair and replace elements. We have to pass a very rigorous acceptance test for the system – there is a 30-day test period where the system has to meet all performance parameters before the county formally accepts the plant and proceeds to the operational stage of the work.'

The contract is now in the very early stages of construction. The plant only treats liquid wastewater – the biosolids are pumped to the county's other WWTP, the Ina Road facility, where a centralised dewatering and treatment facility is being constructed. Apart from the Bardenpho treatment process the other main treatment stages are DAF (dissolved air floatation) clarification and secondary clarification, filtration, disinfection, and two odour control systems – a central biofilter and a carbon absorption system. The plan is for the new Pima County WRF plant to go operational in September 2014. ●

# Who owns the UK's water industry?

The UK's water sector is known around the world for its largely privatised approach, in which the private sector utilities own the assets they operate. This brings with it the potential for changes in ownership of this critical infrastructure, the latest high profile example of which is the takeover of Northumbrian Water by the Hong Kong-based consortium controlled by tycoon Li Ka-Shing. **KEITH HAYWARD** reviews the ownership of the UK's water sector, and speaks with two of the regulators with an interest in this ownership – the Office of Fair Trading, and the sector's economic regulator, Ofwat.

**With a price tag of some £2.4 billion (\$3.7 billion), the acquisition of the UK's Northumbrian Water by the Hong Kong-based Cheung Kong group controlled by tycoon Li Ka-Shing represents no small investment. Indeed the move, when formally announced in August, was said to be the highest value acquisition of a stock exchange-listed company in the UK to date this year. Northumbrian's largest shareholder has been Canada's Ontario Teachers Pension Plan Board, so the move highlights both the potential scale and the international nature of the water business. And it shows how what are critical assets can be moved between quite different forms of ownership.**

This also points to the fact that private sector ownership in the UK comes in different forms. Indeed, the sector is more diverse than that, with parts also being in public hands.

The privatisation of the sector in 1989 by Prime Minister Margaret Thatcher took place only in England and Wales. The sector remains public in Scotland, where Scottish Water serves some five million people in 2.4 million homes, making it the fourth largest water utility in the UK. Meanwhile, in Northern Ireland, government-owned company Northern Ireland Water serves around 800,000 properties for water supply and around 660,000 for sewerage. It describes itself as a statutory trading body owned by central government, but operating under company legislation and with substantial independence from government.

As for England and Wales, there is a long history of private sector involvement in the sector through water supply only companies that currently include names such as Bristol Water, Cambridge Water, Portsmouth Water and South East Water. The privatisation of 1989 saw stock exchange listings for what had previously been ten regional water and sewage

authorities. The last couple of decades have seen the coming and going of excitement around the 'multi-utility' approach of joint water and electricity utilities. They even saw the sector caught up in the Enron bankruptcy scandal of 2001, with Wessex Water being sold early the following year for some £1.2 billion (\$1.9 billion) to pay off the debts of Enron subsidiary Azurix.

The sector has come a long way since then. Of the ten privatised water and sewage utilities, the anticipated takeover completion and presumed delisting of Northumbrian will leave United Utilities, Severn Trent Water and South West Water as those held as part of UK stock exchange-listed companies. Listing means there are many individual small shareholders, but for each company there are also a number of more prominent shareholders. The majority of the ten companies are now privately owned – Thames Water, Southern Water, Wessex Water, Anglian Water and Yorkshire Water, due to be joined by Northumbrian. These may be under the control of a single owner, as what notably happened when Thames Water was acquired by Australia's Macquarie Group, but there may be joint owners, with some notable examples of consortia having been formed to acquire the water utility. That leaves Dwr Cymru Welsh Water, which is run as a not-for-profit trust. As is already clear, owners may well be from outside of the UK, and they may themselves be listed elsewhere. A similar spectrum of ownership is seen in the water-only companies.

One thing that becomes clear when looking at the ownership of the sector is just how complex the arrangements can be. Southern Water provides as good an example as any in this respect. The water undertaking itself, Southern Water Services Ltd, is ultimately owned through a string of companies by Greensands Holdings Ltd, which is incorporated in Jersey, while the group's companies include a financing arm incorporated in the Cayman Islands. Greensands itself has

a number of shareholders, with the largest being identified as IIF International SW UK Investments Limited, advised by investment bank JP Morgan.

But amongst this complexity, there are some clear types of owners.

The Northumbrian acquisition essentially puts it in the hands of a non-UK industrial group. Overseas industrials also own Wessex Water, Bristol Water, Sembcorp Bournemouth Water and, of course, the three Veolia companies.

In the case of Thames Water, Macquarie's acquisition was through its European Infrastructure Fund. Other investors therefore lie behind this – a recent report indicated a South Korean Defence Ministry fund is considering relinquishing its investment in Thames Water made through the Macquarie fund. Recent years have seen a rise in dedicated infrastructure funds, and they are also involved in the ownership of Anglian Water, South East Water, South Staffordshire Water, and Sutton and East Surrey Water, for example.

Pension funds clearly feature prominently, especially the various Canadian and Australian pension funds, who own shares in the listed companies but are equally keen to take part in private ownership arrangements. Banks and many of the private investment funds also take on ownership in both listed and private companies. US-based Invesco and Switzerland's Pictet, for example, feature prominently in listed company share ownership, as does UK-based Legal & General. Banking group HSBC, for example, stepped in recently to take over ownership of Cambridge Water, smoothing the way for CKI's approach for Northumbrian. Deutsche Bank is another good example, having taken on and then syndicated ownership of Sutton and East Surrey Water in 2007.

There are therefore different types of ownership arrangements and different types of owners, and one way those two aspects are linked is in relation to the extent to which owners can be involved

## The ten water and wastewater undertakings of England and Wales: the private companies

### Anglian Water

With 4.3 million customers, Anglian Water Services Ltd is owned by Anglian Water Group, which itself was previously a stock exchange listed company, but was acquired by a consortium, Osprey Acquisitions Ltd, in November 2006.

According to the water company's website: 'Osprey is a consortium of pension funds and long-term infrastructure investors and fund managers. These investors are committed and responsible owners who have strong reputational and ethical standards. The investors have affirmed their support for the management and strategy of AWG.'

Shareholders in Osprey are:

- Colonial First State Global Asset Management (32.3%), an Australian private pension fund (described on Anglian Water's website as the consolidated asset management division of the Commonwealth Bank of Australia group, with assets of A\$145.2 billion (US\$139.4 billion)
- Canada Pension Plan Investment Board (32.9%), a Canadian private pension fund with assets of C\$127.6 billion (US\$121.4 billion)
- 3i (15%), a UK private equity group with assets of £9.6 billion (\$14.8 billion) and listed on the London Stock Exchange
- IFM Global Infrastructure Fund (19.8%), an Australian private infrastructure fund with assets of A\$22.7 billion (US\$21.8 billion). According to Anglian Water's website, IFM (Industry Funds Management) is ultimately owned by Members Equity Bank Pty Ltd.

According to AWG's Annual Report 2010, these shareholders each currently have two non-executive directors on the Board.

Water-only company Hartlepool Water has been merged with Anglian.

### Southern Water

Water undertaking Southern Water Services provides water to around one million homes and wastewater services to around two million homes. In what are perhaps the most complex ownership and financing

arrangements in the sector, the water undertaking is ultimately owned by Jersey-registered Greensands Holdings Ltd, with related companies including the funding vehicle Southern Water Services (Finance) Ltd, a company incorporated in the Cayman Islands.

The consortium that made the acquisition in October 2007 included:

- IIF International SW UK Investment Ltd (28.1%) (advised by JP Morgan Investment Management), an independent infrastructure investments company
- Challenger Infrastructure Fund (23.4%), whose subsidiary was Independent Water Networks Ltd
- Seven Australasian superannuation funds (15.7% in total) (advised by Access Capital Advisers, with the funds including MTAA Super and State Super which, at the time, had shareholdings in Kemble Water Holdings, the holding company of Thames Water Utilities Ltd)
- UBS (15.6%), to be transferred to the UBS International Infrastructure Fund and managed by UBS Global Asset Management

The Challenger holding appears since to have been transferred to management by UBS, who now manages five funds that represent 39% of the shareholding.

According to Southern Water's last two Annual Reports, the two largest shareholders of Greensands are now IIF and US-headquartered The Northern Trust. The Office of Fair Trading, however, in its assessment completed during 2010, put the 23.4% holding in the hands of the Australian government's Future Fund, whose investment managers in the infrastructure sector include UBS Global Asset Management.

Southern Water's directors include non-executive director Paul Moy, Global Head and Chief Investment Officer for UBS Infrastructure and Private Equity. Alternate non-executive directors include representatives of JP Morgan Asset Management and UBS Global Asset Management (UK). All are also directors of intermediary company Greensands (UK).

Additional investors account for the remaining 17.2% of ownership of Greensands. At the takeover these were:

in the management or oversight of the water companies.

Shareholders of listed companies, for example, will generally have relatively little say in how a company is run. One of the most direct examples of involvement can be seen at Northumbrian where, prior to CKI's acquisition, the Ontario Teachers' Pension Plan Board held a 26.76% shareholding in the water undertaking's parent company, whose board has included Claude Lamoureux as a non-executive director. With retirement set at the end of July 2011, he was appointed in December 2006 and was until December 2007 President and CEO of OTTP.

Generally it is in private company structures that owners have a more direct say in how the water companies are run. This can be seen at Thames Water, for example, where the 15-strong board of the water company itself, Thames Water Utilities, includes 12 non-executive directors. These include Ed Beckley, an executive director of Macquarie Capital Funds and Chief Financial Officer of the Macquarie European Infrastructure Funds, Martin Stanley, CEO of the Macquarie European Investment Fund LP and an executive director of

Macquarie Investment Banking Group, and Gordon Parsons, a director of Macquarie Capital Funds with responsibility for Macquarie's UK infrastructure assets.

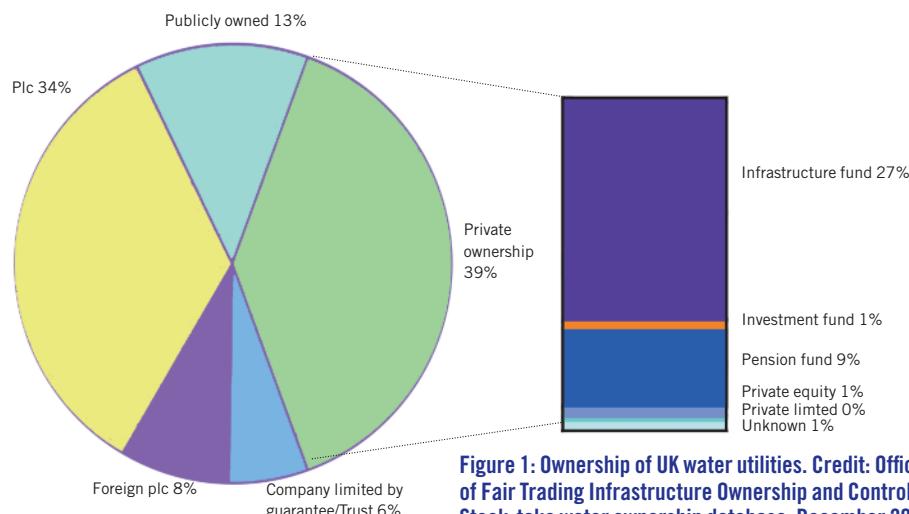
### An issue of infrastructure ownership?

One organisation with an interest in ownership in the sector is the Office of Fair Trading (OFT), a government body which works to protect consumer interests. Last year OFT carried out a review of the ownership and control of

infrastructure as a whole, publishing its results in December.

'We wanted to map who owns what and to understand ownership models and whether they matter,' comments OFT's Chris Jenkins, who was involved in the study.

As with any country, investment in infrastructure forms the basis for economic development, and the UK's national strategy for infrastructure, published last year, puts the overall investment demand at around £40–50 billion



**Figure 1: Ownership of UK water utilities. Credit: Office of Fair Trading Infrastructure Ownership and Control Stock-take water ownership database, December 2010.**

- Sumaya Investments Ltd (4.8%), an 'indirect wholly owned subsidiary of Cheung Kong Infrastructure Holdings Ltd (CKI, at the time owner of Cambridge Water, and now taking over Northumbrian Water)
- Sky Brace Investments Ltd (4.8%)
- Retail Employees Superannuation Trust (2.6%) (at the time had a shareholdings in Kemble Water Holdings, the then holding company of Thames Water Utilities Ltd)
- Hermes (3.9%)
- Paceweald (1.1%)

### Thames Water

Serving 14 million customers, Thames Water Utilities Ltd is owned by unlisted Thames Water plc which is in turn, through Kemble Water Holdings Ltd, owned by Australia's Macquarie Group through its European Infrastructure Fund. The fund acquired the company from Germany's RWE in October 2006 for around £8 billion (\$12.4 billion).

The first (€1.5 billion (\$2 billion)) and second (€4.5 billion (\$6 billion)) Macquarie European Infrastructure Funds list Thames Water as among their investments.

The Thames Water Utilities Board includes 12 non-executive directors. These include Ed Beckley, an executive director of Macquarie Capital Funds and Chief Financial Officer of the Macquarie European Infrastructure Funds, Martin Stanley, CEO of the Macquarie European Investment Fund LP and an executive director of Macquarie Investment Banking Group, and Gordon Parsons, a director of Macquarie Capital Funds with responsibility for Macquarie's UK infrastructure assets.

According to a Bloomberg report in July, the South Korean Defence Ministry's Military Mutual Aid Association may look to sell later this year the 6.9% of Thames Water Utilities it obtained for \$281 million through the Macquarie fund.

### Wessex Water

Wessex Water Services Ltd provides a water supply service to some 1.3

(\$62–77 billion) per year until 2030. OFT is interested in how competition and markets will have to play a role in delivering this investment. Water therefore formed just part of the study, which also covered airports, telecoms, rail, ports, power, waste, car parking, and toll roads.

Many of the OFT's findings were framed around activities that are not currently subject to market regulation – ports, waste, toll roads and car parks – with a separate presentation of data solely on the water sector made available on

OFT's website. The work does however set the developments in the water sector in a wider context.

'We found in terms of ownership across infrastructure as a whole that there was diversity of ownership, so around 42% was public listed companies, 30-something % was private, and there was also a fair degree of public and not-for-profit ownership,' comments Jenkins.

The water sector-only analysis, based on asset value, set out some figures as of last year on, for example, whether the

customers and sewage services to some 2.7 million customers. The company is owned by the unlisted YTL Utilities Ltd, which is in turn owned by Malaysia's YTL Power International Berhad and, ultimately, by the listed YTL Corporation Berhad. The company acquired Wessex Water from the Enron Corporation of America in May 2002.

In May of this year, YTL Corporation announced its latest figures, featuring an 11.5% growth in revenue and a rise in profit before taxation. YTL Group Managing Director Tan Sri Dato' Francis Yeoh Sock Ping said this was due substantially to overseas operations, including Wessex Water.

Wessex Water's non-executive directors include Francis Yeo, as well as Hong Yeoh, director of YTL Corporation and executive director of YTL Power International, Mark Yeoh, a board member of both YTL Corporation and YTL Power International, an Kathleen Chew, group legal advisor for YTL Corporation as an alternate director to Francis Yeoh.

### Yorkshire Water

Serving some 4.7 million people, Yorkshire Water Services Ltd is part of the Kelda Group plc, which was delisted following acquisition by investment consortium Saltaire Water made up of Citigroup, GIC (the Government of Singapore Investment Corporation), Infracapital (of the Prudential Group), and HSBC.

According to last year's Office of Fair Trading assessment, the ownership is:

- Citi Infrastructure Investors (47.1%)
- GIC (26.32%)
- Infracapital Partners LP (19.6%)
- Unknown private equity (6.98%)

### Northumbrian Water

Currently being acquired by to private ownership. See box on listed companies.

parent company is listed or unlisted (38% compared to 62%) and what the shareholder types are (see Figure 1). It also assessed the number of times water utilities had transferred from or to the different types of ownership, and set out the gain or loss of the different types of ownership in terms of market share.

'Water I think has, compared to the infrastructure as a whole, slightly more unlisted private ownership and has a relatively large share of infrastructure fund ownership,' says Jenkins. 'We found about a quarter of ownership was by infrastructure fund, but that is in a way in line with the overall trend which is towards greater private equity and / or infrastructure fund ownership and away from UK-listed plcs (public liability companies).'

The rise of infrastructure funds in the water sector, as seen in particular at Thames Water, therefore fits with wider developments. 'Our findings were that infrastructure funds have clearly grown over the last 10-15 years as a major investment vehicle in infrastructure,' says Jenkins. 'We think there are very sound reasons for the development of those funds. Effectively they match long-term capital looking for long-term returns with long-lived assets which can provide

## The ten water and wastewater undertakings of England and Wales: the not-for-profit company

### Dwr Cymru Welsh Water

Water undertaking Dwr Cymru Cyfyngedig / Welsh Water serves some 1.2 million households. Currently following a different ownership path to the other main utilities of England and Wales, it is fully owned by a trust board, Glas Cymru Cyfyngedig. GCC operates on a not-for-profit basis, and has members who do not receive dividends and who do not have a financial interest in the company. At the end of last year 26 new members were recruited to replace members due to stand down, temporarily bringing the total number of independent members to 82. 12 members appointed in 2001 stood down after this year's Annual General Meeting, and another 12 are due to stand down next year.

Financial surpluses are reinvested, and the company distributes an annual 'customer dividend' – a payment made back to customers. The group structure includes DC Financing, which was formed to issue bonds.

Welsh Water had been part of multi-utility Hyder, which was acquired by Western Power Distribution, a subsidiary of US utility PPL, in 2000. The water utility was then sold to Glas Cymru.

## The ten water and wastewater undertakings of England and Wales: the listed companies

### **Northumbrian Water**

Water undertaking Northumbrian Water Ltd serves a population of 2.6 million in the north-east of England. Following an earlier merger, the company also supplies water to 1.8 million people in the south-east of England, where it trades as Essex and Suffolk Water. NWL is owned by Northumbrian Water Group plc, which has been a listed company since 2003 and is the current focus of attention in the sector, following the move by Hong Kong businessman Li Ka-Shing to acquire the group in what is said to represent the UK's biggest takeover of a listed company to date in 2011.

Prior to this takeover, significant shareholdings in the group (as of the end of March 2011), according to its latest Annual Report, were:

- Ontario Teachers' Pension Plan Board (26.76%)
- Pictet Asset Management Ltd (7.48%)
- Artemis Investment Management LLP (below 3%, but with around 15 million shares at the end of May 2011)
- Legal & General Investment Management Ltd (UK) (3.15%)

The group's board has included Claude Lamoureaux as a non-executive director. Due to retire at the end of July 2011, he was appointed in December 2006 and was until December 2007 President and CEO of OTPP.

Northumbrian Water had been part of the Suez Group, which sold most of its shares in the group in 2003. Suez had previously merged the UK-listed water-only company Essex and Suffolk Water plc with Northumbrian Water in 2000.

The current acquisition is being made by UK Water, a consortium led by Cheung Kong Infrastructure, Cheung Kong Holdings and the Li Ka-Shing Foundation. Li Ka-Shing is chairman of Cheung Kong Holdings Ltd, which owns just under 50% of Hong Kong Stock Exchange-listed Hutchison Whampoa, which in turn owns just over 80% of Cheung Kong Infrastructure. CKI describes itself as the largest publicly-listed infrastructure company in Hong Kong.

CKI previously owned water supply-only company Cambridge Water, which has been sold to help avoid concerns around competition.

### **Severn Trent Water**

Serving over eight million customers, Severn Trent Water Limited is owned by Severn Trent plc, a listed company in the UK. According to Severn Trent's 2011 Annual Report, major shareholdings as of 23 May 2011 were:

- Norges Bank (3.98%)
- Legal & General Group plc (3.97%)
- Aegon Asset Management (3.04%)

According to the 2010 Annual Report, major shareholdings were at that time:

- Pictet Asset Management SA (7.6%)
- Invesco Limited (5.0%)
- Legal & General Group plc (3.9%)

According to the 2011 Annual Report, most of the company's shares (almost 83%) are held by 386 shareholders – about 0.5% of the total number of shareholders.

Some insight into investor motivations is provided by the submission

long-term returns.'

None of this appears to present OFT with concerns though in terms of ownership. 'Our high level finding was that ownership matters a lot less than the regulatory framework that is in place and the degree of competition in the market,' says Jenkins. Rather, he notes a number of benefits of freedom of ownership. 'Change in ownership is more important in a sense than type of ownership. We think strong competition for ownership

can be positive, particularly in industries where there isn't really product market competition,' says Jenkins. 'Given the government's fiscal constraints, much of [the needed] investment is going to have to come from the private sector. I think it fits with our findings on ownership and competition that allowing, for example, foreign investment or allowing different types of investment into the sector should help maximise the funds coming in to fund the necessary investment.'

made by Invesco to a Competition Commission pricing enquiry carried out last in year in relation to Bristol Water. In its submission, Invesco commented last April: 'We, at Invesco Perpetual, currently have a total of £925m (\$1.4 billion) invested across the four quoted water and sewage companies and are the largest institutional investor across the quoted sector... Our continued support for this industry is dependent on an acceptable and appropriate rate of return on our capital. If an attractive rate of return is set, we are happy to put more equity capital into this industry, but the reverse would also apply if an appropriate return is not set. Ultimately we will not hesitate to divest from the sector to find alternative investment opportunities where there are lower risks and better returns.'

### **South West Water**

Serving a permanent population of around 1.7 million, South West Water Services Ltd is part of listed Pennon Group plc.

According to the Pennon Group Annual Report for 2011, as of 13 June 2011 the major shareholders were as follows, accounting for 46.64% of the shares:

- Invesco Ltd (11.98%), US plc investment fund
- Ameriprise Financial Inc (9.98%), US plc investment fund
- Pictet Asset Management SA (7.24), Swiss plc bank
- AXA SA and its Group Companies (6.14%), French investment fund in plc
- Legal & General Group plc (5.91%), UK investment fund in plc
- Prudential plc (5.39), UK investment fund in plc

The investment management arm of the Legal & General Group, Legal & General Investment Management, describes itself as a leading UK institutional investment management group, managing in excess of £362 billion (\$559 billion).

### **United Utilities**

Serving 3.2 million customers, or around seven million people, water undertaking United Utilities Water plc is part of the United Utilities Group plc, with the group describing itself as 'the UK's largest listed water business'.

The group is listed on the London Stock Exchange. Previously United Utilities plc was listed on the LSE, which prior to that was listed on the New York Stock Exchange.

According to the group's 2011 Annual Report, as of 25 May 2011 the major shareholders were as follows, representing around 23% of the company's shares:

- AXA SA (4.933%, direct and indirect holding)
- BlackRock Inc (5.13%, indirect holding)
- Legal & General Group plc (3.94%, direct holding)
- Pictet Asset Management S.A. (4.995%, indirect holding)
- Norges Bank (3.94%, direct holding)

Stock exchange notifications regarding holdings in the company issued towards the end of last year additionally related to Deutsche Bank AG and Invesco.

Initially privatised as North West Water, the water company subsequently became part of multi-utility United Utilities.

### **The need for 'fit and proper' owners**

Another organisation with an interest in water utility ownership is the sector's economic regulator, Ofwat. Just how this interest is manifested can be seen in the consultation Ofwat carried out recently on the acquisition of Cambridge Water by HSBC, following CKI's sale of Cambridge Water to smooth the way for its acquisition of Northumbrian. In this, Ofwat sought views on a range

## The water supply only companies of England and Wales

### Bristol Water

Serving around one million people and another water-only company under non-UK ownership, Bristol Water plc, a subsidiary of Agbar UK Ltd, is owned by Spain's Agbar (Sociedad General de Aguas de Barcelona SA). Three quarters of Agbar's shares are owned by the Spanish subsidiary of Suez Environnement through the listed holding company HISUSA (Holding Infraestructuras y Servicios Urbanos), with most of the remaining shares being held by Criteria CaixaCorp. Minority shareholders hold 0.56% of Agbar's share capital.

### Cambridge Water

Currently undergoing change due to the takeover of Northumbrian Water, Cambridge Water plc had been owned by Hong Kong's Cheung Kong Infrastructure Holdings Ltd (CKI) since 2004. Given CKI's decision in August to make a firm offer for Northumbrian, Cambridge Water was sold and was acquired by bank HSBC. Economic regulator Ofwat has been consulting on this acquisition. A press release issued at the time stated that 'HSBC sees its role as custodian-owner, with three seats on the Cambridge Water board'. Expectation is that the company will be sold on.

### Dee Valley Water

Formed in 1997 through the merger of Chester Water Company and Wrexham Water Company, this is the only UK-listed water supply-only company. According to the company's latest Annual Report, major shareholders as of 1 June 2011 were AXA Investment Managed Funds (35.1%) and Gartmore Fledgling Trust plc (3.8%).

### Portsmouth Water

Portsmouth Water Ltd is ultimately privately owned by South Downs Capital Ltd. According to Ofwat documentation, takeover of the company in 2001 involved a 40% employee stake, a 15% management stake, and a 45% stake for a subsidiary of the Royal Bank of Scotland, but with deferment of the latter's shares effectively giving an ownership split of 73%:27% between employees and management. In 2005, a 36% stake in South Downs Capital held by Abbey National Treasury Services Overseas Holdings was acquired by Secondary Market Infrastructure Fund UK LP. According to Ofwat's consultation document about this acquisition, the transfer did not affect proposals for the investments to be redeemed over a period of approximately 15 years, to leave the employees and management as owners.

### Sembcorp Bournemouth Water

Previously Bournemouth and West Hampshire Water, and renamed in January of this year, Sembcorp Bournemouth Water Ltd serves around half a million people and is, as the name suggests, mainly owned by Sembcorp Industries Ltd, which is listed on the Singapore Stock Exchange.

Bournemouth Water was previously owned by Dutch company Cascal, which was itself part-owned by the UK-based Biwater Group and part listed on the US Stock Exchange.

### South East Water

South East Water Ltd is owned by unlisted company HDF (Holdings), which is in turn 50% owned by Canadian pension fund CDPQ (Caisse de dépôt et placement du Québec) and 50% by the unlisted Utilities Trust of Australia.

According to South East Water's website, CDPQ is one of the largest institutional fund managers in Canada and North America, managing investments worth around £130 billion (\$200.9 billion), and is a shareholder in more than 4000 companies worldwide. UTA, meanwhile, is described as having been established in 1994 as one of Australia's first

of issues which largely centre on whether or not the new owner can be considered 'fit and proper'.

'It's an ongoing view of all owners,' comments Keith Mason, Ofwat's Director of Finance and Networks. 'There's no statute behind fit and proper, but what it does mean is, would we need

to change the licence of the water company to deal with things that we may have concerns about in relation to fitness and properness.'

This can mean looking for what he describes as 'obvious skeletons' in the background. Beyond this, the assessment focuses on two main areas: 'Probably

infrastructure investment funds, with approximately A\$2 billion (US\$1.9 billion) in funds under management.

UTA is managed by Hastings Funds Management Ltd, which also manages the Hastings Diversified Utilities Fund and sold that fund's interest in South East Water to CDPQ at the end of 2010 for A\$206 million (US\$197.5 million). In its announcement to the Australian Stock Exchange, HFM stated that the sale price represented a more than 30% premium on the average broker valuation of HDF's interest in SEW and that it intended to use the proceeds to focus on the energy sector.

SEW had previously been owned by the Macquarie European Infrastructure Fund, which had itself acquired the company from Saur UK, a subsidiary of the French Bouygues Group.

Another water supply only company, Mid Kent Water, has previously been merged with SEW following acquisition by Hastings Diversified Infrastructure Fund / UTA from Swan Capital Group, itself controlled by Germany's Westdeutsche Landesbank.

### South Staffordshire Water

South Staffordshire Water is owned by South Staffordshire plc, which is in turn owned in the UK by Hydriades IV Ltd and ultimately by the US-based Alinda Infrastructure Fund. Alinda Capital Partners LLC describes itself as the world's largest independent infrastructure firm, with over \$7 billion in equity commitments to infrastructure investments. Hydriades IV directors include Alinda managing partner Chris Beale.

### Sutton and East Surrey Water

Supplying water to around 650,000 people in 280,000 homes, the water undertaking Sutton and East Surrey Water plc is owned by East Surrey Holdings Ltd, an unlisted company. This was acquired by Deutsche Bank through Aqueduct Capital UK Ltd. Deutsche Bank syndicated its ownership in 2007. According to the Office of Fair Trading analysis, ownership as of 2010 was:

- iCON infrastructure partners LP (13.89%), a Guernsey-based private infrastructure fund (acquisition March 2010)
- Aqueduct Capital Holding S.a.r.l (25%)
- TIP Master Holdings (GBP) S.a.r.l (10%), a UK private infrastructure fund
- Infra-PSI Canada Inc. (33.61%), an investment vehicle of Canada's Public Sector Pension Investment Board
- Alberta Investment Management (17.5%), a pension fund of the Canadian Province of Alberta

According to Ofwat's 2007 consultation documentation about the syndication, Aqueduct Capital Holding S.a.r.l. is a wholly-owned subsidiary of Lion Global Infrastructure Fund Limited, which is managed by Singapore-based Lion Capital Management and owned by Deutsche bank (20%) and Great Eastern Life (80%).

SES's Board includes non-executive director Paul Malan, Managing Director of Deutsche Bank in London.

### The Veolia Water companies

Veolia Water Central Ltd. Previously Three Valleys Water plc. Approximately 1.3 million connections and three million people. Owned by Veolia Water UK.

Veolia Water East Ltd. Previously Tendring Hundred Water Services plc. Approximately 150,000 people. Owned by Veolia Water UK.

Veolia Water Southeast Ltd. New name for Folkestone & Dover Water Services Ltd. Approximately 160,000 customers. Veolia Water UK is majority shareholder.

Parent company is Veolia Environnement, which is listed on the Paris and New York Stock Exchanges.

more significantly, what are their intentions for the company in respect of management and board structure, and then secondly what is their financial capacity,' says Mason, continuing: 'Water companies generally have a relatively high capital programme... So is there anything about the potential ownership

by whoever it is that may mean that might be restricted or constrained in any particular way.'

Whatever the ownership, the actual water company, the undertaking, is an entity licensed by Ofwat. Importantly, the undertaking's finances are 'ring-fenced' as part of this licensing. Mason explains that this ring-fencing has evolved since privatisation, and he considers it to be well developed. 'It would have to be unusual circumstances for us to change the ring fence now from the standard,' he says.

Issues that may be of concern to Ofwat include, for example, the size of the companies involved – is a very small company trying to acquire a very large one. There could be concerns over the arrangements in place for taking money out of the business. Or there may be concerns over the creditworthiness of the company trying to make the acquisition. Mason considers the hypothetical position where a company with a relatively low credit rating was looking to take over a water company and the rating agencies were 'making noises' about the possible impact on the credit rating of the water company and, as a consequence, the cost of borrowing to finance capital investment. 'If they were to have a poorer level of credit quality, and certainly one that is going towards not being an investment grade quality, we'd look quite seriously at it,' says Mason, adding that Ofwat may then want to ask 'What can we do to prevent that in terms of improving the ring fence?'

Management issues can potentially be of concern also. 'If what they wanted to do with the board, or even perhaps the management, looked a bit strange – say they had no experience of running a water business but they wanted to sack their existing management team – we would ask questions of, well, how are you going to bring the expertise to run this business then,' says Mason. 'If the answer was not satisfactory, we would probably want some licence conditions that gave that a bit of teeth to say they have to do something about the management and the running of the business.'

Having said this, Mason points out that this type of issue would in the first instance probably be raised and discussed informally, and that Ofwat hasn't had to introduce a licence condition in this area. 'Or we haven't so far,' he adds.

What is not relevant, though, is whether or not the owner is from the UK.

## The public bodies

### Scottish Water

Publicly-owned utility serving some five million people in 2.4 million homes in Scotland.

### Northern Ireland Water

'Go-Co', or government-owned company, serving around 800,000 properties for water supply and around 660,000 for sewerage in Northern Ireland.

'Certainly where the owner is based is not a concern,' says Mason, offering the examples of CKI from China, and the previous and current owners of Thames Water, respectively Germany's RWE and Australia's Macquarie. But he does add that Ofwat will still be looking to ensure adequate management expertise is in place.

There are two further aspects relating to ownership, both of which are attached to licences through what is known as 'Condition P'.

The first relates to the governance of the undertaking, and requires that the companies have two or three independent non-executive directors. 'These are people who are not put on the board by the owner... they're completely independent of the owner,' comments Mason. He says there is the hope also that there is a director with, for example, a geographical connection to the area or one able to provide customer services expertise. 'On top of that we expect there to be a majority of non-execs in terms of the governance, [and] we expect the governance to follow the normal corporate rules of governance and the corporate code,' he adds.

The other aspect of Condition P requires Ofwat to identify who, through whatever ownership structure, ultimately controls the water company and to seek a legal undertaking from them. 'This legal undertaking effectively asks that body who controls the water company – not necessarily the direct owner, it's whoever at the top of the chain has the most influence – [to] give a legal undertaking that essentially says they won't do anything to disturb the running of the business, so that they can fulfil their licence conditions,' says Mason.

'It can be quite complex, because you have to work your way through the chain. You have to look at share capital ownership, but also governance – who's on the board, who has influence on the board in terms of voting powers,' says Mason. This can include, for example, considering whether investors in consortia are passive investors and have handed

control over to others.

'We go back as far as we need to go back,' comments Mason. Taking consortia as an example, this can mean going back to the top level company where there is a shareholder management agreement that all parties have signed up to and looking at which party has operational control, but it is not then necessary to go beyond this. 'If it's a pension fund who's part of the consortium, we don't then look behind the pension fund to see who invested in the pension fund, because there's no need,' adds Mason.

'In the end, if there's doubt we get more than one undertaking' says Mason, adding in relation to overseas ownership: 'In some cases we've had joint ones or we get two, so we get one from the ultimate UK holding company and we also get one from their foreign based company.'

As Mason explains, the intention is that these are legally-enforceable undertakings intended to ensure the ultimate owner or owners are identified and the water company can meet its obligations. This begs the question as to whether there has ever been a need to enforce one of these undertakings.

'So far we haven't had to do that over the Condition P, where the behaviour of an owner has been such that we've had to invoke that,' comments Mason, adding lightheartedly: 'I don't know if that's down to good luck or good management or what, but no, we haven't had to do that.' ●



Keith Mason

# Providing incentives for improved services: *outlining benchmarking benefits for Cape Verde*

Cape Verde is characterized by scarcity of water resources which, along with the low socioeconomic status of the population, is one of the main barriers for the improvement of the drinking water supply and sanitation services in the country. Here, **PEDRO SIMÕES** and **RUI C MARQUES** outline their recommendation for improving service quality in Cape Verde, through the use of a benchmarking system.

**G**iven the geographical and hydrological features of Cape Verde, an archipelago located off the Atlantic coast of Africa, the water supply there needs to rely on desalination. Moreover, the socioeconomic status of the country explains the poor level of services and coverage currently found. The situation is even more distressing for sanitation services despite the developments observed in recent years. Considering the increasing water consumption, together with the scenario of water resources scarcity, it is necessary to adopt an appropriate management policy aimed at making better use of these resources.

Accordingly, successive governments of Cape Verde have undertaken several reforms of the water sector (INGRH, 2003). In addition, the creation of the Water Code (Law No. 41/II/84) established the legal regime of ownership, protection, conservation, development, management and use of water resources in Cape Verde. As part of that set of rules, the Government of Cape Verde established the Legal Framework for Regulatory Agencies (Law No. 20/2003). In this regard a multi-sector regulator was created, the Economic Regulation Agency (ARE), which covers water and wastewater activities (as well as electricity, transportation and fuel). In general, the role of ARE has been important and positive. However, concerning the water sector, its regulatory model is not yet well defined.

This article provides an overview of a recommended regulatory model for water utilities in Cape Verde. It is based on the yardstick competition approach of benchmarking, and as far as we know, it is the first research undertaken into the application of benchmarking in the water sector in this country, particularly with its focus on regulation. Cape Verde is quite similar to other island countries in the Caribbean and the Pacific and, therefore,

this case study can enrich the knowledge and information available on water utilities regulation and benchmarking.

## The water sector in Cape Verde and its regulation

### Market structure

The water sector in Cape Verde comprises 15 operators of drinking water services and three operators of wastewater services, including the largest operator in the country, ELECTRA. In addition to the provision of energy services across the whole country, ELECTRA is also responsible for the drinking water supply on four islands (Praia, São Vicente, Sal and Boavista), covering about 200,000 inhabitants (40% of the Cape Verdean population), and for the service of wastewater treatment in Praia. The other islands and cities are supplied by municipal companies (100% public ownership).

ELECTRA, which was partially privatized in 2000 to a consortium of Electricity of Portugal (EDP), and Águas de Portugal (ADP), has, since 2007, had the Cape Verde government as its major shareholder. The remaining operators are related to 11 municipal companies. There are also some private pump trucks that provide water in the peri-urban and rural areas.

### Water sector regulation

ARE, regulated by the Decree-Law No.

26/2003, is endowed with regulatory functions that include assignments at the level of standardization, supervision and sanctioning of violations. Moreover, the agency enjoys administrative, financial and asset management autonomy.

ARE's mission is to promote economic efficiency and financial stability in the regulated utilities, as well as to guarantee the provision of public services in an appropriate way. In addition, ARE tries to ensure the fulfilment of public service obligations (e.g. universal service), to protect customer rights and interests (e.g. tariffs versus quality of service), to guarantee the impartiality of regulation and transparency (either between operators themselves or between them and their customers), to safeguard the implementation and enforcement of legislation, to coordinate the application of principles of the competition law, to assure the (economic) viability of the sectors regulated and, finally, to keep the customers well informed about all the regulatory procedures.

### Tariffs

ARE is responsible for supervising the tariff and price setting according to the legislation, ensuring compliance with the tariff standards imposed in the concession contracts and licenses, and for defining rules for cost accounting and implementing the tariff revision. Until 2010, ARE had not carried out activity in this scope. Tariffs of



**Table 1: List of performance indicators suggested for ARE**

Number	Performance indicator	Unit
1	Water coverage	%
2	Sanitation coverage	%
3	Wastewater treatment	%
4	Unaccounted-for water	%
5	Metering	%
6	Continuity	Hours
7	Staff	Employees / 10 <sup>3</sup> connections
8	OPEX coverage	Return / OPEX
9	Bursts in the water mains	Bursts / 10km
10	Blockage at wastewater network	Blocks / 10km
11	Percentage of residual chlorine	% of sample > 0.5mg/l)
12	Turbidity	% of sample > 5NTU)
13	Complaints	Complaint / 10 <sup>3</sup> customers
14	Billing	Revenue charged / revenue collected
15	Pressure	Metres water column

ELECTRA are proposed by the firm itself and approved by the government (ELECTRA, 2010). For the municipal companies the tariffs are approved by the local government.

As a rule, the tariff system is defined by increasing blocks according to consumption and category of final customer. There is also a fixed tariff, which depends on the size of the meter and on the type of customer.

The current framework for wastewater treatment and collection services is generally characterized by the absence of charges or by a great deficit between the revenues and the real operational cost. However, the water service is extremely costly for customers in Cape Verde, and the operational costs are also very high, basically due to the unavoidable need for desalination (Banerjee et al., 2010). For instance, the average water charges represent about €26.1 (\$37.5) for a domestic customer with a consumption level of 10m<sup>3</sup> (ARE, 2010).

#### Quality of service

The scarcity of water resources and the lack of financial resources to invest in infrastructure, together with the customers' low ability to pay, in general, results in diverse consequences for the water sector development, not only in terms of its coverage expansion but also concerning the drinking water quality and the quality of service provided (e.g. continuity). In fact, the water supplied does not always meet the minimum quality standards for human consumption, and in situations of greater demand there are unexpected interruptions of water supply.

The percentage of water losses is not very high, emphasizing the price and the

value that the Cape Verdeans give to this resource. The problems related to the quality of service are mainly due to economic and financial constraints. Moreover, the priority has been to increase the service coverage and the availability of water resources.

#### Public service obligations

In Cape Verde, public service obligations in the water sector are mainly established by the Decree-Law No. 75/99 and include, *inter alia*, universality, quality of service, accessibility and reliability. Following the legislation and the terms of concession contracts, the principles of universality and accessibility try to ensure that all customers within the concession area that require the service will be served, according to a suitable trade-off between tariffs and quality of service. Furthermore, one of the major aims for the setting of the regulatory agency was to foster the principles of equality, solidarity and transparency in the water service.

#### Use of benchmarking in regulation

The application of benchmarking in regulation has many potential benefits, mainly in the water services (Marques et al., 2011), where the competition in the market is more difficult to implement as the operators generally work in a regional (local) natural monopoly regime (Ballance and Taylor, 2005). Among the main advantages of benchmarking use (Marques, 2006a), the following can be pointed out: strong incentives are provided to operators to be efficient and innovative, mitigating the costs of operation and the capital expenses; an on-going pressure is put on the water utilities to improve the quality of service; a fairer recovery of costs and of the capital investments is assured; and there is an increase of transparency and sharing of information, minimizing the asymmetry between different stakeholders (especially between the regulator and the operators).

It is well known that regulation using (performance) incentives, based on benchmarking, introduces the productivity component associated with cost reduction as a major objective for the regulated utilities. Using this method, the operators take more risks, but can also increase their gains (Marques, 2010). In recent research in Europe, the major reason found to justify the differences in efficiency between water utilities from different countries was the use of benchmarking (Witte and Marques, 2010).

In fact, the search for the best practices, through the implementation of a benchmarking system, has a great impact on performance improvement. Given the particular features of these services, the benchmarking tool is of great importance, allowing the authorities to monitor

**Table 2: Weight of performance indicators**

Number	Performance indicator	Weight
1	Water coverage	10
2	Sanitation coverage	5
3	Wastewater treatment	5
4	Uncounted-for water	10
5	Metering	5
6	Continuity	10
7	Staff	5
8	OPEX coverage	5
9	Bursts in the water mains	5
10	Blockage at wastewater network	5
11	Percentage of residual chlorine	10
12	Turbidity	5
13	Complaints	5
14	Billing	10
15	Pressure	5

**Table 3: Targets and classification for the indicator continuity**

	Target	Value
Excellent	22 – 24h	5
Good	19 – 22h	4
Satisfactory	15 – 19h	3
Non-satisfactory	7.5 – 15h	2
Poor	< 7.5h	1

the process of similar organizations and to identify successful cases. At this point, the application of performance evaluation methodologies, including performance indicators (PIs), which are easily applicable and understandable, is fundamental (Kayaga and Franceys, 2008).

In this regard, PIs represent the most adopted method among regulators to provide incentives for the operators' better performance, as well as to safeguard the customers' interests (Trémolet and Hunt, 2006), e.g. in the context of Guaranteed Standard Schemes. Moreover, PIs have the ability to encompass (and evaluate) the most relevant aspects in water services, such as water resources, customers, assets, quality of service, prices and finances, and health.

Nevertheless, the selection of PIs is not the only issue in the benchmarking process. There is also an important aspect regarding the method and the collection of the relevant operating and financial information (Berg and Corton, 2008). The latter might be a too demanding task for the water utilities. As PIs might require greater detail (and a lot of data) they should also be implemented sequentially (Alegre et al. 2000). This is particularly important in developing countries.

For instance, in Indonesia, the water regulator (Jakarta Water Supply Regulatory Body – JWSRB) adopted a set of PIs to evaluate the main aspects of the service, e.g., continuity, pressure, availability, quality, meter reading, water bills and complaints. This has been considered useful for gaining sound experience (Lanti, 2006). In Zambia, the water regulator (National Water Supply and Sanitation Council – NWASCO) is using PIs of water quality, metering ratio, water coverage, sanitation coverage, hours of supply, staff, collection efficiency and operational costs coverage to develop rankings among the regulated companies (NWASCO, 2010). Also, in Uganda, the National Water and Sewerage Corporation (NWSC), in order to overcome some structural problems and instigate incentives in the service provision, developed a number of Area

Performance Contracts (APCs). These contracts, based on benchmarking, focus on increased accountability and commitment through increased autonomy and apportionment of operating risk to the operating teams through performance-based pay mechanisms (Mugisha, 2008). Regarding South and Central America, there is an association (ADERASA) made up of eight national water regulators, which have formed a global performance assessment among these eight countries through a set of 28 PIs divided into four groups (service structure, e.g., water and sanitation coverage; operational, e.g., staff per connection or bursts per km; quality of service, e.g., complaints per customer or analysis compliance; and economic, e.g., operational costs coverage or operational costs per customer). Several other regions around the globe have also applied benchmarking in the regulatory scope (see IB-NET of the World Bank).

### Proposal for water sector regulation

The ARE regulatory model shows a great potential for improvement. It is clear that the benefits expected from the private sector participation will not overcome the weaknesses of the sector in Cape Verde. ARE must be aware of the dimension and the constraints that actually exist in the implementation of this kind of services, dealing openly with the (likely) failure of ensuring an (non-) economically sustainable service.

Thus, one possible proposal relates to the various technological possibilities for implementing such services, i.e. the regulator should be endowed with the best tools to ensure a suitable trade-off among quality of service, price and service coverage.

As a step forward, a key aspect of the regulatory model would be the creation of incentives for water operators to improve their performance. In this context, we propose a benchmarking system which includes 15 PIs, which can be seen in Table 1.

By encouraging a better performance among the utilities regulated, ARE could

implement its model based on sunshine regulation, whose principle relies on the discussion and publication of performance results for utilities (Marques, 2006b). With recognized merits (e.g. in the water sector regulation of Zambia), the highlighting of performance within the utilities acts as an incentive for its improvement. The results would be guaranteed by external pressures.

In order to provide even more incentives, ARE, based on a weighting system, could develop rankings of the regulated utilities. Moreover, the regulator could recognize, through some kind of award (or prize), the best rated players, and somehow penalize the ones who do not reach the targets established. Table 2 shows the weighting system proposal for the set of PIs.

In this scope, the regulator should also implement targets for each indicator, i.e. goals that ARE deems as likely to be reached by the utilities. However, it should not neglect the external factors that characterize (and often constrain) the services provided. Moreover, in order to standardize the quality of service that is provided, ARE can establish levels according to the utilities performance, for example, excellent, good, satisfactory, non-satisfactory, or poor.

Table 3 shows the example of the continuity indicator. In addition, this classification could be assigned, respectively, with a value between one and five, which would be used as basis for the development of the ranking system.

Based on these ratings, the regulator could provide recommendations to each operator, with the aim of improving their performance and, accordingly, contribute to the overall development of the water utilities.

The regulatory model would take note of (recurrent) cases of poor results. Consequently, the regulator, in such cases, would develop mechanisms that compel the operator to a stricter accountability than the (normal) annual one, such as monthly reports, including all the decisions taken by the board of directors,

**Table 4: Benchmarking system proposed for the ARE**

	Target	Weight	Colour
Excellent	22 – 24h	5	Green
Good	19 – 22h	4	Dark green
Satisfactory	15 – 19h	3	Yellow
Non-satisfactory	7.5 – 15h	2	Orange
Poor	< 7.5h	1	Red

and the performance evaluation results. Thus, the operator would be under a tighter supervision until such a time that the results improve.

Moreover, this process of quality of service regulation could be linked to a colour system, which would set out more clearly the performance of regulated entities. This scheme could be implemented with the adoption of the colour green for excellent performance, a dark green for good performance, yellow for satisfactory performance, orange for non-satisfactory performance, and, finally, red for poor performance. Table 4 shows the benchmarking system proposed for ARE.

The aim of this (colour) system, besides the recognized benefits achieved in various sectors and countries (e.g. in the Portuguese water sector, ERSAR, 2010), is related to the fact that it is easily perceptible by the customer with regard to the operator's results.

As a way of increasing customers' ability to pay for water and wastewater services, the regulator should (at least) propose to the municipalities and the operators the implementation of a pricing system that includes social measures, i.e. by adopting a rate that takes into account the number of people in the household or other type of social tariffs (based on age, income, etc.). The setting of prices should also take into account the results of the benchmarking scheme, allowing the best operators to set tariffs a little higher and compelling the worst ones to reduce them.

Although in some cases the customers can be too demanding and critical, in general, they are the ones who better perceive the quality of service that is provided. In order to take advantage of this feature, the regulator should encourage customer participation in the regulatory process, including the creation of voluntary groups responsible for safeguarding customer rights in the water sector and the dissemination of information available on the service provided such as those resulting from the proposed performance assessment (e.g. the regulator in Zambia created the Water Watch Groups (Kayaga and Kadimba-Mwanamwambwa, 2006)).

## Conclusions

The water sector in Cape Verde shows diverse problems. The need for desalination (to address water scarcity), the poor quality of water, especially in rural areas, and the low coverage level of the services are some of those problems that require

special attention. Despite the governmental actions to tackle these issues, such as the implementation of diverse standards and laws, the role of the water regulator (ARE) is very important to carry out reforms in the water sector.

Although ARE is endowed with the powers of tariff setting and quality of service regulation, assuring the viability of the sector and the defence of customer interests, its action has been somehow limited.

In this regard, the use of benchmarking by ARE has several advantages. In particular, it is one of the few available tools to create some 'competition' in the market. Besides, its use is encouraged by the existence of a significant group of players in the Cape Verdean water sector. This circumstance mitigates the main benchmarking drawback, which is the comparability of operators. In fact, the application of benchmarking creates strong incentives for the operators to be efficient and innovative regarding the operation and capital expenses, transparency, and the dissemination of information, among others.

The identification of best practices in similar countries / regions allows us to infer that there is room for improvement in ARE's regulation policy. Thereby, we put together a proposal of a new regulatory model for the water supply and sanitation services to be adopted by ARE based on benchmarking.

These recommendations have been passed across to ARE, as we feel that the introduction of more incentives for efficiency and innovation represents a step ahead for water and sanitation services in Cape Verde. ●

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# Malaysia's progress with its water sector reform: ***the regulator's view***

Malaysia is making progress with the fundamental reforms of its water sector that were set in motion with legislation introduced in 2006, and the country's water regulator, SPAN, has a central role in these reforms. **KEITH HAYWARD** spoke with CEO **DATO' TEO YEN HUA**, about the progress and his organisation's development.

When Dato' Teo Yen Hua, the Chief Executive Officer of SPAN, the National Water Services Commission of Malaysia, set out his perspective of the country's water sector reforms in the March 2009 issue of *WUMI*, he concluded by noting that the policy and legal framework for the reforms had been put in place, that implementation was on track but may take a little longer than anticipated, and that there was the prospect of improvements in service levels, transparency and funding, all of which would pave the way for a sustainable water sector for the country.

Speaking this September, Teo retains his positive view about the prospects for the country's water sector, but it worth noting that his original comments about the implementation of the reforms were prefaced by a comment that the benefits would come 'once all the necessary arrangements in the form of corporatization and migration to the new regulatory regime are completed'.

That comment has proven to be particularly significant. At their heart, the reforms are based around federal legislation, primarily the Water Services Industry Act 2006 (WSIA 2006), created in a move that required amendments to the federal constitution. This move was to have been followed by a transition by the various state governments to the new arrangements. A central feature of the new structure for the sector is its use of an 'asset-light' approach, with water assets transferred to ownership by a new organisation, PAAB, and with the operators of these assets being licensed by SPAN. There has been progress on this front, including some recent developments (see 'Malaysia makes progress on reform implementation', p3, *WUMI* June 2011).



Dato' Teo Yen Hua, Chief Executive Officer of SPAN, Malaysia's National Water Services Commission.

## Executive summary

Following introduction of the Water Services Industry Act in 2006, Malaysia's water sector has been undergoing a process of reform. Key features are the transfer of ownership of water assets to a new body, PAAB, with water services then being provided by 'asset-light' operators. The new regulator, SPAN, is at the heart of these reforms and its role includes issuing licenses to the country's water operators. The reforms also require completion of the process of corporatisation of state water departments.

SPAN's Chief Executive Officer, Dato' Teo Yen Hua, comments on the progress being made with the reforms. He explains that one of the latest states to transfer to the new regime, Penang, has adopted a version of the asset-light approach that may be followed in other states. He also provides an update on progress with corporatisations.

According to Teo, there is evidence that the new approach is succeeding in states where the changes have been implemented. This includes evidence that under the asset-light approach PAAB is able to achieve financing of capital investment at better rates.

Future developments are expected to include a new tariff-setting mechanism, and greater integration of water and wastewater activities, according to Teo.

As a priority, Teo believes that SPAN must ensure it maintains its independence.

This article also gives a state-by-state review of the status of the reforms, identifying the main water supply entities and concessions operating in each of the states.

But there is still a way to go.

Teo highlights the elections held across the country in 2008 as an important factor as these brought in new governments in a number of states. 'As a result of that we had to go and brief them again to introduce them to this asset-light model and the concept of this water restructuring,' he comments.

Three states transferred their assets to PAAB in 2009. The first states to do so and adopt the new model were, in terms of population, the relatively small states of Melaka and Negeri Sembilan. These were followed by the more populous state of Johor. Last year only Perlis transferred its assets, in August. The more recent developments have involved the states of Penang and Selangor.

## Adapting the asset-light model

Negotiations with Penang were finalised at the end of last year and the restructuring completed in June. Teo notes that there had been a change in government in Penang too. 'They agreed with our model except that there was a slight change,' he says. He explains that the slight change is that some of the assets have been retained by the operator. The new model for the sector is the 'asset-light' approach, but Teo says this does not mean the operator has to be asset-free. Malaysia's water sector is in what he describes as a 'transitional period', where in many cases tariffs are not adequate to fund operating and capital expenditure. But the goal is to reach a point where

tariffs do cover both. 'We are not saying that the water operators must not hold assets. They can hold assets if they can afford to – if there is willingness to pay and when the tariff is able to cover both OPEX (operational expenditure) and CAPEX (capital expenditure). Then the operators should eventually finance their own capital expenditure.'

'In the case of Penang, they are running at a surplus, so rightfully, whatever assets they have, we allow them to keep,' says Teo. Only the outstanding liabilities have therefore been transferred to PAAB. 'I think one or two more states are going to adopt the same model,' he adds.

Progress in Selangor came with the creation of a special purpose vehicle, Acqua SPV Berhad, to acquire the state's water-related bonds. Teo anticipates that further discussions will be needed to pave the way for completion of reforms there. 'I think that it may take a bit longer, until next year, before we can complete the migration,' he says. But overall Teo is expecting further progress on restructuring of the sector this year: 'I think another one or two states will be migrating before the end of the year.'

## Further progress on restructuring

Another dimension of the reforms is that, as well as transferring public water assets to PAAB, states are expected to ensure that any state water departments not already operating as separate entities move to a corporatised set-up. Operators of the assets are to be licensed and regulated by SPAN, and corporatisation will ensure in particular that the finances of the water function are separate from those of the state and that there is clear accountability.

SPAN reported progress with corporatisation during 2009, with the federal government approving corporatisations in Kedah, Perlis and Pahang and with implementation of these changes reaching different stages during the year. Less progress had been made in Perak and Labuan.

In an update provided by SPAN this year, corporatisation in Perlis was expected to be completed by the middle of this year.

According to Teo, corporatisation in Negeri Sembilan took place at the start of 2009, followed by Kedah. In Pahang, Teo notes that 'they are in the process of implementing it', while change is still to take place in the small federal territory of Labuan. Regarding Perak, Teo says the



Dato' Teo Yen Hua being interviewed in October 2010 by Malaysian local TV station TV3's 'Aduan Rakyat' Programme on issues and public complaints which were successfully handled and addressed by SPAN.

water board operates relatively independently to the government. 'In terms of corporatisation, I think we have made a lot of progress over the past three years,' he concludes.

Alongside all of this, Malaysia's water sector is a noted for the extent to which water services are privatised, especially in Penang, Johor and Selangor. The reforms have therefore had to take account of the concessions that are already in place, and SPAN is able to issue authorisations to operate under section 191 of the WSIA 2006 to those entities who have not migrated to the new licensing regime. In 2009 SPAN issued authorisations to 12 entities, and issued 8 in 2010. One of those receiving an authorisation in 2009, GSL Water Sdn Bhd, transferred to the new regime and received a licence in 2010.

Teo contrasts the situation in Selangor, where there are concession agreements, with the case of Johor. 'If you were to continue with the concession, then you will have to regulate them based on whatever terms continue in the agreement, together with the general provision of the law,' he says. Johor, meanwhile, has migrated to a licensing regime, where operating licences run for three years. 'As a regulatory agency, I think that licensing is more in line with the spirit of the law whereby [operators] will be imposed with the KPIs (key performance indicators) and the licence is to be renewed. As a regulator, we feel that it is better for the people.'

#### Evidence for success

There is therefore still a way to go with



**Launching of National Desludging of Septic Tanks Campaign in Muar, Johor, Malaysia, by Deputy Minister of Energy, Green Technology and Water, Noriah Kasnon (pictured far right), on 26 June 2011.**

the corporatisation. In the meantime, some states have begun to work with the new arrangements. According to Teo, benefits can be seen, for example, in the cases of Negeri Sembilan and Melaka. 'They were unable to run profitably – that's why we more or less agreed that they should transfer all the assets to PAAB,' he comments. 'Now they are operating at a surplus, despite the fact that they have to pay the lease rental.'

In the case of Negeri Sembilan, Teo points out that revenues have gone up by

almost 40% since corporatisation – without any tariff increase. 'After they were corporatised, they put in a better system of billing, they have better enforcement, they are very focused on their operation, and in terms of the level of service in providing the water supply to the people, they have shown tremendous improvement.'

As a further example, Teo refers to a new water treatment plant due to start operation by the end of the year and which has been financed through PAAB. 'In terms of lease rental payment, because

#### Behind the scenes: some of the other participants in Malaysia's water sector

Companies acquired by investment holding company Aliran Ihsan Resources Berhad (AIR Bhd) have included two with presence in the water sector in the Malaysian state of Johor: Equiventures Sdn Bhd and Southern Water Corporation Sdn Bhd. A 74% interest in AIR Bhd has since been acquired by MMC Corporation Bhd, which claims to supply 75% of treated water to consumers in the state through its portfolio of 16 water treatment plants. The main shareholders in listed company MMC are Seaport Terminal (Johore) Sdn Bhd, asset manager Permodalan Nasional Berhad (PNB) / Amanah Saham Bumiputera (ASB), and Employees Provident Fund Board. See: [www.airb.com.my](http://www.airb.com.my) and [www.mmc.com.my](http://www.mmc.com.my).

According to the website of Berjaya Corporation, the private business activities of its chairman / CEO Tan Sri Dato Seri Vincent Tan include a controlling stake in Intan Utilities Berhad, which holds a 40.08% stake in Berjaya Infrastructure Sdn Bhd, which is the holding company for Metropolitan Utilities Corporation Sdn Bhd and Air Utara Indah Sdn Bhd, concessions in the states of Perak and Kedah respectively. SPAN issued authorisations to both concessions under section 191 of WSIA 2006 in 2010. According to the Berjaya website, BISB also owns an 80% interest in a build, operate, transfer concession in Bali, Indonesia, and a 100% interest in two water concessions in Qing Yuan County, Guangdong, China. See: [www.berjaya.com/corporate-profile.html](http://www.berjaya.com/corporate-profile.html)

Indah Water Konsortium Sdn Bhd, the national sewerage company, wholly-owned by the Minister of Finance Incorporated, is responsible for providing sewerage services, operating and maintaining over 5750 public sewage treatment plants and 13,000km networks of sewerage pipelines since April 1994. It was authorised by SPAN under section 191 of WSIA 2006 in 2010, covering sewerage services in Peninsular Malaysia (except Kelantan, Johor Bahru and Pasir Gudang) and the federal territory of Labuan. SPAN also issued sewerage authorisations to local authorities in Johor Bahru, Pasir Gudang, Johor Tenggara and Kelantan in 2010. See: [www.iwk.com.my](http://www.iwk.com.my)

it is financed by PAAB, it is much, much lower than the build operate transfer model,' says Teo, adding: 'If you ask me, definitely the process is working.'

### **SPAN's growing role**

As the move to the new industry structure has progressed, so SPAN has had to take on its responsibilities as the sector's regulator.

This has meant, for example, monitoring the progress of the licensed operators. These have to provide a 30-year strategic plan and a three-year rolling plan, with KPIs to measure progress. 'Our requirement now is that they have to submit a quarterly report to us based on the KPIs that have been agreed upon,' says Teo. He

also notes that SPAN has been working with the operators to start to tackle illegal connections. 'If there's any illegal connection then they have an enforcement team which will work closely with our enforcement team and we are able to bring those culprits to court,' he says.

Teo also points to the fact that SPAN is expecting to implement new water rules from the start of next year. 'Previously water operators had their own set of rules, every state had their own set of rules,' he notes. Following consultation with the industry and other stakeholders, new rules will provide uniformity in areas such as planning and design of facilities that will be handed over to the operators.

'We have also successfully reviewed tariffs for four states,' says Teo, pointing out that the outcomes in one case have been implemented this year. He continues: 'We are now also preparing to introduce a tariff-setting mechanism whereby we hope we can depoliticise this tariff setting, and that will come together with a regulatory accounting framework.'

Bear in mind also that SPAN has to regulate a huge number of organisations and individuals, encompassing contractors and, indeed, plumbers. 'The scope and the entities that we are regulating is actually very wide and very broad,' Teo points out. Naturally, it also includes regulation of wastewater. Teo explains that every settle-

## **The Malaysian water sector**

Malaysia, which has a population of around 29 million, comprises mainland Peninsular Malaysia as well as East Malaysia (Malaysian Borneo). Peninsular Malaysia comprises 11 states and two federal territories and has a population of around 23 million. East Malaysia comprises two states and one federal territory and has a population of around 6 million. Most of the states and territories are covered by the reforms of the country's Water Services Industry Act of 2006 – all apart from the East Malaysian states of Sabah and Sarawak.

Under WSIA 2006, regulator SPAN issues licences. Initially operators received authorisations, for two years to allow them to continue operation before migration to the new regime. Authorisations included s.190 (to licensed operators under state water supply enactment;) and s.191 (to water concession companies). These authorisations were extended in 2010 to allow for completion of the transition. Concessionaires who choose not to migrate to the new licensing scheme and whose status has been finalised by the Federal Government will be authorised under s.192(5) until the expiry of their respective concessions.

### **State: Perlis**

Capital: Kangar  
Population: 230,000

#### **Main water supply body**

Corporatisation of the state water supply department, Jabatan Kerja Raya (Cawangan Bekalan Air) Perlis, was approved by the federal government in 2009. Assets were transferred to PAAB in 2010. Corporatisation is in progress and is due to be completed in 2011. See: <http://jkr.perlis.gov.my>

### **State: Kedah**

Capital: Alor Setar  
Population: 1.8 million

#### **Main water supply body**

Corporatisation of the state water supply department, Jabatan Bekalan Air Kedah, was approved by the federal government in 2009. The state government set up Syarikat Air Darul Aman (SADA) as the state's corporatised water operator.

See: [www.sada.com.my](http://www.sada.com.my)

#### **Concessions**

Air Utara Indah Sdn Bhd (AUI)  
Manages, operates and maintains five water treatment plants in Kedah. Authorised under s.191 to enable continued operations. See separate box.

See: <http://aui.com.my/about.asp>

#### Taliworks (Langkawi) Sdn Bhd

Water supply and distribution in Langkawi. Authorised under s.191 to enable continued operations. According to the website of Taliworks Corporation, it also holds the concession for the Sungai Selangor Water Treatment Works Phase 1 in the state of Selangor.  
See: [www.taliworks.com.my](http://www.taliworks.com.my)

### **State: Penang**

Capital: George Town  
Population: 1.5 million  
Includes Penang Island, and Greater Penang – the Conurbation of George Town, one of the largest metropolitan areas in Malaysia.

#### **Main water supply body**

Perbadanan Bekalan Air Pulau Pinang (PBAPP) is the water supply company serving Penang. It is owned by PBA Holdings Bhd, a public company listed on the Malaysian stock exchange. Restructuring arrangements were completed in the middle of this year, with PBAPP retaining fully paid assets and with outstanding liabilities transferred to PAAB. Licence was effective from 1 June 2011.  
See: [www.pba.com.my](http://www.pba.com.my)

### **State: Perak**

Capital: Ipoh

Population: 2.3 million

#### **Main water supply body**

Discussions on corporatization and transfer of assets of Lembaga Air Perak (LAP) ongoing.  
See: [www.lap.com.my](http://www.lap.com.my)

#### **Concessions**

Metropolitan Utilities Corporation Sdn Bhd (MUC)  
Awarded the build-operate-transfer concession under the Greater Ipoh Water Supply Phase II privatisation programme to supply treated water to Lembaga Air Perak. Authorised under s.191 to enable continued operations. See separate box. See: [www.muc.com.my](http://www.muc.com.my)

#### GSL Water Sdn Bhd

Concession for Gunung Semanggol and Taiping water treatment facilities. Shareholders are: Gopeng Berhad, SISMA Water Technology Sdn Bhd (see [www.sisma.com.my/water.php](http://www.sisma.com.my/water.php)), and Suez Lyonnaise des Eaux. The concession expired at the end of 2009. GSL was issued with a service licence by SPAN in 2010.

### **State: Kelantan**

Capital: Kota Bharu  
Population: 1.5 million

#### **Main water supply body**

Air Kelantan Sdn Bhd (AKSB)  
Authorisation under s.191 to enable continued operations. See: [www.airkelantan.com.my](http://www.airkelantan.com.my)

### **State: Terengganu**

Capital: Kuala Terengganu  
Population: 1 million

#### **Main water supply body**

SPAN reported in 2009 that negotiations with Syarikat Air Terengganu Snd Bhd (SATU) were expected to start in 2010. Authorisation to continue operations issued by SPAN in 2010 under the category of 'Authorisation to licensed operators under state water supply enactment'. See: [www.satuwater.com.my](http://www.satuwater.com.my)

ment of 150 population equivalents or more is required to have a centralised sewage treatment plant, but that the tariff ‘is still very, very low’ – he estimates the monthly charge is around MRY8, or less than €2. ‘That is hardly sufficient to cover the operating expenditure,’ comments Teo. ‘The challenge is, how do we ensure that the tariff is slowly moved up to cover OPEX and eventually to cover CAPEX. That is something that I think needs to be done immediately, but the tariff in developing countries is so sensitive and is always linked to politics. We think that we can only review the tariff after the General Election.’

Teo also sees that ultimately there will

need to be a move away from the current separation of water and wastewater in the sector. ‘We believe, and actually the policymakers – our ministry, are tending towards integration of the two sectors. I would say that within three to five years, we would start to see some reform in the sewerage sector.’

That provides a pointer towards one of SPAN’s future priorities, but looking back over what has been done since the regulator’s launch, Teo sees that a great deal of progress has been made. The law was passed in July 2006 and he was appointed at the start of the following March, Teo recounts. The rest of the year was spent setting up the organisation, so

that it began to enforce the law at the beginning of 2008. ‘Today, in terms of the licensing regime, we have five states already under the new regime, we have issued licenses, and in terms of the model, PAAB has proven that they are able to get financing that is much better than the traditional concession model. We are even being appointed to start writing standards – we have been appointed by SIRIM, our standards writing organisation...and we have also gone through a lot of enforcement. We have now I think more than 40 cases convicted in court, and 200 other cases being investigated now.’ To this he adds the registering of qualified individuals, such as engineers and

### **State: Pahang**

Capital: Kuantan  
Population: 1.4 million

#### *Main water supply body*

Corporatisation of the state water supply department, Jabatan Bekalan Air Pahang, was approved by the federal government in 2009. Implementation of restructuring underway. See: <http://jba.pahang.gov.my>

### **State: Selangor**

Capital: Shah Alam  
Population: 5.4 million

### **Federal territory of Kuala Lumpur**

Malaysia’s capital, which lies within the state of Selangor  
Population: 1.6 million  
Greater Kuala Lumpur extends into the surrounding states and has a population of over 7 million

### **Federal territory of Putrajaya**

Established as Malaysia’s federal administrative centre to the south of Kuala Lumpur.  
Population: 70,000

#### *Main water supply body*

The privatised water supplier for the state of Selangor and the federal territories of Kuala Lumpur and Putrajaya is Syarikat Bekalan Air Selangor Sdn Bhd (SYABAS). Authorisation under s.191 has been issued by SPAN to authorise SYABAS, which has not yet migrated to the new licensing regime, to enable it to continue operations.  
See: [www.syabas.com.my](http://www.syabas.com.my)

The main shareholder (70%) of SYABAS is Puncak Niaga Holdings Berhad. The federal government holds one ‘golden share’. The other shareholder is government-linked company Kumpulan Darul Ehsan Berhad group ([www.kdeb.com](http://www.kdeb.com)), which includes Kumpulan Perangsang Selangor Berhad ([www.kps.com.my](http://www.kps.com.my)).

#### *Concessions*

Puncak Niaga (M) Sdn Bhd. Authorisation under section 191 of WSIA 2006 issued by SPAN in 2010.

A subsidiary of Puncak Niaga Holdings Berhad (the main shareholder of SYABAS), Puncak Niaga (M) Sdn Bhd holds five water treatment concessions with the Selangor state government. According to the company, it is the nation’s second largest water supply concessionaire, operating, managing and maintaining 29 water treatment plants with a combined capacity of 1930 million litres per day.  
See: [www.puncakniaga.com.my](http://www.puncakniaga.com.my)

Syarikat Pengeluar Air Sungai Selangor Snd Bhd (SPLASH). Authorisation under section 191 of WSIA 2006 issued by SPAN in 2010.

This is the concessionaire appointed by the state government to build, operate and maintain the Sungai Selangor Water Supply Scheme Phase 3. Shareholders are Gamuda Berhad (40%), The Sweet Water Alliance (30%), and KDEB (30%). See: [www.splash.com.my](http://www.splash.com.my)

Konsortium ABASS Sdn Bhd. This consortium operates and maintain the Sungai Semenyih Water Supply Scheme. According to KDEB, KPS holds a 55% stake in Konsortium ABASS via Titisan Modal (M) Sdn Bhd.  
See: [www.kdeb.com](http://www.kdeb.com)

### **State: Negeri Sembilan**

Capital: Seremban  
Population: 1 million

#### *Main water supply body*

Restructuring in the state took place in 2009, with corporatisation and transfer of assets to PAAB. SPAN issued a service licence in 2009 to Syarikat Air Negeri Sembilan Sdn Bhd (SAINS). See: [www.sainswater.com](http://www.sainswater.com)

### **State: Melaka**

Capital: Malacca City  
Population: 0.8 million

#### *Main water supply body*

Restructuring in the state in 2009, with corporatisation and transfer of assets to PAAB. SPAN issued a service licence in 2009 to Syarikat Air Melaka Berhad.

See: [www.samb.com.my](http://www.samb.com.my)

### **State: Johor**

Capital: Johor Bahru  
Population: 3.3 million

#### *Main water supply body*

Assets transferred to PAAB in 2009. SPAN issued a service licence to SAJ Holdings Sdn Bhd in 2009. SAJ Holdings is a subsidiary of Ranhill Utilities, part of Malaysian stock exchange listed company Ranhill.  
See: [www.saj.com.my](http://www.saj.com.my) and [www.ranhill.com.my](http://www.ranhill.com.my)

#### *Concessions*

With the completion of the restructuring of Johor in March 2009, authorisations were issued under s.192(5) to Equiventures Sdn Bhd (ESB) and Southern Water Corporation (SWC), effective from 1 January 2010 until the end of their concessions i.e. 30 June 2012 and 31 May 2014 respectively. See separate box.

### **State: Sabah**

Capital: Kota Kinabalu  
Population: 3.1 million  
Not covered by WSIA 2006

### **State: Sarawak**

Capital: Kuching  
Population: 2.5 million  
Not covered by WSIA 2006

### **Federal Territory of Labuan**

Capital: Victoria  
Population: 80,000  
A small island off the coast of Sabah

#### *Main water supply body*

Jabatan Bekalan Air Labuan – discussions on corporatization on-going.  
See: [www.jba.gov.my](http://www.jba.gov.my)



**En. Nik Mohd Nasim Nik Ismail (SPAN Central Region Director) officiating the reinstatement of water supply to Saujana Putra in Hulu Langat in 2010, which had been facing prolonged inadequate water supply.**

architects, for the certification of water facilities. 'Based on that, I personally feel that there has been quite a bit of achievement, even though I must agree there is much more to be done.'

### Future priorities

With much more to be done, Teo sees a number of priorities for the coming period. 'I think I need to further expand the organisation a bit, because I find that now the resources are quite stretched,' he says. 'We need a bigger organisation now because people are beginning to count on or depend on SPAN to address some of the daily problems faced by them.'

Teo continues: 'We have also been asked by the Minister to more or less provide the leadership role in planning for future water and sewerage facilities. The plans will have to come from the operators, but we are the ones who have to check through them and ensure that resources are well spent and revenues are sufficient to cover those expenditures.'

To this list he adds capacity building, especially in the area of water loss and non-revenue water. 'I've noticed that the industry requires new competency, because when you look at the non-revenue water, it's still high, it's still in the region of 35 to 36%. That is something that I think we have to seriously look into it... Progress has been there, but I think that much more can be done.'

Teo contrasts the situation in Penang,

where he says non-revenue water is low, in the region of 18%, with that in other states, where it can be as high as in excess of 50%. Commercial losses can be addressed through better billing systems and meter reading, and Teo describes these activities as 'low-hanging fruits'. Physical losses are more challenging, especially since more than 40% of the pipes are based on asbestos cement pipes that need to be replaced, comments

Teo. He believes operators need to have their own teams to deal with non-revenue water, and not always outsource it to contractors. 'I hope that the government, together with the regulator and the facilities owner, PAAB, will be able to come up with a scheme,' he adds.

SPAN must also continue to build on how it fulfils its role as regulator. 'In terms of our role, I think it is very clearly spelt out in the law,' says Teo. 'I think we need to make sure that we are apolitical, we are not linked to any political party or anything, and we are not favouring one party as against another party. Our role in providing advice for the Minister in terms of policy making is another important aspect of it. Another is that we have to ensure that those states that have migrated can benefit from this new regime.'

That said, Teo says it is the public who will ultimately decide on whether the reforms can be seen as a success.

'In terms of the performance for these operators, I think the consumers will be the ones who are going to be the judge. They will be the ones who see whether, [for] those who have migrated, actually it benefits the people.' But Teo feels the evidence so far provides grounds for him to remain optimistic. 'I must say that, from the states that have been migrated, we noticed that, even with the tariff review that was implemented, there was very little objection by the people.' ●



## triOpsis launches Visual Intelligence for Utilities

**UK** software company triOpsis has launched its Visual Intelligence for Utilities, designed to help utilities deliver quality assets through real time visibility and control, it says.

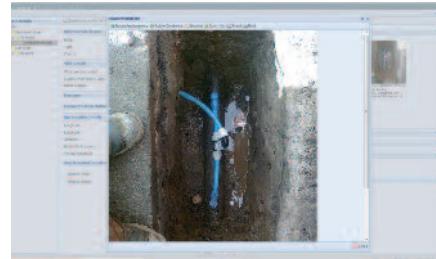
triOpsis says that Visual Intelligence for Utilities enables an onsite worker to record the status of remote assets and the quality of work undertaken, removing the need for repeat visits to a site.

The software works by combining photographs with additional information compiled on each asset. An image can be taken by a mobile worker from any phone with a camera and uploaded, complete with critical data, providing senior management with the intelligence required to make strategic decisions back at head office.

Andy Hutt, CEO of triOpsis, explained to *WUMI* that aborted jobs are a substantial issue for all utility companies, with jobs often being planned in the office with limited information of the site or assets. 'As soon as a gang arrives on site they are faced with the actual state of the site, which could be very different to what was planned, and this is when aborted jobs occur,' says Hutt. 'Jobs are aborted for a large range of reasons, including incorrect skills or equipment, traffic sensitive areas, no access, site not ready, dry holes, unsafe, incorrect job being planned etc. Failing to get the job done right the first time means time, money and manpower are all wasted in rectifying the problem.'

'triOpsis is complementary to existing systems and therefore can be implemented on a standalone basis or integrated with existing systems depending on what provides the most value,' he continues.

Hutt says that this system can be of



particular benefit to utilities covering a large geographical area, and who have a large number of rural assets, due to the increased cost of re-sending workers out to fix a problem. 'triOpsis can also help if the job cannot be done first time because the field worker can photographically survey the reason he cannot do the job, so it can be completed second time with no additional issues.'

Regarding the challenges of implementing the system in a working utility, Hutt says that: 'The primary challenge in any implementation is obtaining buy in from all stakeholders and then clear communication to obtain agreement on the solution design and implementation plan. This is the major challenge because our solution cuts across the full organisation and hence there are a large number of stakeholders. The reports are of interest across many parts of the organisation, ranging from streetworks or insurance.'

'The solutions we provide are not policing tools, they are supportive for the gangs in the field. The solution means the gangs are covered in the event of any claim, dispute or question on any part of workmanship, therefore the uptake from gangs is very high if the project is clearly and effectively communicated.' ● CF

[www.triopsis.com](http://www.triopsis.com)

## Innovyze releases IWLive for InfoWater

**I**nnovyze has announced the release of IWLive for its hydraulic modelling software InfoWater. InfoWater users can now move their hydraulic modelling and analysis from planning and design to operation and control.

Intended for use in the water distribution control room, IWLive allows users to run hydraulic simulations that factor in energy costs, weather, real

time (or delayed) SCADA telemetry, demand history, and valve and pumping control scenarios.

Beyond increasing efficiency and reducing energy consumption, IWLive can help operators understand the impact on CO<sub>2</sub> emissions as well as the effects of main breaks, pump and reservoir shutdowns, and other scheduled maintenance, says Innovyze. ●

[www.innovyze.com](http://www.innovyze.com)

Autodesk adds Autodesk Inventor and Autodesk Revit Structure to plant design software

**U**S design and engineering software company Autodesk, Inc. has released Autodesk Plant Design Suite 2012, the latest version of its plant design software. The new suite, says the company, simplifies cross-department coordination among process plant design stakeholders.

With Autodesk Plant Design Suite 2012, says Autodesk, users can create designs more quickly while sharing data throughout the piping, structural and equipment design processes. By engaging stakeholders at multiple workflow stages, Autodesk Plant Design Suite 2012 helps reduce construction mistakes, expensive reworks and extended plant shutdowns, says the company. ●

<http://usa.autodesk.com>

## UK water utility goes live with HiAffinity

**D**ST Global Solutions, a provider of billing and customer management solutions, has announced that its HiAffinity solution for utilities has been successfully deployed at UK utility South East Water Limited.

Following the merger of South East Water and Mid Kent Water, the new organisation was faced with the challenge of integrating two separate customer service and billing operations for 880,000 billable customers. Earlier this year South East Water successfully went live on a single platform powered by DST Global Solutions' HiAffinity solution. This has enabled the new organisation to consolidate to one call centre and implement consistent business processes across its customer service and billing teams.

'We now have a solid platform which enables us to apply consistent, streamlined processes across the shared customer service team,' said Oliver Martin, Head of Billing and Collections at South East Water. 'We are able to implement changes more quickly and train our users in less time.' ●

<http://dstglobalsolutions.com>

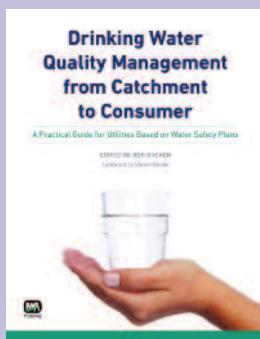
## Drinking Water Quality Management from Catchment to Consumer

*A Practical Guide for Utilities Based on Water Safety Plans*

*Editor: Bob Breach*

The Bonn Network is a global group of water suppliers who have adopted the Bonn Charter for Safe Drinking Water. The network was originally established to develop and share best practice in drinking water quality management.

Drinking Water Quality Management from Catchment to Consumer is a best practice book that brings together the experience of network



water safety plans and is intended to complement and support other relevant publications, particularly the WHO Water Safety Plan Manual.

This emphasis is on practical information 'by operators for operators', learning from the experience of a range of water suppliers across the world.

**IWA Publishing November 2011**

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**ISBN: 9781843393863**

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*Author: Joaquim Pocas Martins*

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- How to introduce innovation

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The book presents case studies, management theory, comparative analysis of situations reported in the literature and the personal experience of an author who has lead a number of successful processes of change in different water companies.

Software is also available, free of charge, for book purchasers by contacting [publications@iwap.co.uk](mailto:publications@iwap.co.uk), and providing details of the book's purchase.

**IWA Publishing February 2012**

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## Evolution of Water Supply Through the Millennia

*Authors: Andreas N Angelakis, Larry W Mays, Demetris Koutsoyiannis, and Nikos Mamassis*

This book presents the major achievements in the scientific fields of water supply technologies and management throughout the millennia. It provides valuable insights into ancient water supply technologies with their apparent characteristics of durability, adaptability to the environment, and sustainability.

Rapid technological progress in the twentieth century created a disregard for past water technologies that were considered to be far behind the present ones. There are a great deal of unresolved problems related to the management principles, such as the decentralization of the processes, the durability of the water projects, the cost effectiveness, and sustainability issues such as protection from floods and droughts.

Moreover, new problems have arisen such as the contamination of surface and groundwater. Naturally, intensification of unresolved problems led societies to revisit the past and to reinvestigate the successful past achievements. To their surprise, those who attempted this retrospect, based on archaeological, historical, and technical evidence were impressed by two things: the similarity of principles with present ones and the advanced level of water engineering and management practices.

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## Water Loss Reduction in Water Supply Systems

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*Acwua's 4th Best Practices Conference*

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**Web: [www.acwua.org](http://www.acwua.org)**

## Water Loss 2012

**26-29 February 2012, Manila, Philippines**

**Web: [www.iwa-waterloss.org/2012](http://www.iwa-waterloss.org/2012)**

**Water Loss 2012** is intended to present and discuss the latest developments, strategies, techniques and applications of international best practices in non-revenue water management. Sessions will provide the opportunity to hear expert opinion on and discuss topics such as pressure management, customer meter management, water loss technologies and strategic planning.

*IWA Water Security Conference – Resilience 2012*

**25-27 March 2012,**

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**Web: [www.watersecurity2012.com](http://www.watersecurity2012.com)**

## Water Loss Europe 2012

**23-25 May 2012, Ferrara, Italy**

**Web: [www.waterlosseurope.com](http://www.waterlosseurope.com)**

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**4-7 September 2012,**

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