

# Promotion into the Water Premier League

As part of his continuing search to add new technologies and ideas to Hydrok's wastewater product and services portfolio, Managing Director, Dave Armstrong engaged in discussions with the Eliquo Water Group, little realising that the result would be Hydrok joining the Eliquo Water Group. Now, within less than two years the company - renamed Eliquo Hydrok - experienced a marvellous growth and now has the size and scope to take its place at the water industry supply chain's top table.

Dave Armstrong is extremely optimistic about the future for Eliquo Hydrok, as the company looks to grow its existing product and services markets, whilst also developing new technologies and solutions. Key to this bright future is Hydrok's acquisition by Eliquo Water Group, a parent company that bundles the activities of SKion GmbH in the field of municipal water and waste water equipment.

Dave explains: "Our discussions with Eliquo with regards to their technologies lead to the consideration of the next water industry AMP period. We'd already considered our own aeration products, looked at adding to our CSO range, as well as enhancing our Mecana and phosphorus recovery technologies. During this planning phase, we identified sludge (biosolids) treatment as an important part of our future strategy - sludge treatment and the cost of disposal is becoming an increasing challenge for the water industry."

"We realised that we needed to learn a great deal more about sludge treatment technologies and are now in a perfect position with the technical support from our colleagues within the Eliquo Water Group. We met up to discuss possible ways of working together and realised that Eliquo's sludge treatment portfolio suited our plans, offering, as it does Thermal Hydrolysis - converting sludges from wastewater to energy and minimising sludge production."

While Hydrok was already highly successful in the UK, becoming part of a larger, international organisation, has provided what one might term as the missing piece in the jigsaw, as Dave explains: "In the past, we have had challenges with some clients, due to our size. We had taken on larger and larger contracts, however, there was always going to be a limit, as Hydrok didn't have the financial resources necessary to underpin the multi-million-pound projects. Our acquisition by Eliquo has resolved this problem overnight. Eliquo has a 'shiny' balance sheet and a supportive owner, plus multiple industry contacts."

Dave continues: "As Eliquo Hydrok our growth has been rapid - we're on target to achieve

£20 million turnover in 2018 and now focusing on how we can best bring the Eliquo biosolids technologies to the UK water industry."

A further benefit of the acquisition is the interaction that takes place between the various companies within SKion GmbH and other members of the Eliquo Water Group - both formally and informally. "We're encouraged to work closely within our group of sister companies," says Dave, "for example, we've talked to Ovivo with regards to offering our Mecmex CSO screens into the US market where there are ongoing discussions around the possibilities of streamlining our manufacturing process. And then there are the periodic board meetings and an annual portfolio event, where all the companies gather together to exchange ideas and opportunities."

While many acquisitions come with significant downsides and can create tensions between the old and the new ways of doing things, Dave is delighted, "without Eliquo, Hydrok would have faced some significant challenges into the future. We've been able to invest over £1 million in our manufacturing plant over the last 12 months, as well as in our wider infrastructure and our people. We've been able to expand enormously. In simple terms, we've gone from the Championship to the Premiership."

## Bigger and better

Eliquo Hydrok's core product portfolio - CSOs, aeration, Mecana, IFAS - continues from strength to strength, but the development and increase of the design team, that is a part of the company's expansion, has made a big difference to the number and size of projects which can be targeted. Dave comments: "with both aeration and IFAS, we're flying with these right now, and a big part of our current order book is tertiary filtration and phosphorus removal - we seem to have the timing right for this programme of works."

Dave continues: "We're hoping that the same will happen with sludge treatment. AMP7 seems to require water companies to start investing in this area and, in advance of this, we're talking to as many potential customers as possible in-order to ensure we develop the right product offering for this market."

"Thanks to a combination of luck and good judgement, we have the right technologies for the industry needs. Eliquo Water Group has the thermal hydrolysis technology LysoTherm® with full scale operational references at multiple wastewater treatment plants in Germany and the Netherlands. LysoTherm® increases digestion efficiency, drastically reduces sludge hauling and is the most energy efficient

THP system on the market. Then there's the need for sludge drying and struvite removal - we have a portfolio of technologies and in-depth know-how available, making us a true sparring partner to: for example, to help the water companies in evaluating how to create and use centralised sludge treatment facilities or maximise capabilities and capacity of regional assets."

"It appears the regulator is driving the water industry to create great energy outputs from the waste sludges produced by their WwTW's, we can help delivering these requirements"

The following case study gives just some idea of Eliquo Hydrok's proven capability in the sludge treatment market.

## Innovative energy and nutrient factory at Amersfoort Wastewater Treatment Plant

Water board Vallei en Veluwe is, amongst others, responsible for the treatment of Wastewater in the deltas of the rivers IJssel and Nederrijn. The Water board is operating and maintaining 81 pumping stations and 16 Wastewater Treatment Plants and is treating sewage of around 1.5 million PE.

All sludges produced by the treatment of wastewater for the communities of Amersfoort, Soest, Nijkerk and Woudenberg are centrally digested at the Amersfoort WwTP. The process of digestion is enhanced with the LysoTherm® Thermal Hydrolysis Process (THP), in-order to increase the biogas yield, and production of Green Electricity. The entire WwTP and sludge facilities are now energy self-sufficient. Furthermore, a surplus of approx. 2,000,000 kWh, not required for the treatment process, can be supplied to the national power grid. This is sufficient to provide 600 households with green electricity during the year.

The digestion and sludge treatment processes also produces liquor streams that are rich of nutrients like phosphorus and nitrogen. The project utilises the Pearl® nutrient recovery technology to produce an environmentally responsible fertiliser called Crystal Green®. This fertiliser is European Certified in the category with the highest quality fertilisers.

Eliquo was responsible for the complete design, realisation and process performance. The project is realised through a multi technology concept utilising LysoTherm® THP technology, Pearl® nutrient recovery technology and nitrogen reject water treatment (using Anammox bacteria).

The facility annually processes 12,225 ton of dry solids and produce 11 million kWh electricity and 900 tons Crystal Green® ready to use fertiliser. The applied LysoTherm® system is fully fabricated at Eliquo's own factories.

All produced biogases are converted into electricity by means of a CHP system (3 x 500 kW<sub>el</sub> / 550 kW<sub>th</sub>). The thermal heat produced is sufficient to provide the THP system with all necessary high grade heat. Non-utilised heat is available to energise future low temperature sludge drying processes.

## Refurbishment activities

If sludge treatment has a lot of potential for Eliquo Hydrok moving forwards, there's plenty of activity around its more established product portfolio. For example, the refurbishment of existing aeration plant, which might have been up and running for the last 10-15 years, is an important activity. Eliquo Hydrok runs an MOT check, working with the client to establish if the aeration process has lost any efficiency over time and, if so, how optimised performance can be re-established.

Dave explains: "The fine bubble diffusers in the aeration process can be damaged and the tanks can become sludged up, which leads to the blowers running at higher speeds. We offer a refurbishment and cleaning service, based on our aeration technology expertise. We can refurbish and/or replace components as necessary and extend the life of these assets. For the client, it's better value for money to refurbish than replace complete assets. Not just in terms of delaying the capital cost of purchasing new aeration tanks, but also, by ensuring that the air blowers are operating as efficiently as possible, there are significant electricity savings to be made."

Dave continues: "While each refurbishment contract is unique, in many cases the fact that Eliquo Hydrok offers retractable diffusers and diffuser lift out grids is a further attraction for customers. Not having to drain down aeration tanks is a major benefit."

As will become obvious later in this article, Eliquo Hydrok have developed a substantial, comprehensive, UK wide, service and maintenance offering right across the business, an area that Eliquo Hydrok is keen to develop further.

## Tertiary treatment

While Eliquo Hydrok's Mecana tertiary treatment technology has long been used for tertiary solids filtration applications, more recently the company has developed a solution which addresses the issue of phosphorus removal. So, a Mecana-based solution now offers tertiary phosphorus removal in combination with precipitation/flocculation - bespoke design for P<sub>tot</sub> consent from 1mg/l to less than 0.1mg/l.

Dave comments: "We were invited to take part in the UK phosphorus removal trials and were delighted with the results, which means that we're now adapting Mecana for many of these schemes across the country. This means that we have a two-year order book right now, and are discussing the AMP7 potential around phosphorus removal. Currently, I think we're only scratching the surface. We're installing many large schemes with two or three of the water companies at present and see many upcoming opportunities with the others."

## Factory investment

Despite the vagaries of Brexit, which did cause a notable slowing down of Eliquo Hydrok's business pipeline for a period of six to nine months, the company has invested heavily within its Cornwall factory. Over a million pounds has been spent on new



tooling and a combination of CNC laser cutting, bending and folding machines, as well as upgrading the company's welding capabilities and installing (another!) new crane. Increased manufacturing speed and efficiency is the result.

The control panel business, which is growing steadily, has been moved to an industrial unit adjacent to the Indian Queens factory and the old canteen has become extra office space for the expanding workforce (don't worry, there is a new canteen as well!).

Outside storage space has been expanded - including the car park - and, since November 2017, the factory has been operating for 18 hours a day. With the Indian Queens facility reaching capacity, Dave had to find further manufacturing capability. His

search led him across the Cornish border into Devon, where he secured a 10,000 square foot factory in Tavistock. Built as a fabrication facility by the owner, Dave was offered the building for rent, and persuaded the owner to come out of retirement to run it. And this newly appointed factory manager contacted his ex-welders and fabricators and re-employed them.

In operation, the Mecana tank components are cut and folded in Indian Queens, taken by lorry to Tavistock and then assembled. The Tavistock facility is similar in size to the one at Indian Queens and Dave has plans to increase its capacity, with a further recruitment drive looking to double the current two welding teams.

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## At your service

Under the heading: 'Asset Life Optimisation', Eliquo Hydrok has launched a dedicated service and maintenance offering for the water industry. Headed up by David Kertai, the underlying philosophy of the initiative is to help water companies address the increasingly important TOTEX aspect of their operations. David comes from a supply background to the military, so has a good understanding of the importance of ensuring that equipment works as it should, when it should!

Eliquo Hydrok has always offered a dedicated service function for the Mecana product line and the idea is to expand this approach across the whole Eliquo Hydrok portfolio, as well as third party plant. David explains: "The biggest challenge we face is engaging end users - trying to find the right person(s) to talk to within an organisation and then helping them to understand the benefits of regular servicing and maintenance. Right now, there's something of a disconnect between equipment suppliers and the end user. The contractor installs the equipment and is responsible for ensuring that it works properly for maybe year one. After that, the responsibility is handed over to the end user, who maybe doesn't understand the ongoing requirement for maintenance or who doesn't have a relationship with the actual equipment supplier, so doesn't understand how to keep the equipment in optimal operating working condition."

David continues: "Asset maintenance is not a high priority right now in the water industry but we've found that, where educational training is carried out, advantages are obvious and tangible to the end user."

AMP7 is set to place an increasing emphasis on maintenance, with the water companies under some pressure to extend the life of their assets. "Frequently, the operations department of a water utility is often faced with unexpected and unplanned service and maintenance costs," David explains, "because equipment is not being serviced and maintained on a regular, planned schedule."

Furthermore, where a level of servicing and maintenance programme is in place, it's vital that the engineers carrying out this work understand the equipment on which they are working. David explains: "Take our Mecana product. The cloth is a significant part of the value of an overall installation. If it's looked after and cleaned in the right way, its effective operational life could be significantly extended."

Dave recognises that changing the culture of the water industry will not be easy. After all, for how long has the relative importance of OPEX and TOTEX, when compared to CAPEX only, been promoted - but with limited success?

However, as and when attitudes change, David is confident that Eliquo Hydrok's Asset Life Optimisation initiative is perfectly placed to offer the best possible servicing and maintenance.





# Promotion into the Water Premier League

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With more and more work being carried out off-site, Dave is delighted that the two-factory approach is contributing to efficient order manufacturing and delivery. He explains: "The Deephams contract for Thames Water was for the biggest Mecana installation we've completed. The concrete holding tanks for this project were constructed on-site, whereas everything else was manufactured off-site."

"We now manufacture stainless steel tanks to house the Mecana units, built in both Cornwall and Devon where they are fully fitted out before being delivered to site, after a thorough quality control. Recently, two large Mecana systems were delivered to Thames' Reading WWTW at eight o'clock in the morning and were ready to be backfilled by the end of that same day."

Looking ahead to AMP7, Dave

believes that, as with the forward planning discussions with the water companies around sludge treatment, Eliquo Hydrok, along with other industry suppliers, needs to have a good understanding of what will be required overall to ensure that projects can be delivered on time. Dave explains: "We need to plan and manage across the whole industry. The initial impact of Brexit caused a delay to a significant number of contracts – when these finally came in, we had a mountain to climb to deliver within programme. And we know that AMP7 will be busy for the supply chain, therefore, it's crucial for us as an industry to understand the overall requirement to enable formed plans to deliver the work load."

Dave adds what has now become a familiar mantra amongst the water industry supply base: "If we are going to be able to deliver what I think the water companies will want in

AMP7, then we're going to need as small a transition phase as possible. We really have to avoid huge troughs or spikes and it would be great when the required investment will happen smoothly over the whole five years and not just squeezed into a couple."

## Workforce expansion

Alongside the expansion of Eliquo Hydrok's premises has come a similar workforce expansion. The company now has 10 CAD engineers and has increased the team of project delivery managers from two to six. Sales administration, field-based employees and fitting teams have also seen an increase in numbers.

Dave comments: "Staffing is an ongoing challenge, but we have been very lucky to find great people down here in the West Country. It does help that people are happy to relocate here. We're now a significant employer within Cornwall, but it's not easy and we're constantly advertising job vacancies and, currently always looking for staff."

## Group dynamics

Traditionally, Eliquo Hydrok has tended to focus on the UK only – the company understands the water industry well and the technologies it brings to market have provided a great, expanding business. CSO screens, for example, has been part of the company's 'bread and butter' and now that the CSOs installed during AMPs 2 and 3 are beginning to show signs of age, there's a great opportunity for Eliquo Hydrok to make further inroads into this market with the Mecmex CSO screen product line.

And it's the CSO screening technologies which have provided the company with some of its first overseas projects. Eliquo Hydrok has sold a screen to Sydney Water but, perhaps of more long-term interest, the company is working with its US-based Sister Company colleagues on installing both a Mecmex CSO screen and a CWF flushing system on a pilot plant. Dave comments: "If that trial runs successfully we'll have a new market open to us where US consents are higher level. We're pre-screening a membrane, it's early days for the pilot, however, confidence is high."

Other research work includes an Exeter University-based project that's looking at optimising the performance of the company's IFAS and HY-SAF plants.

Longer term, Dave is keeping an eye on how the water industry plans to address priority substance removal and a current 'hot topic' – microplastics. He explains: "I see these as future challenges, something which could well come along in AMP8, and it's important that we understand what we need to do to adapt our current technologies to develop new solutions and/or source new solutions."

He continues: "We know that, with Mecana, we can already remove a high percentage of the microplastics out of the flow. But, what happens to the microplastics after you've recovered them, that's the next step. Maybe they are treated as a sludge and collected in a settlement tank. The Eliquo Water Group includes PYREG, which has developed



PYREG pyrolysis technology, whereby dewatered and (pre) dried sludges or screenings are pyrolysed and reduced to a valuable biosolid. At present, this biosolid end-product is used as an effective soil conditioner. But, it's not hard to imagine that microplastics that have been treated by the PYREG technology could then be incinerated, perhaps on a local site by site basis. Another sister company owns a very efficient and effective advance oxidation process (AOP) based on ozone and ultrasound.

"It is a developing area that we are not unaware of but, it's not yet been defined regarding any measurement or consent testing standards for either microplastics or priority substances, but it's a huge subject that could be interesting for us. We will be there when the market is ready"

And, when it comes to huge, announcements don't get much bigger than Eliquo Hydrok's plan to enter the clean water side of the water industry. Full details will be released by the company later in the year, but Dave is happy to confirm: "We've obtained DWI approval for the Mecana Filters

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and we've carried out successful trials for Mecana used on the inlet of a drinking water works. We hope this technology may offer great benefit and expand areas of new business for us. This has extended our agreement with Mecana and they've developed new cloths to be used for raw water filtration."

He concludes: "Raw water intake screening, fine screening and polishing – this is an exciting area for us. Ninety per cent of our business is in the municipal wastewater market, however, now we will be able to serve engineers specialising within the delivery of drinking water technology. Yes, it's something of a challenge, but it's very exciting and we're keen to develop this further."

It might be simplistic to think that what Eliquo Hydrok has achieved in the wastewater sector could be mirrored on the clean water side – and what a size of company that would be! However, there's no doubting that the company's commitment to innovation and excellence is heading towards gaining many new contracts and customers over the coming months and years.

## ELIQUO | HYDROK

SKion GmbH is the investment company of German entrepreneur Susanne Klatten. Via SKion Mrs. Klatten owns 100 % of ALTANA AG (specialty chemicals) and amongst others has major shareholdings in SGL Carbon SE (carbon products and materials), Nordex SE (wind energy) and AVISTA OIL AG (used oil recycling). In the water sector, SKion is owner of ELIQUO WATER GROUP GmbH (municipal water and water treatment), ENVIROCHEMIE GmbH & CLEARFLEAU Ltd (industrial water and waste water solution provider) and shareholder of OVIVO Inc (global provider of process and waste water treatment), PAQUES BV (anaerobic industrial waste water treatment and biological gas desulphurization), MIRANDA AS. (decentral, energy-efficient waste water treatment solutions) and EVODOS BV (advanced separation technology).

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