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# SeaQuest converts complaints into compliments for Thames Water



Scale and discolouration in the water supply will soon be history for 30,000 Thames Water customers in Berkshire - thanks to the use of an innovative new product, which improves water quality by its ability to suspend and inactivate minerals present in the water supply. Scale deposits and discolouration have been a source of customer complaints for many years in the area around Burghfield and Tadley, areas, near Reading. The situation came to a head when residents of Pamber Heath held a public meeting to air their grievances to Thames in October 1997.

The main complaint from the 175 residents who attended the meeting concerned grit-like particles coming through taps and damaging tap washers, heating systems and blocking washing machine filters. These particles were composed mainly of calcium carbonate (lime scale), coloured with a small amount of iron, giving them a sand like appearance producing red discolouration. Thames scientists believed that the problem was caused mainly by hardness and iron discolouration of the water sourced from boreholes at Ufton Nervet and pumped via Burghfield Reservoir to storage towers at Burghfield Common, Silchester and Tadley. Water entering the reservoir or tower inlets cascades down, losing carbon dioxide on the way, and triggers a process which caused precipitation of calcium carbonate. With 30,000 people served by this supply, Thames turned to SeaQuest in an effort to find a long term solution that would clean out the system and prevent further calcium carbonate build up precipitation.

SeaQuest controls and removes scale and corrosion from pipes, it also provides a protective coating to prevent further scale and corrosion and reduces lead and copper levels to well below statutory limits. SeaQuest is manufactured by Aqua Smart, Inc. of Atlanta, Georgia, USA, and is distributed by ExcelFirst of Guildford, Surrey, UK (Tel: 01483 537809), the sole distributor in the UK.

Following a pilot trial at Kempton Park Advanced Water Treatment Works in which SeaQuest was used to successfully de-scale the sodium hypochlorite injection system, a 12 month trial commenced in February 1998 dosing SeaQuest into the water supplied to 8372 properties in Pelican Rd, Pamber Heath. Twenty four Thirty properties in nearby Knolleys Rd and Erskine Rd received CO<sub>2</sub> gas injected into the water supply to lower the pH in an attempt to reverse the aeration effect of and replicate the aeration in the water towers. Jubilee Close, with 6550-60 properties and, like the other roads, at the end of the distribution system, was used as the 'control' for the trial. CO<sub>2</sub> dosing was discontinued because it was found to be impractical in practise. For the first three months SeaQuest was added to the water supply at the

rate of 1.8ppm in order to achieve an initial gradual dispersion of the scale and start a cleaning action in the distribution pipes. "SeaQuest was selected because of its slow and gentle mode of action," said Thames Scientific Consultant, Nick Sutherland. "We knew we had a problem, but we could not shut the system down or go for a quick remedy, which could have clogged up the whole system. It required a more gentle method of treatment."

The dose was doubled to 3.6ppm after three months in an attempt to speed up the process. Within four to five weeks and by six months customers were already reporting reductions in scale in kettles and shower heads. Sections of pipe were cut out, lifted and examined after three, six and 12 months to check on progress of the cleaning action. An open day was held in the village hall after six months to report on what had been achieved so far. Thames also offered residents the services of a plumber free of charge throughout the trial.

Questionnaires were issued to all residents in Pelican, Knolleys and Erskine Rds and Jubilee Close just after before Christmas 1998. Among the results, Thames reported that over 40 percent of the households in Pelican Rd returning the survey remarked on an improvement in water quality compared with less than five percent in Knolleys Rd. This and other positive results from the survey supported Thames Water's decision to use SeaQuest to improve the water quality for the total population of Burghfield and Tadley. Specialist dosing equipment was supplied by Watercare Systems of Bittadon, near Barnstaple, North Devon, and commissioned on site at Ufton Nervet in mid-February following a quick contract turnaround by supervising contractor Montgomery Watson Projects. An information letter about SeaQuest was distributed to all 12,000 properties in the area, which initially resulted in about 30 calls a day from customers enquiring about the use of SeaQuest. A full briefing note had been prepared in advance for them and technical information was supplied to the company's call centres to enable them to handle customer calls in more detail. In addition, some 60-70 company personnel living in the area were also briefed to be able to give answers to neighbours' questions if required.

Dosing of SeaQuest commenced on 22 March 1999 at the rate of 1.86ppm - equivalent to 1614 kilos/day of SeaQuest for Ufton Nervet's output of, typically, 9MI/day of water. "Three months on, the feeling from staff on the ground is that things are calming slowing down," said Nick Sutherland. "Complaint calls are down and we're now receiving letters from customers commending us for our efforts."





Comments from Pelican Rd residents included: "There has been a vast improvement since you introduced the current procedure." "I find the water much improved." "I appreciate your efforts to rectify water quality problems."

Prior to SeaQuest being added, the water softener had to be cleaned frequently. This has improved."

Commented Robert Siaens, a director of ExcelFirst, commented: "SeaQuest is able to improve water quality in a number of ways, but the key process is its ability to suspend and inactivate minerals present in water supplies. For those consuming the water there are many benefits. The first and most noticeable is that the 'sandy' particulate matter and the iron staining will be eliminated. Both of these minerals will be sequestered by the addition of SeaQuest. In addition, any other particulate or non-particulate discoloration previously experienced will be eliminated.

"The knock-on effects of this are wide ranging. Tap washers will last much longer as they are able to seat properly once the scale has been removed. Stains in toilet bowls, baths, showers, and in laundry will be eliminated. The blocking of washing machine filters and shower heads, and the furring up of kettles and heating systems will also be eliminated. Finally, due to the fact that the water will be 'softer', consumers will require less soap and less washing powder; because the water has not actually lost the hardness, simply disguised it, none of the health benefits associated with it are lost."

Nick Sutherland added: "We anticipate a further two years dosing with SeaQuest to achieve a completely successful cleanout of the system. There is every indication that this is happening now. SeaQuest is a relatively cheap solution compared with stabilising the water at source which would involve us in major engineering works. However, one vital improvement we have made is to modify the inlets to the reservoirs and towers, to submerge them, thus reducing the pH levels, but this is not sufficient to completely prevent calcium carbonate precipitation. Ultimately, Thames is dedicated to achieving a long-term solution to the problems in Burghfield and Tadley."

In addition, Thames is also dosing SeaQuest at several sites to prevent scaling in sodium hypochlorite injection systems and clean out existing scale deposits.

Approved in the UK by the Drinking Water Inspectorate and the Scottish Office Environment Department, as well as in several other countries, for use as an additive to drinking water, SeaQuest has attracted much interest from the water industry in Britain, as well as from large water users in industry in general. Developed over two decades in the USA and launched there in 1991, SeaQuest is now in use in 22 States as well as in Argentina, Belgium, Brazil, Canada, China, France, Israel, the Philippines, Poland, South Africa and Taiwan, amongst others.

SeaQuest is a granular blend of complex inorganic phosphates which, when added to water, controls scale deposits and iron corrosion in pipes, valves and other equipment by sequestering iron, manganese and all divalent metals, effectively softening water and suppressing lead and copper. Red and black water is eliminated. It is effective at pH levels of 5-11, allowing lower pH levels, which reduces the potential for THM formation. It provides optimum corrosion control without the need for pH control.

Cost savings to users follow through improved water throughput and lower power consumption. It eliminates the need for pH adjustment, costly cleaning and coating programmes and the replacement of pipes, and leads to reduced chlorine consumption.

## Terry McAllister Memorial Scholarship



## A Water Powered Electricity Supply

### GREG LLOYD

WINNER OF THE THIRD TERRY McALLISTER SCHOLARSHIP

The last few months have really been quite hectic, since I was fortunate enough to be awarded the Third Terry McAllister scholarship in October.

My project for the scholarship originated from an Open University course I was taking during 1999. The course Innovation, Design, Environment and Strategy (T302) required each student to produce a patentable idea and move the idea along the invention pathway towards producing a patentable product.

The idea I chose was a water powered electricity supply. This idea stemmed from a perceived need for greater real time (continuous) pressure monitoring of water mains pressure, within South Staffs and the water industry as a whole. Clearly such monitoring equipment would require some form of electrical power. This power would normally either be provided by a mains electricity supply (expensive and not always available) or from batteries (with a limited life or solar panel charger). The battery operated method for powering such equipment is very valid, but solar panel battery charging techniques are not well suited to urban installations (due to vandalism) and are also not best suited to many below ground water main type of installations.

It seemed a straightforward solution to simply convert some of the water pressure energy (contained in the water mains) into much needed electrical energy. In reality however, such energy conversion is not quite that simple. With the pressing needs of my Open University course and the generous financial support of South Staffs, I managed to produce a working prototype, which proved the principle of energy conversion I had chosen.

Again with the support of South Staffs and Andrew Scudamore our business development director, the idea and principle of energy conversion was patented and is currently patent pending.

Following my scholarship success, I have been able to use the financial support gained from the scholarship to further develop the water powered electricity supply. To this end a fully working prototype is being developed by the Design and Engineering Research Centre (DERC) at the University of Wales.

I look forward to updating many of you on the progress I have made on my project, at the annual conference in Belfast.

In closing I would like to thank my colleagues at South Staffs for their contributions and the encouragement I have received, with special mention to my Directors, my unit manager Garson Cummings and Andrew Scudamore.

Finally on a more personal note I must say how honoured I feel, to be the first winner of Terry's scholarship at South Staffs. Having known Terry and being mindful of the high regard that he is held in by everyone at South Staffs, I thank Terry's vision and commitment to staff development, which has enabled me with the Company's support to undertake my Open University degree course.

If anyone would like advice on studying with the Open University please feel free to contact me at South Staffs or e-mail me at [greg@g-f-lloyd.u-net.com](mailto:greg@g-f-lloyd.u-net.com)

Greg Lloyd, winner of the 3rd Terry McAllister Scholarship (left) with Lynn Harding, IWD General Sec & David Penna, MD South Staffs Water.

