Figure 1: The Intake Reservoir, Kouris Dam

Prevention of Taste and Odor Problems at Limassol Water Treatment Plant

By Lisa Maria Brand

Limassol is the second largest city in Cyprus, with a population of over 200,000 persons. The water treatment plant of Limassol, provides drinking water for the city of Limassol, the villages west of Limassol and the Brittish base of Akrotiri. It treats the raw water from Kouris dam and has a capacity of 40,000 cubic meters per day.

The Challenge: Preventing Formation of Biofilm and Blue-Green Algae that Produce Geosmins

In 2012, the Limassol water treatment plant had an issue with taste and odour problems of the drinking water. The earthy taste problem persisted during summer of 2010. Various physical, chemical and biological tests were done in order to check the process efficiency, which showed problems at various locations in and outside the plant:

- Physical and chemical tests showed no significant deviation from standard values, except the higher dissolved oxygen in raw water which indicated excessive algal and macrophyte growth. Phytoplankton sample test in June confirmed that raw water had high phytoplankton biovolume.
- Despite that WTP uses chlorination as a common method to deal with bacteria, fungi, algae, protozoa, and viruses - disinfection in this case seems not powerful enough. Upon inspection of the water treatment plant, a significant amount of algae and slimy film were noticed in flocculation chambers and sand filters.

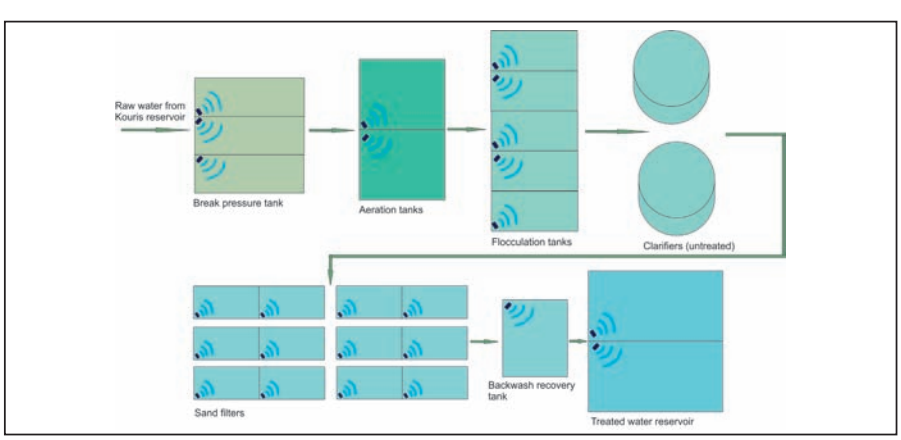

Figure 2: Overview of the Limassol Water Treatment Plant and where LG Sonic Devices were Installed

Figure 3: LG Sonic e-Line

The Solution: Installation of LG Sonic Devices to Inhibit Algae and Biofilm throughout the Plant

To reduce the volume of algae coming from the main water reservoir as much as possible, LG Sonic devices where installed in the break-pressure tank before the water entered the water treatment plant.

LG Sonic devices were also installed in other parts of the water treatment plant, to further reduce the cyanobacterial load in the plant and to minimize growth of biofilms in several other tanks. Because a significant amount of blue-green algae and biofilm had been found in the flocculation tanks and sand filters, also these parts of the water treatment plant where treated with an LG Sonic.

Installations where made in the treated water reservoir, because this is the last stage before the water is being transported to the community.

LG Sonic Technology

Ultrasonic algae control systems from LG Sound, are very specific, underwater sound systems, that emit ultrasonic sound waves that destroy algae, biofilm and actinomycetes. Using scientifically proven frequencies offers the possibility to eliminate many common algae, including the toxic blue-green algae (cyanobacteria) and the biofilm build-up that can cause problems in drinking water and cooling towers.

Effective ultrasonic technologies can be used to treat water environmentally friendly and reduce chemical treatment in several different applications. The LG Sonic products are typically found to be useful in industrial water systems such as irrigation tanks, aquaculture basins, cooling towers and (waste) water treatment plants. Other common applications for LG Sonic are (more or less) stagnant water bodies such as ponds and lakes.

Figure 4: Left: LG Sonic Installed in Sand Filter. Right: When Filter is Empty it can be Seen that the Walls and Filter Medium are Kept Clean.

Figure 5: Left: Break-Pressure Tank, Directly after the Inlet from Kouris Reservoir

The LG Sonic devices are installed directly in a basin or tank, covering the complete water surface and walls of the tank with ultrasound. Everywhere the ultrasound ranges, algae and biofilm are prevented from forming.

The Results: Cleaner Tanks and Reduced Taste and Odour Problems to the Water

After installation of the LG Sonic products in several of the tanks in the treatment plant, a great deal of the taste and odour problems of the treated water was solved. Because further into the plant, algae where prevented from growing, no geosmins are introduced in the water.

By preventing biofilms from growing on the walls within the water treatment plant, the taste and odour to the water becomes better and formation of THM's is drastically reduced.

Further benefits of the LG Sonic products are:

- A reduction of cleaning and maintenance of the tanks.
- More efficient flocculation processes due to disintegration of suspended solids.
- Less backwashing of sand filters thanks to reduced formation of algae and biofilm on the filter medium.
- No clogging of filters and improved efficiency of UV installations.

About the Author

Lisa Maria Brand obtained a diploma in Medical Microbiology, Leiden University, 2002. Since then she has held the position of project manager at LG Sound b.v. She has over 5 years of experience handling projects in water and wastewater treatment, in regards to water quality and performance.

LG Sound was founded in the Netherlands to develop, produce and market the newest generation of ultrasonic algae control units worldwide. LG Sound is focused on remaining on the edge of the market with their technology and invests heavily in improving our existing solutions and developing new ones. LG Sounds' network comprises distributors in, amongst others, the United States, United Kingdom, France, Netherlands, Belgium, Turkey, Japan, Malaysia, Korea, Singapore, Canada, Brazil, and Cyprus.

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