

# **Cape Winelands Biosphere Reserve**

## **South Africa**



### **Aquatron by CWBR South Africa**

**The toilets is connected to Aquatron, which separates the solids and treats liquids with UV light.**

**The water further continues to aquaponics where the water is organically post-treated, and plants use the nutrients as fertilizers to grow food and feed local citizens.**

**The water is then pumped up to a vertical garden to maximise food production. After this the water flows back to the aquaponics. The system works as closed, constant flow system.**

**Aquatron  
Separator**

**Bio chamber**



**Aquatron  
UV unit**

**Aquatron systems are based on utilizing the moving energy of the flushing fluid, the centrifugal force and the gravity to separate particles from the liquid.**

**The toilet is connected to Aquatron, the solid waste (feces and paper) from water and urine.**

**The solid waste is composted in a Bio Chamber**

**The flushing water with urine is purified with UV to remove all bacteria**

**The water further continues to aquaponics where the water is organically post-treated, and plants use the nutrients as fertilizers to grow food and feed local citizens.**







**Once the separator and the UV unit were perfectly levelled, and the pipes' inclinations were checked properly, this resulted in drinkable water quality.**

**The wastewater treatment system was proved to work in South African conditions if properly installed and is a recommendable solution for the current toilet systems in informal settlements, mid- to high-income households, and companies.**

**If you have any further questions regarding the project, please contact:**

**Mark Heistein**

**CEO Cape Winelands Biosphere Reserve**

**[markheistein@gmail.com](mailto:markheistein@gmail.com)**



## Test report

**Dr Kevin Winter from Cape Town University, was involved and monitoring of the units. Please have a look at one of the projects we are involved in, together with them <https://www.thewaterhub.org.za/>**

**Or use search words “franschhoek water hub” to find all information on the web, regarding the project**

**We will also be working with Stellenbosch University to look at the Units themselves with regard to effectiveness under different conditions in various communities, with the Water Conservation Unit.**



**To prove the system functionality, water quality analysis were made at Stellenbosch University WA lab, where Heterotrophic P/C per 1ml at 35°C, Total coliforms per 100ml, Faecal coliforms per 100ml, and E.coli per 100ml, as the general water quality indicators, were examined.**

## Background

**Our planet is in urgent need to develop sustainable methodologies and emission-reduction programs for food production, energy production, wastewater treatment...**

**Often emission-reduction programs lack the ability to boost economic growth, which is the first priority for most of the developing countries. However, societies and communities are increasingly moving from conventional methods to produce and discharge goods to more into resource recovery -based models and waste-to-energy type of systems to avoid and reduce negative impacts of the changing climates. Cape Winelands Biosphere Reserve as an environmental organisation tackles both, climate change adaptation, and mitigation measures.**

## Biosphere team



**In my studies I mainly focus on water management and treatment, so once I heard about Cape Town's water crisis I knew I would have to go see how the situation is and what I could do for helping the locals. One student from my University had done his research internship at Cape Winelands Biosphere Reserve the previous year, so I quickly emailed the organisation and got a positive response. Soon we skyped about the topic of my research and thought that I could work with a Swedish wastewater treatment technology, called Aquatron, and test it in South African conditions.**

**After moving to South Africa I found out, that problems with the existing South Africa's wastewater treatment system are diverse. The wastewater treatment plants are lacking capacity due to the growing population, as well as lack of financial support and maintenance. Another serious problem is the vast amount of untreated wastewater that is discharged into the environment, especially wastewater effluent from townships and informal settlements. Many of the areas are not connected to the sewage system, which causes pollution and eutrophication in the majority of the rivers and other water reservoirs. Thus, the goal of the research was mainly to build an alternative sanitation system to the current water crisis in Western Cape to reduce pollution and overall water quality risks.**

**In addition to this, we also decided to expand the system with a greenhouse, aquaponics, and a vertical garden. First, the wastewater from a toilet, kitchen, and shower flows into the greenhouse, where Aquatron is placed. From there it continues first to aquaponics, and finally to the vertical garden. Furthermore, a constant flow vertical garden was built to offer a solution for local food production, especially in high density areas. Aquaponics in different sizes can be used for food production, but also as storage tanks for treated wastewater. With solar water pumps, the constant water flow system prevents eutrophication and other unwanted nutrient accumulation and bacterial growth.**

**The first order for 100 Aquatrons was made this year. Aquatron program offers a solution to the current water crisis, and it will make a huge contribution to the CWBR and other community projects and generate regular income. Instead of relying on emission-reduction efforts, this alternative proposes a technology that locally treats wastewater and can increase economic and social development.**

**Celin Mac Donald & Mark Heistein**