

# HYBACS®

## Municipal Sewage: Tubli, Bahrain

### Background

The existing activated sludge plant at Tubli Water Pollution Control Centre (WPCC) was designed to treat a daily flow rate of 200,000m<sup>3</sup>/d. However, due to the continuing rapid growth of Bahrain, the flow rate into the works was in excess of 300,000m<sup>3</sup>/d and this is only expected to increase in the future. Because the works were overloaded, the treated effluent was frequently contaminated with ammonia and sludge solids which flow with the effluent into the bay impairing the aesthetics and the ecology of the bay and causing an odour nuisance.

The Ministry of Works requested Bluewater Bio to provide a solution that, in the first instance, alleviated the overloading problem without the requirement for greenfield construction. The solution offered by Bluewater Bio achieved these goals, making use of the existing secondary treatment assets with minimal land take.

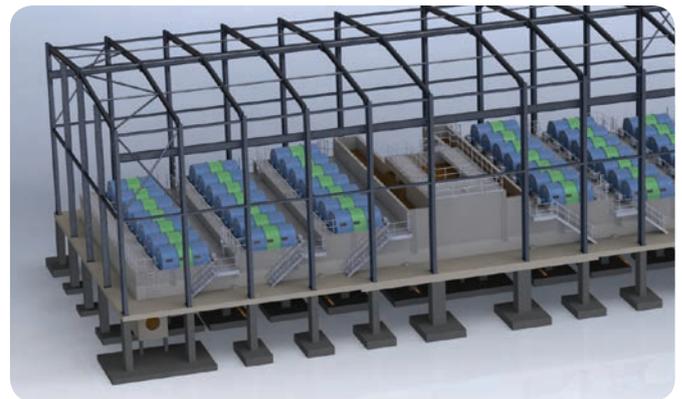
### Solution

The Bluewater Bio solution is based on using its proprietary HYBACS® secondary treatment process. The HYBACS® upgrade comprises the conversion of 2 of the 10 aeration lanes and 4 of the 12 clarifiers into a HYBACS® plant, by installing 42 SMART™ units upstream of the aeration lanes. The upgraded HYBACS® plant will treat 100,000m<sup>3</sup>/d meaning that the two aeration lanes, originally designed for 40,000 m<sup>3</sup>/d, will have a 150% uplift in capacity.

Following treatment within the HYBACS® plant, the secondary effluent is blended with that from the remaining conventional plant. Some is discharged into Tubli Bay but a large proportion flows to the existing tertiary treatment works and is filtered and disinfected for irrigation purposes.

The project is the first phase of works to relieve the overloading on the existing plant. Bluewater Bio's proprietary HYBACS® treatment process is producing a fully-nitrified effluent which surpasses the quality requirements for discharge to the sea. Further, the upgrade has reduced the overloading on the existing plant, enabling an improvement in the quality of the treated water from this section of the plant also.

The result of this has been a dramatic improvement for the environment and ecology in the Tubli Bay area. The long term goal falls within the Bahrain Vision 2030 where improvement of infrastructure is a high priority. With the implementation of the HYBACS® upgrade to eliminate the immediate concerns at the works, the long term Master Plan for the Tubli WPCC improvements can be planned, designed and implemented.



**HYBACS®**  
A BLUEWATER BIO TECHNOLOGY

# HYBACS<sup>®</sup>



A BLUEWATER BIO TECHNOLOGY

The HYBACS plant has operated at its design capacity of 100 MLD since commissioning in 2013 and consistently surpasses the discharge requirements, ensuring improvements to the quality of discharges to Tubli Bay and an increased yield of treated sewage effluent (TSE) for irrigation around the city. The achievements were recognised when Bluewater Bio was invited by the Bahraini Supreme Council for the Environment and Ministry of Works to join them in an exhibition about the RAMSAR-designated wetland in Tubli Bay, attended by the Prince of Wales and other dignitaries in November 2016.

Bluewater Bio is now beginning work on Phase 2 of the HYBACS upgrade, converting a further two aeration lanes from a design capacity of 40 MLD to 100 MLD and incorporating nitrogen removal. Construction will take just 15 months with commissioning in late 2021.



## **Bahrain's Ministry of Works said:**

*"The HYBACS upgrade at Tubli alleviates the current overloading problem without the requirement for green-field construction, thereby utilising the existing secondary treatment assets whilst avoiding additional land take.*

*Early results demonstrate that the plant is operating exceptionally well and meeting the highest standards, with an overall improvement in Nitrogen removal of 80%".*

## **To find out more about HYBACS<sup>®</sup> call:**

### **London Office**

Winchester House,  
259-269 Old Marylebone Road,  
London, NW1 5RA  
Tel: +44 (0)845 519 5800  
Enquiries@bluewaterbio.com

# BLUEWATER BIO



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