

## Industrial Wastewater Treatment

### GRP Ltd, India

#### Background

GRP Ltd is one of the world's leading producers of recycled rubber with five plants strategically positioned across India. One plant in Solapur produces effluent with strong odor in addition to high chemical oxygen demand (COD) and oil content. COD is a commonly used measure of the amount of organic compounds present in water.

GRP's effluent treatment process (ETP) involves acid treatment, oil and grease removal, chemical reduction and neutralization, aeration, and filtration. Due to polymerization arising from the rubber recycling process, there is no production of activated sludge or biological activity.

The plant produces 5-6 kl of effluent per day with COD of 8000-10000 mg/l, which is lowered to 3500-4500 mg/l after the filtration process. The ETP is carried out in batches, with a retention time of 24 hours in the aeration tank.

#### Objectives

In partnership with local distributor BW Indah, GRP Ltd developed a program to validate the effectiveness of BiOWiSH™ Aqua FOG in reducing COD and oil content.

#### Solution

GRP Ltd and BW-Indah selected BiOWiSH™ Aqua FOG as the product best suited for the project. Leading industrial wastewater treatment plants around the world have proven BiOWiSH™ Aqua FOG to reduce odor, COD, and oil content. BiOWiSH™ Aqua FOG is also environment friendly, safe, and easy to use. Implementation Program

In a dedicated tank, 100 g of BiOWiSH™ Aqua FOG was mixed with ten liters of clean water and left to aerate and activate for 24 hours before dosing into the ETP via the aeration tank. As the ETP did not produce any biological activity, it was essential to add about 200 kg of activated sludge into the aeration tank to provide an optimal environment for the BiOWiSH™ microorganisms as well as maintain mixed liquor suspended solids (MLSS).

A mixture of 100 g of NPK fertilizer and ten liters of clean water was added daily to the effluent to increase and maintain nutrient concentration.

After 24 hours of adding the activated sludge, samples were taken from the aeration tank to test for MLSS, Total Phosphorous (TP), Total Kjeldahl Nitrogen (TKN), Dissolved Oxygen (DO), Biological Oxygen Demand (BOD), COD, and Total Dissolved Solids (TDS).

On the day of dosing, a second tank was used to activate the next batch product to ensure continuous daily dosing for 22 days.

#### BiOWiSH™ Aqua FOG



- Rapid enzyme chemistry breaks down fats, oils, and grease
- Reduces sludge production and handling costs
- Increases plant capacity; capital avoidance
- Reduces odors
- Reduces aeration requirements; energy savings
- Reduces need for chemical additives
- Improves plant stability
- Reduces hydrogen sulfide, ammonia, and nitrates
- Natural and non-toxic

#### Available Sizes

- 3.5oz/100g
- 2.2lb/1kg
- 11lb/5kg



After 48 hours, the treated effluent in the aeration tank was allowed to settle for 2 to 3 hours to maintain the activated sludge and MLSS. After settling, about half of the treated effluent quantity was transferred to the tertiary ETP (i.e. filtration process).

After filtration, a sample was drawn for testing for MLSS, TP, TKN, DO, BOD, COD, and TDS and was repeated daily for a period of 15 days. After 15 days, test samples were drawn every 72 hours for the remainder of the 22-day validation program. The retention time for the effluent treatment process was 48 hours.

## Results

Based on samples taken at the ETP outlet, the team observed a 38% reduction in COD, a 40% reduction in BOD, and a 57% reduction in TDS upon completion of the validation program.

The implementation team also observed a significant reduction of oil floating in the aeration tank.

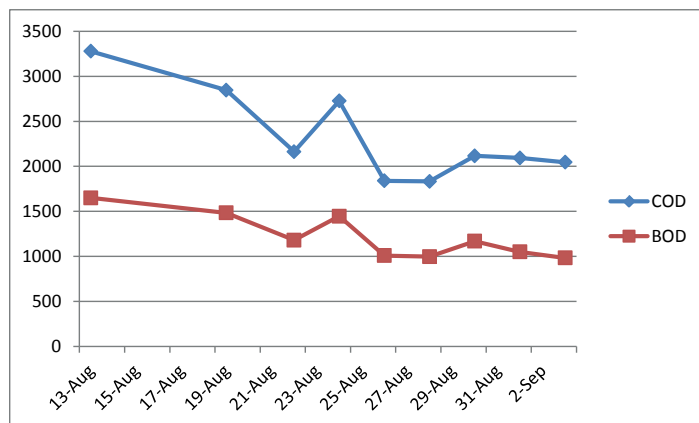


Figure 1- COD & BOD in mg/l at ETP Outlet

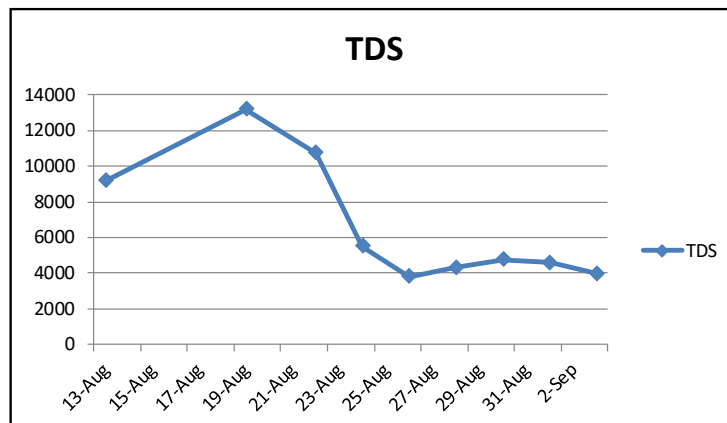


Figure 2 – TDS in mg/l at ETP Outlet

## Conclusion

The results of the validation demonstrates the effectiveness of BiOWiSH™ Aqua FOG in significantly reducing COD, as well as BOD and TDS. The implementation team also observed a reduction in oil content in the effluent. The validation adds to the growing body of evidence to support the efficacy of BiOWiSH™ Aqua FOG in complex industrial wastewater treatment applications.



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### Contact us:

Tel: +1 312 572 6700

Fax: +1 312 572 6710

Email: [wastewater@biowishtech.com](mailto:wastewater@biowishtech.com)

Web: [biowishtech.com](http://biowishtech.com)