

Wastewater Treatment

Open Sewage Canal Pune, India

Background

Pune Municipal Corporation administers the city of Pune, one of the largest and rapidly growing metropolitan areas in India. Like many emerging cities, public services such as sewage treatment have become a focus area by administrators due to the potential impact on public health and the environment. In Hadaspar, an eastern suburb of Pune, a canal system is used for the discharge of sewage and solid waste from homes, restaurants, and small businesses in the area. The canal flows through the city causing various nuisances and health related issues including odors, flies, and water-borne pathogens. Furthermore, the wastewater does not get treated to remove pollutants before it's discharged into the nearby Mula-Mutha River, potentially affecting fish and other aquatic life.

Objectives

BW-Indah partnered with Pune Municipal Corporation to treat sewage in the city's canal. The objectives of the pilot project at Pune were to:

1. Improve the quality of wastewater, measured in terms of Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD)
2. Reduce odor coming from the wastewater in the open canals and ditches
3. Reduce flies in the canals and ditches
4. Improve overall aesthetics

Solution

BW-Indah and Pune Municipal Corporation selected BiOWiSH™ Aqua as the product best suited for the project. Developed and manufactured by Chicago-based BiOWiSH Technologies, BiOWiSH™ Aqua is a novel consortium of biologically active ingredients consisting of enzymes, microorganisms, and non-enzymatic co-factors. The product reduces odor, Volatile Organic Compounds (VOC), COD, BOD, and Total Suspended Solids (TSS). A further benefit of BiOWiSH™ Aqua is that it is 100% natural, certified organic, and nontoxic to the environment.

Implementation Program

No special training is required to use BiOWiSH™ Aqua; the product is non-hazardous and requires no special or expensive equipment to activate and dose. BiOWiSH™ Aqua is manufactured as dry powder and comes in vacuum sealed bags. Dosing stations can be as simple as a tank with a tap on it.

The dosing station for the activated BiOWiSH™ product was chosen at the point where the canal opens. Samples were taken at this "Origin" point and about 2km further down.

BiOWiSH™ Aqua



A novel consortium of biologically active ingredients consisting of enzymes, microorganisms, and nonenzymatic co-factors

- Reduces Odor and Volatile Organic Compounds
- Reduces Biological Oxygen Demand, Chemical Oxygen Demand and Total Suspended Solid
- Simple to use and apply. Only equipment needed are simple drums or totes, a valve, and hose
- 100% natural and non-toxic

Available Sizes

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



The canal, after origin, is covered for a length of about half a kilometer. It then opens and carries about 1.1 MLD of wastewater each day. Initial dosing was carried out by activating 2 kg of BiOWiSH™ Aqua in 1000 L plastic drum.



Figure 1. Dosing Equipment

Results

Flow of the open canal was measured by taking the volume and velocity of wastewater, which was found to be about 1.1 MLD. Before treating with BiOWiSH™ Aqua, the initial average BOD was 165 mg/L and COD 400 mg/L. Sampling at the origin was carried out three times during the treatment.

While implementing BiOWiSH™ Aqua, accidental breaks occurred in two sewer lines. Fresh sewage entered the canal being treated, causing BOD, which had begun to drop, to spike. Dosing in the canal was then doubled and sand bag dams (simple barricades) were set at two locations, one at the origin and other at a distance of 1 km from origin. The barricades slowed the water flow, allowing more time for treatment to occur.



Figure 2. Initial dosing point



Figure 3. Sand bag location

After treatment, at a distance of about 2 km, BOD had decreased to as low as 37 mg/L, or a reduction of 71%. COD was reduced by as much as 70 mg/L, or 72%.

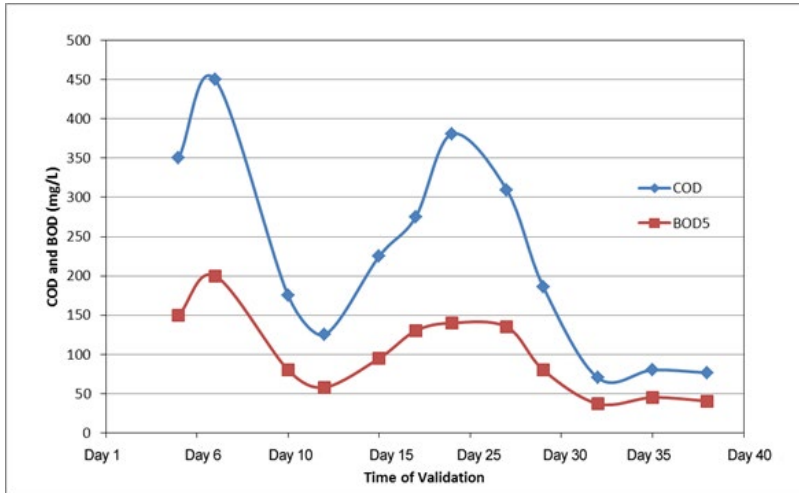


Figure 4. COD and BOD5 Graph

Significant nutrient removal in the form of Total Kjeldahl Nitrogen (TKN) was observed. TKN was reduced by 85.5%.

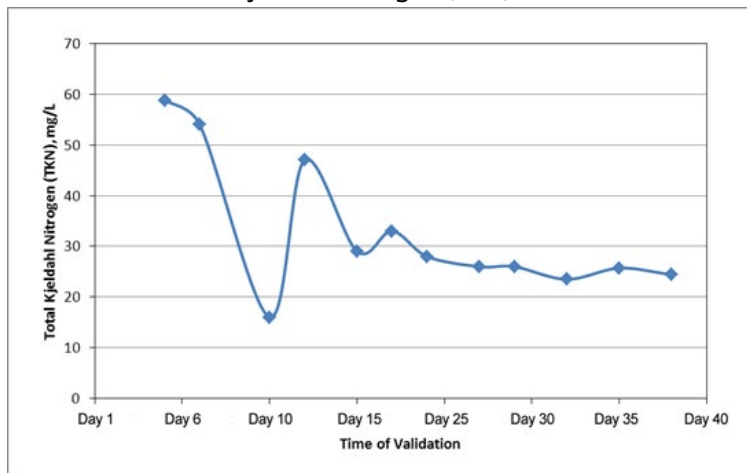


Figure 5. TKN Graph

Residents near the canal also reported a dramatic reduction in odor and flies, potentially reducing the incidences of waterborne pathogens and the human health problems they cause.

BiOWiSH™ Aqua also helps reduce the negative impact on the river by decreasing Biological Oxygen Demand (BOD) and other nutrients. Because the river currents spread the beneficial BiOWiSH™ microorganisms, the benefit is seen well past the dosing location. Decreased BOD and COD indicate increased availability of oxygen in the canal, which is a key measure of aquatic health.

Conclusion

To many emerging cities, BiOWiSH™ technology provides a simple, cost effective, and environment friendly way to treat sewage in open canals. In Pune, BiOWiSH™ Aqua dramatically improved the quality of water in the canal system while also reducing odors and flies in the system. Implementation only required simple drums and a valve and hose system, making BiOWiSH™ Aqua an extremely economic way to improve water quality and overall human health conditions. In all, it was estimated that using BiOWiSH™ Aqua takes just about ten minutes a day.



BiOWiSH™ is a registered trademark of BiOWiSH Technologies International, Inc.

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