A REVIEW OF STP'S PERFORMANCE EVALUATION FOR THE TREATMENT OF DOMESTIC WASTE WATER (300KLD)

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ABSTRACT

The trend of urbanization in Bengaluru is exerting stress on civic authorities to provide basic requirement such as safe drinking water, sanitation and infrastructure. The rapid growth of population has exerted the portable water demand, which requires exploration of raw water sources, developing treatment and distribution systems. The study is based on the environmental engineering. The efficiency of the RRMCH domestic sewage Treatment Plant, Bengaluru will be worked out during the entire project. The selected parameters are pH, Turbidity, TSS, COD and RC. The treated and non- treated samples will be collected every Thursday and Friday say for 5 day and have been tested in RRCE laboratory. Results obtained from collected samples are compared with BIS and GPCB standards to evaluate the efficiency of the plant. The removal efficiencies of the activated sludge plant will also be calculated. Hence the measure against non-treated water can be made to protect the environment. Additionally, the problems associated with the operation and of wastewater treatment plant is discussed and suitable recommendations have been adjusted to reactive the sewage treatment plant and help the RRMCH

INTRODUCTION

Since the beginning of time, sweepers have manually collected, transported, and disposed of a society's waste products, including human excreta, at a secure location. The outdated technique of gathering and discarding rubbish from society has been replaced with a more advanced system that involves mixing waste with enough water and directing it via closed tubes so that gravity takes over. Wastewater, often known as sewage, is a mixture of water and waste materials that naturally flows to a location where it is disposed of after receiving the appropriate treatment. This eliminates the need to carry waste on heads or carts. The cleaned sewage effluents can be dumped in a body of flowing water, like a stream, or it could be applied to crops as irrigation.

LITERATURE REVIEW

- The BOD, COD, and DO of the sewage treatment plant were measured by Hassan et al. (2015); the results showed that the BOD was 7.78 mg/l at the receiving point and 7.82 mg/l at the outflow. Agyemang et al. (2013) conducted study on the water quality assessment of sewage treatment plants, yielding results of 3.6±0.6 mg/l DO at the receiving point and 5.7±0.6 mg/l DO at the outflow. In a study on decentralized sewage treatment, Bhagwatkar et al. (2017) found that the DO at the receiving point was more than 2 mg/l at the outlet and lower than the detection limit. Additionally, Bhaarat et al.'s investigation on pharmaceutical company wastewater produced results that showed 1.4 mg/l DO at the receiving point and 4.5 mg/l at the outflow.Rajkumar (2016) conducted research on how to understand biological methods for the discovered 225 mg/1 BOD at the receiving site and 9 mg/l at the output after sewage treatment. Agyemang et al. (2013) conducted a study on the water quality assessment of a sewage treatment facility, recording 1118.6±182.5 mg/1 BOD at the receiving point and 45.7±35.2 mg/l at the output. In a study on the design of sewage treatment plant units, Patil et al. (2018) reported BOD values of 30-150 mg/l at the output and 189.78 mg/l at the receiving point. According to the results of a study on decentralized sewage treatment by Bhagwatkar et al. (2017), there were 100–200 mg/l at the receiving point and less than 5 mg/l at the outflow. In a 2017 study on the interpretation of sewage treatment plant performance, Dahamsheh and Wedyan recorded BOD of 335.7 mg/l at the receiving point and 15.5 mg/l at the outlet. In their 2015 study, Sahu and Negi evaluated the waste water treatment plant's effectiveness, finding that the BOD levels were 22.6 mg/l at the outflow and 200.46 mg/l at the receiving point.

- The literature review comprises a critical evaluation of seven research publications that have undergone peer review and address the effectiveness of STPS in various contexts. The research address a variety of subjects, such as the application of cutting-edge treatment technology, the measurement of pollutants in effluent, and the assessment of STP effectiveness in multistory structures. The results of these

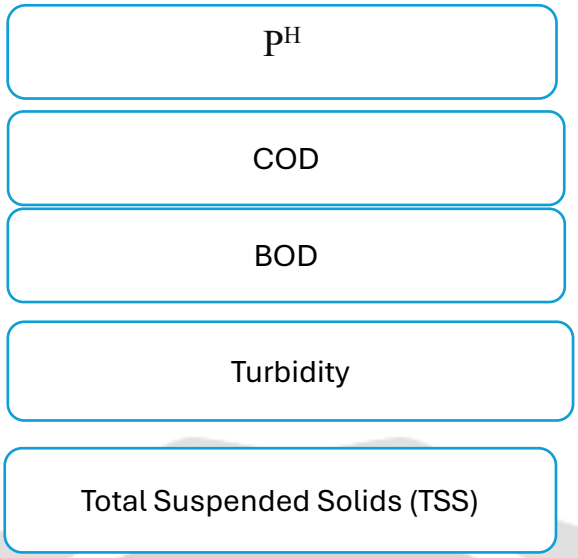
investigations imply that the treatment technique employed and the characteristics of the influent can have a substantial impact on how well STPs perform. For instance, a study by Kumar et al. (2010) discovered that variables including the sludge age, organic loading rate, and hydraulic retention time affected a wastewater treatment plant's performance.Likewise, Lusweti et al. (2010) examined the contaminant concentrations in the wastewater of two wastewater treatment facilities in Blantyre, Malawi, and discovered notable variations in the efficacy of contaminants removed. A different study conducted by Kadam et al. (2014) assessed the performance of a 25 MLD STP in Kalyan and discovered that problems with the plant's hydraulic loading rate and sludge retention time were the reason it wasn't running as efficiently as it could have.

- The "mixed liquor," or aeration basin effluent, is moved to the secondary clarifier. Here, the clear wastewater is pumped to a nitrification basin while the activated sludge sinks to the bottom. Optimizing the rates of waste sludge contributes to the plant's increased efficiency. Although there are numerous ways to achieve this, the majority of plants decide to maintain their mixed liquor suspended solids (MLSS) concentration within the permitted concentration range. The effluent from the nitrification basin is directed into a mix tank where phosphorus is precipitated by adding aluminum sulfate, or alum. To enhance settling qualities, polymer and flocculent are added next. After that, the effluent is refined using a gravity filtration method that usually uses sand or anthracite coal filters. Chlorine is used to sterilize the gravity filter's effluent. and aerated to raise the water's dissolved oxygen content. is de-chlorinated at last.

- In order to evaluate the functioning of a STP in Kaithal, Haryana, Pipraiya Ashutosh (2017) carried out a study from January to April of that year. The facility is based on SBR technology and has a 10 MLD capacity.The STP's input (grit chamber) and output were sampled. pH, BODS, COD, TSS, turbidity, nitrate, phosphate, total nitrogen (TN), and total phosphorus (TP) were the parameters that were examined. Turbidity, BOD5, COD, TSS, nitrate, phosphate, TN, and TP removal efficiency were 91.14%, 95.66%, 90.89%, 96.74%, 42.59%, 35.29%, 46.20%, and 43.34%, respectively, according to the laboratory analysis [6]. It is determined that because of adequate aeration and settling mechanisms, BOD5, COD, and TSS in the effluent were within allowable limits. The cleaned wastewater is discovered to be used for irrigation and protected from being thrown away on land. It is advised to settle properly to lessen turbidity in the effluent. Variations in pH, BODS, COD, TSS, turbidity, TN, and TP were shown for each sample. visually In 2016, Gedekar Ankusha R. et al. evaluated the effectiveness and efficiency of a tractor manufacturing company's sewage treatment facility (STP) at MIDC, Hingana, Nagpur, Maharashtra. The STP is intended to handle a flow of 270 m3/d and is based on an extended aeration process. Sewage was examined for design characteristics such as pH, solids, COD, and BODS during the investigation. Grab and composite samples were gathered over the course of the six-month study period. from every STP unit, including the aeration tank, equalization tank, secondary sedimentation tank, and final eefluent.

- We have read the material that is pertinent to the project's goal, which is to evaluate a wastewater treatment plant's performance. There is a talk about the goal of the performance review of the treatment plant, which includes an efficiency test of each unit. Among the few works of literature we have looked at are To assess the efficacy of the wastewater treatment plant A case handled by Darshan Mehta, Margi A. Sheth, and Kavita N. Choksi. The Anjana Sewage Treatment Plant in Surat provided the treated and untreated samples used in this study. The plant's efficiency is determined by analyzing the crucial parameters using the samples that were gathered. Once more, B.G. Mahendra and Prema perform a good job in their paper titled Performance. Assessment of Current Wastewater Treatment Facilities They evaluated the efficacy of the KMF, Gulbarga wastewater treatment plant (Dairy Industry 1.6). Aside from myself, two works were recommended: "Water Supply and Sanitary Engineering" by G.S. Broche and 3.5 Bride and Wastewater Engineering by Drs. BC. Puunia Er Ashok Kumar Jaan and Dr. Бли K. Jani.

TEST TO BE CONDUCTED



CONCLUSION

• The observation and data analysis lead to the following conclusions:
• After treatment, the pH is maintained within the desired limits; initially, the pH and turbidity were determined to be high.
• The residual chlorine in the collecting tank was kept below the allowed limits; this suggests that the treatment unit is effective in eliminating organic and inorganic materials from the waste water.
• The total suspended particles and dissolved solids were greater in the return sludge.
• The COD is found to be high at the beginning, but it decreases with treatment using different units.
• Because there is a significant amount of organic matter present, the initial value of DO is zero; however, after the organic matter is removed, DO increases to mg/L.
• After the biological treatment, BOD falls and Do rises from its initial high level.
We can see from the aforementioned observations that the 300 KLD capacity STP Unit at RRDCH is operating satisfactorily.

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