Performance Evaluation of a Water Treatment Plant at Davangere-(Karnataka)

Madhu K.M[1] , Soumyashree S.H [2]

[1]PG Student, M.Tech (Civil Environmental Engineering**), B.I.E.T, Davangere, Karnataka
[2]Assistant Professor, Dept. of Envi. Engg., B.I.E.T, Davangere, Karnataka.

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Abstract - *Supply of safe and purified drinking water to the public has become crucial thing to the concerned municipalities. Hence, to meet this necessity the performance of treatment processes can be enhanced by regular evaluation of the treatment plant units is extremely obligatory.The main objective of this work is to estimate the working performance of the water treatment plant at Neelanahalli near Davangere city, Karnataka. In this case study , Water samples from five different units of the treatment plant is collected for three months and analysed for water quality parameters like, pH, total dissolved solids, Do, Conductivity, and total hardness.*

*Key Words***:** Water treatment plant, Performance evaluation, Total Hardness, Dissolved Oxygen(DO), pH, etc

1. INTRODUCTION

Since water serves as the most significant need for the survival of humans. It must be safeguard for its best use. Drinking water must be purified and made safer for the consumption without any aesthetics. In India , municipalities are responsible in facilitating pure drinking water supply to the public. Here, Water treatment plants place a vital role in accomplishing this. The main course of these plants is to treat the available water from rivers lakes and streams through various steps and thus making water fit for drinking by removing disease causing pathogens, colour and aesthetic odour. In present study, the water treatment plant consists of various segments like Aeration system which is cascaded, Flocculation system, filtration through sand bed filters, Disinfection unit and finally the underground storage sump. Water treatment plant is situated at neelanahalli, near Davangere district, Karnataka-India. This plant is 6Km away from the main city which has the treating capacity of 20MLD of water at a stretch. Water is drawn from the Tungabhadra river which flows through Harihar Taluk near davangere district through pipelines and is initially aerated in the cascade aeration unit where all the volatile compounds gets evaporated to the atmosphere then, it is fed with coagulants such as, Alum and made to settle in the clarriflocculator in which the floccs produced are removed and then water is taken for the filtration process where the water gets filtrated through series of sand bed filters later the clear water from filtration unit is disinfected by adding required amount of bleaching powder and liquid chlorine and finally it is stored in the storage sump. One of economical advantage of this treatment plant is that the treated water is lifted to the Bathi hill which is located beside the plant and from there the water is supplied to the public of Davangere city through pipelines hence; the power requirement for supply is less.

1.1 Materials and Methods

In this study, Grab Sampling was done at Five different Stations of the treatment plant and named as Station-1, Station-2, Station-3, Station-4, Station-5. During this study, Water samples are once in a month for about three months from March to May and analyzed titrometrically for five parameters like pH, Turbidity, Do, TDS and Total Hardness.

1.2. Observations

Table -1 *Average Readings of three months (March, April and May) were represented in the table below,*

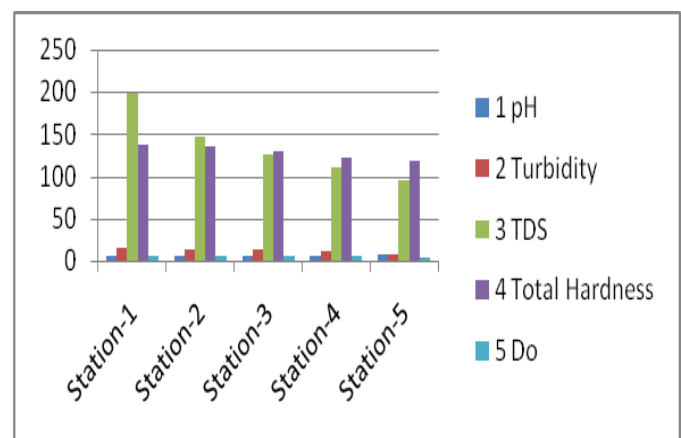| Parameter	S-1	S-2	S-3	S-4	S-5
pH	6.1	6.2	6.5	6.6	6.8
Turbidity	15	13	13	11	8
TDS	199	147	126	111	96
Total Hardness	138	135	129	122	119
Do	5.7	5.8	5.3	5.2	4.7

Fig -1: *Average Fluctuations of the parameters for three months is graphically represented*

1.3. CONCLUSIONS

It has been found that,

- ➢ Since, it was summer The raw water was less turbid and was odourless
- ➢ Total Hardness was initially slightly more but not more than standard value (300 mg/ltr). After treatment hardness was within limits of drinking standards.
- ➢ pH of the water varies from 6.1 to 6.8 which is desirable.
- ➢ Due to irregular cleaning of the clarriflocculator Coagulation process was not so efficient.
- ➢ Disinfection was done at unequal intervals of time and inadequate concentrations of chlorine.
- ➢ Maintenance of storage sump must be improved.

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