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Study On Sewage Quality From Sewage Treatment Plant At Vashi, Navi Mumbai.

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Abstract

The aim of this study is to evaluate the quality of sewage generated from 100 MLD Sewage Treatment Plant (STP) located at Vashi, Navi Mumbai which is based on latest Cyclic Activated Sludge Technology. Study of sewage quality of this plant is an essential as the most of the treated effluent discharged into Vashi Creek and remaining used for Gardening purpose. Water samples were collected from raw inlet and treated outlet and analyzed for the major waste-water quality parameters, such as pH, Biological Oxygen Demand (BOD), Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS) etc. The overall quality of sewage of 100 MLD Sewage treatment plant will be evaluated by collecting samples. The results of these evaluations also determine whether the effluent discharged into the water body are under limits given by MPCB.

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1. Introduction

The production of waste from human activities is unavoidable. A significant part of this waste will end up as wastewater. An understanding of the nature of waste-water is fundamental for the design of appropriate wastewater treatment plants and the selection of effective treatment technologies. The aim of wastewater treatment is to enable wastewater to be disposed safely, without being damage to public health and without polluting water bodies. Sewage

is 99 % water carrying domestic wastes originating in kitchen, bathing, laundry, urine and night soil. The objective of sewage treatment is to meet the relevant discharge standards laid down by the CPCB.

There is a Township newly established by CIDCO on the either side of Thane Belapur Road which is known as Navi Mumbai and is governed by Navi Mumbai Municipal Corporation. Population of Requirement of water for the Township is 317 MLD which is fulfilled by Morbe, Barvi and Hetwane dam, and generation of sewages is 245 MLD. The NMMC have provided seven Sewage Treatment Plants (STP) at various places. STP at Vashi has total capacity of 100 MLD. There are total six basins are provided. Maximum Effluent is discharged into Creek and remaining is used for gardening.

1.1 The Cyclic Activated Sludge Treatment Process

The Cyclic Activated Sludge Treatment Process System is operated in a batch reactor mode. The complete process takes place in a single reactor, within which all biological treatment steps take place sequentially. The complete biological operation is divided into cycles. Each cycle is of 3 – 5 hrs duration, during which all treatment steps take place.

- Fill-Aeration (F/A)
- Settlement (S)
- Decanting (D)

Fill-Aeration: The raw wastewater is filled in the C-Tech basin up to a set operating water level. Aeration is done simultaneously for a pre-determined time to aerate the effluent along with the biomass.

Settlement: After the aeration cycle, the biomass settles under perfect settling conditions.

Decanting: Once settled the supernatant is removed from the top by using decanter. Solids are wasted from the tank during decanting phase.

These phases in a sequence constitute a cycle, which is then repeated.

2. Methodology

Samples were collected from the influent and effluent of the sewage treatment plant. Samples have been collected ten times from date 2nd April 2015 to 29th April 2015. Collected samples were analysed for the important parameters Ph, BOD, COD, TSS etc. Samples were tested as quickly as possible after its collection. The results which are obtained after analysing samples from raw influent and treated effluent of STP are compared with standard parameter of MPCB.

3. Observation and Result

Samples were collected during period of one month was tested in the laboratory for four wastewater quality parameter pH, BOD, COD, TSS.

Table no. 1 listed test observations of wastewater quality parameters taken at Inlet and Outlet. The pH values of treated outlet observed in between 7.1 to 7.5 which are within the permissible limits as per MPCB. (MPCB Limit: 7-8). BOD values of treated outlet are in between 2.0 to 3.8 which are within the permissible limits of MPCB. (MPCB Limit: ≤ 5). Minimum COD value of treated outlet is 20 and maximum value is 32. which is much lower than MPCB limit. (MPCB Limit: ≤ 50). Minimum TSS value of treated outlet is 6 and maximum value is 6.6 which is again within the permissible limits of MPCB. (MPCB Limit: ≤ 10).

Table no.1 Results of wastewater quality parameter for the 10 samples collected at STP, Vashi.

S.No.	Date	pH		BOD		COD		TSS	
		Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
1	02-04-2015	6.23	7.41	115	2	224	25	168	6.7
2	05-04-2015	6.98	7.5	140	2.9	220	20	154	6.1
3	06-04-2015	6.78	7.46	115	2.8	238	25	178	6.4
4	12-04-2015	6.61	7.14	100	2	214	22	162	6.6
5	14-04-2015	6.75	7.3	116	2.5	230	25	175	6.4
6	17-04-2015	6.64	7.35	120	2.3	235	24	151	6
7	20-04-2015	6.95	7.3	116	2.4	240	25	182	6.4
8	23-04-2015	6.77	7.44	112	2.1	215	24	160	6.4
9	26-04-2015	6.78	7.46	115	2.8	238	25	178	6.4
10	29-04-2015	6.9	7.1	112	3.8	272	32	164	6.4

From the above obtained results BOD, COD, TSS removal efficiencies are calculated and graphs showing variations of these wastewater quality parameters at influent and treated effluent are plotted.

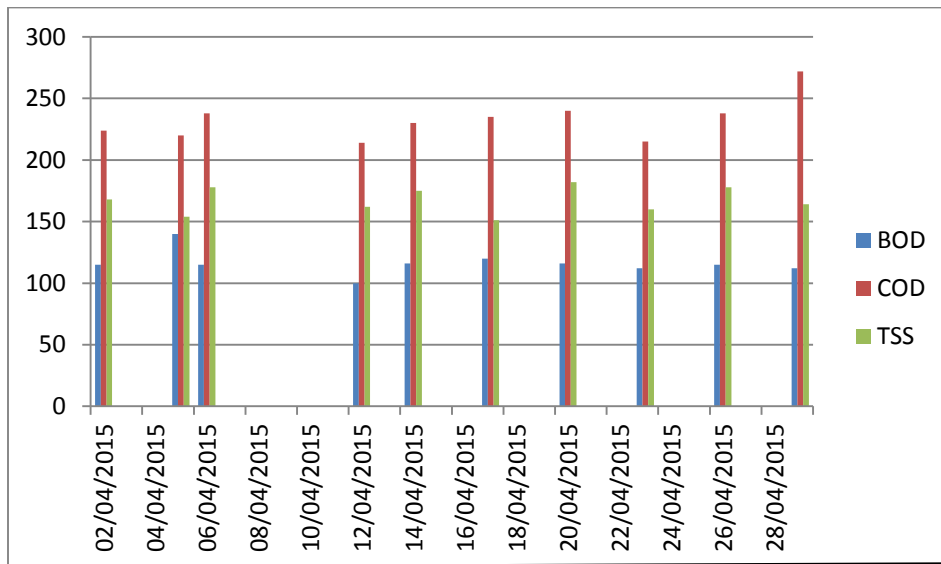


Fig.1 Variation of BOD, COD, TSS at Influent

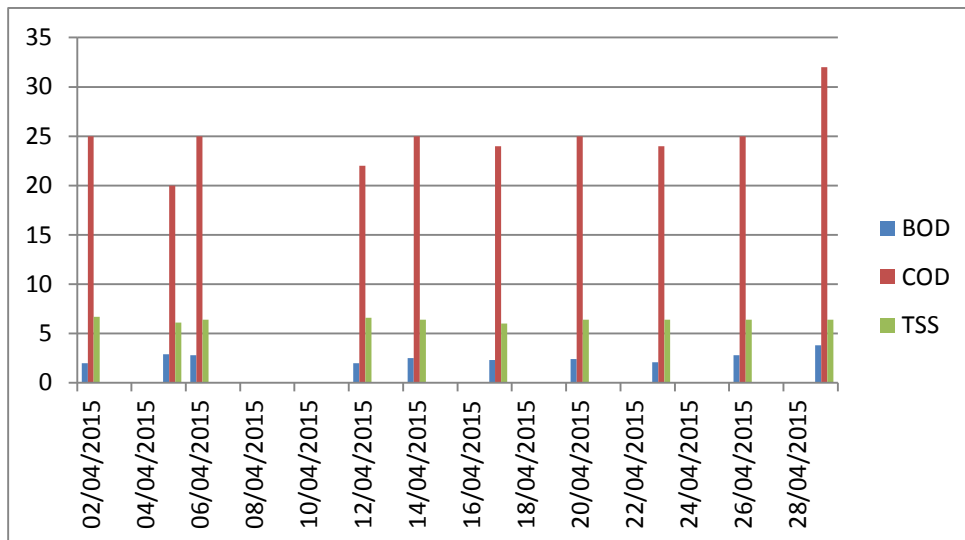


Fig.2 Variation of BOD, COD, TSS at Effluent.

4. Conclusion

A supply of clean water is an essential requirement for the establishment and maintenance of diverse human activities. Water resources provide valuable food through aquatic life and irrigation for agriculture production. The results indicates all major waste water quality parameters were reduced to much extend after the treatment and treated effluent values were well within limit of discharge into creek as per MPCB. Hence it concludes that STP based on C-TECH Technology is working with the standards given by MPCB. The results obtained indicates this latest technology is very effective in wastewater treatment.

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