

Life Cycle Costing on Sewage Treatment Plant

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Abstract— Over the recent years, sewage treatment is becoming an issue of paramount importance for cities and towns as government are not only giving emphasis to treat wastewater in order to protect their resources but also paying stress to the concept of reuse and recycling of waste waters to reduce burden on fresh water resources. Therefore this study is therefore performed with a key objective to evaluate the working performance of 100 MLD Activated sludge process technology based plant at pardi by analyzing the physico and chemical parameters and to design analysis of water treated through ASP Process. The study also tries to upgrade the ASP Process by suggesting recommendation for efficient management of waste water reaching the inland water bodies through daily generated municipal sewage. It compare with the standards permissible limit.

Key words: Sewage Treatment Plant, Activated Sludge Process, Chemical & physical Parameters, Overall Equipment Effectiveness. In India in Nagpur

I. INTRODUCTION

India is a developing country as well as fastest growing in world. To increase the economy of India it is necessary to give more attention on infrastructure development. As a population increase their infrastructure needs are also increases. While developing any infrastructure proper management is necessary. Here, LCC are carried out for STP's located in Nagpur city. In Pardi Plant Sewage Is Generated from Koradi thermal power plant and it is treated by Activated Sludge Process by used of different parameters in the process. Sewage also includes Liquid Waste from Industries Now day's greywater and impure water is becoming more same in the developed world with treated greywater being permitted to be used for cooling purpose in koradi plant. Why resue of waste water is required to reduce the ever increasing gap of Potable Water Supply and Demand in Urban Cities

To bring down slip charges of clean water resulted due to long distance transportation, gradie to mitigate conflicts of water resource allocation between the Domestic and Agricultural / Industry

To reduce groundwater extraction and Increase conservation of water resources

Make water and sanitation sector sustainable. Challenges of sewage treatment plant

Need Psychological acceptance to use sewage water as an alternative source.

In case of deficiency in quality/quantity of treated sewage water in unavoidable circumstances, the following additional precautionary measures have to be taken Side Stream filtration for C.W. System to reduce TSS. Additional chlorination in power plant area for disinfection.

Back-up source of fresh water (30%).

A. Data Collection

The Samples were collected at inlet and outlet points of the treatment units and analyzed as outlined in the standard methods for the examination of water and wastewater the parameters reading collected from the pardi sewage tretment plant and it compare with the standars permissible limit.

STANDARDS FOR SEWAGE TREATMENT PLANTS ALONG WITH TIME FRAME FOR IMPLEMENTATION			
Effluent discharged standards for Sewage Treatment Plant are mentioned below:			
Sl. No.	Industry	Parameters	Standards for New STPs (Design after notification date)*
	Sewage Treatment Plant	pH	6.5-9.0
		BOD	10
		COD	50
		TSS	20
		NH ₄ -N	5
		N-total	10
		Fecal Coliform (MPN/100ml)	<100

Note:
 (i) All values in mg/l except for pH and Coliform.
 (ii) These standards will be applicable for discharge in water resources as well as for land disposal. The standards for Fecal Coliform may not be applied for use

Table 1.1:

- Sewage treatment Pardi NMC Daily water sample analysis.
- Date-3-07-2017 Time-8:30
- The samples were collected in plastic sample bottles of 500 ml

Each and rinsed with the effluent water at the sampling points. inlect sample consisted of raw waste water entering the ASP plant through the inlet chamber while the outlet water consisted of treated water from the plant.

Parameters	pH	SS	TDS	BOD	COD	DO
Inlet	6.97	130	847	118	356	0.4
Outlet	7.46	36	36	17	64	5.1
MPCB NORMS	55	30	2100	20	100	
	TO	max	max	max	max	
	30					

Table 1.2:

II. LITERATURE REVIEW

A. DONGJ, 2012

Have carried out LCC on Sewage treatment plant. Water pollution increases day by day hence it was important to develop and improve the sewage treatment plant. Sewage treatment plant required huge investment and high operation and cost. Due to lack of technical level low quality of staffs and proper management. The performance of sewage treatment plant was poor LCC was necessary for proper management, to control the cost and useful in decision making process.

B. KOUL & SIBY, 2015

Have applied LCC analysis technique to STP. The STP's based on technologies were in practice. The performance of STP's was based on parameters like BOD, COD a TSS. After comparison of these parameters they found that there was no much more variation UASB reactor required larger land compare to other, therefore it required highest investment.

C. Sandeep Kumar Gautam et al (2013)

Carried Out a Conventional Kind of monitoring study. Parameters are used in sewage treatment plant:

1) BOD 2. COD 3. pH 4. SS 5. TDS 6. DO

1) BOD: $BOD_5 = [\text{oxygen consumed}] * \text{dilution ratio}$

Where,

$\text{dilution ratio} = \frac{\text{vol. of diluted sample}}{\text{vol. of undiluted sewage sample}}$

2) COD: COD can be determined if the chemical formulas and concentration of chemical compounds present in water are known.

3) TDS: $TDS = K_e EC$

Where,

$K_e =$ Corelation Factor

$EC =$ Electrical Conductor

4) DO:

III. CONCLUSION

This investigation of the working performance of the ASP plant located At pardi , Nagpur In This plant BOD and TDS are maximum as compare to the permissible limit. So we suggestion will given to the NMC to overcome the problems. Before this plant have capacity is 100MLD Now better result and more profit to Nagpur city such as they used portable water only for drinking purpose and waste water are treat and used in industrial purposes in koradi plant for cooling purpose.

REFERENCES

- [1] Abishek koul ,Siby John 2015. Comparative Evaluation of sewage treatment plant
- [2] Singh , D.D. and John, S., 2013. Study the different parameters of sewage treatment with ASP process
- [3] Waste Water sewage treatment reference book of punmia, jain
- [4] Base paper used from the Net