Design of Municipal Water Supply Treatment Plant

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Abstract - *Water is an important element of physical environment and a valuable resource with numerous and varied use. Industrialization made everything worse which in turn affecting water resources adversely by solid waste dumping, exposure to chemical and poisonous effluences etc. infiltration followed by participation causes the leachate and finds its way into the water source causing contamination. It threatens the health and well-being of mankind along with plants and animals. Here lies the importance of knowing the characteristics of river water and give an appropriate treatment methods and municipal area carrying safe and much pure drinking water. We choose Ramanattukkara municipality because it is highly industrialized area. We takes six spots which are near to the industries and collect the sample, conduct the sample test in laboratories. At finally we reach a conclusion.*

Key Words*: *water pollution, Industries

1. INTRODUCTION

Surface Waters comprise of flowing water as in river, other natural courses and irrigation canals. Water from rivers, streams and canals are generally more variable in quality and less satisfactory than those from lakes and impounded reservoirs. The quality of the water depends upon the character and area of the watershed, its geology and topography, the extent and nature of development by man, seasonal variations and weather conditions. Streams from relatively sparsely inhabited watersheds would carry suspended impurities from eroded catchment, organic debris and minerals salts. Substantial variations in the quality of the water may also occur between the maximum and minimum flows. In populated regions, pollution by sewage and industrial wastes will be direct. The natural and man-made pollution results in producing color, turbidity, tastes and odours, hardness, bacterial and other micro-organisms in the water supplies.

1.1 Scope of Project

1. The present treatment method evaluation.

2. Finding out what method of treatment more suitable for river water.

3. Present municipal issues regarding deficiency of drinking water got mitigated by providing safe and wholesome water to consumers.

1.2 Aims and objectives

1. To collect the water sample from river.

2. To conduct all the tests and representing in graphically.

2. LABORATORY TEST AND RESULT

The sample is collected from Chaliyar river in ramanattukara municipality. This is the first sample and carried out the testes on environmental engineering lab, the sample is shows the color difference and the sedimentation rate is very less.

Table -1: laboratory result

Sl. No.	Characteristics	Analysis Method	Desirable limits	Actual contents	Unit
1	Turbidity	Nephelometric	1	3.5	NTU
2	Taste , Color & Odor	Visual comparison	Unobjectionable	Turbid, Pungent Smell	
3	pH	Electro meter	6.5-8.5	7.8	
4	Electrical conductivity	Conductivity meter		62.8	µS/cm
5	Total dissolved solids	Gravimetric	500	58.0	mg/litre
6	Alkalinity(Total)	Titrimetric	200	15.0	mg/litre
7	Total Hardness (as $CaCO_3$)	EDTA Titrimetric	200	25.0	mg/litre
8	Chloride	Titrimetric	250	18.0	mg/litre
9	Calcium hardness	EDTA Titrimetric	75	14.0	mg/litre
10	Calcium	EDTA Titrimetric	75	12.0	mg/litre
11	Iron	Spectrophotometric	0.3	1.6	mg/litre
12	Sulphate	Spectrophotometric	200	73.0	mg/litre
13	Magnesium	EDTA Titrimetric	30	0.3	mg/litre
14	Total coliforms	m-Endo Method	Zero	Nil	MPN/100ml
15	*E.Coli*	m- FC Method	Absent	Absent	MPN/100ml
16	*BOD*	Titrimetric method	5	3	mg/litre
17	*COD*	Digestion/ Titrimetric method	250	200	mg/litre

For drinking water BOD has to be less than 5 mg/L and for treated wastewater to be disposed of in the water bodies it is 30 mg/L, 100 mg/L if treated waste water is discharged into the sewerage system in India. No Bacterial Presence found, Turbidity and Iron content is high, Other Physical and Chemical Parameters are within the limit. Based on this result get an idea about that sample and know about the chemical charactristics, colour, odour, taste ,BOD and COD.

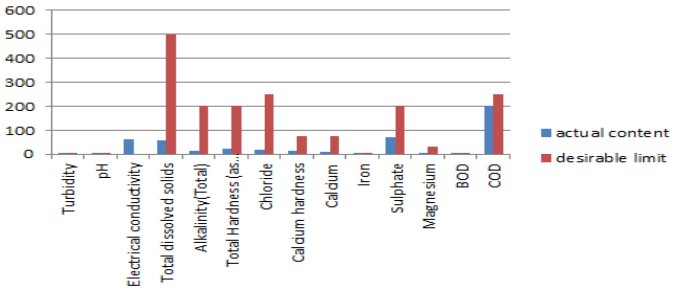

Chart -1: Graphical report of the result

The graphical representation is gives the comparison form of actual content and desirable limit.

Fig -1: collected sample

3. CONCLUSIONS

It is commonly treated using either a settling or filtration process. Depending on the application, chemical reagents will be dosed into the wastewater stream to increase the effectiveness of the settling or filtration process. Potable water treatment and municipal wastewater plants often remove turbidity with a combination of sand filtration, settling tanks, and clarifiers. In-situ water treatment or direct dosing for the treatment of turbidity is common when the affected water bodies are dispersed (i.e. there are numerous water bodies spread out over a geographical area, such as small drinking water reservoirs), when the problem is not consistent (i.e. when there is turbidity in a water body only during and after the wet season) or when a low cost solution is required. In-situ treatment of turbidity involves the addition of a reagent, generally a flocculants, evenly dispensed over the surface of the body of water. The flocs then settle at the bottom of the water body where they remain or are removed when the water body is drained. This method is commonly used at coal mines and coal loading facilities where storm water collection ponds have seasonal issues with turbidity. A number of companies offer portable treatment systems for in-situ water treatment or direct dosing of reagents. There are a number of chemical reagents that are available for treating turbidity. Reagents available for treating turbidity include aluminium sulfate or alum ($Al_2(SO_4)_3 \cdot nH_2O$), ferricchloride ($FeCl_3$), gypsum ($CaSO_4 \cdot 2H_2O$), poly-aluminium chloride, long chain acrylamide-based polymers and numerous proprietary reagents.[22] The water chemistry must be carefully considered when chemical dosing as some reagents, such as alum, will alter the pH of the water. The dosing process must also be considered when using reagents as the flocs may be broken apart by excessive mixing. Conductivity is proportional to dissolved solids. Reducing the dissolved solids would be the only way to decrease conductivity. Reverse osmosis (RO) is effective but expensive. Iron filters (such as a manganese greensand filter) are a common treatment for red-water iron levels up to 10-15 mg/L. Aeration (injecting air) or chemical oxidation (usually adding chlorine in the form of calcium or sodium hypochlorite) followed by filtration are options if iron levels are more than 10 mg/L.

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