Reuse of Waste Water by Low Cost Method

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Abstract - In recent years water pollution problems has arised in metropolitan region in India. In this study Rasayani Region is considered which is situated in Raigad District. Waste Water Parameter such as BOD, COD, are calculated from various areas of Rasayani Region. So by Analyzing and studying BOD, COD, method of treatment has been suggested. Low cost sanitation techniques are used to minimize main constituents of water pollution. Water Conveyance system from Rasayani to Treatment plant is designed for this study and found to be economical. The stabilization pond is designed for waste water treatment to reduce organic content. As a result this will allow the key objective of reuse increasing the water resource for various purposes such as water for industries, domestic and for public use.

Index Terms - Low cost technique, Stabilization pond

I. INTRODUCTION

Throughout the last two decades, municipal wastewater reuse has emerged as an important and viable means of supplementing dwindling water supplies in a large number of regions throughout the world. In many instances, reuse is also promoted as a means of limiting wastewater discharges to aquatic environments. Reclamation and reuse hazards are usually defined according to standards issued or recommended by local authorities or international agencies.

In examining the rationale behind such approaches, several inconsistencies are apparent. These include agreement on key parameters, philosophical differences in the approaches taken to risks assessment and management, the adequacy of control parameters, a lack of definition of appropriate sampling points, and the number of samples and analysis necessary. Successful reclamation and reuse practices require careful planning steps, economic calculations, and detailed social considerations and assessments. Then individual scenarios must be established for the correct comparison of the possible alternatives, including all the data needed to reach a true comparison, comprehensive evaluation
and finally, a correct decision.

From the 'zero scenario' (no reuse) to theoretically more complex and expensive scenarios (e.g. reclamation using reverse osmosis), adequate tools are required to help stakeholders consider the best options for improved management of water resources. Among the available tools, decision support systems are essential for evaluating knowledge. However, the effectiveness of such processes will depend on the thoroughness of preliminary studies undertaken to adequately characterize the necessary technologies and schemes. As public health concerns are usually among the main constraints for reuse, risk assessment, based on public health hazard calculations, is an important basis for several definitions in reclamation and reuse projects.

II. NEED FOR THE STUDY

Fisheries

Clear and crystal water is critical to plants and animals which live in water. This is important to the fishing industry, sport fishing enthusiasts, and for many operations.

Wildlife Habitats

Our rivers and ocean are teem with life which depends upon shoreline, beaches and marshes. They are critical habitats for thousands of species of fish and other aquatic life. Migratory water birds shift for the purpose of resting and feeding.

Recreation and Quality of Life

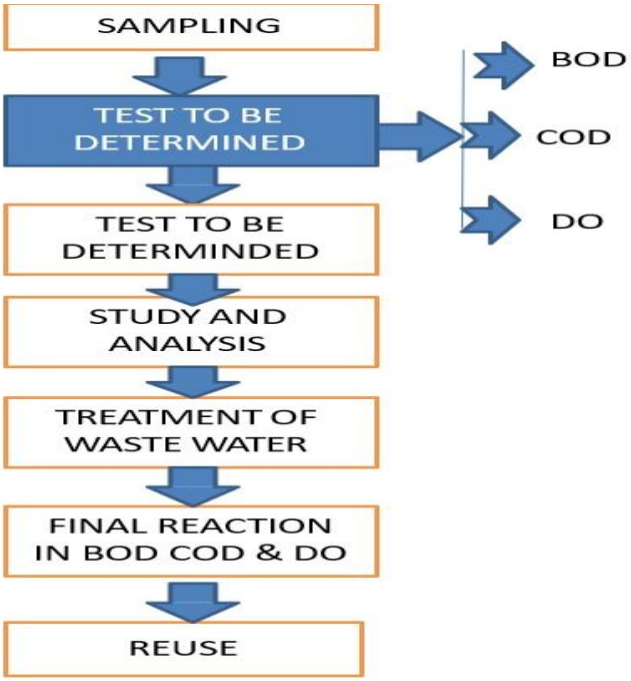
Water is great playground for us all. The scenic and recreational values of our waters are reasons many people choose to live where they do. Visitors are drawn to water activities for recreation purposes.

Health Concerns

If it is not properly cleaned, may carry disease. Since we live, work and play so close to water, harmful bacteria have to be removed in order to render water safe.

It's a matter of caring for our environment and health.

III. METHODOLOGY



Flowchart of the study

SAMPLING FROM DIFFERENT AREAS:

1) HOC COLONY: Population: 1000 including residential and commercial areas, sampling is done for BOD and COD.
2) REES: Population 8632 including residential and commercial areas, sampling is done for BOD and COD.
3) CHAMBHARLI: Population 30000 including residential areas sampling is done for BOD and COD.
***4) MOHOPADA*:** Population 9694 including residential and commercial areas, sampling is done for BOD and COD.

Analysis and Study:

Samples were collected from various locations: Mohopada, Chambharli, and Rees and HOC colony. BOD and COD are two important parameters used in estimating the degree of organic pollution in wastewater. The determination of BOD is tedious and time consuming and depends on biochemical factors while COD is precise, saves time and completely chemical in nature. COD is independent of biochemical factor.

We have studied various methods 1) RBCs 2) Anaerobic lagoon 3) Oxidation pond. We will determine which method is more profitable and convenient, can be used economically for low cost reuse of waste water.

IV. RESULTS AND DISCUSSION

Sewage samples were taken from different areas of the Rasayani region. These areas are HOC Colony, Chambharli, Mohopada, and Rees.

Following table shows the computed values of BOD and COD.

Table 1 BOD and COD values for Rasayani region

TEST	HOC	Chambharli	Mohopada	Rees
BOD	194	240	382	352
COD	318.03	557.37	626.22	577.04

Based on above result low cost treatment is provided to reduce the impact of BOD and COD. Stabilization pond having efficiency of 80 to 90% can be provided for the Rasayani region. For the collection/conveyance of waste water from different areas of Rasayani Region to Stabilization the conveyance system is designed. The conveyance system can be designed by using the formulae hazen – Williams formulae. So the diameter of the conduit for the conveyance of the waste water to the treatment is found to be 35cm.

By considering 50000 population and rate of water supply 135 lpcd stabilization pond for low cost treatment is designed

And its dimensions are length as 360m and breadth as 120m.

V. CONCLUSION

In this thesis we have covered the area from Rasayani region (Hoc colony, Rees, Chambharli and Mohopada). So generally all these areas are residential and commercial. From each area we have collected waste water sample and tested for BOD and COD. It is observed that COD and BOD value for Mohopada Region is around 626.62Mg/L and 382.2Mg/L.

We have studied different Low cost methods to reduce BOD and COD from that we have selected Stabilization pond method to reduce BOD and COD. The design of Oxygen pond is carried out to know the complete dimensions with conveyance system is designed. The expected reduction by using Stabilization pond for COD and BOD are 80 to 90%.

VI. REFERENCES

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