

# EXPREMENTAL STUDY OF CHARACTERISTICS OF WASTE WATER AND DESIGN OF TREATMENT PLANT

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## ABSTRACT

The steady incremental in the bharathiyar institute of engineering for women students population results in the increase of domestic sewage generation .but till date the waste water treatment facility is not available. Hence it is essential to design a sewage treatment plant with sufficient capacity to treat the increasing amount of sewage generation.

The project deals with the design of the sewage treat plant and its major components such as **Screening chamber, Grid chamber, Aeration tank, Secondary clarifier, Active sludge tank and Sludge drying beds**. The location of engineering college, and almost the entire town and its environment are plain and the general gradient is from south to north.

The soil of the area is being gravel, rocky and a large proportion of sand and gravel.

While designing the projects, the climatic condition, topography and the projected of student population rate are considered. By the execution of the project the entire sewage of the college can be treated effectively and efficiently.

## INTRODUCTION

Sewage treatment is the process of removing contaminants from waste water and household sewage, both runoff (effluents) and domestic. It includes physical, chemical, and biological processes to remove physical, chemical, and biological contaminants. Its objective is to produce a treated effluent and a solid waste or sludge suitable for discharge or reuse back into the environment. This material is often inadvertently contaminated with many toxic organic and inorganic compounds.

Sewage implies the collecting of wastewater from occupied areas and conveying them to some point of disposal. The liquid wastes will require treatment before they are discharged into the water body or otherwise disposal of without

endangering the public health or causing offensive conditions.

Water is a precious commodity. Most of the earth water is sea water. About 2.5% of the water is fresh water that does not contain significant levels of dissolved minerals or salt and two third of that is frozen in ice caps and glaciers. In total only 0.01% of the total water of the planet is accessible, more than one in six people still lack reliable access to this precious resource in developing world.

The raw water quality available in India varies significantly, resulting in modifications to the conventional water treatment scheme consisting of aeration, chemical coagulation, flocculation, sedimentation, filtration and disinfection. The backwash water and sludge generation from water treatment plant are of environment concern in terms of disposal. Therefore, optimization of chemical dosing and filter run carries importance to reduce the rejects from the treatment plant.

Also there is a need to study the water treatment plants for their operational status and to explore the best feasible mechanism to ensure proper drinking water production with least possible rejects and its management.

## **SCOPE**

Determine the physical characteristics of sewage like turbidity, odour, temperature.

Determines the chemical characteristics of sewage like sulphides, chlorides, nitrates, lead, total solids, suspended solids.

Determines the biological characteristics of sewage like BOD&COD content.

## **NEED FOR STUDY**

The student population is increasing every year and the sewage generation in the college is also increasing rapidly. Thus, a sewage treatment plant is essential in the college campus.

The land around the college are agricultural land so a treatment plants is very essential to prevent the contaminates from entering those agricultural land which would affect the cultivation

## **TREATMENT OF SEWAGE**

The treatment of sewage consists of many complex functions. The degree of treatment depends upon the characteristics of the raw inlet sewage as well as the required effluent acharacteristic

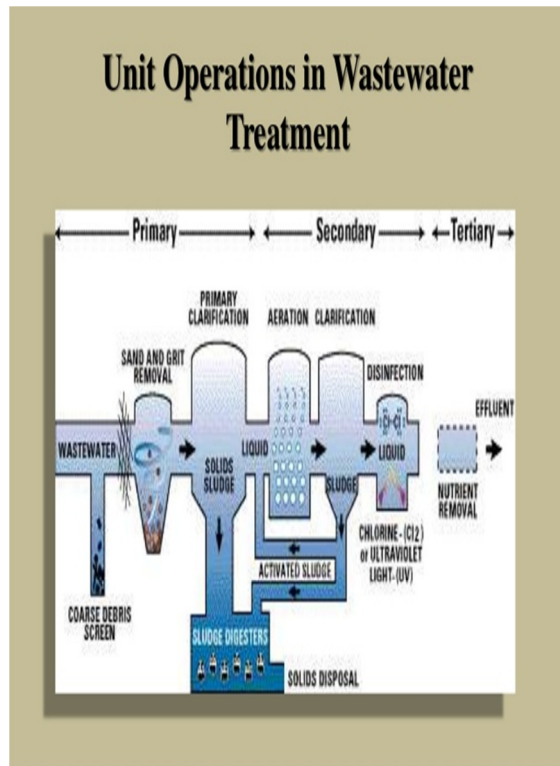
.Treatment processes are often classified as:

Preliminary treatment

Primary treatment

Secondary treatment

Tertiary treatment



## PRELIMINARY TREATMENT

Preliminary treatment consists solely in separating the floating materials like tree branches, papers, pieces of rags, wood, etc. and heavy settleable inorganic solids. It helps in removal of oils and greases and reduces the BOD by 15% to 30%. The processes under this are:

Screening - to remove floating papers, rags, clothes.

Grid chamber - to remove grit and sand.

Skimming tank - to remove oils and greases.

## PRIMARY TREATMENT:

Primary treatment consists in removing large suspended organic solids. It is usually accomplished by sedimentation in settling organic solids. The liquids effluent from the primary treatment often contains a

large amount of suspended organic material and has a high BOD (about 60% of original)

## SECONDARY TREATMENT:

Here the effluent from primary treatment is treated through biological decomposition of organic matter carried out either aerobic or anaerobic conditions.

### Aerobic biological units:

Filters (intermittent sand filters, trickling filters)

Activated sludge plant (feed of active sludge, secondary settling tank aeration tank)

Oxidation tank and aeration lagoons

### Anaerobic biological units:

Anaerobic lagoons

Septic tanks

Imhoff tanks

The effluent from the secondary treatment contains a little BOD (5% to 10% of original) and may contain several milligrams per liter of DO.

## Activated Sludge Plant



## TERTIARY TREATMENT

The purpose of tertiary treatment is to provide a final treatment stages to raise the effluent quality before it is discharged to the receiving environment (sea, river, lake ground, etc.). More than one tertiary treatment process may be used at any treatment plant.

## CONCLUSION

Effluent from the treatment is absolutely free from the contaminants is safe for disposal.

This sewage effluent can be used for sewage flood irrigation for the agricultural lands after proper aeration process has been done.

Sewage effluent can be used for sewage flood irrigation for the agricultural lands after proper aeration process has been done.

Effluent can also be used for gardening purpose in the college campus, so that the water usage can be reduced and used effectively.

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