JSS COLLEGE OF ARTS, COMMERCE AND SCIENCE

(An Autonomous College of University of Mysore, Re-accredited by NAAC with 'A' Grade)

Ooty Road, Mysuru-570025, Karnataka

A REPORT SUBMITTED TO DEPARTMENT OF ENVIRONMENTAL STUDIES

SUBMITTED TO:

The Dept. Of Environmental studies
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Year/Sem: I year II Sem

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CERTIFICATE

It is hereby certified that Mr/Ms Manasa N of BA (HEG)has undergone and completed field visit of Sewage treatment plant as part of the curriculum in the course Environmental Studies in SECOND SEMESTER of the year 2019-2020.

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UNIT 2: SEWAGE WATER TREATMENT

CONTENTS:

SEWAGE MICROBIOLOGY

Sewage is waste water from a community, containing solid and liquid excreta, from houses, streets and yard washing, factories and industries, it resembles dirty water an unpleasant smell

Constituents:

Sewage contains 99% of water. The solids which comprise barely 0.1% are partly organic and partly inorganic; they are partly suspension and partly in solution. The offensive nature of the sewage is mainly due to the organic matter which it contains.

Why sewage purification?

If the sewage disposal is not properly done, the following environmental problems mmay be created.

- Creation of nuisance and unpleasant water
- Breeding of flies and mosquitoes
- Pollution of soil and water supplies
- Contamination of food
- Increasing in the incidence of diseases.

The raw sewage should not discharged into the rivers, sea or other sources of water supply. This is because, the oxygen in the water supply is used up y the numerous aerobic bacteria found in the sewage. Depletion of oxygen may lead to the depth of the plant and animal life in water.

AIM:

The aim of sewage treatment is to " stability" the organic matter so that it can be disposed off safely and to convert the sewage water into an effluent of an acceptable standard of purity. Which can be disposed off into the ground , land ,sea. The " strength " of the sewage is expressed in the terms of **BIOCHEMICAL OXYGEN DEMAND (BOD)**.

MUNCIPAL SEWAGE FARM, VIDYARANYAPURAM, MYSORE

A brief history

Sewage treatment is situated at vidyaranyapuram, mysore .it was established in 1998. totally 18 months was taken to build it. The cost of this plant is 10.31 crores.

The plant consist of 18 acre of land. This is entirely open chamber and also pure aerobic.

The domestic and industrial waste water from different areas of myosre city are collected here. It consist of bboth organic and inorganic waste. In this plant only PRIMARY TREATMENT is done. In primary treatment, the solids are separated from the sewage partly by sedimentation.

METHODS INVOLVED IN PRIMARY TREATMENT

Primary treatment is a physical treatment in which various mechanical deices are used to remove suspended and flowing solids from sewage. This includes the following steps

- Screening
- Grit chamber
- Sedimentation

SCREENING:

The sewage coming from the mysore city is collected inside the plant by inlet chambers. The coming water is called *row water*. From this inlet chamber, it is passed through channels. The Screens are placed horizontally on these channels. The metal screen intercepts large floating subjects such as wood, rags, masses of garbage and dead animals. Their removal is necessary to prevent clogging of the treatment plant. Therefore solid free waste is passed from this channel to grit chamber.

GRIT CHAMBER

They are located before the primary sedimentation tank. In this chamber the sewage flows through the chamber in a horizontal direction. Special influent distribution gauges are present to control the entry of sewage.

Water is rest at 5 days in this grit chamber. The function of the grit chamber is to allow the settlement of heavier solids such as sand, gravel, while permitting the organic matter to pass through. All these materials together constitute " GRIT"

The grit which collects at the bottom of the chamber is removed periodically or continuously disposed by dumping or trenching.

AERATORS

Then this water is treated to aerators. Aerators are nothing but open chambers where aerobic digestion of water takes place.

Inlet chamber	7.4m* 2.75m* 1.32m SWD
Screen chamber	1.6m*1.26m SWD
Grit chamber	2 nos. 20m*5.68m malide
Parshoul chamber	2 nos . 5.8844m length
Division bar	6.63m*2.67m * 0.87m
Facultative aerated lagoons(eastern and western)	150m*300m *4.00m deep +0.5m FB
Sedimentation basin(Northern and southern)	150m*170111*1.27m deep+ 0.5m FB
Aerator control panel 100m	6.0m *3.6m*3.5m height

LAGOONS

The sewage coming from the grit chamber enters the lagoons. This lagoon has 150*300*4m in diameter. Here the lagoons are divided into based on the locality of lagoons. They are

- eastern lagoon
- western lagoon

The sewage from the grit chamber flows in two direction by separated channels. The sewage enters the eastern and western lagoons.

Eastern lagoon

The water enters the eastern lagoon is aerated with the help of aerator. For these aerator the required quality of air is supplied. The velocity of agitation of sewage governs the separation of the grit particles. This aerator consist of cylindrical tanks in which the flow of water enters tangentially in a centrifugal direction. So that it tends to grit separation

Each of these lagoons has 6 walk ways and 3 aerators in each walk way. So that, 18 aerators are present in eastern lagoons.

Western lagoon:

This lagoon has 18 aerators and 6 walk ways. Here also the process is same as that of eastern lagoon.

The aerator has a rotation of 56 RPM .after aeration period the sewage water somewhat pure and does not contain solid waste. This water moves to the sedimentation tank.

From the eastern lagoon the water enters to northern sedimentation tank and western lagoon were goes to eastern sedimentation tank through a channel.

Sedimentation:

The aerated water comes to the sedimentation tank. Here it is left and undistributed for some days. During this period of relatively still condition in the tank, a very considerable amount of purification takes place. Mainly sedimentation of suspended matter . Nearly 50-70% of solids settles down under the influence of gravity a reduction of between 30-40% in the number of coli forms organisms is obtained. This organic matter which settles down is called sludge is removed by mechanically operated devices, without disturbing the operation in the tank. Some of the microorganisms present if the sewage attack complex organic solids and break them down into simpler soluble substances and

ammonia. A certain amount of fat and grease raised to the surface to form scum which is removed from time to time and disposed off.

Northern sedimentation tank is also called outlet channel. Here finally treated water is stored. Totally 67.65 million gallons capacity of water is stored here.

Disposal of effluent:

Through outlet channel purified water is released to " DALAVAI" Lake and other places. Finally this water is used for irrigational purposes, not for general purposes.

The crops that are found suitable to grow are those which do not come in contact with sewage and likely to be eaten raw. Fodder grass seems to the most paying crops. Fruits trees are high above the ground level can be grown. But sugarcane, coriander, cucumber, tomato, onion etc., should not be grown.

FLOW DIAGRAM OF PRIMARY SEWAGE TREATMENT PLANT

→ screen → grit hamber → primary sedimentation tank →

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Methane gas ← Sludge digester

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Sludge drying beds

CONCLUSION:

By visiting municipal sewage water treatment vidyaranyapuram, we finally know that how primary water treatment is done without the help of any chemicals. Here sewage treatment is done only with the help of aerobic microorganisms. Oxygen and sunlight rays play an important role in this treatment.