Name .S. Mutasim Billah

ID 7725

Section C

Subject Waste Water Engineering

Teacher Engr Nadeem ullah

Q no 1

Ans

Waste Water Treatment :-

Waste water Treatment is a process used to remove Contaminants from Wastewater for Sewage and Convert it into an effluent that can be returned to the Water Cycle With minimum impact on the environment or directly reused. The latter is Called Water reclamation because treated Wastewater can be used for other purposes.

Importance of Waste water Treatment

- The principal objective of Wastewater Treatment is generally to allow human and Indultrial effluents to be disposed off Without Causing danger to human health or unacceptable damage to the natural environment.
- Wastewater if properly Treated is an Important resource and can be used for various purposes Including irrigation, lawn watering Car washing, flushing toilets and landsclaping.
- Waste water Treatment can also generate biogas as final product Which is potential source of Energy.

Rectangular Tank :-

These are the most widely used Tanks. it has a greater Surface Area While a Cylinderical Water Tank has the least possible ratio of Circumference to the area. i.e Less Surface area than a box-Shaped water Tank that holds the Same ~~amounts~~ amounts of Water Economical Comparison for Smaller Capacities. rectangular Shape tank is economical.

So rectangular Tanks are prefered over Circular Tank for the removal of Settlable Solids.

Q2

Ans

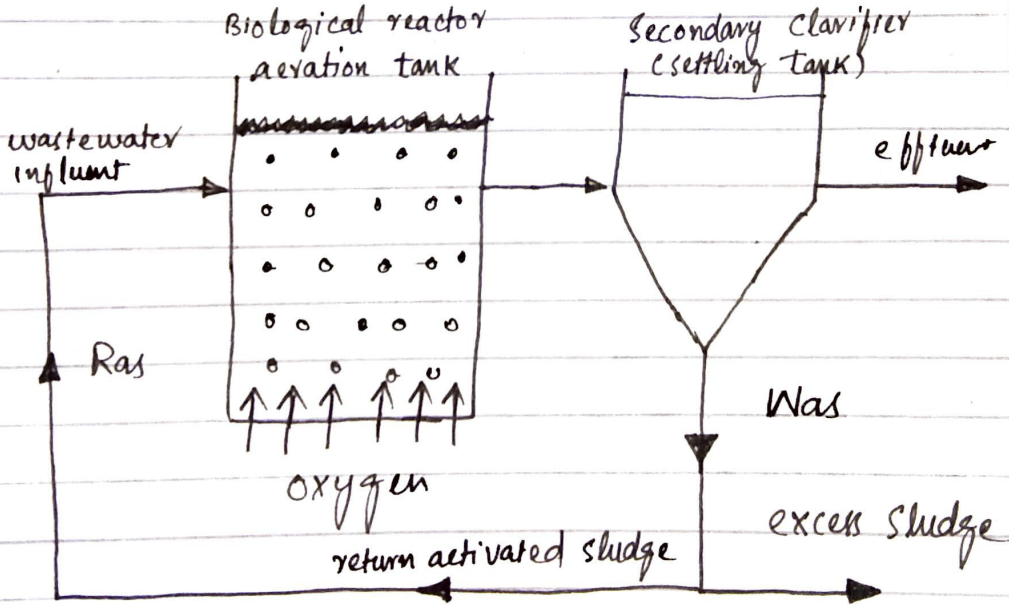
Difference blw Aerobic and Anerobic Treatment

Parameter	Aerobic Treatment	Anerobic Treatment
Application	Low to medium Strength wastewater (<1000 ppm) e.g Municiple Sewage, refinery waste water, etc.	Medium to high Strength wastewater (>4000 ppm) e.g food and beverage Industry waste water
Capital Investment	Relatively high	Relatively low with pay back
Energy Consumption	Relatively high	Relatively low
Foot print	Relatively large	Relatively small and Compact
Net Sludge yield	Relatively high	Relatively low
Post-treatment	Typically direct discharge	Required to fullfil Wastewater Standard discharge requirement.
Example Technologies	Activated Sludge process, Trickling filter and Rotating Biological Contactor	Anaerobic Digestor, Continous Stirred Tank Reactors, Sequencing Bath Reactors

Activated Sludge process

- Micro-organism responsible for treatment are maintained in **liquid suspension** by appropriate mixing **method**.
- Main Consitituents of Asp are Aeration tank in which oxygen is provided for the micro-organisms to grow. This aeration also helps to keep micro-organisms in suspension.
- Aeration tank is followed by clarifier in which the micro-organisms form flocs and settled down at the bottom.
- Formation of floc particles, ranging in size from 50 to 200 μm, removed by gravity settling, leaving relatively clear liquid as treated effluent.
- A part of settled bio flocs are recycled back to the aeration tank to maintain certain amount of micro-organisms in the system for efficient operation of the system.
- Remaining settled bio flocs are removed from the system and is termed as wasted Activated Sludge.
- Aps involved production of activated mass of micro-organisms capable of stabilizing waste under aerobic conditions;

- In aeration tank, Contact time is provided for mixing and aerating influent Wastewater with microbial Suspension generally refferred to mixed liquor Suspended Solids.
- Typically 99% of Suspended Solids and up to 90% of dissolved organics are removed by Activated Sludge process.
- The main draw back associated with Aps is its high electricity Consumption particularly for aeration.



Q3

Ans

Assimilative Capacity of Receving Bodies :-

- Assimilative Capacity of receving water bodies refers to the ability of a body of water to clean itself; it is the capacity to receive Waste waters Without deterious effects and Without causing damage to aquatic life or humans Who Consume the water. it is level to Which water body or nature Control the Toxicity without affecting the aquatic life.

- Although Waste water is properly treated before it is disposed of to the natural Water Streams still it has impurities / pollutants that need to removed or make them less effective So that the receiving water bodies may not become unstable for use or cause damage to the aquatic life.

Assimilative Capacity help in Waste water treatment

Assimilative Capacity help in waste water Treatment utilization of the biological Chemical and physical properties of Terretrial Environment to further Solid and liquid waste beyond the waste water Treatment plant.

The concept of assimilative capacity has been suggested as a basis of permitting the controlled of disposal of anthropegenic wastes in the ocean. this has been applied for the disposal of radioactive wastes, mercury and bacteria and extended to overall health of the ecosystem are considered.

Q4

Ans

Sludge Management :-

Sludge Management describes the processes used to manage and dispose of sewage Sludge produced during sewage treatment. Sludge is mostly water with lesser amount of solid material removed from liquid sewage. primary Sludge includes settelable solids removed during primary Treatment in primary clarifiers. Secondary sludge separated in Secondary clarifiers includes Treated sewage sludge from Secondary treatment bioreactors.

Advantages :-

(1) Diverse Can be used for one house hold up a huge plant.

(2) Remove organics.

- Oxidation and Nitrification Achieved.
- Biological Nitrification without adding Chemicals.
- Biological phosphorus Removal
- Solid / liquid Seperation
- Stabilization of Sludge.
- Capable of removing 97% of Suspended Solids.
- The most widely used waste water treatment process.

Q5

Ans **EIA :-**

A technique and a process by which information about environmental effects of a project is collected both by the developer and from other sources, and taken into account by the planning authority in forming the judgement on whether the development should proceed.

Parameter to be considered while Conducting EIA for newly proposed Waste water treatment plant

Although legislation and practice vary around the world, the fundamental components of an EIA would necessarily involve the following stages.

- Screening to determine which project or developments requires a full or partial impact assessment study.
- Scoping to identify which potential impacts are relevant to assess (based on legislative requirements, international conventions, expert knowledge and public involvement) to identify alternative solutions that avoid mitigate or compansate adverse impact on biodiversity.

- Assessment and evaluation of impact and development of alterndtives ... to predict and identify the likely environmental impact of a proposed project or development including the detailed elaboration of alternative.
- Reporting the Environmental Impact Statement (EIS) or EIA report, Including an environmental management plan and a non technical summary for the general audience.
- Review of the Environmental Impact Statement based on the terms of Refrence and public partcipation.

Environmental Impacts Assessment and Mitigation Measures

The first attempt to assess the environmental impacts was done with in the initial Environmental Examination. (IEE level Study) using the basic data from this study following genral recommendation for elaboration of the Environmental impact using update information and large amount of new data and taking into consideration all media and their interaction detailed Envoronmental Impact Study was prepared an order to assess in more detail in possible

Impact during Construction, operation phase and post operation phase (closure) or some changes which are planned in the view of capacity and technology, of the access roads main collectors, Siphon and WWTP. the followings phases and activities have been taken in Consideration.

Construction phase :-

- Construction of the access roads in main collectors (left and right river bank)
- Construction of the Siphon structure across the river varder.
- preparatory works at the location of WWTp. and excavation works.
- Transport and disposal of surplus excavated material.
- Construction of the structures of the WWTp (Civil work, use of heavy machinery and vehicles).
- Disposal of construction waste
- Installation of equipment.