Name: Ahmad Ajaz

I.D: 7780

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Subject: waste-water engeneering

Instructor: Nadimullah Sahab

Exams: Finnal Jetm.

Qno1 What is wastewater treatement and its importance?

Ans(A) wastewater treatement is the means by which water that has been used and/or contained by humans or nature is restored to a desirable quality. Treatement may consist of chemical, biological, or physical process or a combination thereof. Water may be treated to any of level of quality desired; however, as its purity increases, so does the cost of attaing that purity. The required quality of water is dicateted by its intended use, for example, aquatic life, drinking water, or irrigation The purpose of this chapter is to describe wastwater treatement technologies predominantly in use day.

ultimately, the technology selected as appropriate for one application may not be the optimal for another. Selection will be based on site specific factors such as resources available, climate, and availability, economic etc.

(B) Why rectangular tanks are preferred over circular tanks for removal solids during peliminary treatement?

Ans The shape of the rectngular clasifiers provides a longer path for waste water flow and the suspended soilds to travel, and subsequently longer detention time which warrantants less short circuiting and more sludge setting compared to the center-feed peripheral overflow circular clasifies. In addition

flow distribution among several classifiers is usually more even and often requires less head loss for rectangular classifiers.

Qno2. What is the difference b/w aerobic and aneorbic wastewater treatment?

AEROBIC WAST-WATER TREATMENT.

Ans. Aerobic process use bacteria that require oxygen. So, air is circulated throughout the the treatement tank.

- These aerobic bacteria then break down the waste within the wastewater.
- Some systems utilize a pretreatment stage prior to the main treatment to reduse the chance of clogging the system.
- Electeriaty is required For system operation.

ANAEROBIC waste wáter Jreatement

- Anaerobic bacteria transform

organic matter in the wastewater into biogas that contains large amounts of methane gas and carbon dioxide.

- Energy-efficient process
- often used to treat industrial wastewater that contains high levels of organic matter in warm temperatures.
- It can be used as a pretretmnt prior to aerobic municipal waste water treament

- Briefly describe Activated sludge process with diagram.

Ans

Activated Sludge process:-

- Process for treating sewage or industrial wastewater using aeration and a biological floc composed of bacteria and protozoa. floc composed of bacteria and protozoa.

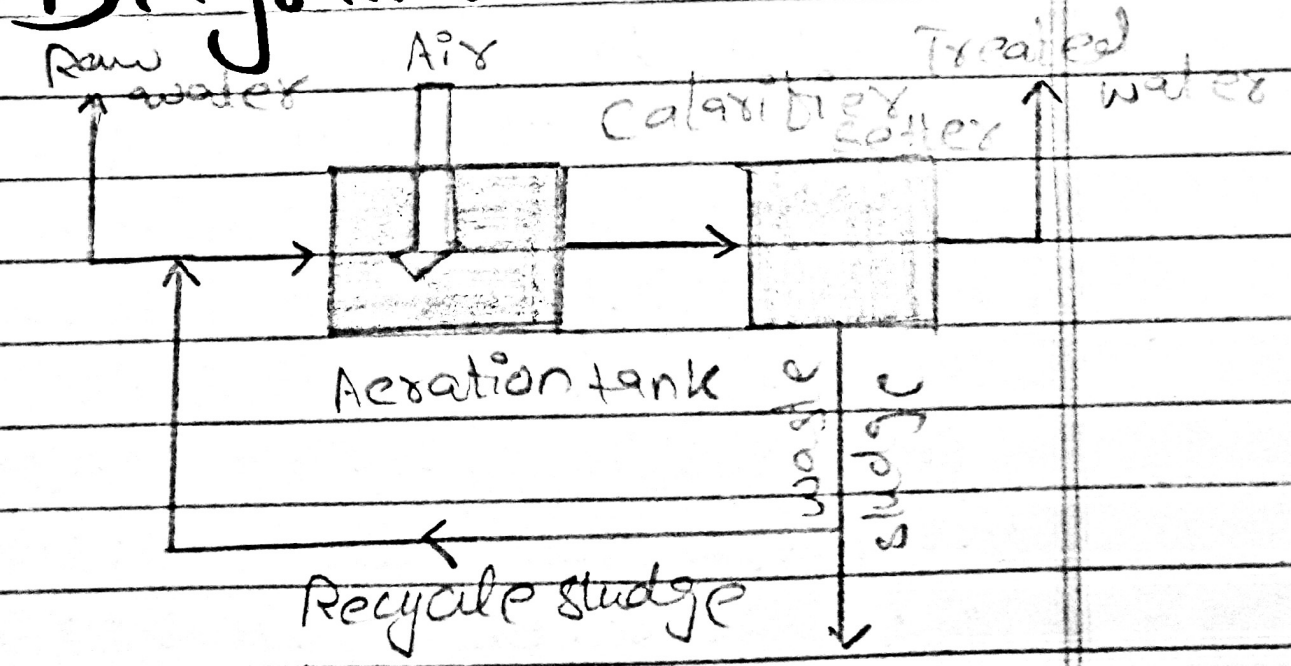
- is a biological process that can be used for oxidizing carbonaceous biological matter, oxidizing nitrogenous matter (NH_3 and N_2).
- Aeration methods. diffused aeration, square aerations (cones) and pure oxygen aeration. The sludge blanket is measured from the bottom of the clarifier.
- The sludge volume index is the volume of 1 gram of sludge in mm occupied by 1 gram of dry sludge solids after 30 mins of setting in a 100 ml. graduated cylinder.
- The main cell residence time is the total mass (kg) of mixed liquor suspended solids in the aerator and clarifier devided by the mass flow

rate (kg/day) of mixed Liquor suspended solids in the reactor and clarifier solides in the aerator and clarifir devided by the mass flow rate (kg/day) of MISS effluent. The F/M is amount of BOD feed to the the aerator (kg/day) divided by the amount (kg/day) divided by the amount of MLVSS (kg) under aeration.

Some used mixed liquor suspended solids for expendience, but mixed liquor volotile Suspended solids is con considered more accurate for the measure Liquor ~~to~~ of micro-organisms. pre-tretment stage to remove large solids and othe undesirble substances.

- Aeration stage, where aerobic bacteria digest biological waste.
- Setting stage allows undigested solids to settle stage allows from a sludge that must be periodically removed from the system.
- Disinfecting stage, where chlorine or similar disinfected is mixed with water, to produse an antiseptic output.

Diagram :-



Qno3 what is meant by assimilative capacity of receiving water bodies?

Ans(A) ➢

Assimilative Capasity of recieving Boolies:-

➢ Assimilative capasity of receiving wates bodies refers to ability of a body of water to clense itself; its capacity to reciene wastewater without deleteious effects and without causing damage to equatic life or humans who consume the water. It is level to which waterbody or nature

control the toxicity without affection the equatic life.

→ Although waste water is properly treated befor it is disposed of to the natural water steams still it has impurites / Pollutants that need to removed or make them less effective so, that the receving water bodies may not become unsuitable for use or cause damage to the equatic life.

Qno4 Breifly Sludge mangemn2- and its advantages in wastewater engineering?

Ans **Sludge management:-**

Sludge mangement and management is a growing challenge for countries globally. sluddge reffers to residual,

semi soild, matterial form, muncipal wastewater or sludge treatement industrial water treatment process. sludge mangement, including production charcterization, stabilization, cast-feetive method that meets the requirement of efficient recycling of resources whil sustainble sludge handling may be defined as, socially acceptable, cost-effective method of resources while the harmful substances are not transferred to air or

1. humans or the environment i.e. water, air or, soil...

semisoild, matterial form municipal wastewater or sludge treatement industrial water treatment process. sludge mangement, including production charcterization, stabilization, cost-feetive method that meets the requirement of efficient recycling of resources whil sustainble sludge handling may be defined as, socially acceptable, cost-effective method of resources while the harmful substances are ~~not~~ transferred to humans or the environment i.e. water, air or, soil etc.

1. **Primary operations:**

This process includes:

(a) Grindings: It includes particle size reduction.

(b) Screening: It includes removal

of sand fibrous materials.

(c) Degriting: It includes removal of sand or other inorganic materials.

(d) Blending: It includes making the sludge homogenous.

(e) storage: It ensures flow equalization and decreased volume.

2. Thikening:
The objectives is that to remove water before stabilization and decrease volume.
process:

(a) Gravity thickening (same equipment as sendimentation but smaller).

(b) Dissolved air flotation (DAF)

(c) centrifuge.

3. Sludge stabilization:
The objective: kill pathogens, eliminate odors, stabilize

organics, and concrete
Solids.

Ques Define Environmental Impact Assessment (EIA)? In your opinion, What pramaters should be considered while conducting EIA for newly fopeal waste water treatmat plant?

Ans (EIA Definations)

"an enviormental study comprising collection of data, prediction of qualitative and quantitative impacts, compasion of alternatives, evaluations of preventive of enviormental management and training plans and monitoring program, and forming of recommendations and such other components as may be perescribed".

Qno = 5
(B)

In our opinion, the following parameters should be considered, while conducting EIA for newly proposed wastewater treatement plant:
Althought legislation and practice vary arroned the would, the fundamental of an EIA would necessory of the following stages:

- screening to determine which project to developments require a full a Partial impact assesment study,
- scoping to identify which potential impact are revelent to asses (based on legislative Requirments, international convention) to identify avoid, migrate or compeasate adverse impacts on biodivesty (including the option of not proceeding with the development finding the alternative avoid impacts incorporating safeguards in the design of the project, providing comporation for adverse impacts) for the impact assessment.
- Assessment and evalution of impacts & alternatives, to predict the likely

environmental impacts of a proposed project development, including the detailed elaboration of alternatives.