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SUBJECT :- WASTE WATER ENGINEER

ASSIGNMENT NO :- 1

Briefly describe each one of these parameters?

① What are methods used for decoupling SRT from HRT?

"METHODS USED FOR DECOUPLING SRT"

→ The solid retention time is the average time the activated sludge solid are in the system the SRT is are important design and operating parameter for the activated sludge process is usually expressed in days.

→ Briefly describe Hydraulic Retention Time (HRT):-

HYDRAULIC RETENTION TIME:-

HRT in waste water treatment plant is a measure of an average length tank. It is also known as a hydraulic residence time.

The waste water is retained in different treatment unit at a particular time to achieve the desired parameters.

The HRT followed in the homogenization tank is 12 to 24 hours
20 to 48 hours in aeration tank.

72 to 120 days anaerobic reactors,
5 to 12 hours in secondary clarifiers
3 to 5 hours in primary clarifiers
30 minutes in coagulation tanks etc.

During the design stage itself the HRT of waste water in various stages are calculated in order to achieve the out last parameter.

(3)

=> Solid Retention Time

The 'Solid retention time (SRT) is time of the solid fraction of the wastewater spend in a treatment unit.

It is quantity of solids maintained in the reactor divide by the quantity of solids coming out the reactor each day

$$SRT = V \times c_d / Q_{out} \times C_{out}$$

C_{out} is the solids concentration of the effluent. in a conventional, completely mixed or plug flow reactor, the HRT equal the SRT.

The solid retention time (SRT) controls the concentrations of bacteria through the treatment system.

⇒ small reactor size

⇒ large separate size

⇒ Reduce sludge production

(4)

Q NO: 2

Ans: Methods Used For Decoupling SRT from HRT

By decoupling the SRT and HRT, the liquid wastewater can be processed faster

HRT is the time water is retained within the digester and is equal to reactor volume divided by the average volumetric flowrate. In many instances a short HRT will reduce capital operation cost. There may have some advantages for a simple design generally reliable and easily managed.

Through modern control permits it hands off management of more complex design that decouple HRTs and CBT.

(5)

Some of the more common digester types are given below.

- Continuous stirred tank reactor
- HRT contact Reactor.
- HRT sequencing Batch reactor.
- Plug flow reactor.
- Induced lag Reactor.

(6)

Q NO: 3

Ans: Advantages of
decoupling SRT from HRT

⇒ HRT treatment technology has relatively low equipment cost.

⇒ Available HRT treatment system can be applied at small as well as larger scale.

⇒ HRT Process stability can be easily achieved.

⇒ Management requirement is low.

⇒ Off-gas air pollution can be eliminated.

⇒ Foaming of surfactant containing wastewater can be avoided!

⇒ The HRT treatment technology does not require the input of expensive equipment.

(7)

⇒ HRT non-degradable organics can be degraded.

⇒ less space is required for an HRT treatment plant compared to an HRT treatment plant.