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Subject

Wastewater Engg

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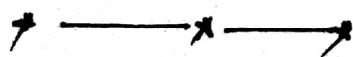
Q No.1

Briefly describe each one of these

Parameters?

Hydraulic Retention Time:-

HRT defined as the ratio b/w the reactor volume and feed flow rate, represents the average time the cells and substrates stay inside the reactor. HRT is very important parameter for hydrogen and methane production in continuous mode. Very low HRT causes the washout of the reactor, which means all the active micro-organisms escape out from the reactor. On the contrary, an adequate HRT results in abundant hydrogen and methane yields. Low HRT favored the washout of methanogens, jeopardizing the survival of hydrogen producers.



⇒ Solid Retention Time:-

The SRT θ_{RD} is the time the solid fraction of the wastewater spend in a treatment unit. It is quantity of solids maintained in the reactor divided by the quantity of solids coming out of the reactor each day.

$$SRT = \frac{V \times C_d}{Q_{out} \times C_{out}}$$

C_{out} is the solids concentration of the effluent.

In a conventional > completely mixed or plug flow reactor, the θ_{RD} equals the SRT.

The solids retention time or SRT controls the concentrations of bacteria through the treatment system.

- * Smaller reactor size
- * Larger separator size
- * Reduced sludge production.

Q.NO #02

What are the methods used for decoupling SRT from HRT.

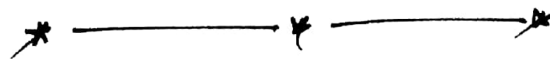
Ans:

By decoupling the SRT and HRT, the liquid wastewaters 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 be some advantages for a simple design generally reliable and easily managed.

Although modern controls permit it hands off management of more complex design that decouple HRT and SRT.

Some ~~are~~ of the more common digester types are given below

- * Continuous Stirred tank reactor
- * CSTR Contact Reaction
- * CSTR Sequencing batch reactor
- * Plug Flow reactor
- * Induced ~~Load~~ Reactor.



Q.No#03 What are the advantages of decoupling SRT From HRT:

Ans: 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~~ Foaming of surfactant containing wastewater can be avoided.

* The HRT treatment technology does not require the import of expensive equipment.

*1) HRT ~~non biodegradable~~ ^{non biodegradable} organics
can be degraded.

*1) Less Space is required for
an HRT treatment plant compared
to an ~~HRT~~ treatment plant

