Assignment # 01

WASTEWATER ENGINEERING

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Section : A

Semester : 8th Semester

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(Q1)

Hydraulic Retention Time:

Hydraulic Retention Time is the measure of the average length of time line that a soluble compound remains in a constructed bioreactor.

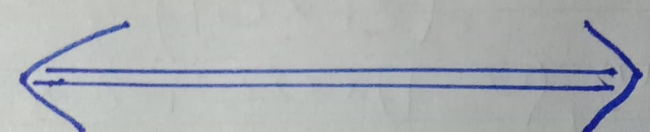
The volume of the tank by inflvent flow rate is T(tau) the hydralic retention time.

In short we can say that it yields a higher hydrogen production rate and lowers capital outlay by reducing the size of bioreactor.

According to Bolzonella David (2014)

"The ratio b/w reactor volume and feed flow rate, represents the

average time the cells and the substrate stay inside the reactor- HRT is very important parameter for hydrogen and methan production in continuous mode-



Solid Retention Time:

The Solid Retention Time (SRT) is the time of solid friction of the wastewater speed in a treatment unit-
It is quantity of solids maintained in reactor divided by quantity of solids coming out the reactor each day-

$$SRT = V \times cd / Qout \times Cout$$

Cout is solid concentration of

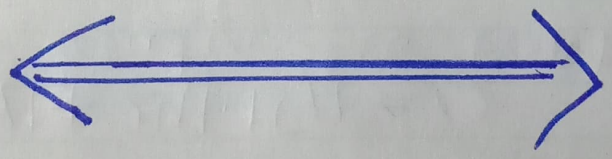
effluent in conventional, completely mixed or plug flow rate the HRT equal the SRT -

The (SRT) controls the concentration of the effluent through the treatment system -

→ Small reactor size

→ Large Seperate size

→ Reduce Sludge production -



(Q2)

Methods Of Decoupling SRT from HRT

⇒ By decoupling SRT from HRT, the liquid wastewater can be processed faster-

HRT is the water retained in digester and is equal to reactor volume divided by average volumetric flow rate in many instance, a short HRT will remain aspiration cost. There may have some advantages for simple design generally reliable and easily managed-

The modern control permits its management of more complen design the decople the HRT and SRT-

Some of more common digester types are:

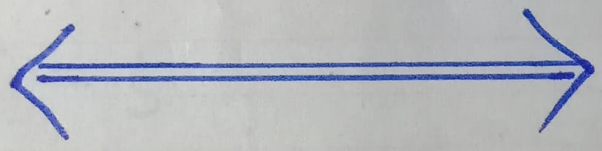
⇒ Continuous Stirred Reactor

⇒ HRT Contract Reactor.

⇒ HRT sequencing Batch reactor

⇒ Plug flow reactor

⇒ Induced Load reactor-



(Q3)

Advantages Decoupling SRT from HRT:

⇒ HRT technology has low cost.
⇒ HRT can be applied on large as well as small scale.
⇒ HRT process stability can be achieved low.
⇒ Gas pollution can be eliminated.
⇒ Farming can be avoided.
⇒ HRT treatment does not require the impact of expensive equipment.
⇒ HRT mutrodegradable organics can be degraded.
⇒ HRT requires less space as compared to HRT treatment plant.