

ZONE OF POLLUTION IN THE RIVER:

The self purification process of a stream polluted by the effluent or waste water discharged in to it can be divided into following four zones.

1. Zone of degradation
2. Zone of active decomposition
3. Zone of recovery
4. Clean water zone

1. Zone of degradation

This zone is situated just below the outfalls sewer when discharging its content in to the stream. In this zone, water is dark and turbid having the formation of sludge deposits at the bottom. The DO is reduced to 40% of the saturation values. There is an increase in the CO_2 content and reaeration is much slower than deoxygenation though conditions are unfavorable for aquatic life, fungi at higher point and bacteria at lower points breed small worms will work over and stabilize the sewage sludge. The decomposition of solid matter takes place in this zone and anaerobic decomposition prevails.

2. Zone of active decomposition

This zone is just after the degradation zone and is marked by heavy pollution. Water in this zone becomes greyish and darker than the previous zone. The DO concentration in this zone falls down to zero. Active anaerobic organic decomposition takes place with the solution of methane, Hydrogen sulphide, carbon dioxide and nitrogen bubbling to the surfaces with masses of sludge forming black scum. Fish life is absent this zone but bacteria flora will flourish in this zone with the presence of anaerobic bacteria at the lower end. Protozoa and fungi will first disappear. However near the end of this zone, as the decomposition slackens reaeration sets in and DO again rises to its original level of 40%

3. Zone of Recovery

In this zone, the process of recovery starts, from its former condition. The stabilization of organic matter takes place in this zone, Due to this most of the organic matter settles down as sludge, BOD falls and DO content rises above 40% value. Mineralization is active with the resulting formation of products like Nitrates, Sulphides and Carbonates. Near the end of this zone, microscopic aquatic life reappear, fungi decrease and algae reappears.

4. Clear water zone

In this zone the natural condition of the zone is restored with a result that

1. Water becomes clearer and attractive in appearance
2. DO rises to the saturation level and is much higher than BOD.
3. Oxygen balance is attained

Thus the recovery is said to be complete in this zone, though some pathogenic organisms may be present in this zone.

