Improving efficiency of O & M for water quality management in treatment plants

- By
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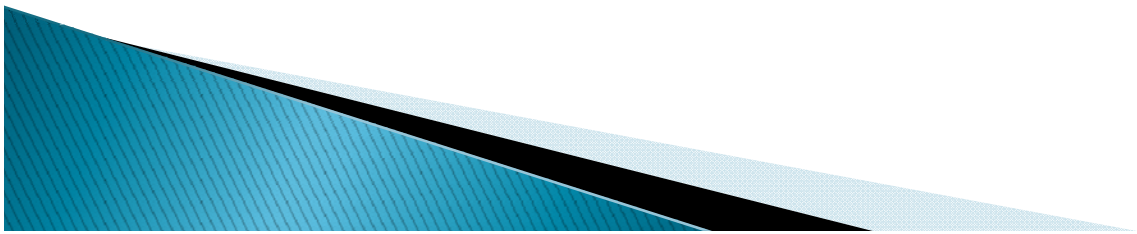
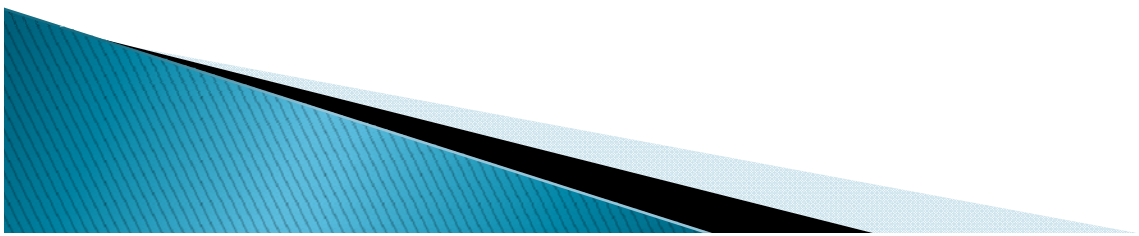


Monitoring & performance evaluation of sewage treatment plants in Kolkata Metropolitan area

STPs at Howrah, Srirampur, Titagarh, Bhatpara, Bandipur, Natagarh, Kona

Treatment Units

- Screen
- Grit Chamber
- Primary sedimentation tank
- Aeration tank / Trickling filter
- Secondary sedimentation tank
- Sludge digester
- Sludge drying bed



Screen

- Floating materials cross the screen
- Regular cleaning to regulate flow
- Dispose by burial / incineration

Grit chamber

- Adjust frequency of grit removal
- Regular cleaning of grit chambers
- Wash, lubricate as per manufacturer's schedule
- Safe disposal of grit

Primary sedimentation tank

- Frequent sludge removal to avoid septic condition, contents black & odorous
- Mechanical sludge scrapers advised
- Bulking & rising sludge problem, bubbles rising in tanks
- Skimming for floating matter that pass the screen & plant leaves (scum removal)
- Avoid trees & plants around PST
- V notch broken or bend & non functional
- Sedimentation time 2-3 hrs, not designed properly
- Sludge pipes choke, sludge hard to remove from hoppers.

Aeration tank

- Rate of flow of sewage
- Air supply to sewage
- MLSS value 1200 – 3500
- Return sludge rate & its condition
- SVI – 80 to 150, higher than 200 will indicate bulking, F/M ratio 0.3 to 0.4
- Type of system – conventional, high rate, extended aeration or contact stabilization
- Lubricate & check mechanical parts like bushes, bearings, transmission gears etc.
- Frothing due to synthetic detergents

Trickling filter

- Filter ponding (surface) due to small media size or high organic loading
- Clogging of filter media – clean filter, under drain pipes
- Leveling of arms, rotary distribution uniform
- Filter flies
- Odor due to anaerobic condition
- Dry filter media, zoogleal film destroyed
- Recirculation pump checking

Secondary sedimentation tank

- Sludge with poor settling character may be due to anaerobic condition leading to formation of nitrogen gas or due to presence of filamentous organisms
- Adjust sludge pumping to digester as return sludge, avoid excessive pumping of dilute sludge, observe & close pump
- pH value of 7.0 to 7.6
- Microbial count 10^3
- Chlorination not desired

Sludge digester & drying beds

- Methane gas production very poor
- Leaking digester
- Size too big require sludge detention time to increase
- Withdrawal of digested sludge
- Fluctuation in sludge temperature
- Sludge dries slowly, bed surface clogged, broken or clogged drains, second dose applied too late
- Replenishment of sand media

Waste stabilization ponds

- Silting problem in anaerobic pond, frequent de-sludging required
- Proper screening & grit removal required
- Growth of water hyacinth, duckweed etc. scum removal
- Repair damaged embankments caused by rodents
- Between Anaerobic & facultative pond mostly broken, permitting mixing of water
- Avoid overloading of ponds – Anaerobic condition

Thank you