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# Applying Floating Cover Technology
# To
# Enhance Aerobic & Anaerobic Wastewater Treatment, Heat Retention, Odor Containment & TSS Reduction

IEC's insulated cover system improves pond dynamics by retaining heat, settling solids and maximizing the detention time in conjunction with strategically placing aeration and mixing systems. Regardless if the existing pond is a single or multi-pond system, the facility can be converted into a combination of aeration and mixing cells designed as either complete mix or partial mix zones depending upon $BOD_5$ loading. The removal of $BOD_5$ is based upon $1^{st}$ order removal kinetics which takes into account both detention time and temperature of the wastewater.

Sources of aeration will be fine bubble or aspirated depending upon pond depth and length to width ratios. The aerated mixing cells will transfer a portion of the solids downstream to where they will be reduced through settling within the last cell. The cover creates a completely quiescent settling cell (clarifier affect) that effectively eliminates any affect caused by wind or wave disturbance, therefore settling bio-mass and algae which may have developed upstream. The system accommodates pond level fluctuations resulting during rainfall events from inflow and infiltration problems that are common in older collection systems in rural communities

For communities that have ammonia and low BOD limits, an attached growth media system can be added downstream of the covered settling cell. Typically course bubble aeration provides the needed mixing and aeration for that last polishing step whether it's an MBBR system or a fixed media for attached growth. Covered lagoons can more readily achieve low levels of phosphorus due to the fact effluent TSS is lower. Alum and ferric chloride can easily be incorporated in this type of system to precipitate phosphorus. Effluent phosphorus levels of less than 1 mg/l can be met on a year-round consistent basis

Traditional pond systems lose significant amounts of heat through the water surface, thus adversely impacting biological activity. Autotrophic bacteria are affected first, followed by heterotrophic populations. The cover reduces heat loss which creates an environment that is more conducive to stable, year-round bacterial populations. The benefit to minimizing bacterial fluctuations is the system achieves consistent and predictable effluent quality. Facilities that rely upon anaerobic treatment have also found the cover improves process performance while simultaneously managing offensive odors.

Although odor control is not an environmental regulatory criteria for most municipalities, the IEC cover reduces the transmission of odors by eliminating the air to water interface. Most facilities have a non-detectable smell outside the immediate confines of the basin perimeter. Most system upgrades can be accomplished in less than a month with primarily unskilled laborers and basic equipment with minimal to no infrastructure changes. The cover and ancillary equipment can be installed while the existing wastewater treatment facility is on-line and treating wastewater.

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