Conventional Activated Sludge Wastewater Treatment Plant Flow Diagram

Aeration Opportunities in Blue

1. Sewer Mains/Lift Stations
   - Raw Waste Starts Here

2. Equalization Tank/Basin

3. Aeration Basin
   - Return Activated Sludge
   - Waste Activated Sludge

4. Sludge Digester
   - Post Aeration

5. Secondary Clarifier
   - Disinfection
   - Receiving Waters (Rivers, etc.)

Details on each Aeration Opportunity (1-5) are listed on the next page
<table>
<thead>
<tr>
<th>Location</th>
<th>System Name</th>
<th>Purpose for Aeration</th>
</tr>
</thead>
</table>
| Lift Stations  
Sewer Mains  
Force Mains  | Odor Control -- prevent septic conditions  
Solids Suspension & Oil/Grease Dispersion  
Corrosion Prevention (H₂S) |                                                                                      |
| Equalization Tank or Basin | Odor Control -- prevent septic conditions  
Solids Suspension & Oil/Grease Dispersion  
Pretreatment of BOD Removal |                                                                                      |
| Aeration Basin  
Activated Sludge Basin  | BOD Removal/Nutrient Removal  
Supplemental Aeration for Older Facilities  
Retrofit/Replacement of Old/Existing Aeration Equipment (i.e. blowers/diffusers or surface aerators) |                                                                                      |
| Sludge Digester  
Sludge Holding Tank  | BOD Removal/Nutrient Removal  
Solids Suspension & Odor Control  
Freshening -- prevent septic conditions |                                                                                      |
| Post-Treatment Effluent Aeration | Increase DO Level to Meet Effluent Regulations -- many states have new regulations for minimum effluent DO levels... *fish and plants will die if water with no O₂ is discharged to rivers, lakes, etc.* |                                                                                      |

**DO = Dissolved Oxygen**

**BOD = Biochemical Oxygen Demand**... concentration of the wastewater/nutrient level

**Wastewater Treatment 101:** Oxygen is required to maintain a biomass (microbio) in the wastewater. The biomass uses oxygen to digest waste nutrients (BOD, etc.). After digestion, the waste particles are settled out, and separated from the water (these concentrated particles, along with the biomass are called “sludge”). The water continues on and is disinfected, aerated, and sent out to a river, lake, etc. The sludge is either de-watered and disposed of or recycled back (RAS -- Return Activated Sludge) to the aeration basin.

**Competition Review:** 1. Blowers/Diffusers - sub-surface grid of diffusers powered by a blower  
2. Surface Aerators - shallow water limits, broadcasts odors, maintenance-intensive

**Mazzei Advantages:** Low Maintenance; No Fouling; No Blowers (quiet); Equipment is Land Based; Maintains Water Temperature; Energy Efficient (better than competition when water is deeper than 12’ - 15’).