



Self Aspirating Aerator/Mixer

PROVEN ATAD PERFORMANCE SINCE 1989

Turborator[®]

- Turborator[®] - superior mixing and aeration since 1989
- The simplicity of design results in a rugged, durable, low maintenance system with reduced energy costs.
- The Turborator[®] offers oxygen transfer efficiency higher than other mechanical self aspirating aerators due to the manner in which gas is introduced below the liquid surface.

Features and Benefits

- Easy Installation / Low Maintenance
- Increased Efficiency & Energy Savings
- Ideal for Retrofits or New Installations
- No Blowers or Compressors Required
- Enhanced Mixing and Temperature Distribution
- Enhanced process Performance

Salmon Arm, BC

1st ATAD System in North America (1989)

Features Turborator® Technology



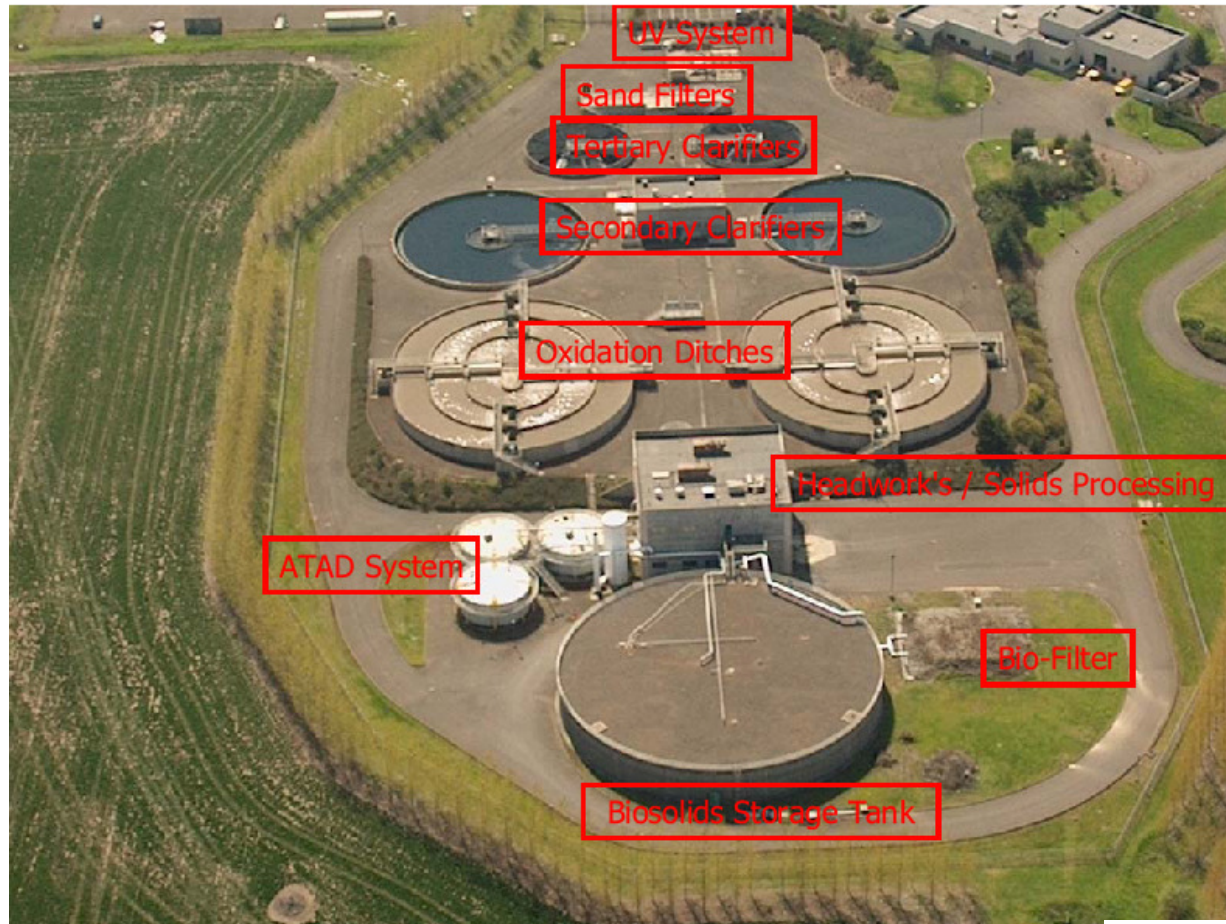
District of Salmon Arm Water Pollution Control Centre

Owner: District of Salmon Arm

Engineers: Dayton & Knight Ltd.

The District of Salmon Arm Water Pollution Control Centre was completed in several stages through 1987 to 1989 as a trickling filter solids contact facility and was designed and functions as enhanced biological nutrient treatment facility removing phosphorus and ammonia from the effluent, without chemical addition. The facility also includes the first North American autothermal thermophilic aerobic digester for stabilizing municipal sludges. The upper tank in the above photograph illustrates the four Turborator mixer aerators installed in the three digester cells. Temperatures consistently meet the 55 to 65°C design objectives and ensure the pasteurization of stabilized solids before the solids are used as soil conditioner on District property. The lower part of the photograph illustrates a portion of the biological nutrient removal process. The photograph was taken from the 6.1 m deep trickling filter towers.

McMinnville, OR
Improved with Turborator® Technology 2006 and 2008



McMinnville, OR Water Reclamation Facility (WRF)

- Population Served 32,000
- Design Dry Weather Flow 3.1 MGD
- Max Capacity 32 MGD
- Secondary Treatment Capacity 21.5 MGD

- **ATAD**
- Waste Activated Sludge (0.8% - 5.0% Solids)
- 3 Stages 60,000 gallons each (original)
- (2) 7.5 HP and (2) 9.0 HP Spiral Aerators per Stage

Original Spiral Aerators Only

The Spiral Aerators

Mounted Tangentially through the wall of the reactor and provides vertical as well as horizontal mixing.



- Limited mixing
- Operational difficulties
- Poor temperature control
- Frequent upsets with long recovery periods

Temperatures – Pre Turborator®

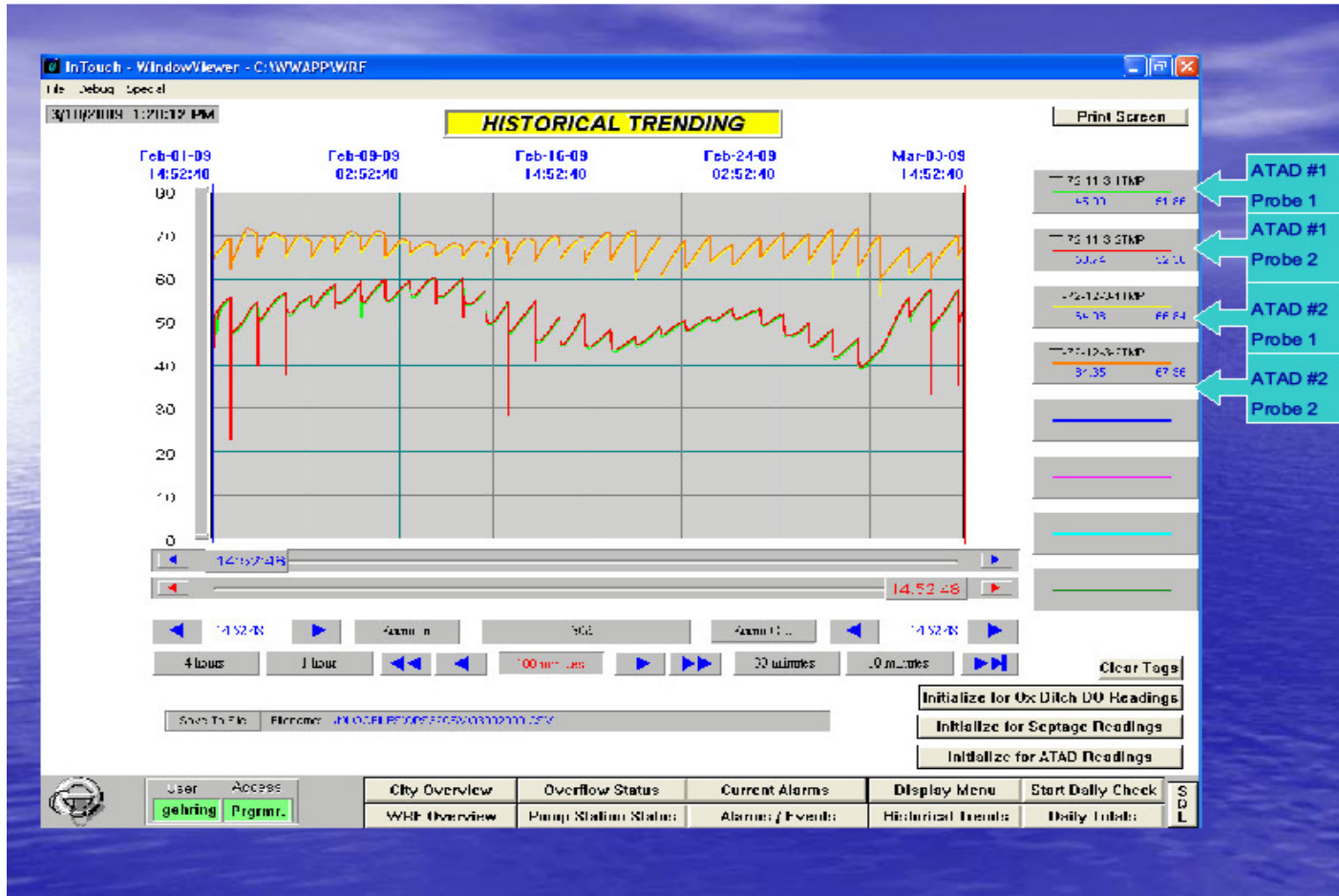


- Tank # 1 – Approx 30° C
- Temperature variation within tanks due to poor mixing

Turborators® installed in Tanks #1 and #2 to provide enhanced mixing and temperature control



Temperatures - Post Turborator® Installation



- Tank # 1 – Temperature increased from 30° C to 50° C
- No temperature variation within tanks
- Third stage eliminated!

McMinnville, OR ATAD Improvements Summary

Original Spiral Aerators Only

- Limited mixing
- Poor temperature control with variations within tanks
- Frequent upsets with long recovery periods

Turborators® added for Mixing and Temperature control

- Dramatic temperature increase in stage 1
- Eliminated requirement for 3rd stage
- Greater process control and stability – less upsets
- Less Maintenance and Increased Capacity



IMPROVE YOUR ATAD PERFORMANCE

- **ENHANCED MIXING**
- **QUICKER TEMPERATURE RISE**
- **GREATER STABILIZATION AND PROCESS CONTROL**
- **LESS COSTLY UPSETS**
- **DECREASED OVERALL OPERATION AND MAINTENANCE REQUIREMENTS**
- **INCREASED TREATMENT PERFORMANCE AND OVERALL CAPACITY**
- **MOUNTS EASILY TO EXISTING TANKS WITH LITTLE OR NO MODIFICATIONS**