**Wastewater Experts, Inc.**
Balancing Engineering Realities with Financial Necessities

**Client: Civil Engineering Company** **Project: Large Municipal WWTP in Canada**

**Services Requested:**

- **Assessment of existing ATAD process and process equipment**
- **Identification of obvious problems or shortcomings in the system**
- **Identification of potential ATAD system improvements**
- **Estimation of current and future sludge treatment capacities**

Type of Treatment:

1. Wastewater Process: Rotating Biological Contactor (RBC) Process
2. Waste Biosolids Process:
    a. Physical – Waste Sludge Thickening
    b. Biological – Aerobic Thermophilic Sludge Stabilization/Destruction (ATAD)

The existing ATAD system at this wastewater treatment plant (WWTP) had struggled to produce satisfactory Class A sludge and experienced frequent foaming. ***Wastewater Experts, Inc.*** was hired to evaluate and improve the ATAD system.

Class 'A' Biosolids consistent with CFR 503 must meet these three parameters:

1. Time-Temperature Duration of Treatment: Completion of required sludge processing duration (Time) at adequate Temperature to achieve pathogen destruction per the Federal EPA mathematical relationship formula.
2. Direct measurements to insure the treated sludge is within acceptable pH range prior to land application.
3. Proof of pathogen reduction results as demonstrated by fecal coliform bacterial counts of less than 1000 MPN/gram of treated dried sludge (TS) as measured by a state-certified independent laboratory.

An initial review was completed of the ATAD design basis, the detailed design calculations, the historical operating data, and the future projected loading conditions. The original design was sound and conservative in terms of process equipment sizing, reactor volumetric capacity, and thermodynamic

equilibrium allowance. Current ATAD design practice would allow for a greater freeboard height to accommodate occasional foam accumulation.

Initial inspection revealed that the ATAD system (Autothermal Thermophilic Aerobic Biosolids Digestion) was not being operated at acceptable conditions:

- ✓ Sludge feed solids (TSS) load was within design parameters but the volatile solids (VSS) concentration was only 60% of design value.
- ✓ A significant portion of the inert TSS was composed of waste minerals from the Potable Water Treatment Plant and should be eliminated.
- ✓ Hydraulic Retention Time was too variable: sludge feed TSS concentration varied widely (4% to 7%), making consistent ATAD operation difficult.
- ✓ Aeration Supply was inadequate; Recirculation pumps vibrated excessively.
- ✓ Reactor Liquid Levels were too low.

***Wastewater Experts, Inc.*** eventually identified the cause of each of these issues, and worked with the ATAD Process Supplier and the Owner to repair/replace/modify as necessary and restore the system. Successful operation of the ATAD system required significant changes in plant operation and some major repairs to damaged pump impellers and the mixing system caused by excessive grit loads.

## Results

The repairs and modified procedures recommended by ***Wastewater Experts, Inc.*** were implemented and the system returned to successful operation.