



**Activated Sludge/Troubleshooting Activated Sludge  
Online  
January 16, 18, 23, 25, 2024  
(course is covered over 4 days)**

**Day 1 – two 2-hr sessions- January 16, 2024 8:30-10:30 and 11:30–1:30 PST (both times required)**

**Overview of Wastewater Treatment - .5 hr**

- Composition of Wastewater - types of solids, organics
- Preliminary Treatment - screening, equalization
- Primary Treatment - settleable solids vs. suspended solids removal
- Secondary Treatment - conversion of organics, solids capture
- Sludge Treatment - thickening, dewatering, disposal

**Primary Treatment - .5 hr**

- Solids Capture and Efficiency
- Negative Impacts from Primary on Secondary Treatment

HOUR BREAK

**Overview of Biological Treatment – 1 hr**

- Bacterial growth - metabolism, respiration, growth phases
- Growth Pressures: F/M, Temp., pH, dissolved oxygen, nutrients, toxics, hydraulic loading

**Day 2 – two 2-hr sessions January 18, 2024 8:30-10:30 and 11:30–1:30 PST (both times required)**

**Activated Sludge Process Control Tests – 2 hr**

- Settlemeter - measuring sludge settling characteristics
- Depth of blanket - determining clarifier inventory and sludge detention time
- Oxygen uptake - assessing metabolic rates; toxicity detection; shock loads
- Process monitoring

HOUR BREAK

**Microscope – 2 hr**

- floc formation, filament abundance, EPS
- Protozoa/Metazoa

**Day 3 – two 2-hr sessions January 23, 2024 8:30-10:30 and 11:30–1:30 PST (both times required)**

### **Controlling Return Sludge Flow – 1 hr**

- RSF strategies
- Optimizing clarifier capacity
- Controlling clarifier inventory

### **Controlling Waste Sludge Flow – 1 hr**

- MCRT/Sludge age
- F/M
- Sludge yield
- Controlling sludge inventory
- Wasting strategies

Hour Break

### **Controlling Aeration – 2 hr**

- Monitoring, D.O. probes
- Mixing
- Oxygen demand - organic, nitrification, endogenous respiration
- D.O. deficiency

**Day 4 – one 2-hr session January 25, 2024 8:30-10:30 PST**

### **Nutrient Management – 1 hr**

- Nutrients - ammonia, phosphorus, various types used
- Nitrogen - managing considerations
- Nitrification/Denitrification
- Nutrient management plan

### **Troubleshooting Overview of Activated Sludge Problems – 1 hr**

- Poor floc formation
- Foaming
- Rising sludge
- Toxicity
- Rapid settling, turbid effluent
- Slime bulking
- Filamentous bulking – short-term and long-term control

### **PRESENTER:**

Rick Marshall specializes in start-up, optimizing, and troubleshooting of wastewater and water treatment facilities, along with work in producing O & M manuals, troubleshooting guides, SOPs and other technical documents. He has over 35 years of experience in industrial (Pulp & Paper, various types of food processing, chemical, refinery) and municipal treatment systems. He has dealt with a variety of operating problems ranging from sludge settling problems, floc formation problems, biomass toxicity, effluent toxicity, foaming and floating sludge problems.

### **CONTACT INFORMATION:**

Registration can be made by faxing or mailing the registration form on the reverse of this page. For further information, Clara Shea at 902-434-8874.

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(course is covered over 4 days)

Name: \_\_\_\_\_

Organization: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City, Province: \_\_\_\_\_ Postal Code: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

**Invoices will be sent to the address listed above.**

PO number to be included on the invoice \_\_\_\_\_

**Payment can be made by Visa, Master Card or cheque.**

Card Holder's  
Name \_\_\_\_\_

Credit Card Number \_\_\_\_\_ Expiry \_\_\_\_\_

CVV \_\_\_\_\_

Signature \_\_\_\_\_

Email address for credit card receipt \_\_\_\_\_

**Payment can be made by cheque and is due prior to workshop date.**

Members \$575.00 plus HST 15% = \$661.25  
Non-Members \$625.00 plus HST 15% = \$718.75

**Cheques should be made payable to:  
MPWWA  
C/O Clara Shea, Executive Secretary  
PO Box 28142 Dartmouth, NS B2W 6E2  
Phone 902-434-8874 Fax 902-434-8859**