



WE094: Wastewater Treatment Plant Operation Complete





Training Description:

Wastewater Treatment Plant – Level 1 is designed to train participant to safely and effectively operate and maintain wastewater treatment plants. This course is designed to train delegate in the practical aspects of operating and maintaining wastewater treatment plants, emphasizing the use of safe practices and procedures. The information from this course includes the role and responsibilities of a treatment plant operator, an explanation of why wastes must be treated, and detailed descriptions of the equipment and processes used in a wastewater treatment plant.

Participant will learn to operate and maintain racks, screens, comminutors, sedimentation tanks, trickling filters, rotating biological contactors, package activated sludge plants, oxidation ditches, ponds, and chlorination facilities.

Wastewater Treatment Plant – Level 2 is designed to train students in the practical aspects of operating and maintaining wastewater treatment plants, emphasizing safe practices and procedures. Topics covered in this course include conventional activated sludge processes, sludge digestion and solids handling, effluent disposal, plant safety and good housekeeping, plant and equipment maintenance, laboratory procedures and chemistry, use of computers for plant operation and maintenance, analysis and presentation of data, and records and report writing.

The Wastewater Treatment Plant Operation program includes 2 major parts:

Wastewater Treatment Plant – Level 1

Wastewater Treatment Plant – Level 2

Training Objectives:

At the end of the training, participants will be able to:

- ✓ Apply and gain an in-depth knowledge on the operation of wastewater treatment plant
- ✓ Discuss the basic principles of waste water treatment for the daily follow-up of a waste water treatment plant
- ✓ Identify the difference between several types of wastewater and its constituents
- ✓ Characterize and describe wastewater in terms of the common parameters used
- ✓ Present general overview of a wastewater treatment facility
- ✓ Recognize the operational principles and basic characteristics to operate pre and primary treatment systems as well as operating an aerobic biological system
- ✓ Explain the principles and calculate the basic parameters for separation techniques including the settling tanks and membrane systems
- ✓ Read and evaluate the results of microscopic analysis of activated sludge
- ✓ Use the general principles of sludge dewatering to operate its systems
- ✓ Determine the principles of biological nitrogen removal and calculate the basic parameters to operate its systems
- ✓ Explain the principles and identify the key parameters of tertiary treatment systems





Training Designed for:

This course is intended for all wastewater treatment plant operation for industrial waste water compliance Managers, Supervisors, Engineers, Inspectors, Plant Managers and HSE staff as well as operations, inspection, maintenance and design engineers and technical staff including laboratories.

Training Program:

DAY ONE:

- ❖ PRE-TEST
- ❖ Wastewater Treatment Plant – Level 1
- ❖ **MODULE 1:**
 - **Water Treatment Operators & Facilities**
 - What is a Treatment Plant Operator?
 - The Water Quality Protector
 - Your Qualifications
 - Staffing Needs & Future Job Opportunities
 - Prevention of Pollution
 - Types of Waste Discharges
 - Effects of Waste Discharges
 - Solids in Wastewater
 - Natural Cycles
 - NPDES Permits
 - Collection of Wastewater
 - Treatment Plants
 - Flow Measuring Devices
 - Solids Handling & Disposal
 - Advanced Methods of Treating Wastewater
 - Effluent Discharge, Reclamation, & Reuse
 - Bar Screens & Racks
 - Comminutors & Barminutors
 - Grit Removal
 - Operational Strategy & Design Review
- ❖ **MODULE 2:**
 - Wastewater Treatment Plant
 - Sedimentation, Flotation & Trickling Filters
 - Purpose of Sedimentation and Flotation
 - Operation & Maintenance
 - Sampling & Laboratory Analysis
 - Sludge & Scum Pumping
 - Safety Issues
 - Principles of Operation
 - Review of Plans & Specifications
 - Flotation Processes





- Combined Sedimentation Digestion Unit
- IMHOFF Tanks
- Septic Tanks
- How the Trickling Filter Works
- Classification of Filters
- Starting, Operating, & Shutting Down a Filter
- Filter Operational Strategy
- Filter Maintenance & Troubleshooting
- Loading Criteria
- Trickling Filter / Solids Contact (TF/SC) Process

DAY TWO:

❖ MODULE 3:

- Wastewater Treatment Plant
- Activated Sludge & Wastewater Stabilization Ponds
- Description of Rotating Biological Contractors
- Process Operation & Pretreatment Requirements
- Maintenance & Troubleshooting: Drives, Bearings & Motors
- Safety of Equipment, Connections & Surfaces
- Loading Calculations
- The Activated Sludge Process
- Package Plants & Extended Aeration Oxidation Ditches
- Use of Ponds
- History of Ponds in Waste Treatment
- Pond Classifications & Applications
- Explanation of Treatment Process
- Pond Performance
- Starting the Pond
- Daily Operation & Maintenance of Ponds
- Surface Aerators
- Pond Sampling & Analysis of Performance
- Review of Pond Plans & Specifications
- Eliminating Algae from Pond Effluents
- Wastewater Treatment Plant

❖ MODULE 4:

- Disinfection Processes
- Need for Disinfection
- Disinfection Using Chlorine
- Points of Chlorine Application
- Chlorination Process Control
- Chlorination Feed Rate & Control
- Measurement of Chlorine Residual
- Chlorine Safety Program
- Chlorine Handling





- Chlorination Equipment & Maintenance
- Other Uses of Chlorine
- Dechlorination
- Sulfur Dioxide Hazards
- Sulfur Dioxide Supply System
- Operation & Maintenance of Sulfur Dioxide Systems
- Disinfection Using Ultraviolet (UV) Systems
- Uses of UV Systems
- Emergency Alarms
- Maintenance & Troubleshooting of UV Systems
- Disinfection Using Ozone Systems

DAY THREE:

❖ **Wastewater Treatment Plant – Level 2**

❖ **MODULE 5:**

- **Activated Sludge Plants**
- The Activated Sludge Process
- Aeration Systems
- Safety of Aeration Systems
- Checking Out a New Plant
- Process Start-Up Procedures
- Routine Operational Control
- Abnormal Operation Conditions
- Equipment Shutdown, Abnormal O & M
- Modifications of the Activated Sludge Process
- Sequencing Batch Reactors (SBRs)
- Microbiology for Activated Sludge
- Collection & Preparation of Samples
- Interpretation & Response to Results
- Monitoring the Changes & Trends in Microbiology

❖ **MODULE 6:**

- Sludge Digestion, Effluent Discharge, Reclamation, & Reuse
- Need for Sludge Digestion
- Components in the Anaerobic Sludge Digestion Process
- Gas Systems
- Digester Heating & Mixing
- Operation of Anaerobic Digesters
- Anaerobic Digestion Controls & Test Interpretation
- Operational Strategy
- Digester Cleaning
- Aerobic Sludge Digestion
- Digested Sludge Handling
- Sludge Disposal
- Effluent Discharge to Surface Waters





- Receiving Water Monitoring
- Sampling & Analysis

DAY FOUR:

❖ **MODULE 7:**

- Plant Safety & Maintenance
- Why Safety?
- Types of Hazards
- Specific Hazards
- Pumping Stations
- Treatment Plants
- Industrial Waste Treatment
- Safety in the Laboratory
- Fire Prevention
- Water Supplies
- Safety Equipment & Information
- How to Develop Safety Training Programs
- Hazard Communication (Worker Right-to-Know Laws)
- Treatment Plant Maintenance
- Mechanical Equipment Maintenance
- Electrical Equipment Maintenance
- Motors & Maintenance
- Mechanical Maintenance
- Unplugging Pipes, Pumps, & Valves
- Flow Measurements – Meters & Maintenance

DAY FIVE:

❖ **MODULE 8:**

- Laboratory Procedures & Computer Use
- Importance of Laboratory Procedures
- Basic Laboratory Words, Equipment, & Techniques
The Metric System
- Chemical Names & Formulas
- Use of a Spectrophotometer
- Safety & Hygiene in the Laboratory
- Personal Safety & Hygiene in the Laboratory
- Representative Sampling
- Laboratory Procedures for Plant Control
- Tests for Activated Sludge Control
- Tests for Digestion Control
- Laboratory Procedures for NPDES Monitoring
- Dissolved Oxygen (DO) & Biochemical Oxygen Demand (BOD)
- Hydrogen Ion (pH), Metals, Nitrogen, & Ammonia
- Nitrites, Phosphorus, & Sulfate
- Computer Use in a Treatment Plant





- Data Analysis, Report Generation & Recordkeeping
 - Systems Monitoring with Computers
 - Time Saving & Better Communication with Computers
 - SCADA Systems
- ❖ **MODULE 9:**
- **Analysis, Records, Reporting & Administration**
 - Need for Analyzing & Presenting Data
 - Causes of Variations in Results
 - Monometer & Gauge Reading
 - Chart Reading
 - Average or Arithmetic Mean
 - Arithmetic Range of Values
 - Understanding Median & Mode
 - Geometric Mean
 - Moving Averages
 - Graphs & Charts
 - Variance & Standard Deviation
 - Prediction Equations, Trends, & Correlations
 - Metric Calculations
 - Records & Report Writing
 - Typical Monthly Report
 - Emergency Planning & Response
 - Function of a Manager
 - Planning, Organizing & Staffing
 - Communication, Conducting Meetings & Public Relations
 - Financial Management
- ❖ Course Conclusion
- ❖ POST-TEST and EVALUATION

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request”.

Please note that the above topics can be amended as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test





Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

As per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

For training registrations or in-house enquiries, please contact:

Aisha Relativo: aisha@cmc-me.com

Tel.: +971 2 665 3945 or +971 2 643 6653 | Mob.: +971 52 2954615

Training & Career Development Department

