BASIC WATER TREATMENT

Purpose:

This course is designed as a basic introduction for controlling unit treatment processes of drinking water treatment facilities. Training focuses on "the need to know" fundamentals of plant operation and public health protection. The course is suitable for operators who require a working level of knowledge of drinking water production. Successful completion of this course is a prerequisite for intermediate and advanced ETI courses in drinking water treatment and supply.

CEU Value: 2.8 **Duration: 28 hours**

Scope:

The curriculum includes the following topics:

a. WATER SOURCES & SUPPLIES
b. AQUATIC MICROBIOLOGY
c. PHYSICAL / CHEMICAL / BIOLOGICAL / RADIOLOGICAL
d. PRETREATMENT & INTAKE STRUCTURES
e. COAGULATION / FLOCCULATION PROCESS
f. SEDIMENTATION (Gravimetric Processes)
g. FILTRATION OPERATION
h. PRODUCTION DISINFECTION
i. PROCESS CALCULATIONS
j. ANALYTICAL CONTROL TESTS
k. SAMPLING / RECORD KEEPING
1. PUBLIC HEALTH CONSIDERATIONS
m. DRINKING WATER LEGISLATION

Minimum Passing Grade:

70% based upon a written examination.

ADVANCED WATER TREATMENT

Purpose:

This advanced course discusses operating unit treatment processes of specialized drinking water treatment facilities. Training focuses on "the need to know" fundamentals of plant operation and public health protection.

CEU Value: 2.1 **Duration: 21 hours**

Scope:

The curriculum includes the following topics:

a. SOURCE WATER MORPHOLOGY
b. AQUATIC MICROBIOLOGY
c. PHYSICAL / CHEMICAL / BIOLOGICAL / RADIOLOGICAL
d. PREOXIDATION
e. MEMBRANE FILTRATION
f. BIO-FILTRATION
g. UV DISINFECTION
h. OZONATION
i. PROCESS CONTROL
j. COMPOUND DISINFECTION
k. ANALYTICAL CONTROLS
l. BIOSOLIDS MANAGEMENT
m. PUBLIC HEALTH CONSIDERATIONS

Prerequisites:

In preparation for successful completion of the course, applicants ideally should:

1. have completed ETI's Basic Water Treatment course.

Minimum Passing Grade:

70% based upon a written examination.

BASIC CHEMISTRY CONCEPTS

Purpose:

A course designed to introduce basic chemical concepts and terms used throughout the water/wastewater industry. Because operators today use pre-packaged reagents without an understanding of the underlying fundamental facts, concepts or principals involved in water chemistry, specific comprehension of chemistry and its related terminology is required to understand what really happens. Through theory and specific chemical analyses' the learner will realize why factors of cleanliness, sample preparation, reaction time and reagent quality are important to valid sample collection, analysis, and data generation.

CEU Value: 2.5 **Duration: 25 hours**

Scope:

The curriculum includes the following topics:

a. ATOMIC THEORY
b. CHEMISTRY TERMINOLOGY
c. COMMON COMPOUNDS
d. SYMBOLS & FORMULAE
e. CHEMICAL BONDING
f. REACTIONS
g. ATOMIC/MOLECULAR WEIGHTS
h. NORMALITY/MOLARITY
i. RELATIVE DENSITY
j. DOSAGE CALCULATIONS
k. PROCESS CHEMISTRY

Minimum Passing Grade:

70% based on written examination.

UTILITY MANAGEMENT

(Correspondence Format)

Purpose:

Certified operators are responsible for the complete facility in which they work, a basic understanding of how to manage is a required part of the job in addition to technical treatment expertise. This course teaches the knowledge and skills to responsibly manage utilities and its resources. Emphasis is placed on human, infrastructure and financial resource management practices, which are models for daily management of water or wastewater treatment facilities.

CEU Value: 2.5 **Duration: 25 hours**

Scope: The curriculum includes the following topics:

a. PRINCIPLES OF MANAGEMENT
b. MANAGER'S ROLE
c. PLANNING
d. HUMAN RESOURCES
e. COMMUNICATION
f. PUBLIC RELATIONS
g. FINANCIAL MANAGEMENT
h. OPERATIONS & MAINTENANCE
i. RECORDKEEPING
j. PROGRAMS & POLICIES
k. LEGISLATIVE REQUIREMENTS

Minimum Passing Grade:

70% based upon a written examination.

ENVIRONMENTAL TRAINING INSTITUTE

CONFINED SPACE ENTRY

(Due Diligence Standard)

Purpose:

An experience course designed for learners working in confined spaces or responsible for safe confined space management. "Hands on" practical field exercises reinforce classroom lessons, building trainee confidence and knowledge. Learners use electronic gas detection monitors and perform real entries using real retrieval and rescue systems. Safe entry procedures and proper equipment use are stressed throughout. This course exceeds mandatory training criteria of Federal and Provincial safety legislation and establishes a standard of employer training diligence. This course is the original on which other confined space courses are based.

CEU Value: 2.5 **Duration: 25 hours**

Scope: The curriculum includes the following topics:

a. CONFINED SPACE LEGISLATION
b. ATMOSPHERIC HAZARD RECOGNITION
c. HUMAN TOXICOLOGY / PHYSIOLOGY
d. PHYSICAL HAZARD ASSESSMENT & ISOLATION
e. PROTECTIVE EQUIPMENT REQUIREMENTS
f. RESPIRATORY SYSTEMS (AIR LINE or SCBA)
g. AIR MONITOR FUNCTION & FIELD CALIBRATION
h. VENTILATION SYSTEMS
i. ENTRY PROCEDURES & EMPLOYER POLICY
j. FALL ARREST / RETRIEVAL RIGGING
k. EMERGENCY & RESCUE ACTIONS

Prerequisites:

In preparation for successful completion of the course, applicants ideally should:

1. be physically able to perform the required "hands on" tasks;
2. have a valid "emergency level" First Aid certificate; and trained in CPR.

Minimum Passing Grade:

70% based upon both written and practical examinations.

WATER FLUORIDATION ISSUES

Purpose:

This course examines drinking water fluoridation and the safe handling of fluorosilicates used in water treatment facilities and distribution systems, through exploring the health outcomes of inorganic fluoride compounds on the drinking water treatment process and infrastructure. Materials are presented with fully referenced facts, concepts and principles. Legislative responsibilities and liabilities for municipal councils, facility owners, operating authorities and professional operators are outlined. Mechanisms for fluoridation system maintenance or discontinuance are explained.

Offered only to operating staff of fluoridating municipalities, their elected officials or public health professionals.

CEU Value: 0.7 **Duration: 7 hours**

Scope: The curriculum addresses the following topics:

a. CHEMICAL CHARACTERISTICS
b. FLUORIDATION REALITIES
c. DRINKING WATER QUALITY
d. SAFETY & HANDLING
e. DOSAGE VS CONCENTRATION
f. HEALTH BENEFIT / HARM ANALYSIS
g. ENVIRONMENTAL FATE
h. LEGISLATIVE AUTHORITIY
j. NEW INSIGHTS

Minimum Passing Grade:

70% self-assessment quiz

ENVIRONMENTAL TRAINING INSTITUTE

EXAMPREP: BASIC WATER TREATMENT 1

Purpose:

An introductory primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in drinking water treatment operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain drinking water treatment facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent water treatment facts, principles and legislation.

CEU Value: 2.1 **Duration: 21 hours**

Scope: The curriculum addresses the following topics:

a. WATER CHARACTERISTICS & SOURCES &
b. TREATMENT NOMENCLATURE
c. HYDRAULIC PRINCIPLES
d. TREATMENT PROCESSES
e. PROCESS CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. WATER QUALITY ISSUES
l. LEGISLATION
m. EXAM STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

EXAMPREP: INTERMEDIATE WATER TREATMENT 2-3

Purpose:

An intermediate primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in drinking water treatment operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain drinking water treatment facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent water treatment facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope: The curriculum addresses the following topics:

a. WATER CHARACTERISTICS & SOURCES &
b. TREATMENT NOMENCLATURE
c. HYDRAULIC PRINCIPLES
d. TREATMENT PROCESSES
e. PROCESS CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. WATER QUALITY ISSUES
l. LEGISLATION
m. EXAM STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

EXAMPREP: ADVANCED WATER TREATMENT

Purpose:

An advanced primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in drinking water treatment operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain drinking water treatment facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent water treatment facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope: The curriculum addresses the following topics:

a. WATER CHARACTERISTICS & SOURCES &
b. TREATMENT NOMENCLATURE
c. HYDRAULIC PRINCIPLES
d. TREATMENT PROCESSES
e. PROCESS CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. WATER QUALITY ISSUES
l. LEGISLATION
m. EXAM STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

EXAMPREP: WASTEWATER COLLECTION 1-2

Purpose:

An introductory primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in wastewater collection systems operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain wastewater collection facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent wastewater collection facts, principles and legislation.

CEU Value: 2.1 **Duration: 21 hours**

Scope: The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. SYSTEM INFRASTRUCTURE
c. HYDRAULIC PRINCIPLES
d. GENERAL CONSTRUCTION
e. INSPECTION METHODS
f. FLOW CONTROL SYSTEMS
h. SAMPLING & TESTING
i. PIPELINE CLEANING
j. OPERATIONAL FACTS
k. REPAIR & REHABILITATION
l. SAFE WORK PRACTICES
m. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz

EXAMPREP: WASTEWATER COLLECTION 3-4

Purpose:

An advanced primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in wastewater collection systems operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain wastewater collection facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent wastewater collection facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope: The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. SYSTEM INFRASTRUCTURE
c. HYDRAULIC PRINCIPLES
d. GENERAL CONSTRUCTION
e. INSPECTION METHODS
f. FLOW CONTROL SYSTEMS
h. SAMPLING & TESTING
i. PIPELINE CLEANING
j. OPERATIONAL FACTS
k. REPAIR & REHABILITATION
l. SAFE WORK PRACTICES
m. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz

ENVIRONMENTAL TRAINING INSTITUTE

MATH SKILLS for OPERATORS

Purpose:

To ensure that system or facility operators can perform technical process calculations required for reporting and operational troubleshooting. Simple problem solving strategies are used to help analyze complex problems. A practical review for those whose math skills are rusty. Skills and methods shown are practical, relevant and a good preparation for operators planning to write MOE license exams. This course is not intended as a crash course for those who aren't numerate.

CEU Value: 2.1 **Duration: 21 hours**

Scope: The curriculum includes the following topics:

a. PROBLEM SOLVING METHODS
b. FORMULA CONCEPTS
c. REPORTING DATA
d. ESTIMATING
e. MEASUREMENT CONVERSION
f. NUMBER SYSTEMS (S.I. Imp. & US)
g. DECIMALS/FRACTIONS/EXPONENTS
h. VELOCITY/FLOW RATE
i. PRESSURE/FORCE/HEAD
j. EFFICIENCY/PERFORMANCE/LOSSES
k. CHEMICAL SOLUTION PREPARATION
l. FEED RATE CONTROL
m. HYDRAULIC & ELECTRIC POWER
n. CHEMICAL DOSAGE

Minimum Passing Grade:

70% self-assessment quiz

EXAMPREP: WATER DISTRIBUTION 1-2

Purpose:

An introductory primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in water distribution systems operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain water distribution facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent water distribution facts, principles and legislation.

CEU Value: 2.1 **Duration: 21hours**

Scope: The curriculum addresses the following topics:

a. WATER CHARACTERISTICS
b. SYSTEM INFRASTRUCTURE
c. HYDRAULIC PRINCIPLES
d. WATER QUALITY ISSUES
e. SYSTEM CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. LEGISLATION
l. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

EXAMPREP: WATER DISTRIBUTION 3-4

Purpose:

An advanced primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in water distribution systems operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain water distribution facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent water distribution facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope: The curriculum addresses the following topics:

a. WATER CHARACTERISTICS
b. SYSTEM INFRASTRUCTURE
c. HYDRAULIC PRINCIPLES
d. WATER QUALITY ISSUES
e. SYSTEM CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. LEGISLATION
l. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

EXAMPREP: BASIC WASTEWATER TREATMENT

Purpose:

An introductory primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in wastewater treatment operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain wastewater treatment facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent wastewater treatment facts, principles and legislation.

CEU Value: 2.1 **Duration: 21 hours**

Scope: The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. TREATMENT NOMENCLATURE
c. HYDRAULIC PRINCIPLES
d. UNIT PROCESSES
e. PROCESS CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. BIOSOLIDS HANDLING
l. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

EXAMPREP: INTERMEDIATE WASTEWATER TREATMENT 2-3

Purpose:

An intermediate level primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in wastewater treatment operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain wastewater treatment facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent wastewater treatment facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope: The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. TREATMENT NOMENCLATURE
c. HYDRAULIC PRINCIPLES
d. UNIT PROCESSES
e. PROCESS CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. BIOSOLIDS HANDLING
l. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

EXAMPREP: ADVANCED WASTEWATER TREATMENT

Purpose:

An advanced primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in wastewater treatment operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain wastewater treatment facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent wastewater treatment facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope: The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. TREATMENT NOMENCLATURE
c. HYDRAULIC PRINCIPLES
d. UNIT PROCESSES
e. PROCESS CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. BIOSOLIDS HANDLING
l. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

ENVIRONMENTAL TRAINING INSTITUTE

CONFINED SPACE ENTRY: Reg. 632

Purpose:

This one day course is designed for persons working in confined spaces or responsible for safe confined space management. Safe entry procedures and proper equipment use are stressed throughout. This course establishes a standard of employer training diligence. Suitable for initial subject introduction or as refresher training.

CEU Value: 0.7 **Duration: 7 hours**

Scope: The curriculum includes the following topics:

a. CONFINED SPACE LEGISLATION
b. ATMOSPHERIC HAZARD RECOGNITION
c. PHYSICAL HAZARD ASSESSMENT & ISOLATION
d. PROTECTIVE EQUIPMENT REQUIREMENTS
e. AIR MONITOR USE, FUNCTION & FIELD CALIBRATION
f. AIR RESPIRATORY SYSTEMS (AIR LINE or SCBA)
g. ENTRY PROCEDURES & EMPLOYER POLICY
h. VENTILATION SYSTEMS
i. EMERGENCY & RESCUE ACTIONS

Minimum Passing Grade:

70% based upon a written examination

CONFINED SPACE MANAGEMENT

Purpose:

This management seminar is specifically designed for workplace supervisors and joint committee members as an executive overview of current confined space concerns. Issues address legislative interpretation, equipment technology and worker training. The seminar centers on how to meet legislative requirements for confined spaces and manage confined workplaces. Discussion pointers regarding equipment selection and management policies related to confined workplaces.

This seminar is suggested as a prerequisite for the management team prior to conducting ETI's CONFINED SPACE ENTRY: (Due Diligence Standard) course.

CEU Value: 0.7 **Duration: 7 hours**

Scope:

The curriculum includes the following topics:

a. SUPERVISORS PERSPECTIVE
b. CONFINED SPACE LEGISLATION
c. CONFINED WORKPLACES
d. PROTECTIVE EQUIPMENT
e. RESPIRATORY PROTECTION
f. ATMOSPHERIC SENSING TECHNOLOGY
g. HUMAN TOXICOLOGY / PHYSIOLOGY
h. CORPORATE POLICY
i. WORKER TRAINING
j. LEGAL PRECEDENTS / CASE STUDIES

Prerequisites:

Suitable participants should be:

1. supervisors of confined workplaces; or
2. members of a health and safety committee; or
3. OHS inspection or enforcement personnel; or
4. an employer's designee.

Minimum Passing Grade:

Self-evaluation exercise. Appropriate certificates ("has attended") are issued.

EXAMPREP: WATER QUALITY ANALYST

Purpose:

The Water Quality Analyst (WQA) examination is intended for water laboratory technicians. This examprep course is also ideally suited for individuals who are not classed as operators yet are required to sample and analyze drinking water for physical, chemical biological, and radiological characteristics. The course content relates to examination "need to know" information. It's not a crash course in water quality analysis. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain water distribution facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent water quality facts, analytical techniques and legislation.

CEU Value: 2.1 **Duration: 21 hours**

Scope:

The curriculum addresses the following topics:

a. DRINKING WATER CHARACTERISTICS
b. DRINKING WATER LEGISLATION
c. WATER QUALITY ISSUES
d. CHEMISTRY CONCEPTS
e. ANALYTICAL EQUIPMENT
f. SAMPLING PROTOCOLS
h. ANALYTICAL TECHNIQUES
i. PROCESS CALCULATIONS
j. LABORATORY QA/QC
k. LAB SAFETY
l. EXAM STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

RESPIRATORY PROTECTION SYSTEMS

Purpose:

This course is specifically designed for people who use "Air Purifying" or "Supplied Air" respiratory systems in the workplace. The training centres on the use, care, maintenance and application of various respiratory protection systems. A "hands on" approach reinforces classroom lessons, helping build trainee confidence and knowledge. Successful candidates will demonstrate competency in respiratory protection system use, care and handling as required in CSA publication Z94.4-02. This course exceeds mandatory training criteria of Federal and Provincial safety legislation and establishes a standard of employer training diligence.

CEU Value: 0.7 **Duration: 7 hours**

Scope:

The curriculum includes the following topics:

a. RESPIRATORY PHYSIOLOGY
b. RESPIRATORY HAZARDS
c. LEGISLATIVE REQUIREMENTS
d. SELECTION & FITTING
e. FIT TESTING / DONNING & DOFFING
f. INSPECTION & CLEANING
g. ROUTINE MAINTENANCE / STORAGE
h. SUPPLIED AIR SYSTEMS (AIR LINE or SCBA)
I. RESPIRATOR LIMITATIONS
j. SAFETY DEVICES
k. AIR PURITY STANDARDS
l. ABNORMAL CONDITIONS
m. PRACTICAL DEMONSTRATIONS

Prerequisites:

In preparation for successful completion of this course applicants ideally should:

1. be medically fit to use air purifying and supplied air respirators.

Minimum Passing Grade:

Correct demonstration of equipment use. Appropriate certificates ("has attended") are issued.

ACTIVATED SLUDGE PROCESS

Purpose:

This course is designed to increase the learner's understanding of common wastewater biochemical treatment processes. Through process control and "hands on" measurement of activated sludge characteristics operators gain valuable troubleshooting and analytical experience. The relationships of the processes controlling factors are studied in detail, so operator's can adjust treatment efficiency to best match the quality of incoming wastewater.

CEU Value: 2.1 **Duration: 21 hours**

Scope:

The curriculum includes the following topics:

a. WASTEWATER CHARACTERISTICS
b. BACTERIOLOGY / MICROBIOLOGY
c. ACTIVATED SLUDGE PROCESS PARAMETERS
d. ALTERNATE BIOCHEMICAL PROCESSES
e. PROCESS QUALITY CONTROL
f. PROCESS CALCULATIONS
g. ANALYTICAL TECHNIQUES
h. SAMPLING / MONITORING
I. INTERPRETIVE MICROSCOPY
j. PHOSPHORUS REMOVAL
k. NITRIFICATION / DENITRIFICATION
1. PHYSICAL / CHEMICAL CONTROLS

Prerequisites:

In preparation for successful completion of this course applicants ideally should:

1. Completed ETI's Basic Wastewater Treatment course or equivalent.

Minimum Passing Grade:

70% based upon a written examination.

EXAMPREP: WATER DISTRIBUTION & SUPPLY 1-2

Purpose:

A general primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in water distribution and supply systems operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain water distribution and supply facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent water distribution and supply facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope:

The curriculum addresses the following topics:

a. WATER CHARACTERISTICS
b. GROUNDWATER SOURCES
b. SYSTEM INFRASTRUCTURE
c. HYDRAULIC PRINCIPLES
d. WATER QUALITY ISSUES
e. SYSTEM CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. DISINFECTION SYSTEMS
l. LEGISLATION
m. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

TRENCHING / SHORING

Purpose:

This course is designed to apprise the learner of the health and safety requirements for workplaces requiring the use of trenching and shoring systems. A review of the workplace hazards, safe work practices and OHSA requirements for trenching and shoring is discussed. On completion the learner will be able to recognize a safe shoring system and know the limitations of work that can be performed within such systems.

CEU Value: 0.3 **Duration: 0.5 days**

Scope:

The curriculum includes the following topics:

a. PROTECTIVE EQUIPMENT
b. TRENCHING / SHORING LEGISLATION
c. EMERGENCY CONDITIONS
d. SOIL TYPE EVALUATION
e. APPROVED SHORING/TRENCHING SYSTEMS
f. TRAFFIC / PEDESTRIAN SAFETY
g. UTILITY LOCATING
h. HANDLING OTHER UTILITIES
I. HAZARD RECOGNITION
j. WORK AREA PROTECTION
k. EMPLOYER POLICY

Minimum Passing Grade:

70% quiz. Appropriate certificates ("has attended") are issued.

BASIC WASTEWATER TREATMENT

Purpose:

This course is designed for industrial and municipal operators as a practical introduction to unit treatment wastewater processes. Training focuses on "the need to know" fundamentals of wastewater treatment and is suitable for untrained and/or inexperienced employees as a basic introduction to the subject. Successful completion of this course is a prerequisite for other ETI training courses in wastewater treatment.

CEU Value: 2.8 **Duration: 28 hours**

Scope:

The curriculum includes the following topics:

a. WASTEWATER CHARACTERISTICS
b. BACTERIOLOGY / MICROBIOLOGY
c. PRETREATMENT
d. PRIMARY TREATMENT
e. ACTIVATED SLUDGE PROCESS
f. SLUDGE DIGESTION
g. PROCESS CALCULATIONS
h. SLUDGE HANDLING METHODS
i. CHLORINATION / DISINFECTION
j. LABORATORY PROCESS CONTROL
k. SAMPLING / RECORD KEEPING
1. PREVENTIVE MAINTENANCE
m. OPERATIONS SAFETY
n. PERSONAL HYGIENE

Minimum Passing Grade:

70% based upon a written examination.

LABORATORY SKILLS

Purpose:

To provide treatment operators with the sampling, testing and analytical skills to perform in-plant process control. The curriculum covers techniques, methods and dally tests that provide decision making operational data. Successful students will competently demonstrate the ability to perform in-plant laboratory tests and relate the data to what is observed in the treatment facility.

CEU Value: 2.1 **Duration: 21 hours**

Scope:

The curriculum includes the following topics:

a. BASIC CHEMISTRY
b. LAB SAFETY
C. INSTRUMENTATION & GLASSWARE
d. ACCURACY & PRECISION
e. LAB SOLUTION PREPARATION
f. ANALYTICAL TECHNIQUES
    - Sample preparation & preservation
    - Gravimetry (liquids/solids)
    - Spectrophotometry
    - Colorimetric analysis
    - Microscopy
    - Jar Testing
    - Respirometry
    - Physical/Chemical parameters
g. DATA INTERPRETATION
h. TREND ANALYSIS/CHARTING

Minimum Passing Grade:

70% based upon both written and practical examinations.

BIOSOLIDS TREATMENT & DISPOSAL

Purpose:

This course is intended to familiarize engineering and operational personnel with the various technologies available for handling biosolids sludges. The advantages and limitations of physical, chemical and biological sludge processes will be surveyed. Unit process operation and troubleshooting is discussed.

CEU Value: 2.1 Duration: 21 hours

Scope:

The curriculum includes the following topics:

a. BIOSOLIDS CHARACTERISTICS
b. CHEMICAL PRECONDITIONING
c. UNIT PROCESSES
   - gravity thickening - aerobic digestion
   - anaerobic digestion - filtration methods
   - lagooning - incineration
   - thermal treatment - dissolved air floatation
   - chemical treatment - drying beds
   - composting - landfarming and landfilling
   - anaerobic filtration
d. LABORATORY PROCESS CONTROL
e. BIOSOLIDS UTILIZATIONOUIDELINES
f. PROCESS CALCULATIONS
g. PERSONAL HYGIENE

Minimum Passing Grade:

70% based upon a written examination.

ANAEROBIC DIGESTION PROCESS

Purpose:

The course is designed for operators of biological anaerobic sludge digestion facilities. Suitable for the new or inexperienced operator, the training centers on unit operation, process control and troubleshooting. The safe operation and maintenance of biogas production and handling systems is stressed.

CEU Value: 2.5 **Duration: 3.5 days**

Scope:

The curriculum includes the following topics:

a. SLUDGE CHARACTERISTICS
b. PRIMARY TREATMENT
c. PRECONDITIONING
d. MICROBIOLOGY
e. ANAEROBIC PROCESS CONTROL
f. GAS PRODUCTION & HANDLING SYSTEMS
g. TROUBLESHOOTING
h. DEWATERING
i. DIGESTER CLEANOUT
j. STARTUP & SHUTDOWN
k. LABORATORY ANALYSIS
1. SLUDGE UTILIZATION GUIDELINES
m. PROCESS CALCULATIONS
n. DIGESTER SAFETY & PERSONAL HYGIENE

Minimum Passing Grade:

70% based upon a written examination.

WASTEWATER COLLECTION SYSTEMS

Purpose:

Designed to increase an operator's on the job understanding of operating wastewater collection systems. It is ideally suited for individuals who operate, troubleshoot and maintain collection systems. The curriculum focuses on methods of routine operation and maintaining collection system infrastructure. Desirably, one year of operational experience is recommended.

CEU Value: 2.8 **Duration: 28 hours**

Scope:

The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. SYSTEM NOMENCLATURE
c. HYDRAULIC PRINCIPLES
d. GENERAL CONSTRUCTION
e. INSPECTION TECHNIQUES
f. FLOW CONTROL
h. SAMPLING & TESTING
i. PIPELINE CLEANING
j. CORROSION CONTROL
k. PIPE REPAIR & REHABILITATION
1. SAFE WORK PRACTICES
m. EXAMINATION

Minimum Passing Grade:

70% based upon a written examination and daily minitests.

WASTEWATER STABILIZATION PONDS
(Classroom or Correspondence format)

Purpose:

To familiarize operators with the operation and maintenance of wastewater stabilization ponds. Operators learn to optimize the treatment efficiency and perform routine maintenance. Because stabilization pond operation can be either a part time duty or a tertiary part of a conventional system, the scope of the course covers all applications. The correspondence format used allows learner's to acquire needed skills and information at their own pace, while having guided access to an instructor.

CEU Value: 2.1 **Duration: 21 hours**

Scope:

The curriculum includes the following topics:

a. WASTEWATER CHARACTERISTICS
b. STABILIZATION PROCESSES
c. POND TYPES & APPLICATIONS
d. FACTORS AFFECTING OPERATION
e. POND MICROBIOLOGY
f. ROUTINE MAINTENANCE
g. BIOSOLIDS DISPOSAL
h. OPERATIONAL CALCULATIONS
i. PROCESS CONTROL TESTS
j. OPERATOR RESPONSIBILITIES
k. EMERGENCY OPERATION

Minimum Passing Grade:

70% based upon both written examinations and hand in exercises.

DUE DILIGENCE for OPERATING SUPERVISOR'S & MANAGERS

Purpose:

This seminar is specifically designed to acquaint operating supervisors and managers with their duties/responsibilities under environmental and occupational health & safety legislation. The seminar centers on how to integrate due diligence requirements into today's workplace. By examining recent case studies and legal precedents, participants will understand what the law expects from decision makers and supervisory staff.

CEU Value: 0.7 **Duration: 7 hours**

Scope:

The curriculum includes the following topics:

a. SUPERVISORS PERSPECTIVE
b. ACCIDENT THEORY
c. LEGAL OBLIGATIONS
d. DUE DILIGENCE CONCEPT
e. RISK SYSTEMS vs. PROGRAMS
f. AUDITING & CORRECTION
g. CORPORATE CULTURE
h. WORKFORCE TRAINING

Prerequisites:

Suitable participants should be;

1. supervisors, senior management,
2. corporate officers or directors,
3. board members, trustees, governors, or
4. an employees designee.

Minimum Passing Grade:

Self-evaluation quiz. Appropriate certificates ("has attended") are issued.

SURFACE WATER TREATMENT

Purpose:

This course is designed to increase the knowledge and skills of surface water treatment operators. It is ideally suited for individuals who make daily process control decisions. Operational troubleshooting, process control and chemical dosage efficiency are stressed throughout. Successful completion of the Basic Water Treatment course or equivalent is a prerequisite. Desirably, one year of operational experience is recommended.

CEU Value: 2.8 **Duration: 28 hours**

Scope:

The curriculum addresses the following topics:

a. WATER CHEMISTRY & REACTIONS
b. MICROBIOLOGICAL LIMITS
c. TREATMENT CHEMICALS
d. COAGULATION / FLOCCULATION /SEDIMENTATION
e. FILTRATION EFFICIENCY
f. DOSAGE CALCULATIONS & FEED RATES
h. LABORATORY TESTS & SKILLS
i. TASTE & ODOUR CONTROL
j. IRON & MANGANESE CONTROL
k. OPERATIONAL TROUBLESHOOTING
1. EXAMINATION

Prerequisites:

In preparation for successful completion of this course applicants must:

1. have successfully completed ETI's Basic Water Treatment course.

Minimum Passing Grade:

70% based upon a written examination, daily minitests

MICROSCOPY

Purpose:

This course acquaints the trainee with microscope use and microscopy as an analytical tool. Hands on instruction focus on the nomenclature of the microscope as well as its operation, care and storage. Trainees will learn to prepare and evaluate slides for examination. Proper scanning, staining and illumination techniques will be discussed and demonstrated. Samples will be examined for species identification and interpretive analysis of conditions within specific aquatic environments. Trainees will know what features to consider in making microscope purchases.

CEU Value: 1.4 **Duration: 14 hours**

Scope:

The curriculum addresses the following topics:

a. MICROSCOPY FUNDAMENTALS
b. NOMENCLATURE
c. SLIDE PREPARATION
d. CARE, USE AND STORAGE OF A MICROSCOPE
e. SCANNING TECHNIQUES
f. DRY/WET MOUNTING
h. STAINING
i. MICROBIOLOGICAL IDENTIFICATION
j. ALGAE ENUMERATION
k. ILLUMINATION METHODS
1. EXAMINATION

Minimum Passing Grade:

70% based upon a written examination, daily minitests

EXAMPREP: WASTEWATER TREATMENT 1-2

Purpose:

A primer for operators writing level 1-2 certification exams. The course content relates to examination "need to know" information. It's not a crash course in wastewater treatment operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain wastewater treatment facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent wastewater treatment facts, principles and legislation.

CEU Value: 2.1 **Duration: 21 hours**

Scope: The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. EQUIPMENT NOMENCLATURE
c. HYDRAULIC PRINCIPLES
d. UNIT PROCESS FUNCTIONS
e. PROCESS CALCULATIONS
f. BIOCHEMISTRY
h. SAMPLING
i. ANALYTICAL TECHNIQUES
j. CHEMICAL TREATMENT
k. ANCILLARY SUPPORT
l. BIOSOLIDS HANDLING
m. EXAM STRATEGIES

Minimum Passing Grade:

70% self-assessment quiz.

ADVANCED SLUDGE MICROSCOPY

Purpose:

This course reacquaints the trainee with microscope use and microscopy as an analytical tool. Hands on instruction focus on the nomenclature of the microscope as well as its operation, care and storage. Trainees will learn to stain, prepare and evaluate slides for filament examination. Proper scanning and an introduction to advanced illumination techniques (phase contrast, dark field) will be discussed and demonstrated. Samples will be examined for filament phenotype identification and interpretive analysis of conditions as well as control mechanisms used to inhibit filament growth.

CEU Value: 1.4 **Duration: 14 hours**

Scope:

The curriculum addresses the following topics:

a. FUNDAMENTALS/NOMENCLATURE REVIEW
b. CARE, USE AND STORAGE OF A MICROSCOPE
c. SLIDE PREPARATION
d. SCANNING & ENUMERATION
e. DRY/WET MOUNTING
f. FILAMENT CHARACTERISTICS
h. COLOUR STAINING TECHNIQUES (gram/neiser/carbon)
i. MICROBIOLOGICAL IDENTIFICATION
j. ILLUMINATION METHODS
k. FILAMENT INHIBITION/CONTROLS
1. EXAMINATION

Prerequisites:

In preparation for successful completion of this course applicants must:
Have a basic understanding of wastewater protozoan life forms.

Minimum Passing Grade:

70% based upon a practicum of identified filaments and staining preparation

ANAEROBIC DIGESTION OPERATION

Purpose:

The course is suited for professional operators of two stage biological anaerobic sludge digestion facilities. The training focuses on common WW mesophyllic anaerobic operation parameters, loadings, biosolids and biogas yields, process control, analysis and troubleshooting. The safe operation and maintenance of biogas production and handling systems is also stressed. On completion operators will have the requisite skills to efficiently load, run and monitor WW anaerobic digestion processes and their ancillary systems. This course can be split over two, two day parts.

CEU Value: 2.8 **Duration: 4 days (28 hours)**

Scope:

The curriculum includes the following topics:

a. DIGESTION PARAMETERS
b. PRIMARY TREATMENT
c. PRECONDITIONING
d. ANAEROBIC MICROBIOLOGY
e. ANAEROBIC PROCESS CONTROL
f. GAS PRODUCTION & HANDLING SYSTEMS
g. TROUBLESHOOTING ACTION
h. DEWATERING
i. DIGESTER CLEANOUT
j. STARTUP & SHUTDOWN ACTION
k. LAB SAMPLING & ANALYSIS
l. BIOSOLIDS & BIOGAS YIELDS
m. PROCESS CALCULATIONS
n. DIGESTION SAFETY & PERSONAL HYGIENE

Prerequisites:

In preparation for successful completion of this course applicants ideally should:

1. have completed ETI's "Wastewater Treatment" course or equivalent.

Minimum Passing Grade:

70% based upon a written examination

ENVIRONMENTAL TRAINING INSTITUTE

ATP: MICROBIAL MONITORING

Purpose:

ATP is a molecule of energy transference in living cells. Quantitative analysis by enzymatic reaction allows a direct measurement of microbial densities in water, storage or piping biogrowths. Microbial ATP characterizations of source water, treatment processes, stored water and finished water are possible in minutes. Microbial loading measured across processes or entire systems can pinpoint deteriorating water quality or access the efficacy of remedial actions used to restore quality. This course defines what ATP microbial monitoring is and is not and demonstrates through a practicum of how to use the technology for in plant process control and distribution evaluation and storage verification. Students will use ATP protocols for drinking water testing and/or water distribution deposit and surface analysis.

CEU Value: **1.4** Duration: **2 days**

Scope: The curriculum addresses the following topics:

a. ATP THEORY
b. ATP EQUIPMENT
c. ANALYTICAL TECHNIQUES
d. BIOMASS CALCULATIONS
e. DRINKING WATER ATP PROTOCOLS
f. PIPING & STORAGE ATP PROTOCOLS
h. TREATMENT PLANT CHARACTERIZATION
i. DISTRIBUTION SYSTEM CHARACTERIZATION
j. ATP EVALUATION AND INTERPRETATION

Prerequisites:

In preparation for successful completion of this course applicants ideally should:

1. be certified Water/Wastewater operators or water quality analysts.

Minimum Passing Grade:

Quiz 70%, hands on demonstration of analytical techniques.
Appropriate certificates are issued.

Chemical Dosage Control and Optimization

Purpose:

A course designed to highlight the importance of good chemical dosage control. Physical, chemical and biochemical processes rely on optimum conditions for efficient treatment. Chemical enhancements improve removal efficiency, but at higher input costs for infrastructure, inventory, energy and manpower. Managing chemical dosages correctly ensures compliance while keeping costs low.
This course is suitable for certified operators who have working knowledge of the chemical treatment processes used for Water or Wastewater treatment.

CEU Value: 1.4 **Duration: 14 hours**

Scope:

The curriculum includes the following topics:

a. PHYSICAL, CHEMICAL, BIOCHEMICAL PROCESSES
b. NEED for CHEMICAL ENHANCEMENT
c. DOSAGE vs. CONCENTRATION
d. FEED RATE CALCULATIONS
e. CHEMICAL CONTROL SYSTEMS
f. JAR TESTING vs. FULL SCALE TESTING
g. PRECIPITATION CONTROL
h. DISINFECTION CONTROL
i. THICKENING / DEWATERING CONTROL
j. OXIDATION / REDUCTION CONTROL
k. CONDITIONAL LIMITATIONS
l. COST/ENERGY CONSIDERATIONS

Minimum Passing Grade:

70% based upon a written examination.

ENVIRONMENTAL TRAINING INSTITUTE

Gas Chlorination Workshop

Purpose:

Designed for professional water /wastewater operator's who operate gas chlorinators connected to 150 lb or one ton containers. Ideally the workshop is suited for individuals who must operate, troubleshoot and maintain gas chlorination systems. The workshop focuses on gas chlorinator theory of operation and diagnosing common startup, shutdown and running problems. Candidates will solve operational problems through simulated failures of various chlorinator systems. The use of SCBA's, is addressed. Candidates can practice donning, doffing and care skills through guided instruction.

CEU Value: **1.4** Duration: **2 days**

Scope: The curriculum addresses the following topics:

a. GAS CHLORINATOR OPERATION THEORY
b. SAFETY & EMERGENCY PRACTICES
c. CYLINDER / TONNER HANDLING
d. GAS CHLORINATOR NOMENCLATURE
e. INSPECT, CLEAN, REPAIR, REPLACE CHLORINATORS
f. GAS CHLORINATOR STARTUP / SHUTDOWN
h. PRACTICAL CHLORINATOR TROUBLSHOOTING
i. ORAL / PRACTICAL PERFORMANCE DEMONSTRATIONS

Prerequisites:

In preparation for successful completion of this course applicants ideally should:

1. be functionally numerate and literate at grade 12 level.
2. have mastered water/wastewater chlorination theory.
3. hold Level 1 operator certification.

Minimum Passing Grade:

Oral/practical demonstration 70%, appropriate certificates are issued.

STATE POINT ANALYSIS

Purpose:

State Point Analysis (SPA) integrates well as a process control tool than does traditional activated sludge control methods such as F/M, SRT, Mass Balance or Sludge Age protocols. It provides for real time process control resulting in less out of compliance events especially during instability or crisis modes of operation. SPA can also be built into the SCADA system or run standalone and runs without having to perform repetitive process calculations. A graphical interface supplies operators with a predictive process control tool for managing flow variations, loadings fluxes and sludge production quality. The method is fully adaptable for use with conventional, extended aeration, or contact stabilization treatment facilities.

CEU Value: 1.4 **Duration: 14 hours**

Scope:

The course curriculum includes discussion about:

a. Secondary Treatment
b. Analysis Methodology Limits
c. Biomass Inventory Control
d. Clarification Objectives
e. SPA Description and Definitions
f. SPA Data Integration
g. Using SPA for Process Control
h. Biosolids Recovery

ENVIRONMENTAL TRAINING INSTITUTE

MASTER CLASS: Efficiency Operations

Purpose:

Learners are shown how to interpret and use real time data to determine plant efficiency in two areas, energy efficiency of pumps and pumping systems and chemical dosage control. By computing wire to water ratios for high energy pumping systems, power losses and energy costs are determined, providing the basis for continuous maintenance and operation improvements. Through a series of jar testing exercises, the importance of proper lab skills and stock solution preparation techniques are reinforced. Accurate measurement and precision leads to improved control of chemicals. Performing calculations and showing the correct use of applied measuring and transfer techniques demonstrate mastery. A pass/fail is based on a practical evaluation.

CEU Value: 0.7 **Duration: 7 hours**

Scope:

The curriculum includes the following topics:

a. EFFICIENCY CACULATIONS
b. DATA INTERPRETATION
e. WIRE to WATER RATIO
f. RETREIVING PLANT DATA
g. REAL TIME ANALYSIS
h. DOSAGE CONTROL
g. BENCH to PLANT SCALE
h. STOCK SOLUTION PREPARATION
i. LAB TECHNIQUES
j. PERFORM JAR TESTS
k. PRACTICAL EVALUATION

Prerequsite: **Level II Certification**

WATER /WASTEWATER UTILITY MANAGEMENT

Purpose:

Because senior professional operators are now responsible for the complete facility in which they work, a basic understanding of how to mange is a required part of the job in addition to technical expertise. This course teaches the knowledge and skills to responsibly manage utilities and its resources. Emphasis is placed on due diligence, regulatory compliance, human and financial resource management practices, which can serve as models for daily management of water/wastewater facilities.

CEU Value: **2.0** Duration: **2.5 days** (20 hours)

Scope: The following topics are included in the curriculum:

a. PRINCIPLES OF MANAGEMENT
b. MANAGER'S ROLE
c. PLANNING
d. HUMAN RESOURCES
e. COMMUNICATION
f. PUBLIC RELATIONS
g. FINANCE & BUDGETING
h. OPERATIONS & MAINTENANCE
i. REGULATORY COMPLIANCE
j. PROGRAMS & POLICIES
k. DUE DILIGENCE

Prerequisites:

In preparation for successful completion of this course applicants ideally should be;

1. a line supervisor, lead hand or foreman.

Minimum Passing Grade:

70% based upon a written examination. Appropriate certificates ("successfully completed" or "has attended") are issued.

ADVANCED WATER TREATMENT

Purpose:

This advanced course discusses operating unit treatment processes of specialized drinking water treatment facilities. Training focuses on "the need to know" fundamentals of plant operation and public health protection.

CEU Value: 2.1 **Duration: 21 hours**

Scope:

The curriculum includes the following topics:

a. SOURCE WATER MORPHOLOGY
b. AQUATIC MICROBIOLOGY
c. PHYSICAL / CHEMICAL / BIOLOGICAL / RADIOLOGICAL
d. PREOXIDATION
e. MEMBRANE FILTRATION
f. BIO-FILTRATION
m. UV DISINFECTION
n. OZONATION
o. PROCESS CONTROL
p. COMPOUND DISINFECTION
q. ANALYTICAL CONTROLS
r. BIOSOLIDS MANAGEMENT
m. PUBLIC HEALTH CONSIDERATIONS

Prerequisites:

In preparation for successful completion of the course, applicants ideally should:

1. have completed ETI's Basic Water Treatment course.

Minimum Passing Grade:

70% based upon a written examination.

BASIC CHEMISTRY CONCEPTS

Purpose:

A course designed to introduce basic chemical concepts and terms used throughout the water/wastewater industry. Because operators today use pre-packaged reagents without an understanding of the underlying fundamental facts, concepts or principals involved in water chemistry, specific comprehension of chemistry and its related terminology is required to understand what really happens. Through theory and specific chemical analyses' the learner will realize why factors of cleanliness, sample preparation, reaction time and reagent quality are important to valid sample collection, analysis, and data generation.

CEU Value: 2.5 **Duration: 25 hours**

Scope:

The curriculum includes the following topics:

a. ATOMIC THEORY
b. CHEMISTRY TERMINOLOGY
c. COMMON COMPOUNDS
d. SYMBOLS & FORMULAE
h. CHEMICAL BONDING
i. REACTIONS
g. ATOMIC/MOLECULAR WEIGHTS
h. NORMALITY/MOLARITY
i. RELATIVE DENSITY
j. DOSAGE CALCULATIONS
k. PROCESS CHEMISTRY

Minimum Passing Grade:

70% based on written examination.

EXAMPREP: WASTEWATER COLLECTION 1-2

Purpose:

An introductory primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in wastewater collection systems operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain wastewater collection facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent wastewater collection facts, principles and legislation.

CEU Value: 2.1 **Duration: 21 hours**

Scope: The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. SYSTEM INFRASTRUCTURE
c. HYDRAULIC PRINCIPLES
d. GENERAL CONSTRUCTION
e. INSPECTION METHODS
f. FLOW CONTROL SYSTEMS
h. SAMPLING & TESTING
i. PIPELINE CLEANING
j. OPERATIONAL FACTS
k. REPAIR & REHABILITATION
l. SAFE WORK PRACTICES
m. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz

EXAMPREP: WASTEWATER COLLECTION 3-4

Purpose:

An advanced primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in wastewater collection systems operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain wastewater collection facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent wastewater collection facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope: The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. SYSTEM INFRASTRUCTURE
c. HYDRAULIC PRINCIPLES
d. GENERAL CONSTRUCTION
e. INSPECTION METHODS
f. FLOW CONTROL SYSTEMS
h. SAMPLING & TESTING
i. PIPELINE CLEANING
j. OPERATIONAL FACTS
k. REPAIR & REHABILITATION
l. SAFE WORK PRACTICES
m. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz

ENVIRONMENTAL TRAINING INSTITUTE

MATH SKILLS for OPERATORS

Purpose:

To ensure that system or facility operators can perform technical process calculations required for reporting and operational troubleshooting. Simple problem solving strategies are used to help analyze complex problems. A practical review for those whose math skills are rusty. Skills and methods shown are practical, relevant and a good preparation for operators planning to write MOE license exams. This course is not intended as a crash course for those who aren't numerate.

CEU Value: 2.1 **Duration: 21 hours**

Scope: The curriculum includes the following topics:

a. PROBLEM SOLVING METHODS
b. FORMULA CONCEPTS
c. REPORTING DATA
d. ESTIMATING
e. MEASUREMENT CONVERSION
f. NUMBER SYSTEMS (S.I. Imp. & US)
g. DECIMALS/FRACTIONS/EXPONENTS
h. VELOCITY/FLOW RATE
i. PRESSURE/FORCE/HEAD
j. EFFICIENCY/PERFORMANCE/LOSSES
k. CHEMICAL SOLUTION PREPARATION
l. FEED RATE CONTROL
m. HYDRAULIC & ELECTRIC POWER
n. CHEMICAL DOSAGE

Minimum Passing Grade:

70% self-assessment quiz

EXAMPREP: WATER DISTRIBUTION 1-2

Purpose:

An introductory primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in water distribution systems operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain water distribution facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent water distribution facts, principles and legislation.

CEU Value: 2.1 **Duration: 21hours**

Scope: The curriculum addresses the following topics:

a. WATER CHARACTERISTICS
b. SYSTEM INFRASTRUCTURE
c. HYDRAULIC PRINCIPLES
d. WATER QUALITY ISSUES
e. SYSTEM CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. LEGISLATION
l. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

EXAMPREP: WATER DISTRIBUTION 3-4

Purpose:

An advanced primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in water distribution systems operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain water distribution facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent water distribution facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope: The curriculum addresses the following topics:

a. WATER CHARACTERISTICS
b. SYSTEM INFRASTRUCTURE
c. HYDRAULIC PRINCIPLES
d. WATER QUALITY ISSUES
e. SYSTEM CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. LEGISLATION
l. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

EXAMPREP: BASIC WASTEWATER TREATMENT

Purpose:

An introductory primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in wastewater treatment operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain wastewater treatment facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent wastewater treatment facts, principles and legislation.

CEU Value: 2.1 **Duration: 21 hours**

Scope: The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. TREATMENT NOMENCLATURE
c. HYDRAULIC PRINCIPLES
d. UNIT PROCESSES
e. PROCESS CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. BIOSOLIDS HANDLING
l. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

EXAMPREP: INTERMEDIATE WASTEWATER TREATMENT 2-3

Purpose:

An intermediate level primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in wastewater treatment operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain wastewater treatment facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent wastewater treatment facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope: The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. TREATMENT NOMENCLATURE
c. HYDRAULIC PRINCIPLES
d. UNIT PROCESSES
e. PROCESS CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. BIOSOLIDS HANDLING
l. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

EXAMPREP: ADVANCED WASTEWATER TREATMENT

Purpose:

An advanced primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in wastewater treatment operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain wastewater treatment facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent wastewater treatment facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope: The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. TREATMENT NOMENCLATURE
c. HYDRAULIC PRINCIPLES
d. UNIT PROCESSES
e. PROCESS CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. BIOSOLIDS HANDLING
l. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

CONFINED SPACE ENTRY: Reg. 632

Purpose:

This one day course is designed for persons working in confined spaces or responsible for safe confined space management. Safe entry procedures and proper equipment use are stressed throughout. This course establishes a standard of employer training diligence. Suitable for initial subject introduction or as refresher training.

CEU Value: 0.7 **Duration: 7 hours**

Scope: The curriculum includes the following topics:

a. CONFINED SPACE LEGISLATION
b. ATMOSPHERIC HAZARD RECOGNITION
c. PHYSICAL HAZARD ASSESSMENT & ISOLATION
d. PROTECTIVE EQUIPMENT REQUIREMENTS
e. AIR MONITOR USE, FUNCTION & FIELD CALIBRATION
f. AIR RESPIRATORY SYSTEMS (AIR LINE or SCBA)
g. ENTRY PROCEDURES & EMPLOYER POLICY
h. VENTILATION SYSTEMS
i. EMERGENCY & RESCUE ACTIONS

Minimum Passing Grade:

70% based upon a written examination

CONFINED SPACE MANAGEMENT

Purpose:

This management seminar is specifically designed for workplace supervisors and joint committee members as an executive overview of current confined space concerns. Issues address legislative interpretation, equipment technology and worker training. The seminar centers on how to meet legislative requirements for confined spaces and manage confined workplaces. Discussion pointers regarding equipment selection and management policies related to confined workplaces.

This seminar is suggested as a prerequisite for the management team prior to conducting ETI's CONFINED SPACE ENTRY: (Due Diligence Standard) course.

CEU Value: 0.7 **Duration: 7 hours**

Scope:

The curriculum includes the following topics:

a. SUPERVISORS PERSPECTIVE
b. CONFINED SPACE LEGISLATION
c. CONFINED WORKPLACES
d. PROTECTIVE EQUIPMENT
e. RESPIRATORY PROTECTION
f. ATMOSPHERIC SENSING TECHNOLOGY
g. HUMAN TOXICOLOGY / PHYSIOLOGY
h. CORPORATE POLICY
i. WORKER TRAINING
j. LEGAL PRECEDENTS / CASE STUDIES

Prerequisites:

Suitable participants should be:

1. supervisors of confined workplaces; or
2. members of a health and safety committee; or
3. OHS inspection or enforcement personnel; or
4. an employer's designee.

Minimum Passing Grade:

Self-evaluation exercise. Appropriate certificates ("has attended") are issued.

EXAMPREP: WATER QUALITY ANALYST

Purpose:

The Water Quality Analyst (WQA) examination is intended for water laboratory technicians. This examprep course is also ideally suited for individuals who are not classed as operators yet are required to sample and analyze drinking water for physical, chemical biological, and radiological characteristics. The course content relates to examination "need to know" information. It's not a crash course in water quality analysis. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain water distribution facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent water quality facts, analytical techniques and legislation.

CEU Value: 2.1 **Duration: 21 hours**

Scope:

The curriculum addresses the following topics:

a. DRINKING WATER CHARACTERISTICS
b. DRINKING WATER LEGISLATION
c. WATER QUALITY ISSUES
d. CHEMISTRY CONCEPTS
e. ANALYTICAL EQUIPMENT
f. SAMPLING PROTOCOLS
h. ANALYTICAL TECHNIQUES
i. PROCESS CALCULATIONS
j. LABORATORY QA/QC
k. LAB SAFETY
l. EXAM STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

RESPIRATORY PROTECTION SYSTEMS

Purpose:

This course is specifically designed for people who use "Air Purifying" or "Supplied Air" respiratory systems in the workplace. The training centres on the use, care, maintenance and application of various respiratory protection systems. A "hands on" approach reinforces classroom lessons, helping build trainee confidence and knowledge. Successful candidates will demonstrate competency in respiratory protection system use, care and handling as required in CSA publication Z94.4-02. This course exceeds mandatory training criteria of Federal and Provincial safety legislation and establishes a standard of employer training diligence.

CEU Value: 0.7 **Duration: 7 hours**

Scope:

The curriculum includes the following topics:

a. RESPIRATORY PHYSIOLOGY
b. RESPIRATORY HAZARDS
c. LEGISLATIVE REQUIREMENTS
d. SELECTION & FITTING
e. FIT TESTING / DONNING & DOFFING
f. INSPECTION & CLEANING
g. ROUTINE MAINTENANCE / STORAGE
h. SUPPLIED AIR SYSTEMS (AIR LINE or SCBA)
I. RESPIRATOR LIMITATIONS
j. SAFETY DEVICES
k. AIR PURITY STANDARDS
l. ABNORMAL CONDITIONS
m. PRACTICAL DEMONSTRATIONS

Prerequisites:

In preparation for successful completion of this course applicants ideally should:

1. be medically fit to use air purifying and supplied air respirators.

Minimum Passing Grade:

Correct demonstration of equipment use. Appropriate certificates ("has attended") are issued.

EXAMPREP: WATER DISTRIBUTION & SUPPLY 1-2

Purpose:

A general primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in water distribution and supply systems operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain water distribution and supply facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent water distribution and supply facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope:

The curriculum addresses the following topics:

a. WATER CHARACTERISTICS
b. GROUNDWATER SOURCES
b. SYSTEM INFRASTRUCTURE
c. HYDRAULIC PRINCIPLES
d. WATER QUALITY ISSUES
e. SYSTEM CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. DISINFECTION SYSTEMS
l. LEGISLATION
m. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.

TRENCHING / SHORING

Purpose:

This course is designed to apprise the learner of the health and safety requirements for workplaces requiring the use of trenching and shoring systems. A review of the workplace hazards, safe work practices and OHSA requirements for trenching and shoring is discussed. On completion the learner will be able to recognize a safe shoring system and know the limitations of work that can be performed within such systems.

CEU Value: 0.3 **Duration: 0.5 days**

Scope:

The curriculum includes the following topics:

a. PROTECTIVE EQUIPMENT
b. TRENCHING / SHORING LEGISLATION
c. EMERGENCY CONDITIONS
d. SOIL TYPE EVALUATION
e. APPROVED SHORING/TRENCHING SYSTEMS
f. TRAFFIC / PEDESTRIAN SAFETY
g. UTILITY LOCATING
h. HANDLING OTHER UTILITIES
I. HAZARD RECOGNITION
j. WORK AREA PROTECTION
k. EMPLOYER POLICY

Minimum Passing Grade:

70% quiz. Appropriate certificates ("has attended") are issued.

BASIC WASTEWATER TREATMENT

Purpose:

This course is designed for industrial and municipal operators as a practical introduction to unit treatment wastewater processes. Training focuses on "the need to know" fundamentals of wastewater treatment and is suitable for untrained and/or inexperienced employees as a basic introduction to the subject. Successful completion of this course is a prerequisite for other ETI training courses in wastewater treatment.

CEU Value: 2.8 **Duration: 28 hours**

Scope:

The curriculum includes the following topics:

a. WASTEWATER CHARACTERISTICS
b. BACTERIOLOGY / MICROBIOLOGY
c. PRETREATMENT
d. PRIMARY TREATMENT
e. ACTIVATED SLUDGE PROCESS
f. SLUDGE DIGESTION
g. PROCESS CALCULATIONS
h. SLUDGE HANDLING METHODS
i. CHLORINATION / DISINFECTION
j. LABORATORY PROCESS CONTROL
k. SAMPLING / RECORD KEEPING
1. PREVENTIVE MAINTENANCE
m. OPERATIONS SAFETY
n. PERSONAL HYGIENE

Minimum Passing Grade:

70% based upon a written examination.

LABORATORY SKILLS

Purpose:

To provide treatment operators with the sampling, testing and analytical skills to perform in-plant process control. The curriculum covers techniques, methods and dally tests that provide decision making operational data. Successful students will competently demonstrate the ability to perform in-plant laboratory tests and relate the data to what is observed in the treatment facility.

CEU Value: 2.2 **Duration: 22 hours**

Scope:

The curriculum includes the following topics:

a. BASIC CHEMISTRY
b. LAB SAFETY
C. INSTRUMENTATION & GLASSWARE
d. ACCURACY & PRECISION
e. LAB SOLUTION PREPARATION
f. ANALYTICAL TECHNIQUES
    - Sample preparation & preservation
    - Gravimetry (liquids/solids)
    - Spectrophotometry
    - Colorimetric analysis
    - Microscopy
    - Jar Testing
    - Respirometry
    - Physical/Chemical parameters
g. DATA INTERPRETATION
h. TREND ANALYSIS/CHARTING

Prerequisites:

In preparation for successful completion of this course applicants ideally should:

1. have completed ETI's Basic Water or Wastewater Treatment course.

Minimum Passing Grade:

70% based upon both written and practical examinations.

BIOSOLIDS TREATMENT & DISPOSAL

Purpose:

This course is intended to familiarize engineering and operational personnel with the various technologies available for handling biosolids sludges. The advantages and limitations of physical, chemical and biological sludge processes will be surveyed. Unit process operation and troubleshooting is discussed.

CEU Value: 2.1 Duration: 21 hours

Scope:

The curriculum includes the following topics:

a. BIOSOLIDS CHARACTERISTICS
b. CHEMICAL PRECONDITIONING
c. UNIT PROCESSES
   - gravity thickening - aerobic digestion
   - anaerobic digestion - filtration methods
   - lagooning - incineration
   - thermal treatment - dissolved air floatation
   - chemical treatment - drying beds
   - composting - landfarming and landfilling
   - anaerobic filtration
d. LABORATORY PROCESS CONTROL
e. BIOSOLIDS UTILIZATIONOUIDELINES
f. PROCESS CALCULATIONS
j. PERSONAL HYGIENE

Prerequisites:

In preparation for successful completion of this course applicants ideally should:

1. have completed ETI's "Wastewater Treatment" course or equivalent;

Minimum Passing Grade:

70% based upon a written examination.

ANAEROBIC DIGESTION PROCESS

Purpose:

The course is designed for operators of biological anaerobic sludge digestion facilities. Suitable for the new or inexperienced operator, the training centers on unit operation, process control and troubleshooting. The safe operation and maintenance of biogas production and handling systems is stressed.

CEU Value: 2.5 **Duration: 3.5 days**

Scope:

The curriculum includes the following topics:

a. SLUDGE CHARACTERISTICS
b. PRIMARY TREATMENT
c. PRECONDITIONING
d. MICROBIOLOGY
e. ANAEROBIC PROCESS CONTROL
f. GAS PRODUCTION & HANDLING SYSTEMS
g. TROUBLESHOOTING
h. DEWATERING
i. DIGESTER CLEANOUT
j. STARTUP & SHUTDOWN
k. LABORATORY ANALYSIS
1. SLUDGE UTILIZATION GUIDELINES
m. PROCESS CALCULATIONS
n. DIGESTER SAFETY & PERSONAL HYGIENE

Prerequisites:

In preparation for successful completion of this course applicants ideally should:

1. have completed ETI's "Wastewater Treatment" course or equivalent;

Minimum Passing Grade:

70% based upon a written examination.

WASTEWATER COLLECTION SYSTEMS

Purpose:

Designed to increase an operator's on the job understanding of operating wastewater collection systems. It is ideally suited for individuals who operate, troubleshoot and maintain collection systems. The curriculum focuses on methods of routine operation and maintaining collection system infrastructure. Desirably, one year of operational experience is recommended.

CEU Value: 2.8 **Duration: 28 hours**

Scope:

The curriculum addresses the following topics:

a. WASTEWATER CHARACTERISTICS
b. SYSTEM NOMENCLATURE
c. HYDRAULIC PRINCIPLES
d. GENERAL CONSTRUCTION
e. INSPECTION TECHNIQUES
f. FLOW CONTROL
h. SAMPLING & TESTING
i. PIPELINE CLEANING
j. CORROSION CONTROL
k. PIPE REPAIR & REHABILITATION
1. SAFE WORK PRACTICES
m. EXAMINATION

Minimum Passing Grade:

70% based upon a written examination and daily minitests.

WASTEWATER STABILIZATION PONDS
(Classroom or Correspondence format)

Purpose:

To familiarize operators with the operation and maintenance of wastewater stabilization ponds. Operators learn to optimize the treatment efficiency and perform routine maintenance. Because stabilization pond operation can be either a part time duty or a tertiary part of a conventional system, the scope of the course covers all applications. The correspondence format used allows learner's to acquire needed skills and information at their own pace, while having guided access to an instructor.

CEU Value: 2.1 **Duration: 21 hours**

Scope:

The curriculum includes the following topics:

a. WASTEWATER CHARACTERISTICS
b. STABILIZATION PROCESSES
c. POND TYPES & APPLICATIONS
d. FACTORS AFFECTING OPERATION
e. POND MICROBIOLOGY
f. ROUTINE MAINTENANCE
g. BIOSOLIDS DISPOSAL
h. OPERATIONAL CALCULATIONS
i. PROCESS CONTROL TESTS
j. OPERATOR RESPONSIBILITIES
k. EMERGENCY OPERATION

Minimum Passing Grade:

70% based upon both written examinations and hand in exercises.

OZONATION

Purpose:

To highlight ozone's use for improving water quality or disinfection. A description is achieved detailing ozonation processes, operation of equipment and the measurement of residual. Classroom discussion of operating & troubleshooting ancillary systems is performed by analyzing the unit processes within the entire treatment train. This course is suitable for OIT, WT, WWT, WWC, WD or WDS operators at all levels.

CEU Value: 0.7 **Duration: 7 hours**

Objectives:

Learners will be able to:

- recall the applications for ozone to enhance water quality.
- operate equipment or systems used for the safe generation, contact, quench and destruction of ozone.
- describe ozone's characteristics, safe handling techniques and emergency procedures.
- perform operational start up system checks and routine sampling.
- perform shut down procedures.
- answer certification exam questions about the subject.

ENVIRONMENTAL TRAINING INSTITUTE

MEMBRANE TREATMENT

Purpose:

To familiarize operators with membrane filtration for water treatment and production. Details and parameters of the membrane filtration processes are discussed. Membrane startup, cleaning and maintenance & repair techniques are covered. Classroom discussion of operating & troubleshooting of membrane ancillary systems is performed by analyzing the unit processes within the treatment train. SCADA data tracking analysis is introduced. This course is suitable for OIT, WT, WWT, WWC, WD or WDS operators at all levels.

CEU Value: 2.1 **Duration: 21 hours**

Objectives:

Learners will be able to:

- describe membrane filtration modes and how each mode works.
- recall membrane startup, run and shutdown procedures and understand the limits of operation.
- recall operational system checks to verify membrane performance.
- describe cleaning. shut down, and repair procedures.
- identify how data tracking is used for membrane troubleshooting.

EXAMPREP: PROCESS MATHEMATICS

Purpose:

A review of the common calculations used throughout operator certification exams. Examples are drawn from experience and from actual process problems using a logical approach to problem solving. The guiding document used is the ABC conversion and formulae sheets. As time permits, a detailed analysis of process mathematics is conducted. The course is suitable for OIT, WT, WWT, WWC, WD or WDS examinees at all levels.

CEU Value: 1.4 **Duration: 14 hours**

Scope:

The curriculum includes the following topics:

a. FUNDAMENTAL MATH REVIEW
b. TERMS, COEFFICIENTS AND UNITS OF EXPRESSION
c. MAGNITUDE & CONVERSION FACTORS
d. MANIPULATING EQUATIONS
e. PROBLEM SOLVING STRATEGIES
f. CONVERSIONS
g. AREA, VOLUME, FLOW RATES
h. DETENTION TIME, LOADING RATES
i. CONCENTRATION, DOSAGE, FEED RATES
j. POWER, ENERGY, EFFICIENCY

Minimum Passing Grade:

70% based on written quiz.

CLARIFIER OPTIMIZATION

Purpose:

Clarifier Optimization teaches the knowledge and skills to correctly operate clarification or sedimentation unit processes. Emphasis is placed on hydraulic and organic loading indicators, clarifier control, chemical augmentation and recognizing bottleneck limits. These objectives are achieved through an understanding of settling characteristics, clarification processes and troubleshooting operational problems.

CEU Value: **0.7** Duration: **1 day**

Scope: The following topics are included in the curriculum:

a. CLARIFICATION PRINCIPLES
b. SETTLING CHARACTERISTICS
c. FUNCTIONAL LIMITS
d. LOADING RATES
e. CHEMICAL AUGMENTATION
f. OPERATOR CONTROL
g. STARTUP & SHUTDOWN
h. TROUBLESHOOTING
i. CASE STUDIES
j. PRACTICAL EXAMINATION

Prerequisites:

In preparation for successful completion of this course applicants ideally should:

1. be a certified water/wastewater operator.

Minimum Passing Grade:

70% based upon a written examination, daily minitests and demonstrated lab analysis. Appropriate certificates ("successfully completed" or "has attended") are issued.

Drinking Water Treatment for Distribution Operators

Objective:

This is an introduction to drinking water treatment technologies used prior to discharge into drinking water distribution systems. A variety of methods are employed to treat drinking water based on source water quality, public health regulations, and economics. The most common systems are discussed in general terms. Specific water treatment technologies used for your system will be indentified during a guided orientation of local drinking water treatment facilities. At the end of the training distribution operators will comprehend the water treatment controls taken before finished drinking water is delivered into a water distribution system. Where relevant, discussion of how the distribution system is impacted will be made.

CEU Value: **0.7** Duration: **1 day**

Scope: The following topics are included in the curriculum:

a. WATER QUALITY FACTORS
b. TREATMENT UNIT PROCESSES
c. DOWNSTREAM HYDROCHEMISTRY
d. PROCESS CONTROL POINTS
e. PRIMARY/SECONDARY DISINFECTION
f. CROSS CONNECTION CONTROL
g. CORROSION CONTROL
h. HOW TREATMENT AFFECTS THE DISTRIBUTION SYSTEM

Minimum Passing Grade:

Appropriate certificates are issued.

WATERMAIN DISINFECTION (2016)

Purpose:

To familiarize operators with MOECC revised 2015 watermain disinfection procedures and regulations. MOECC's Watermain Disinfection Procedure document will be explained and discussed. Use of the appended flowcharts to determine disinfection methods and protocols are highlighted as well as discussion about the relevant changes to ANSI AWWA Standard 651-14. This course is suitable for OIT, WT, WWT, WWC, WD or WDS operators at all levels.

CEU Value: 0.7 **Duration: 7 hours**

Objectives:

Learners will be able to:

- recall the regulatory changes to watermain disinfection procedures.
- use the appended logic flowcharts to determine procedures.
- understand why the changes of lessened bacteriological resampling times are in effect.
- describe watermain shut down, cleaning and disinfection repair procedures.
- identify Category 1 and 2 watermain disinfection situations of the Procedure.
- identify "special cases" and emergencies when they occur onsite.

EXAMPREP: WATER DISTRIBUTION

Purpose:

An introductory primer for individuals writing operator certification exams. The course content relates to examination "need to know" information. It's not a crash course in water distribution systems operation. Designed to aid knowledgeable operator's who seek higher scores on certification exams. It's ideally suited for individuals who operate, troubleshoot and maintain water distribution facilities. The course centres on methods and strategies for exam taking, problem solving and reviews pertinent water distribution facts, principles and legislation.

CEU Value: 2.8 **Duration: 28 hours**

Scope: The curriculum addresses the following topics:

a. WATER CHARACTERISTICS
b. SYSTEM INFRASTRUCTURE
c. HYDRAULIC PRINCIPLES
d. WATER QUALITY ISSUES
e. SYSTEM CALCULATIONS
f. CHEMISTRY CONCEPTS
h. SAMPLING & TESTING
i. ANALYTICAL TECHNIQUES
j. SUPPORT SYSTEMS
k. LEGISLATION
l. EXAMINATION STRATEGY

Minimum Passing Grade:

70% self-assessment quiz.