OPERATOR EDUCATION PROGRAM

COURSE CATALOGUE

BCWWA
BC WATER & WASTE ASSOCIATION

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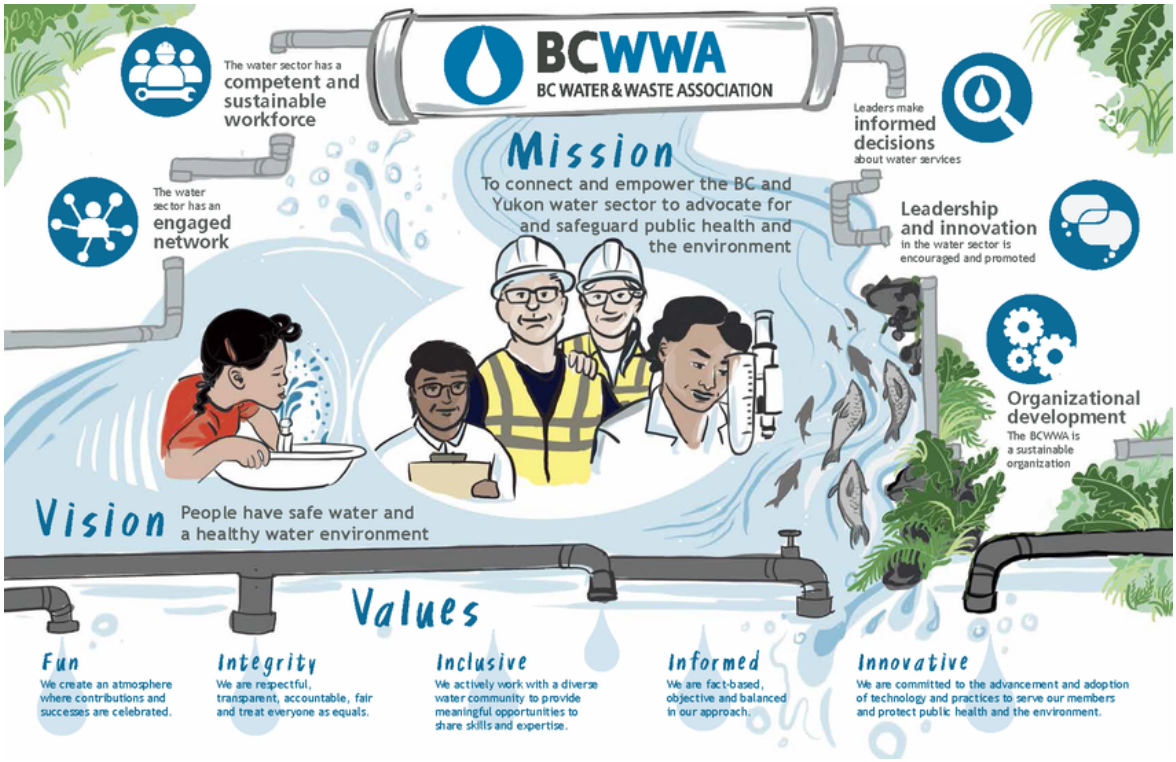


ABOUT THE BCWWA

The BC Water & Waste Association (BCWWA) is a not-for-profit association representing more than 4,000 water professionals who are responsible for ensuring safe, sustainable and secure water, sewer and stormwater systems in BC and the Yukon.

Our members work every day to keep our water systems clean and safe – from source to tap to drain and back to the environment. They include water and wastewater facility operators, utility managers, engineers, technicians and technologists, consultants, government policy and regulatory staff, backflow assembly testers and cross connection control specialists, researchers and suppliers.

Operator education has been a core program of the BCWWA since before the organization was incorporated in 1978. For more than four decades we have been one of the most trusted sources of training in BC and the Yukon, preparing water and wastewater professionals for certification exams, providing continuing education unit credits, and helping advance their careers.

UPGRADE YOUR SKILLS AND ADVANCE YOUR CAREER

Contact us at 604-433-4389 or education@bcwwa.org for more information. You can also visit us at bcwwa.org to view our full course catalogue or to register for a class.

ARE YOU A BCWWA MEMBER? JOIN TODAY AND RECEIVE A DISCOUNT ON ALL CLASSES AND PROFESSIONAL DEVELOPMENT EVENTS

One annual membership fee of $129 gives you access to preferred rates for quality training and professional development events, keeps you informed about the latest industry news and best practices, helps you build your career and professional network, and provides opportunities to influence change as part of a strong and cohesive voice for water and wastewater issues.

CERTIFICATION PREPARATION COURSES: WATER AND WASTEWATER SYSTEMS

WATER TREATMENT 1

CEUs: 2.4 Course Length: 5 days
This course provides operators with the basic knowledge of water treatment plant components and treatment methods used with varying degrees of complexity.

You should take this course if you are:

- Maintaining a facility classified as a Water Treatment 1 (WT1) facility;
- Wanting to understand more, or entering into a role where you will be dealing with the treatment of water; or
- An operator who wishes to prepare for EOCP certification.

After completing this course, you will be able to:

- Describe procedures associated with monitoring, evaluating and adjusting treatment processes;
- Describe the drinking water regulations and their implications to water treatment;
- Describe the practical aspects of plant operations, perform basic operational and maintenance procedures on equipment; and
- Perform safety, security and administrative procedures and basic laboratory analysis procedures.

WATER TREATMENT 2

CEUs: 2.4 Course Length: 5 days
This intermediate course continues the learning for operators on key concepts in the field of water treatment and broadens an operator's knowledge of system fundamentals.

You should take this course if you are:

- Maintaining a facility classified as a Water Treatment 2 (WT2) facility;
- In a role that requires an in-depth understanding of how water treatment works;
- Wishing to move to an Operator Level 2 role within your organization; or
- An operator who wishes to prepare for EOCP certification.

After completing this course, you will be able to:

- Describe and apply procedures associated with monitoring, evaluating and adjusting treatment processes;
- Describe and apply more complex laboratory analysis procedures;
- Address complex chlorine and chemical problem solving; and
- Describe quality control systems.

WATER TREATMENT 3-4

CEUs: 3.0 Course Length: 4.5 days

This course provides the knowledge and understanding required to operate, repair and maintain water treatment plants; and to meet provincial requirements for treatment facility classification.

You should take this course if you are:

- Require an in-depth understanding of how water treatment systems work;
- Operate or maintain a facility classified as water treatment 3 or 4; or
- Are preparing to write the Environmental Operators Certificate Program (EOCP) certification exam for water treatment 3 or 4

After completing this course, you will be able to:

- Gain knowledge required to operate, repair and maintain water treatment plants;
- Probe in-depth, on related treatment concepts and practical applications, advanced math for operators,
- Evaluate various operational treatment processes and associated equipment;
- Develop a keen understanding of plant process requirements to meet regulations and system design.
- Obtain exposure on water supply management, plant residuals management, plant administration, effective leadership and supervisory skills training will also be covered.

WATER DISTRIBUTION 1

CEUs: 2.4 Course Length: 5 days

Water Distribution 1 provides an introductory appreciation of water distribution practices and focuses on the practical aspects of construction, operation and maintenance of water distribution.

You should take this course if you are:

- interested in a career as a water operator;
- wanting to understand more about water distribution; or
- An operator who wishes to prepare for level 1 EOCP certification.

After completing this course, you will be able to:

- Understand and apply water distribution system information/components including regulations; water quality, sources, and storage; valves, hydrants and meters; plan reading, water main construction and cross connection control;
- Monitor, evaluate and adjust disinfection in water distribution systems, sampling requirements and other monitoring;
- Understand the functions of a variety of equipment including hydrants, meters, pipes, service connections, pumps and water mains;
- Understand the maintenance of water mains including types of maintenance, pumps and controls; and
- Understand how to perform certain security, safety, and administrative procedures.

WATER DISTRIBUTION 2

CEUs: 2.4 Course Length: 5 days

This intermediate course provides an advanced understanding of water distribution practices and focuses on the practical aspects of construction, operation and maintenance of water distribution.

You should take this course if you are:

- Maintaining a facility classified as a Water Distribution 2 (WD2) facility;
- Wanting to advance your understanding or move into a level 2 operator role; or
- An operator who wishes to prepare for EOCP certification.

After completing this course, you will be able to:

- Understand and apply water distribution system information / components including how to assess system demand, distribution systems hydraulics, system layouts and maps, perform pressure readings, prepare contingency plans and read blueprints, readings and maps;
- Monitor, evaluate, and adjust disinfection in water distribution systems and inspect and evaluate source water for contamination;
- Understand the functions of a variety of equipment, and how to operate and perform maintenance on equipment including pumps, chlorinators, engines, generators, hand tools, etc.; and
- Understand how to perform security, safety and administrative procedures including administering a safety / compliance program, conducting cross connection surveys, developing and maintaining a sample site plan and preparing regulatory reports.

WATER DISTRIBUTION 3-4

CEUs: 3.0 Course Length: 4.5 days

The course provides the knowledge and understanding required to construct, repair and maintain water distribution systems at an intermediate to advanced level.

You should take this course if you are:

- Wanting to advance your understanding or move into a level 3/4 operator role; or
- An operator who wishes to prepare for EOCP certification

After completing this course, you will be able to:

- Understand and apply water distribution system information/components including how to assess system demand, distribution systems, hydraulics, system layouts and maps, perform pressure readings, prepare contingency plans and read blueprints, readings and maps;
- Monitor, evaluate, and adjust disinfection in water distribution systems and inspect and evaluate source water for contamination;
- Understand the functions of a variety of equipment, and how to operate and perform maintenance on equipment including pumps, chlorinators, engines, generators, hand tools, etc.; and
- Understand how to perform security, safety and administrative procedures including administering a safety/compliance program, conducting cross connection surveys, developing and maintaining a sample site plan and preparing regulatory reports.

WASTEWATER COLLECTION 1

CEUs: 2.4 Course Length: 5 days
Wastewater Collection 1 introduces operators to key concepts in the field of wastewater collection and broadens an operator's knowledge of system fundamentals.

You should take this course if you are:

- In a role that requires an understanding of how wastewater collection works; or
- An operator who wishes to prepare for EOCP certification.

After completing this course, you will be able to:

- Understand wastewater collection systems of both the operation and maintenance and related equipment, including: cleaning equipment, inspection equipment, safety equipment, valves, pumps, etc., rehabilitating and repairing the collection system;
- Monitor, evaluate and adjust collection systems including an understanding of aeration, cross connections, infiltration, force mains, gravity sewers, lift stations; and
- Understand how to perform security, safety, and administrative procedures including administering a safety / compliance program, developing operation and maintenance plans, maintaining records, performing workplace safety evaluations, etc.

WASTEWATER COLLECTION 2

CEUs: 2.4 Course Length: 5 days
Wastewater Collection 2 continues the learning for operators on key concepts in the field of wastewater collection and broadens an operator's knowledge of system fundamentals.

You should take this course if you are:

- In a role that requires an in-depth understanding of how wastewater collection works;
- Wishing to move to an Operator Level 2 role within your organization; or
- An operator who wishes to prepare for Level 2 EOCP certification.

After completing this course, you will be able to:

- Further understand wastewater collection systems and increase your understanding of pipeline construction, pumps and layout;
- Understand the maintenance and restoration of the collection system including pipeline cleaning, system inspection and testing;
- Understand engineering principles such as design periods, flow measurements and flow variations; and
- Perform certain security and administrative procedures including electrical safety, how to handle sewer gases, odour control, etc.

WASTEWATER COLLECTION 3-4

CEUs: 3.0 Course Length: 4.5 days
The course provides the knowledge and understanding required to construct, repair, and maintain wastewater collection systems at an intermediate to advanced level.

You should take this course if you are:

- Require an advanced understanding of how wastewater collection systems work;
- Operate or maintain a wastewater collection system classified as level 3 or 4; or
- Are preparing to write the Environmental Operators Certificate Program (EOCP) certification exam for wastewater collection level 3 or 4.

After completing this course, you will be able to:

- Describe types of wastewater collection systems along with their history and evolution;
- Define physical, chemical, and bacterial characteristics and identify harmful gases and their associated impacts on collection systems;
- Perform advanced practical calculations involving system velocities, flow rates, chemical concentrations and dosages, horsepower and pump efficiencies as well as determining operating costs and budgets;
- Outline lift station configurations and detail types of level control systems;
- Analyze positive displacement and velocity pump dynamics;
- Interpret design drawings and properly construct collection systems;
- Perform various maintenance activities;
- Practice safe operating procedures in the workplace; and
- Apply effective leadership skills .

WASTEWATER TREATMENT 1

CEUs: 2.4 Course Length: 5 days
Wastewater Treatment 1 introduces operators to key concepts in the field of wastewater treatment, and provides operators with the basic knowledge of wastewater treatment plant components and treatment methods used with varying degrees of complexity.

You should take this course if you are:

- Maintaining a facility classified as a Wastewater Treatment 1 (WWT1) facility;
- Wanting to understand more, or entering into a role where you will be dealing with the treatment of wastewater; or
- An operator who wishes to prepare for Level 1 EOCP certification.

After completing this course, you will be able to:

- Evaluate physical characteristics of a waste stream;
- Perform related security, safety and administrative procedures involving chemical hazards, personal protective equipment, general health and safety procedures, and emergency preparedness;
- Evaluate and maintain related equipment including preventative and corrective maintenance and equipment evaluation;

WASTEWATER TREATMENT 1 - CONTINUED

- Operate equipment including hydraulics, pumps, valves, etc.; and
- Understand how domestic water systems impact wastewater treatment.

WASTEWATER TREATMENT 2

CEUs: 2.4 Course Length: 5 days

Wastewater Treatment 2 is an intermediate course that continues the learning for operators on key concepts in the field of wastewater treatment and broadens an operator's knowledge of system fundamentals.

You should take this course if you are:

- Maintaining a facility classified as a Wastewater Treatment 2 (WWT2) facility;
- In a role that requires an in-depth understanding of how wastewater treatment works;
- Wishing to move to an Operator Level 2 role within your organization; or
- An operator who wishes to prepare for level 2 EOCP certification.

After completing this course, you will be able to:

- Evaluate physical characteristics of a waste stream including colour, flow, odour, temperature, etc.;
- Perform related security, safety and administrative procedures involving chemical hazards, personal protective equipment, general health and safety procedures and emergency preparedness;
- Evaluate and maintain related equipment including preventative and corrective maintenance and equipment evaluation;
- Operate equipment including hydraulics, pumps, valves, etc.;
- Understand how domestic water systems impact wastewater treatment; and
- Understand the metric system, measurements and solving equations.

WASTEWATER TREATMENT 3-4

CEUs: 3.0 Course Length: 4.5 days

This course will provide intermediate to advanced knowledge of wastewater treatment practices. Participants will review the uses of racks, screens and sedimentation tanks and examine the processes of sedimentation, floatation, trickling filters, rotating biological contactors, activated sludge, oxidation ditches and ponds and disinfection.

You should take this course if you are:

- are involved in the operation of a wastewater treatment plant;
- are involved in the supervision of wastewater treatment facilities; or
- wish to prepare for EOCP levels 3 and 4 certifications.

After completing this course, you will be able to:

- Understand the concepts behind the various operational strategies employed in lagoon treatment systems;

WASTEWATER TREATMENT 3-4 - CONTINUED

- Review and understand the principles behind the design and operation of fixed growth processes;
- Understand the operating concepts behind the most common suspended growth processes;
- Describe the processes available to improve effluent quality beyond that which is achievable by conventional treatment processes;
- Be familiar with the processes used to thicken, dewater and ultimately stabilize primary and secondary sludge; and
- Identify the need for disinfection of an effluent before it is returned to the environment and the methods available to achieve that goal.

SMALL WATER SYSTEMS

CEUs: 1.2 Course Length: 2 days
This 2-day Small Water Systems course introduces students to the fundamentals of small water system operations and maintenance, and what operators need to know to ensure that their systems comply with legislation and protect public health.

You should take this course if you:
- Operate and maintain water systems that serve a population of less than 500; or
- Are preparing to write the EOCP certification exam for Small Water Systems.

After completing this course, you will be able to:
- Understand the factors that impact water quality, the legislation that governs water quality and supply and how to monitor and report on your water system to protect public health;
- Understand common water treatment methods, including filtration, and the safe use of chlorine, ozone and UV for disinfection; and
- Understand how water distribution systems function, including the materials and equipment, repair and maintenance procedures and safety.

SMALL WASTEWATER SYSTEMS

CEUs: 1.2 Course Length: 2 days
This 2-day Small Wastewater Systems course introduces students to the fundamentals of small wastewater system operations and what is needed to comply with legislation to protect public health, safety and the environment.

You should take this course if you:
- Operate and maintain wastewater systems that serve a population of less than 500; or
- Are preparing to write the certification exam for Small Wastewater Systems.

After completing this course, you will be able to:
- Understand the regulations that govern wastewater collection, treatment and discharge, and how to monitor system performance to protect public health and the environment

SMALL WASTEWATER SYSTEMS - CONTINUED

CEUs: 1.2 Course Length: 2 days
This 2-day Small Wastewater Systems course introduces students to the fundamentals of small wastewater system operations and what is needed to comply with legislation to protect public health, safety and the environment.

You should take this course if you:

- Operate and maintain wastewater systems that serve a population of less than 500; or
- Are preparing to write the certification exam for Small Wastewater Systems.

After completing this course, you will be able to:

- Understand the regulations that govern wastewater collection, treatment and discharge, and how to monitor system performance to protect public health and the environment;
- Understand the characteristics of wastewater, and how this impacts collection and treatment systems;
- Understand how wastewater collection systems are designed, built, operated, maintained and repaired. You will be familiar with the equipment, materials, methods and safety considerations;
- Understand wastewater treatment methods, including the design, operation and maintenance of septic systems and mechanical systems including preliminary, primary and secondary treatment; and
- Understand and apply safe workplace practices, including confined space entry, WHMIS, lock out / tag out procedures.

ELECTIVE CEU COURSES: WATER AND WASTEWATER SYSTEMS

HYDRANT MAINTENANCE AND CLEANING

CEUs: 0.6 Course Length: 1 day
The Hydrant Maintenance Program course provides training on the implementation of a hydrant maintenance program for a water system. The course will provide students with the knowledge required to set up and carry out a hydrant maintenance program.

You should take this course if you are an operator who is responsible for ensuring that hydrants in your water system are in good working order.

After completing this course, you will be able to:

- Describe the process for properly implementing a hydrant maintenance program for a water system;
- Identify and perform the administrative and physical tasks involved in conducting hydrant maintenance; and
- Create and carry out a hydrant maintenance program that suits the individual needs of your system.

LEAK DETECTION

CEUs: 0.6 Course Length: 1 day
This course provides a practical approach to leak detection and how to apply leak detection methods to reduce water loss.

You should take this course if you operate, maintain or manage a water distribution or wastewater collection system.

After completing this course, you will be able to:

- Understand how leaks are initiated and propagated;
- Understand leak detection theory, equipment and application;
- Quantify “Real Loss” and amount of leakage; and
- Know how to manage water loss and leak detection.

PREVENTING WATERBORNE ILLNESSES

CEUs: 0.6 Course Length: 1 day
This one-day course is designed to emphasize the multi-barrier approach to the provision of safe drinking water. Course content includes exercises, case studies, group exercises and practice problems.

You should take this course if you are a drinking water supplier and operator, operating manager or water quality analyst.

PREVENTING WATERBORNE ILLNESSES - CONTINUED

After completing this course, you will be able to:

- Understand the responsibility of operators;
- Recognize pathogen risks;
- Treat hazards with treatment technologies; and
- Plan for emergencies and unexpected events.

RESERVOIR MAINTENANCE AND CLEANING

CEUs: 0.6 Course Length: 1 day

The Reservoir Maintenance & Cleaning Course is a one day course that addresses best practices for maintenance, cleaning, safety and chlorination of reservoirs.

You should take this course if you are:

- A water system operator or administrator responsible for the operation and maintenance of reservoirs, tanks or other distribution system storage facilities; or
- A certified operator in water treatment, water distribution, small water systems or are interested in earning CEU credits.

After completing this course, you will be able to:

- Understand distribution system storage, maintenance, inspection and cleaning methods;
- Recognize safety concerns involved with operating or maintaining a reservoir, including confined space entry; and
- Produce a chlorination plan for a reservoir.

WATER QUALITY AND SAMPLING FOR WATER SYSTEMS

CEUs: 1.2 Course Length: 2 days

This course provides a working knowledge of sampling for potable water, providing case studies and group activities to create an environment of robust conversation and learning.

You should take this course if you are:

- An operator in a water treatment or water distribution system, or responsible for water quality;
- Interested in moving into a laboratory testing role; or
- Preparing for a certification exam or interested in earning CEUs.

After completing this course, you will be able to:

- Understand how sampling is used to monitor for compliance with regulations for drinking water;
- Describe common sampling methods and procedures used for grab samples and automatic samplers;
- Determine which samples are appropriate and the frequency of sampling which include bacteriological sampling, chemical analysis, THMs and HAAs, and HPC analysis; and
- Demonstrate sampling test kits for turbidity, chlorine residual and temperature;

WATER QUALITY AND SAMPLING FOR WATER SYSTEMS - CONTINUED

- Explore the importance of sampling trends and the importance of recording and presenting sampling data
- Describe the chain of custody from sample to lab to report; and
- Apply quality management methods for quality assurance and quality control (QA/QC).

WATER QUALITY AND SAMPLING FOR WATER AND WASTEWATER SYSTEMS

CEUs: 1.2 Course Length: 2 days

The Water Quality and Sampling for Water and Wastewater course provides a working knowledge of sampling for both potable water and wastewater systems.

You should take this course if you are:

- An operator in a water treatment or water distribution system, an operator in a wastewater treatment facility or responsible for water or effluent quality;
- Interested in moving into a laboratory testing role; or
- Preparing for a certification exam or want to earn CEU credits.

After completing this course, you will be able to:

- Understand how sampling is used to monitor for compliance with regulations for drinking water and wastewater effluent;
- Understand common sampling methods and procedures including grab samples, composite samples and automatic sampler tools, and how to determine which procedure is appropriate based on the circumstance, including routine bacteriological sampling, full chemical analysis, sampling for THMs, influent sampling, primary clarifier sampling, mixed liquor sampling and monitoring well sampling;
- Calculate the area, volume and time required to flush tanks and pipes;
- Understand the equipment and materials used for sampling, and safety risks;
- Apply the concepts that guide a sampling plan, including chain of custody; and
- Apply quality management methods for quality assurance and quality control (QA/QC).

SOURCE WATER PROTECTION

CEUs: 0.6 Course Length: 1 day

This course provides the foundation needed to develop a source water protection plan for your water supply system.

You should take this course if you are:

- A small water system owner (including trustees and councilors), operator, water user or community member interested in protecting the sources of your water supply;
- An operator interested in earning CEUs; or
- A larger water supply system owner or operator.

SOURCE WATER PROTECTION - CONTINUED

After completing this course, you will be able to:

- Create a source water protection plan, including understanding how to create a community planning team, build community support, delineate the source protection area, evaluate assessment tools and develop and implement an action plan, including emergency response planning;
- Understand how to use various assessment tools; and
- Identify and assess potential contaminants and risks that can affect source water quality, including pathogens (bacteria, viruses and protozoa), nitrates, volatile organic chemicals (VOCs), inorganic chemicals and endocrine disruptors.

UNIDIRECTIONAL FLUSHING

CEUs: 0.6 Course Length: 1 day

This course is designed to enhance the operator's knowledge about how to plan, implement, troubleshoot and evaluate a unidirectional flushing program, to achieve effective water flushing and enhance water quality within a distribution system.

You should take this course if you are:

- An operator of a water distribution system;
- Interested in a career as a water operator, wanting to understand more about water distribution; or
- An operator who wishes to prepare for a certification exam or earn CEUs.

After completing this course, you will be able to:

- Understand the purpose and benefits of unidirectional flushing, the role of flushing in maintaining water quality, the equipment used and alternative methods for flushing;
- Prepare a plan for a unidirectional flushing program that integrates water system maps, financial and staff resources, scheduling, equipment, community notification, evaluation and computer modelling software; and
- Safely implement and troubleshoot unidirectional flushing procedures and calculate water flows and velocities.

DAM INSPECTION AND MAINTENANCE

CEUs: 0.6 Course Length: 1 day

This course provides operators with the basic technical knowledge of dam safety fundamentals and inspection methods used for embankment dams, concrete dams and related works.

You should take this course if you:

- Own, maintain or operate a water storage structure classified as a dam under the regulations;
- Are seeking to understand more, or entering into a role where you will be tasked with inspecting, maintaining or operating a dam; or
- Are an operator who wishes to prepare for EOCP certification.

DAM INSPECTION AND MAINTENANCE - CONTINUED

After completing this course, you will be able to:

- Understand basic key terminology used in the dam safety field;
- Identify common issues and problems that lead to critical failure modes of dams;
- Apply inspection and maintenance methodology and techniques for dams; and
- Understand historical dam failures, including their effect on dam safety at a provincial and global scale.

DAM SAFETY MANAGEMENT

CEUs: 0.6 Course Length: 1 day

This course provides operators and managers with the fundamental knowledge of dam safety management and records management. Content in this course will be based on the dam safety regulatory requirements in British Columbia, as well as historical dam failure events on a global scale.

You should take this course if you are:

- An owner or operator of a water storage structure classified as a dam under the regulations;
- Seeking to understand more, or entering into a role where you will be tasked with inspecting, maintaining or operating a dam; or
- An operator who wishes to prepare for EOCP certification.

After completing this course, you will be able to:

- Understand basic key terminology used in the dam safety field;
- Understand minimum regulatory requirements for dam owners under the dam safety regulations in BC;
- Identify common issues and problems that lead to critical failure modes of dams;
- Apply basic components in a dam safety management system; and
- Understand historical dam failures, including their effect on dam safety at a provincial and global scale.

INTRODUCTION TO HYDROGEOLOGY AND GROUNDWATER MANAGEMENT

CEUs: 1.2 Course Length: 2 days

This course is developed and taught by Ineke Kalwij. The purpose of this course is to provide the participant with basic knowledge and understanding of hydrogeology and groundwater management in the context of groundwater-based water supply and distribution systems.

You should take this course if you are:

- An operator in a water treatment or water distribution system, or responsible for water quality;
- Wanting to understand hydrogeology and groundwater treatment; or
- An operator who wishes to prepare for a certification exam or earn CEUs.

INTRODUCTION TO HYDROGEOLOGY AND GROUNDWATER MANAGEMENT - CONTINUED

After completing this course, you will be able to:

- Become familiar about general groundwater aspects;
- Become familiar about BC aquifers and the classification system;
- Identify selected groundwater system components;
- Identify selected groundwater flow concepts;
- Identify steps and planning requirements for well construction projects;
- Describe the purpose of various well testing and evaluation requirements;
- Identify tools for monitoring and evaluating well performance;
- Describe a well monitoring and maintenance plan;
- Identify potential water quality risks and hazards;
- Describe the requirements for wellhead and aquifer protection; and
- Become familiar with provisions of groundwater regulation.

NEW SECTOR PROFESSIONALS

Course Length: 2 days

The purpose of this module of the series is to introduce participants to the regulatory framework surrounding the water and wastewater industry at all three levels of government, and to provide guidance in navigating the bureaucracy of the sector.

You should take this course if you are:

- New to working in or with the water and wastewater sector;
- Want to gain or deepen an understanding of how and why the sector is regulated;
- Want to improve your ability to navigate the sector to better serve your customers or clients; or
- Are a certified operator interested in better understanding the regulatory environment surrounding your profession.

After completing this course, you will be able to:

- Understand the full scope of the water and wastewater sector (source to tap to environment);
- Be familiar with the regulatory environment of the water and wastewater sector. This includes developing an understanding of the independent and interconnected jurisdictions of municipal, provincial, and federal and Indigenous governments relating to all aspects of the sector;
- Understand the role of various professional associations in supporting the sector;
- Feel comfortable with the broad scope of regulations that govern the water and wastewater sector (source to tap to environment); and
- Be familiar with various funding bodies and sources, and procurement practices typically used by municipalities / utilities.

PROCESS CONTROL AND SCADA FUNDAMENTALS

CEUS: 0.6 Course Length: 1 day

The purpose of this module of the series is to introduce participants to the regulatory framework surrounding the water and wastewater industry at all three levels of government, and to provide guidance in navigating the bureaucracy of the sector.

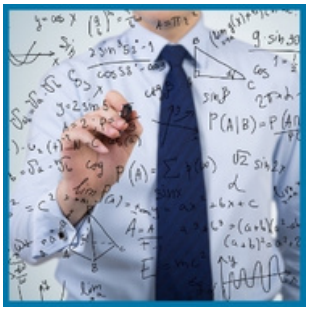
You should take this course if you are:

- New to working in or with the water and wastewater sector;
- Want to gain or deepen your understanding of process control systems, PLCs and SCADA;
- Involved with facility operations, maintenance, supervision and / or engineering, as you will get a better understanding of how control systems can add value;
- Want to be more efficient troubleshooting control systems; or
- Interested in how new technology can be used in Control Systems.

After completing this course, you will be able to:

- Understand the components of a SCADA system;
- Understand SCADA fundamentals from instrumentation at the plant to the Human Machine Interface used by Operators;
- Understand why control systems play an integral part of facility design and operation; and
- Be more efficient troubleshooting Control System related issues.

CALCULATIONS FOR WATER AND WASTEWATER OPERATORS



CEUs: 0.6 Course Length: 1 day

This one-day workshop will focus on the common concepts, mathematical principles and related calculations found in water treatment, wastewater collection and treatment fields. Utilizing the EOCP Formulae, Conversions and Abbreviations, participants will cover the essentials, working through various topics such as detention times, velocities and flows, hydraulic loading, pump calcs, chemical feed rates and more. This workshop is intended to better prepare attendees for the math component of the ABC/EOCP operator certification exam.

You should take this course if you are:

- Operators responsible for the maintenance of water and wastewater utility systems
- Technicians responsible for system design and quality control; or
- Supervisors & Managers of water or wastewater systems.

After completing this course, you will be able to:

- Perform basic algebraic functions and calculate values related to water and wastewater operation;
- Analyze and convert between common units of measure;
- Recognize abbreviations, conversions and apply formulae used in the wastewater fields; and
- Understand the associated science behind the calculations.

LIFT STATIONS OPERATION AND MAINTENANCE

CEUs: 0.6 Course Length: 1 day
Topics:

- Determining the purpose and evaluating the viability of wastewater lift stations
- Identifying different types of station configurations and various features
- Detailing recommended maintenance activities and inspections
- Understanding common level controls used in wet wells
- Identifying and responding to lift station failures

You should take this course if you are:

- Operators responsible for pump stations and related infrastructure;
- Operators responsible for maintenance of wastewater collection systems; or
- Supervisors & Managers of wastewater collection systems.

After completing this course, you will be able to:

- Detail the differences between various lift station types and configurations;
- Perform regular maintenance and repairs to lift station equipment and appurtenances;
- Understand the operation and nuances of level controls; and
- Recognize and respond to common lift station failures.

MANAGING INFILTRATION & INFLOW IN WASTEWATER COLLECTION SYSTEMS

CEUs: 0.6 Course Length: 1 day
Topics:
This one-day workshop will focus on determining the sources of inflow & infiltration in wastewater collection systems. Drawing on best practices of utilities across North America, participants will describe and understand the differences between infiltration and inflow in wastewater collection systems, recognize sources of I & I, analyze and determine effective strategies to minimize or eliminate I & I within a wastewater collection system and discuss effective communication to stakeholders/owners.

You should take this course if you are:

- Operators responsible for maintenance of wastewater collection systems;
- Operators responsible for pump stations and related infrastructure; or
- Supervisors & Managers of wastewater collection systems.

After completing this course, you will be able to:

- Describe and understand the differences between infiltration and inflow in wastewater collection systems;
- Recognize sources of Inflow and Infiltration;
- Analyze and determine effective strategies to minimize or eliminate Inflow and Infiltration within a wastewater collection system; and
- Communicate to stakeholders/owners.

LOW PRESSURE MEMBRANE TECHNOLOGIES

CEUs: 0.6 Course Length: 1 day

The course covers the theory and applications of [ultrafiltration and microfiltration] membrane technologies for drinking water treatment. Implementation considerations and other applications (i.e., wastewater treatment and reuse) are also introduced. The course is structured to provide opportunities to learn the fundamental principles governing the performance of membrane systems and to apply this fundamental theory to optimize the performance of membrane systems and address operational challenges. This course is developed and taught by Dr. Pierre Bérubé.

You should take this course if you are:

- A water treatment professional (including treatment system operators, design engineers, medical health officers and managers) involved with the evaluation, selection, design, operation and/or regulation of microfiltration and/or ultrafiltration technologies for water treatment.

After completing this course, you will be able to:

- Recognize the opportunities as well as challenges associated with microfiltration and ultrafiltration technologies;
- Identify differences between systems offered by different vendors;
- Interpret performance data from pilot and full-scale system operation; and
- Develop strategies to optimize performance.

OPERATIONAL BEST PRACTICES IN WATER DISTRIBUTION

CEUs: 0.6 Course Length: 1 day

This one-day workshop is intended for operators from large or small distribution systems, whether they are experienced or new in the water distribution field. The workshop aims to refresh operators as to expected best practices in running a utility, assess where gaps may exist and, using up-to-date resources, determine practical steps to address them.

You should take this course if you are:

- Water system operators engaged in the operation and maintenance of large or small distribution systems; or
- Interested in entering or further understanding a role where you will be dealing with the safe and reliable distribution of water to the community.

After completing this course, you will be able to:

- Identify the conditions that reflect efficiently run systems;
- Define hazards-identifying approved methods, devices and assemblies and administration of a cross connection program;
- Ensure water quality after interruption of service;
- Gain understanding of unidirectional flushing as a measure of system integrity; and
- Apply logistical processes, safe dig practices, preventing damage, ensuring sanitary conditions during construction, and pipe handling.

MUNICIPAL PLAN READING

CEUs: 0.6 Course Length: 1 day

This one-day workshop is an introduction to plan reading using engineering drawings utilized in public works construction. This will involve correlation between existing utilities, proposed utilities, construction layout, specifications and standard drawings, and the related safe operating procedures. Participants will be actively engaged in interpreting various engineering drawings and the proper use of engineering scales to measure various quantities.

You should take this course if you are:

- An operator, supervisor or part of technical support staff engaged in all aspects of utility construction operation and maintenance; and
- Wanting to learn more about plan reading or entering a role where you will be interpreting various engineering drawings and the proper use of engineering scales to measure various quantities.

After completing this course, you will be able to:

- Measure and transpose scaled info to the field and apply aerial angles;
- Read and check grade;
- Review the use of survey equipment, including builder's level, smart level, grade laser, hand levels, laser levels, and range finder;
- Use engineering drawings to ensure construction to specifications;
- Interpret drawings to work safely around other underground and overhead utilities;
- Analyze discrepancies between the drawing and the field; and
- Accurately record as built information.

WATER RIGHTS BASICS FOR LICENSED GROUNDWATER USERS IN BRITISH COLUMBIA

CEUs: 0.6 Course Length: 1 day

This course is developed and taught by Mike Wei. A half-day workshop that introduces water supply system managers and operators to the main principles governing groundwater licensing in BC. The workshop will also present the most common impacts that can occur in BC and the data that water supply systems can collect to help assess those impacts as part of their responsibility as a licensee under the Water Sustainability Act.

You should take this course if you are:

- Working for a water supply system (WSS) that relies on groundwater as a source of supply and want to better understand how, as a licensee, your groundwater use is regulated under the Water Sustainability Act (WSA).
- A consultant interested in how the WSA governs groundwater (and water) use and water rights in BC..

WATER RIGHTS BASICS FOR LICENSED GROUNDWATER USERS IN BRITISH COLUMBIA - CONTINUED

After completing this course, you will be able to:

- Explain the governing principles related to the diversion and use of (ground)water in the Water Sustainability Act (WSA).
- Explain the rights and responsibilities of licensees.
- Recognize the common impacts of diverting and using groundwater in BC and the data that can be collected to assess the impact of pumping on:
  - Nearby wells (well interference);
  - Sustainability of the aquifer (mining);
  - Stream depletion; and
  - Saltwater intrusion.
- Explain the timing of pumping impacts can be estimated.

ELECTIVE CEU COURSES: DISINFECTION

CHLORINE HANDLING

CEUs: 2.4 Course Length: 5 days

This course provides operators with the fundamental knowledge to be able to safely use and handle chlorine gas and hypochlorite solutions.

You should take this course if you are operating or maintaining a facility that uses chlorine gas or hypochlorite solutions for disinfection purposes.

After completing this course, you will be able to:

- Understand the factors that can impact water quality, and the different methods that are used for disinfecting water, and their advantages and limitations, including filtration, aeration, UV disinfection, pH adjustment, and oxidants such as chlorine, chloramines and ozone;
- Safely apply chlorination and hypochlorination methods in your facility, including controlling for gases and residual by-products;
- Understand how to safely install, use, troubleshoot and maintain equipment for chlorination and hypochlorination;
- Calculate chlorine and hypochlorination dosages based on water distribution system demands and hydraulics;
- Understand chlorine system design principles, including engineering controls, ventilation, alarm systems and detection instruments; and
- Understand and apply chlorine safety practices, and prepare for emergencies.

CHLORINE HANDLING FOR POOL OPERATORS

CEUs: 1.2 Course Length: 2 days

This course provides pool operators with the fundamental knowledge to safely operate and maintain a variety of disinfection processes which use chlorine and hypochlorite products.

You should take this course if you are maintaining a recreational pool or spa facility that uses chlorine gas and hypochlorite solutions for disinfection purposes.

After completing this course, you will be able to:

- Understand the physical and chemical properties of chlorine, hypochlorite and residuals;
- Understand safe handling practices for chlorine and hypochlorite;
- Become familiar with common equipment, including measurement technologies, and understand maintenance requirements for systems;
- Understand the design principles for chlorine buildings and systems; and
- Plan for emergencies.

CHLORINE HANDLING REFRESHER

CEUs: 0.6 Course Length: 1 day
This course updates operators on the current processes for the safe handling of chlorine gas.

You should take this course if you are maintaining a facility that uses chlorine gas or hypochlorite solutions for disinfection purposes, and have previously completed chlorine handling training.

After completing this course, you will be able to:

- Understand the physical and chemical properties of chlorine and how chlorine works as a disinfectant;
- Understand how to safely handle chlorine and hypochlorite products, and maintain chlorine equipment; and
- Understand and apply chlorine safety practices, and prepare for emergency response.

HYPOCHLORINATION

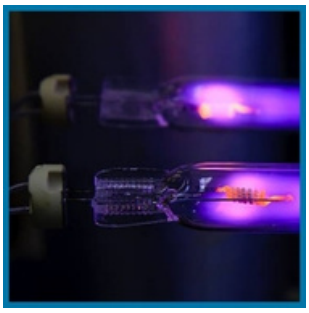
CEUs: 1.2 Course Length: 2 days
This course provides operators with the basic knowledge to work with hypochlorite at the worksite.

You should take this course if you are maintaining a facility that uses hypochlorite solutions for disinfection purposes.

After completing this course, you will be able to:

- Describe why chlorine is crucial to safe water;
- Describe the manufacturing, use and safe handling of hypochlorites;
- Explain major water pathogens and how they infiltrate water sources;
- Describe safe drinking water regulations and how to perform key tests;
- Describe the role of chlorine in the disinfection process, including reservoirs and mains;
- Describe the equipment components for hypochlorination and best practices for maintenance;
- Perform key calculations related to chlorine; and
- Describe the process of dechlorination.

ULTRAVIOLET (UV) DISINFECTION



CEUs: 0.6 Course Length: 1 day
The Ultraviolet (UV) Disinfection Course provides an overview of ultraviolet disinfection technologies, typical applications and operational considerations for facilities.

You should take this course if you are:

- A water or wastewater system operator with at least a level 1 certification; or
- Responsible for evaluating the application of UV technology for a water or wastewater system.

After completing this course you will be able to:

- Understand how and why UV light is used to disinfect water, including how UV works and how it compares to other treatment processes;
- Understand and evaluate UV equipment, and the factors that affect UV dosage; and
- Apply your knowledge in an operating environment to monitor and maintain equipment.

DISINFECTING AND SAMPLING OF WATER SYSTEMS

CEUs: 0.6 Course Length: 1 day
A one-day training seminar for water systems operators intended to provide an understanding of some of the technical issues, underlying risks and best practices that apply to proper disinfection and quality assurances for drinking water systems. Based on real experiences and practical perspectives of operators involved in the provision of good quality potable water, the primary focus is on identifying risks, disinfection techniques, sampling protocol and programs, water quality complaint investigation, emergency management, and administration. Information is based on AWWA and government sources and is recommended for operators regardless of experience.

You should take this course if you are a water operator, regardless of experience, and involved with the safe and reliable distribution of potable water to the community.

After completing this course, you will be able to:

- Gain an awareness of risks within the distribution system;
- Assess underlying conditions and determine the level of risk;
- Evaluate systems' condition and vulnerability to contamination;
- Understand why disinfection is necessary and how it works;
- Determine locations and sampling stations and apply proper sample collection techniques and use of field equipment;
- Handle water quality complaints; and
- Prepare documentation and data handling.

WATERMAIN DISINFECTION FOR THE FIELD OPERATOR

CEUs: 1.2 Course Length: 2 day

This 2-day course is for the operator who installs, repairs, adds to, and operates water mains. Starting from the history before disinfection to the advent of disinfection with resulting plunge in mortality rates. It details why and how disinfection is effective with a focus on all the practical methods of application. This course follows and covers industry standards and regulations including safety considerations, testing and field calculations.

You should take this course if you are:

- Operators or field supervisors of water utilities systems of any size or setting.

After completing this course, you will be able to:

- Explain the reason of disinfecting - A history of mortality rates, life expectancy and population before sanitized water.
- Recognize the advent of sanitary water supply and the significance to society
- Differentiate between various waterborne disease with an an overview of the 4 major categories of transmission and a description of waterborne bacterial pathogens, viruses and protozoan parasites
- Understand disinfection types used in the water industry and their applications
- Outline regulatory agencies Drinking water protection act relevant sections - BC Health and Relevancy to the field worker and Standards agency AWWA, NSF, CSA
- Differentiate between various methods of disinfecting pipelines and reservoirs
- Perform practical calculations such as: volume, velocity, and flow rate applications, chemical feed rates and concentration and flow rate calculations
- Comprehend verification process and dechlorination techniques

MANAGEMENT SKILLS COURSES

MANAGING PEOPLE

CEUs: 3.0 Course Length: 5 days
This course is a five-day program focusing on the "people management" skills required in the water and wastewater industry.

You should take this course if you are:

- Recently promoted to a supervisory / management role, or interested in advancing to a supervisory or management role in the future;
- Interested in brushing up on your management skills and taking them to the next level; or
- A certified operator interested in earning CEUs.

After completing this course, you will be able to:

- Understand alternative problem solving strategies, and how to apply these appropriately in a supervisory or management role;
- Assess your leadership style, learn about alternative leadership approaches and understand and apply essential management skills including time management, conflict resolution, coaching and the role of leaders;
- Conduct effective meetings and understand how to set the agenda, manage conflict, build agreement and make decisions;
- Understand how to effectively manage communications to peers, direct reports and senior managers;
- Understand business systems such as asset management, information management and privacy protection;
- Understand Employment Standards Act concepts, collective agreements and how to manage in a unionized work environment; and
- Effectively supervise staff and complete performance evaluations.

COMMUNICATION AND FINANCIAL SKILLS

CEUs: 3.0 Course Length: 5 days
The Writing, Communication and Financial Skills course is a five-day program covering the development of communication and financial skills in the water and wastewater industry. The course will also provide tools and techniques that help students work step-by-step through workplace problems and scenarios.

You should take this course if you are an operator, a water sector worker or a front line supervisor.

After completing this course, you will be able to:

- Develop accurate and effective budgets
- Effectively communicate;

COMMUNICATION AND FINANCIAL SKILLS - CONTINUED

- Report orally;
- Make engaging presentations;
- Develop succinct and relevant business plans; and
- Prepare clear peer-reviewed reports.

PROJECT MANAGEMENT SKILLS

CEUs: 3.0 Course Length: 5 days

The Project Management Skills course is a five-day course focusing on project management skills in the water and wastewater industry. The course will also provide tools and techniques that help students work step-by-step through workplace problems and scenarios.

You should take this course if you are:

- Recently promoted to a supervisory or management role, or are interested in advancing to a supervisory or management role;
- Interested in brushing up on your project management skills and taking them to the next level; or
- A certified operator interested in earning CEUs.

After completing this course, you will be able to:

- Successfully deliver projects;
- Effectively lead your team and engage stakeholders;
- Manage priorities and stress; and
- Perform a post-project analysis.

INTRODUCTION TO SUPERVISORY AND LEADERSHIP SKILLS FOR OPERATORS

CEUs: 1.2 Course Length: 2 days

The purpose of this course is to provide a basic introduction to management skills within the water and wastewater industry.

You should take this course if you are:

- Recently promoted to a supervisory / management role, or interested in advancing to a supervisory or management role in the future;
- Interested in management skills, but not certain if you would like to take the Management Skills Certificate Program (MSCP); or
- A certified operator interested in earning CEUs.

After completing this course, you will have an introduction to:

- Leadership, basic management, managing resources and performance;
- Customer service;
- Mechanisms for resolving conflict;
- Performance assessment tools, budgeting and controls; and
- Interviewing and recruiting.

WE'RE COMMITTED TO BEING YOUR PARTNER IN CONTINUING EDUCATION

Do you have a group of operators that require training? Are you looking for a customized training curriculum tailored for your operation? Do you want to host a training event at your facility? We work with you to design the curriculum and delivery method that best suits your needs. For a custom solution, contact us at education@bcwwa.org or 1-877-433-4389, and we'll work to meet your specific training needs and budget.

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