Wellhead Protection Planning

Course Outline

Course Description

This 1 day (6 hour) course is designed to increase a water operator's knowledge in wellhead and source water protection planning, which includes the purpose of wellhead protection, review of basic hydrogeology, well and wellhead construction and protection, groundwater source protection, developing a wellhead protection plan, reviewing a case study, and looking at source water protection across Yukon.

Course Pre-requisites

There are no specific pre-requisites for this course. However, Grade 12 (or equivalent) math skills are an asset. Math upgrades are available –contact us.

CEU Credit

This course is recognized by EOCP for 0.6 CEUs (core for SWS, BWD and WD certifications, and related for WT, WWT, WWC and SWWS certifications).

Course Duration

- 1 day
- 8:30 am to 4:00 pm
- 1 hour lunch break
- morning and afternoon break (15 minutes each)

Course Agenda and Objectives

Introduction
- Housekeeping
- Instructor Introduction
- Operator Introductions

What is Wellhead Protection Plan (WPP)?
- Why Do We Need WPPs?
- Walkerton Summary
- What Drives / Will Drive WPPs in the Yukon

Basic Hydrogeology – Review
- Hydrologic Cycle
- Types of Aquifers
- Aquifer Vulnerability

The Importance of Groundwater and Protecting our Groundwater Resource
- Why is it a Good Water Source?
- Why is it Important?

The Ideal Well – Aquifer Type, Well Location, and Well Construction
- Well Location
- Wellhead Construction
- Proper Well Construction
- Well Construction Techniques
- Proper Well Abandonment

Developing Wellhead Protection Plans or Source Water Protection Plans
- Why develop a WPP/SWPP
- Multi-barrier Approach
- Purpose / Goals / Objectives / Tools
- Typical steps in developing the plan
- Short comments on climate change impacts in Yukon

Case Study – Dawson City Wellhead Protection Plan
- Capture Zone Analysis
- Risks, Management, and Monitoring
- Conclusions & Recommendations

Yukon Wide Source Protection Study
- Overview of Study
- What Wellhead protection and source protection exists in Yukon
- Findings

Delivery Method/Format

Instructional Method	Percentage of Class Time
Hands-on/Q & A	10%
Examples/Case Study	15%
Presentation/Lecture Slides	75%

Material/Handouts (supplied)

- Student Binder: Yukon University. Wellhead Protection Planning; an elective technical skills development course. Whitehorse, Yukon.
- EOCP Course Completion and Evaluation Form.
  - every student needs to complete and return this form for any CEU allocation
- Calculators are provided but students are welcome to use their own.
  - please return

Course Requirements

Attendance and participation in class are required. It is the student's responsibility to attend all classes.

CEUs will be allocated based on attendance and course completion; Yukon University records will show a pass or fail result. If the participant doesn't attend the class, Yukon University records will show a "no show" result and no CEUs will be allocated.

Evaluation

There will be a quantifiable evaluation at the end of this course with a passing mark of 70%. Please note that this evaluation is for self-assessment purpose only.

The final evaluation for this course is NOT an EOCP certification exam. To challenge a certification exam, register separately with EOCP at least 3 weeks in advance: 1-866-552-3627 or crm.eocp.ca.

Appropriate Language
In all areas of the college environment, students are responsible for showing respect for others. Swearing, or language that is discriminatory or derogatory in relation to race, sex, ethnic background, religious beliefs, age, and physical condition is not appropriate.

Electronic Devices
In order to be successful in classes and minimize distractions for others, cell phones, iPods, and other electronic devices must be turned off while students are in class. In an emergency situation, the instructor may give a student permission to use a cell phone or pager.

Academic and Student Conduct
Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/Admissions & Registrations web page.

Plagiarism
Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Resubmitting a paper which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

Academic Accommodation
Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon University Academic Regulations (available on the Yukon University website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, they should contact the Learning Assistance Centre (LAC) at LearningAssistanceCentre@yukonu.ca.

Class Outline

Topic	Time
Introductions, Why Needed?, Walkerton Overview, Basic Hydrogeology, Physical Wellhead Protection	8:00 to 9:30 (1.5 hrs.)
Coffee break	9:30 to 9:45 (0.25 hrs.)
Wellhead Protection planning – part 1	9:45 to 11:30 (1.75 hrs.)
Lunch	11:30 to 12:30 (1 hr.)
Wellhead protection planning – Part 2	12:30 to 1:45 (1.25 hrs.)
Coffee break	1:45 to 2:00 (0.25 hrs.)
Case Study – Dawson Yukon Wide Study	2:00 – 3:30 (1.5 hrs.)