Yukon Water & Wastewater Operator Program

Passive Wastewater Treatment North of 60: Beyond Lagoons

Course Outline

INSTRUCTOR:	Michel Duteau (Duteau Bioresource Contracting)
Guest Speakers:	Amelie Janin (Yukon Government, Water Branch) Adam Greenwood (Morrison Hershfield) Greg Bull (G. J. Bull & Associates Inc.)
DATE:	Nov 15-16, 2018 (Thursday – Friday)
TIME:	8:00 am – 3:30 pm
LOCATION:	Ayamdigut; web-conferencing (ZOOM) is available

Course Description

This 2 day (12 hour) course introduces participants to the fundamentals of Passive Wastewater treatment systems such as Constructed Wetlands. The course is focused on treatment in extreme cold climates, presenting case studies and current state of knowledge in this field. Design considerations are presented, along with a variety of sizing tools such as Subwet. The participants are also introduced to operations and maintenance of treatment wetlands.

This course was developed by Dr Colin Yates in collaboration with Fleming College (ON). Guest speakers will present and discuss the Yukon experience in terms of passive wastewater treatment systems such as Constructed Wetlands, Slow Rate Infiltration Systems, and Bioreactors.

The course is targeted to operators working in wastewater treatment, and is relevant to any health professional, supervisor, technician or homeowner involved with or interested in water & wastewater.

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.

Continuing Education Units (CEUs)

This course is anticipated to be recognized by EOCP for 1.2 CEUs (core for WWT and SWWS certifications and related for SWS, WT, WD and WWC certifications).

Course Duration

- 2 days
- 8:00 am to 3:30 pm each day
- 1 hour lunch break
- morning and afternoon break (15 minutes each)

Course Topics and Learning Outcomes

Upon successful completion of the course, the students will be able to:

- Identify the key components of a typical constructed treatment wetland
- Describe the key processes (physical, biological and chemical) in a constructed treatment wetland
- Understand the treatment capabilities and limitations of constructed wetlands
- Develop an understanding of treatment wetland systems used across the Canadian Far North
- Recognize predictive performance modeling tools and use them to design and size up effective constructed treatment wetland systems
- Interpret data acquired from treatment wetland systems

Delivery Method/Format

Instructional Method	Percentage of Class Time
Examples/Case Study	20%
Slides	75%
Demonstration	5%

Material/Handouts (supplied)

- Student Binder: Yukon College, 2018. Passive Wastewater Treatment North of 60: Beyond Lagoons; an Elective –Technical 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 College records will show a pass or fail result. If the participant doesn't attend the class, Yukon College records will show a "no show" result and no CEUs will be allocated.

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.

Class Outline

Day 1 – morning
- Fundamentals of passive wastewater treatment (1hr)
- Wastewater constituents and treatment processes in passive systems (1hr)
- Extreme cold climate influence on treatment mechanisms (1hr)

Day 1 – Lunch (1hr)

Day 1 – afternoon
- Current state of knowledge on extreme cold climate passive treatment systems (1.5hr)
- Case studies of existing extreme cold climate treatment wetland systems North of 60 – their design, performance, and O & M (2hr)
- Guest speaker on Yukon experience with passive wastewater treatment systems
  - Amelie Janin (0.5 hour)
    - Keno Hill – Bioreactors for the treatment of mine-impacted water

Day 2 – morning
- Predictive performance models, and design/sizing of passive treatment systems
  - Part 1: considerations for North of 60 (1 hour)
  - Part 2: introduction to basic First Order Kinetics (1 hour)
  - Part 3: Kinetics Models (1.5hr)

Day 2 – Lunch (1hr)

Day 2 – afternoon
- Operation of extreme cold climate systems (1hr)
- Management of extreme cold climate systems (1hr)
- Guest speakers on Yukon experience with passive wastewater treatment systems
  - Adam Greenwood and Greg Bull (1hr)
    - Carcross – Slow Rate Infiltration System for the treatment of lagoon effluent
    - Old Crow –Subsurface Flow Constructed Wetland as a potential upgrade to the lagoon system
    - Carmacks – development a long term strategy for management of wastewater as a collaboration between Little Salmon Carmacks First Nation and Village of Carmacks