The Yukon Mine Research Consortium and Yukon Environment invite you to:

YUKON PASSIVE WATER TREATMENT WORKSHOP

JUNE 3-4 2014 **AT**
YUKON COLLEGE **(ROOM T1023)**
Registration fees: $360 *

The event is sponsored by

YukonCollege
Yukon Environment
capstone MINING CORP
CRSNG NSERC
YukonZinc CORP
Victoria GOLD CORP
ALEXCO
ACCESS

*** Please confirm attendance before May 16th 2014.**

Workshop goal and objectives

The goal of this event is to foster discussions between industry, regulators and researchers and identify the gaps that need to be addressed to support development of passive water treatment in Yukon. The workshop will offer an opportunity for mine reclamation practitioners and land/water managers to learn about passive water treatment with a focus on biological treatment. This event will highlight Yukon case studies and identify strategic initiatives that will further support the development of passive mine water treatment in the territory.

Who should attend?

Mining Environmental Personnel, Regulators, Project Managers, Consultants, Design Engineers, Wastewater Treatment Specialists, University & College Staff & Students.

Day 1 - Short course

By **Dr. James Higgins***, Environmental Technologies Development Corporation

Passive Treatment Technologies for Minewaters

- Passive Treatment Technologies for Minewaters
- The Use of Wetlands for Minewater Treatment
- Aerobic & Anaerobic Bioreactors for Minewater Treatment
- Cyanide chemistry and biological closure of heap leach pad
- Nitrate, Sulphate & Iron Reduction in Bioreactors
- The Use of Permeable Reactive Barriers (PRBs) in Minewater Treatment
- The Use of Constructed & Engineered Wetlands in Minewater Treatment
- Minewater Management after Closure

***See page 3 for a short bio of Dr. Higgins.**

Day 2 - Yukon Case Studies

8:00-8:30	Breakfast
8:30-9:15	"**Anaerobic reactor trials at the Keno Hill District, YT**" by **Jim Harrington**, President of Alexco Environmental Group
9:15-10:00	"**Wetlands design for operation at Minto Mine, YT**" by **Dr. Haakensen**, President and founder of Contango Strategies and Research Associate at the University of Saskatchewan;
10:00-10:15	Coffee break
10:15-11:00	"**Genomics: How can this tool be used for better characterization of biological water treatment**" by **Dr. Baldwin**, Professor at the University of British Columbia
11:00-11:45	"**Experience with biological treatment at Yukon's abandoned mines**" by **Frank Patch**, Senior Project Manager, AAM Branch, EMR, Yukon Government
11:45-12:00	"**Yukon College's research initiatives to support local mining industry**" by **Dr. Janin**, NSERC Industrial Research Chair at Yukon College
12:00	Visits of Yukon College's research laboratory facilities by **Dr. Janin** (in two groups, 20 min each)
12:00-1:15	Lunch break
1:15-3:15	**GROUP SESSION**: "**What are the next steps required to support development of passive treatment for mine-impacted waters in Yukon**" facilitated by **Mr. Haefele**, Permitting Manager Capstone Mining Corp
3:15-3:30	**Closing comments** by **Robert Truelson**, Manager, Water Quality Section, Yukon Government

Short course instructor:

Dr. James Higgins

Dr. Higgins has been the Project Director/Project Executive/Technical Manager/Qualified Person for a variety of mining and environment projects in operating and mines in several provinces including Yukon. He has been involved in the preparation of closure plans, PEAs, applications for permits and licenses for new and re-activated mines, and in the design and engineering of active and passive wastewater treatment systems for all sorts of mine waters, including the most recalcitrant ones. He led the team for the design, engineering and commissioning of the now-successfully-operating treatment system at Buffalo Niagara International Airport which includes four large Bioreactor Engineered Wetlands (BREW Bioreactors), each as large as a football field. The team was awarded an Honor Award in 2010 by the American Association of Engineering Companies for this project. Dr. Higgins has been an Adjunct Professor and a Lecturer in chemical engineering at the Universities of Ottawa and Toronto, and is currently an Adjunct Professor in the School of Environmental Science at the University of Guelph. He has taught numerous short courses on subject areas such as the natural & active wastewater treatment of minewaters, wetlands engineering, site reclamation, phytoremediation, minewater metals and metalloids management (e.g., As, Cr), and ecological engineering. He has been an active member of several mining related committees including the Ontario Mining Association's Environment Committee. Jim Higgins was involved with short courses on minewater treatment areas at conferences such the ICARD 2006, Sudbury 2007 and CIM 2013. Dr. Higgins recently retired from Stantec but continues to manage R&D and development projects for that firm.

Workshop organizers:

Dr. Amelie Janin, Industrial Research Chair, Yukon College

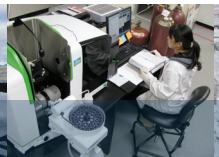
Amelie Janin specialized in metals chemistry and environmental remediation during her PhD in Water Sciences at the National Institute for Scientific Research (INRS) in Quebec City and during her following experience at the University of Toronto where she coordinated an applied research project with Hydro-Quebec. Living in Yukon since 2011, Dr. Janin now holds the NSERC Industrial Research Chair at Yukon College since January 2013. Through this program entitled "Mine Life Cycle", Amelie is collaborating with Alexco Resource, Capstone Mining, Victoria Gold and Yukon Zinc to advance research on cold climate environmental remediation technologies.

Bob Truelson, Manager, Water Quality Section, Yukon Government

Robert (Bob) Truelson, B. Sc., is a graduate of UBC and has accumulated 35 years of work experience with water resources departments in B.C. and Yukon. He has served as the Yukon representative on the CCME Water Quality Task Group for the past 11 years. Bob is presently Manager, Water Quality Section of Yukon Environment and involved with the regulation of water licenses through all sectors of water use and wastewater discharges. His current activities include managing a water quality trend monitoring network across key sites in the territory and he maintains a keen interest in development of new aquatic health assessment tools and emerging science in genomics and biotechnology.

Martin Haefele, Permitting Manager, Capstone Mining Corp.

Martin's interest in bioremediation goes back to his student days when he worked on contaminated sites for an environmental NGO in his native Germany. After a stint in academia his professional path veered off into the field of impact assessment and project licensing. For the past 15 years he has been involved in assessing projects ranging from mineral exploration to infrastructure, to oil and gas developments and mining. Virtually all of it in the Northwest Territories and Yukon. Along the way he picked up experience in organizing and facilitating community meetings, public hearings, workshops and conferences. Currently he is Capstone Mining Corp's permitting manager for the Minto Mine.



Workshop speakers:

Jim Harrington, President, Alexco Environmental Group

Mr. James Harrington, Jim, MSc, has been the President of Alexco Environmental Group at Alexco Resource Corporation since January 2010. Mr. Harrington served as Vice President of Engineering - Alexco Resources U S Corp. of Alexco Resource Corporation since February 2007. Mr. Harrington, whose technical expertise is focused on groundwater related remedial technologies and water treatment, has worked for the Alexco Environmental Group since 2007 as Vice President of Engineering ... and Technical Services. Previously, He served as Vice President in the corporate technical group at ARCADIS G&M and Vice President of mine remediation and closure at Shepherd Miller. He holds an MSc in Microbiology and Biochemistry.

Dr. Monique Haakensen, President and founder of Contango Strategies; Research Associate, University of Saskatchewan

Dr. Monique Haakensen is the President and Principal Scientist of Contango Strategies which she founded in 2010 and has grown into a thriving environmental firm with laboratories and dedicated constructed wetland pilot facilities serving North America and Europe. As a result, she has been named one of Canada's future entrepreneurial leader's by Profit Magazine. Monique sits on a number of boards and committees, and serves as an Adjunct Professor at the University of Saskatchewan, lecturing and assisting in the supervision of students in the Toxicology, Bioresources, and Bioinformatics departments. Monique previously served as an Academic lead for the University Arctic. In 2014, Dr. Haakensen became the youngest person ever appointed to Canada's Science, Technology and Innovation Council, providing the federal government with confidential, evidence-based advice on key issues that affect Canadian society and our economic development.

Dr. Sue Baldwin, Professor, University of British Columbia

Dr. Susan Baldwin is an associate professor at UBC in the Department of Chemical and Biological Engineering and is currently studying the use of microbial communities in the bioremediation of mine drainage. She holds a doctorate from the University of Toronto in Biomedical Engineering and an MSc in Mechanical Engineering from the University of Cape Town, South Africa. Dr. Baldwin completed her postdoctoral training at McGill University in Montreal in the modeling of hydrometallurgical reactors and at Delft University of Technology in the Netherlands in hydrometallurgy with a focus on iron oxidation.

Frank Patch, Senior Project Manager, AAM Branch, EMR, Yukon Government

Frank Patch B.Sc., has worked in Yukon since 2001 as a Water Inspector for DIAND Water Resources, as an Environmental Assessment Analyst for YG Environment, and as a Senior Project Manager for YG Assessment and Abandoned Mines Branch. He has experience with the regulatory approval of mine development, water licence enforcement, and environmental protection and development of closure plans for abandoned mines.