



**POLYTECHNIQUE
MONTREAL**

TECHNOLOGICAL
UNIVERSITY



PhD Project in mining environment Reclamation of AMD generating filtered tailings storage facilities

Polytechnique Montreal, Qc, Canada @polymtl

RIME – Research Institute of Mines and Environment @irme.uqat.polytechnique

#phd #environment #mining #geochemistry #hydrogeology #reactivetransport #modelling

RIME-Polytechnique is presently looking for a PhD candidate in mineral engineering to study the hydro-geochemical behaviour of acid generating filtered tailings and to develop innovative progressive reclamation solutions.

Project description

One of the most critical issues faced by the mining industry is the management and safe disposal of the large quantities of mine wastes produced during operations. Despite several technical developments in the last decades, geotechnical instabilities of tailings storage facilities still regularly occur. Although reasons for failures are numerous, they typically involve water. Filtered tailings management (i.e. dewatering) therefore present many advantages over traditional approaches, such as an improved water recovery and greater mechanical properties, thus gaining in popularity. However, filtered tailings are also more susceptible to generate contaminated acid mine drainage (AMD).

This research project aims to evaluate the kinetics of AMD generation *in situ*, depending on deposition conditions (initial water content, deposition rate, layer thickness, tailings mineralogy) and to propose progressive reclamation solutions to prevent contamination at the source. Using physical medium scale models in the laboratory, field experiments (at our mining partners' sites) and advanced numerical simulations, the PhD candidate will evaluate the performance of several reclamation approaches such as cover systems, mixing with neutralizing materials and/or climate-controlled reclamation (e.g. thermal covers). The final objective is to propose practical recommendations for management and reclamation of AMD generating filtered tailings storage facilities.

Research fields: Mining environment, geochemistry, hydrogeology, reactive transport modelling.

Candidate profile: Master's degree in geological, mining or civil engineering, or any other relevant field.

Scholarship: 22 000 \$/year (not subject to income tax) + exemption from differential tuition fees
+ scholarship to participate to at least 2 conferences during the PhD studies

Duration: 3 years - **Location:** Polytechnique Montreal, Quebec Province, Canada - **Project start:** Autumn 2020

FOR MORE INFORMATION OR TO APPLY (please send cover letter, CV and transcripts):

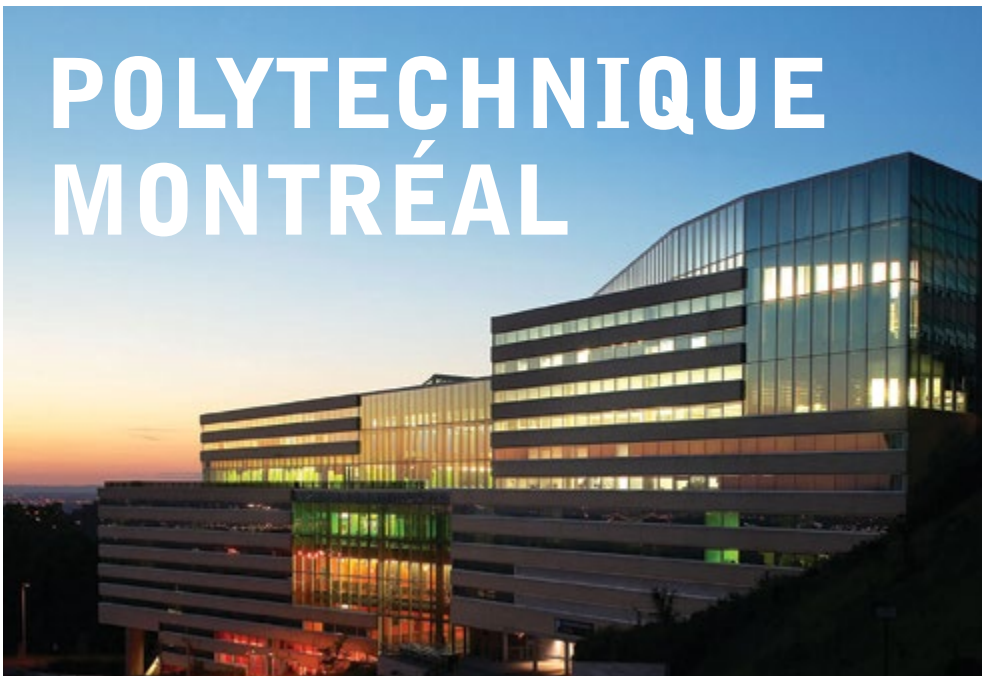
Prof. Thomas Pabst, Eng. Ph.D., Scientific Director RIME Polytechnique
Polytechnique Montreal, Department of Civil, Geological and Mining Engineering
Phone: 514-340-4711 #4731 - Email: t.pabst@polymtl.ca

Application deadline: April 30, 2020



<http://www.irme.ca/en>
<http://www.polymtl.ca/en>

POLYTECHNIQUE MONTRÉAL



MISSION

Respectful of the principles of sustainable development and attuned to the needs of society, Polytechnique Montréal, in accordance with its values:

- educates engineers and top-level scientists to meet the challenges of an evolving world and make them key agents of change;
- conducts research that addresses major societal issues; and
- influences its environment intellectually, economically and socially.

POLYTECHNIQUE AT A GLANCE

Founded in 1873, Polytechnique Montréal is a technological university, and one of Canada's largest engineering teaching and research institutions. It ranks first in Québec in terms of the scope of its research activities.

Polytechnique offers courses and programs in numerous engineering specialties, in which fields the institution accounts for the production of nearly one-quarter of university research in Québec. The university also conducts some of Canada's most intensive research activities through its approximately 60 research units and faculty comprising world-renowned experts.

Polytechnique Montréal is a world-class science and technology centre. The university has agreements with more than 200 institutions across the globe, and international students account for more than one-quarter of Polytechnique's student body. Polytechnique's Lassonde buildings have become a benchmark in sustainable construction, as the first Canadian university buildings to be awarded LEED (Leadership in Energy and Environmental Design) Gold international certification.

POLYTECHNIQUE BY THE NUMBERS

- Almost 9,000 students (28% women)
- 2,200 graduate students
- More than 120 programs
- 1,706 diplomas awarded in 2018-2019
- 50,957 graduates since 1873
- 278 professors
- 1,530 employees
- Annual budget of \$260 million
- 29% international students

RESEARCH

- \$100-million annual budget
- 23 Industrial Research Chairs (including 12 NSERC Chairs)
- 20 Canada Research Chairs
- 1 Canada Excellence Research Chair
- 105 concrete improvements to existing technologies
- 56 Patents held
- 27 Active spinoff companies

BACHELOR'S, MASTER'S AND DOCTORAL ENGINEERING PROGRAMS: AEROSPACE • BIOMEDICAL • CHEMICAL • CIVIL
COMPUTER • ELECTRICAL • ENERGY AND NUCLEAR • ENGINEERING MATHEMATICS • GEOLOGICAL • INDUSTRIAL
MECHANICAL • METALLURGICAL • MINING • MINERAL • SOFTWARE • PHYSICS



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