

## Doctoral and Masters Project Offers / Integrated mine waste management for surface mines

RIME – Research Institute on Mines and Environment

Polytechnique Montréal

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- You are concerned with the environment and mine wastes management?
- You are interested in geotechnical engineering, hydrogeology or geochemistry?
- You are attracted by research projects with practical industrial applications?
- You wish to further your knowledge with an applied research project?

RIME-Polytechnique is presently looking for **Ph.D.** and **Masters candidates** in mineral engineering to work on several projects in mining environment, and in particular the backfilling of open-pit mines. Short-term **internships** (4-6 months) are also available.

### Duration

Ph.D. project duration: 3 years.

Masters' project duration: 2 years.

### Location

Polytechnique Montreal.

### Beginning of project

Summer 2017, Autumn 2017 and Winter 2018.

### Project description

The safe management of the large volumes of mine wastes produced by mining operations is a challenge for the mining industry and society as a whole. Storing these wastes in open-pit mines is a promising solution, but which also raises several technical and operational challenges. The development of this method requires a more detailed evaluation of different aspects, especially concerning the consolidation and drainage of the mine wastes deposited in the pits, and the interactions between the wastes and the surrounding environment.

The objective of this research program is to study selected aspects of the method in order to propose solutions that are practical and that could be rapidly applied to mining sites. We are planning field and laboratory work, complemented with numerical simulations to interpret data and study the behaviour of mine wastes at different scales. The analysis will include operational requirements (identified by our industrial partners). This will result in realistic solutions which will optimise the conception and placement of the mine wastes in open pits, while taking into account the properties of the materials, the in-situ field conditions, the physical and chemical stability objectives, and the security of the site.

The project will be completed at Polytechnique Montréal, in collaboration with the Université du Québec en Abitibi-Témiscamingue (UQAT), and three partner mining companies of the RIME (IAMGold, Canadian Malartic Mine and Agnico Eagle Mines).

### **Research fields**

Mine wastes management, mining geotechnics, hydrogeology, geochemistry, and environment.

### **Thesis advisors**

Thomas Pabst (Polytechnique Montreal), with the collaboration of Michel Aubertin (Polytechnique Montreal), Bruno Bussière (UQAT), Li Li (Polytechnique Montreal), Michael James (Polytechnique Montreal), Mamert Mbonimpa (UQAT).

### **Candidate profile**

Ph.D.: Candidate must have a master's degree (or equivalent) in civil, mining or geological engineering, or any other relevant field.

Masters': Candidate must have a bachelors' (or equivalent) in civil, mining or geological engineering, or any other relevant field.

### **Scholarship**

Ph.D.: Research scholarship of 20,000\$/year (22,000\$/year after the pre-doctoral examination).

Masters': Research scholarship of 17,500\$/year.

### **Required documents**

Resume (CV), student transcripts, motivation letter and references.

### **Note:**

Field work is planned at the mining sites of the industrial partners in Abitibi.

### **For more info**

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The Research Institute on Mines and the Environment (RIME) UQAT-Polytechnique supports research that favors the development of original and practical environmental solutions for the entire mine cycle

The RIME UQAT-Polytechnique offers:

- A multidisciplinary and dynamic research environment.
- Partnership with the mining industry.
- Access to several mining sites.
- Laboratories equipped with cutting edge technologies.
- A team of professors and researchers with world class expertise.