UNIVERSITY OF SASKATCHEWAN

Ph.D. Opportunities in Environmental Geochemistry

The Environmental Geochemistry Group in the Department of Geological Sciences at the University of Saskatchewan (USask) is currently recruiting graduate students for three fully-funded Ph.D. projects starting in May or September 2019. Details on these projects, qualifications, and application procedures are provided below.

The Environmental Geochemistry Group is led by Dr. Matthew Lindsay, who is an Associate Professor in the Department of Geological Sciences and the NSERC/Syncrude Industrial Research Chair in Mine Closure Geochemistry. Our research examines the impacts of geochemical processes on groundwater and surface waters. Much of this research is focused on mineral-metal(loid)-microbe interactions and their relationship with carbon, sulfur, and iron cycling along redox gradients. For more information visit: www.mbjlindsay.ca.

Project Descriptions

Applicants are invited to submit applications detailing their interest in one or more of the following potential thesis topics:

(i) Geochemical evolution of sulfide tailings generated at oil sands mines

Start Date: May 2019 (preferable) or September 2019

Overview: Oxidative weathering of sulfide-bearing mine tailings can generate acid and release metal(loid)s to pore waters. This Ph.D. project will combine field sampling, laboratory experiments, and modeling to constrain controls on water chemistry during sulfide-mineral oxidation in a sulfide-bearing tailings deposit. Specifically, this project will examine controls on acid generation, metal(loid) release, and metal(loid) attenuation in this deposit. This project will integrate aspects of geochemistry, mineralogy, geomicrobiology, and hydrogeology, but several novel lines of enquiry can be pursued depending upon student expertise and interest.

(ii) Geochemical implications of soil covers on oil sands sulfide tailings

Start Date: September 2019

Overview: Soil covers are used to limit oxygen availability and water infiltration within sulfide mine wastes. This Ph.D. project will combine field experiments and modeling to evaluate geochemical responses to soil covers applied to oil sands froth treatment tailings. Specifically, this project will examine the impacts of soil covers on sulfide-mineral oxidation in non-weathered tailings and on metal(loid) mobility in (partially-) weathered tailings. This research will integrate aspects of geochemistry, mineralogy, geomicrobiology, and hydrogeology, but several novel lines of enquiry can be pursued depending upon student expertise and interest.

(iii) Passive water treatment in integrated mine closure landscapes

Start Date: May 2020 (preferable) or September 2020

Overview: Oil sands mine closure landscapes will integrate waste materials exhibiting varied geochemical characteristics. This Ph.D. project will examine potential to utilize waste materials to promote passive water treatment within integrated closure landscapes. Specifically, this project will examine potential for acid neutralization and metal(loid) attenuation within oil sands fine tailings deposits. This research will integrate aspects of geochemistry, mineralogy, and geomicrobiology, but several novel lines of enquiry can be pursued depending upon student expertise and interest.

Qualifications

The following qualifications will be considered during review of applications. Applicants deemed to be lacking these qualifications will not be considered or contacted.

Education:

Applicants must hold an undergraduate degree in geoscience, environmental science, or a closely related science or engineering discipline. Degree requirements for a thesis-based M.Sc. in a related discipline must be completed by the project start date. Please refer to the College of Graduate and Postdoctoral Studies webpage (https://grad.usask.ca/) for further information on educational requirements.

Experience:

Applicants must have previous laboratory experience gained through undergraduate coursework or previous research experience. Experience with field work and associated safety training will be considered an asset.

Skills/Certifications:

The following skills will be considered asset during review of applications:

- motivated, reliable, and well-organized
- prepared to work in a team-oriented and multidisciplinary research environment
- fluent in written and oral English communication
- Canadian driver's licence or ability to secure one (vehicle not required)
- previous safety training (e.g., First Aid, WHMIS)

Other Considerations:

The following considerations should be made when determining whether to apply:

- these positions will involve field work for extended times (i.e., 2+ weeks)
- travel to the United States for synchrotron measurements may be required

How to Apply

Complete applications and enquiries can be sent via email to Dr. Matthew Lindsay (env.geochem@usask.ca):

- please include "PhD Application" in the subject line of the your email
- please do not apply to the graduate program through the University of Saskatchewan website

Applications should include the following components:

- Cover letter (1–2 pages) including: (i) educational background, (ii) career goals, (iii) project(s) of interest, (iv) alignment of project(s) with educational background; (v) availability to begin studies, (vi) indication of whether you would be a domestic (Canadian Citizen or Permanent Resident) or international applicant
- Transcript(s): unofficial copies are acceptable
- Curriculum Vitae or Resume
- Names and contact information for three referees

Evaluation of applications will begin immediately and continue until positions are filled. Incomplete applications will not be considered. Shortlisted applicants may be asked for additional documents (e.g., language test scores, examples of written work).

About the University Of Saskatchewan

The University of Saskatchewan is a member of the prestigious U15 Canadian research university group and provides excellent facilities and analytical tools to our students. We are located in Saskatoon, Saskatchewan, Canada on Treaty 6 Territory and the Homeland of the Métis. Our historic campus is recognized as one of the most beautiful in Canada, and our warm community welcomes people from around the world including growing numbers of Aboriginal and international students. The University of Saskatchewan is strongly committed to a diverse and inclusive workplace. All members of the university community share a responsibility for developing and maintaining an environment in which differences are valued and inclusiveness is practiced. We welcome applications from those who will contribute to the diversity of our community.

Additional information on the University of Saskatchewan (https://www.usask.ca/about.php) and graduate studies (https://grad.usask.ca/) is available online.