Job Description

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| **Job Title:** | Manager, Environmental Geochemistry Laboratory |
| **Department:** | Earth & Environmental Sciences |
| **Reports To**: | Principal Investigator |
| **Jobs Reporting:** | Interns, Contract technicians, PDFs, Grad and Undergrad/Co-op Students |
| **Salary Grade:** | USG 9 |
| **Effective Date:** | November 2019 |

## Primary Purpose

The incumbent will provide technical and scientific expertise for development, execution and coordination of research projects related to watershed biogeochemical cycling. The incumbent will assist the Principal Investigator (PI) with funding applications and deliverables and provide leadership and supervision for experimental and field experiments/collections, analytical instrument operations, and data analyses, including QA/QC and training of graduate students, undergraduate students and technicians.

## Key Accountabilities

**Laboratory Administration**

- Assist in development of project proposals and the design, set-up, monitoring and summation of research projects.
- Coordinate safety and compliance training and procedures for lab operations.
- Prioritize and manage laboratory workflow based on student needs and laboratory efficiency.
- Periodically evaluate staffing needs of the laboratory for efficient and effective operation.
- Prepare applications for staff funding (NSERC USRA, UW URI. UW Work-Study Program), hire and oversee the work of casual employees (e.g. contractors, term work students, work study students).
- Take leadership in the coordination, administration and implementation of training programs, including Environment Canada and Natural Resources Canada Career Launcher Internship Programs.
- Support and participate in technical training (e.g. demonstrations) for graduate and undergraduate students and visiting fellows and researchers.
- Co-ordinate and maintain data bases for the lab's generated data.
- Contribute to the preparation of scientific reports and articles. Conduct literature searches, review and assist in preparation of manuscripts and make informal and formal presentations.
- Perform other administrative duties as needed to further the mission and goals of PI.

**Financial Administration**

- Manage financial and budgetary resources of the Environmental Geochemistry Laboratory (Overhead, Operating and Research accounts).
- Oversee purchasing and budgeting for lab operation and field research (ranging from $200K to >$500K/year).
- Ensure laboratory operates in a fiscally responsible and financially stable condition.

**Service Work**

- Evaluate and set fees for collaborative and commercial service.

- Respond to inquiries about services.
- Communicate with laboratory customers regarding laboratory services, analytical needs, sample status, and analytical results.
- Prepare invoices for analytical services (typically ranging from $1K-$50K/project).

**Laboratory Operations, including Health and Safety**

- Ensure maintenance of lab infrastructure (estimated value >$1.5M)
- Apply advanced sample collection methods for environment matrices including water, wastewater, sediment and biota for elemental analysis, including preservation of samples to ensure integrity, (e.g., spiking, blanks, prevention of biological activity, etc.).
- Application of sample preparation, and extraction techniques for geochemical and stable isotope analysis. Use of filtration, freeze-drying, direct precipitation, ion exchange, ultra-filtration, dissolved gas extraction and automated analytical techniques.
- Quantification of dissolved constituents using: Ion chromatography (Dionex ICS 2100); High temperature combustion (Shimadzu TOC-L, OI Aurora, Dohrmann DC-190); Discrete Chemical Analysis (SmartChem 200); Gas Chromatography (Varian 3800, Agilent 6890); UV/VIS spectrometry (Agilent Cary 100); Isotope ratio mass spectrometry (Isochrom GC-IRMS, MAT 253 GC-IRMS); including operation and maintenance of analytical equipment, sample processing, and quality control and reporting of analytical results.
- Use of data acquisition software (e.g. Chromeleon, ChemStation, Galaxy) and management of research databases.
- Manage laboratory inventory, and purchase supplies.
- Establish and implement scientific methods, protocols, and procedures through research and laboratory experiments for gas and isotopic analysis of gaseous and aqueous samples. Conduct experiments to develop and improve new and existing methods and procedures when needed.
- Supervise, mentor, and lead students and junior staff to achieve success and foster a culture of innovation and high-level performance at both individual and organizational levels. This includes task assignment, scheduling, on-going performance management with coaching and feedback.
- Ensure the safety of staff. Coordinate safety and maintenance services (e.g., balance maintenance, pipette calibrations, periodic eye wash and safety shower assessments).
- Proactively address laboratory safety issues. Facilitate annual lab inspections and respond fully to all Departmental/Faculty Safety audit findings. Define and implement laboratory best management practices.
- Apply QA/QC protocols to sample processing procedure to ensure high-quality analytical results.
- Establish laboratory quality assurance and quality control standards through laboratory experiments and testing, and where appropriate involve inter-laboratory proficiency assessments.
- Develop and maintain records (including electronic databases and paper files) with results of laboratory analyses and appropriate ancillary data for purposes including the storage, maintenance, tracking, reporting, and archiving of sample related information.
- Introduce new computer software and technology to laboratory operation to enhance efficiency and effectiveness of laboratory processes, enhance data quality, and reduce operational cost.
- Prioritize equipment needs of the laboratories including maintenance and acquisition.
- Acquire and assemble analytical equipment required to carry out functions of the environmental geochemistry laboratory.

**Field Work**

- Establish and implement scientific methods, protocols, and procedures for collection of gaseous, aqueous, and biotic samples including techniques for water, sediment, soil and vegetation.
- Ensure all sample collection licensing/permit requirements are in place
- Support, plan and lead proficient geochemical field sampling as well as laboratory and field experimentation.
- Ensure safe field collections and operations, including water safety (open water and boats), driving of vehicles (trucks) and trailers, use of sondes, pumps, water samplers, sediment corers and dredges.
- Resolution of problems related to the preparation and implementation of research projects including the sampling (laboratory and field) of biological and environmental samples, preparation, and analyses of contaminants in complex environmental matrices.
- Oversee and ensure the quality of data and the safe operation of the laboratory and field operations
- Maintenance and testing of field equipment and purchasing field supplies.

**Data Analysis and Reporting**

- Ensuring Quality Assurance and Quality Control (QA/QC) and Good Laboratory Practices (GLP) on all lab and field procedures. Ensure routine maintenance of equipment.
- Write and maintain the technical procedures (SOPs) and records for all techniques including QA/QC procedure and Good Lab Practices (GLP).
- Maintain Lab data base and ensure reporting as per requirements of funding agencies.

**All employees of the University are expected to follow University and departmental health and safety policy, procedures and work practices at all times. Employees are also responsible for the completion of all health and safety training, as assigned. Employees with staff supervision and/or management responsibilities will ensure that assigned staff abide by the above, and actively identify, assess and correct health and safety hazards, as required.*

## Required Qualifications

**Education**

- Master's degree in earth science, chemistry, biology, or related discipline.
- Alternate degree fields will be considered/accepted depending on the nature and depth of the experience as it relates to this position.

**Experience**

- Minimum of 5 years of related industry or research experience.
- Demonstrated experience in laboratory management skills including problem solving, QA/QC practices, data management, budget management, invoicing and supply management.
- Experience in developing applications for staff funding and proposals for research funding.
- Demonstrated experience with a range of techniques in geochemical and isotope analysis.
- Experience in the operation and maintenance of a wide range of analytical equipment including ion and gas chromatographs, uv/vis and isotope ratio mass spectrometers.
- Demonstrated ability to critically review existing methods and research and develop new laboratory methods, procedures, and standards.
- Ability to apply analytical/scientific thinking to define and solve problems.

**Knowledge/Skills/Abilities**

- Effective communication, personal relations, collaboration, organizational, teamwork, and leadership skills.
- Demonstrated ability to perform effectively in a diverse and fast-paced work environment consisting of multiple and changing priorities with stringent deadlines, under minimal supervision.
- Attention to detail, sound judgment, and strong conflict resolution skills. Ability to work effectively both independently and in team settings.
- Proficiency in commonly employed software and databases as well as analytical equipment specific software.
- Ability to operate laboratory and field sampling/collection programs safely and efficiently for environmental samples including wastewater, water, sediment, and biological matter.
- Ability to administer, organize, and lead training workshops and programs.
- Experience with database or laboratory information management system software (MS Word, Excel, PowerPoint, Chromeleon, Galaxy, ChemStation)

**Nature and Scope**

- **Contacts:** The position requires strong interpersonal skills in order to manage laboratory and field operations that include interactions with numerous clients, vendors, undergraduate and graduate students and researchers. These interactions require professionalism, patience and considerable judgement. Examples include the discussion of research plans and technical requirements with researchers, the negotiation with vendors for instruments and equipment (often for hundreds of thousands of dollars), the training of students and scientific collaborators, discussions with research partners in government and industry, setting work schedules, etc. Internally the individual will mainly oversee action, reach agreement and negotiate solutions with other key personnel. Externally they deal with and influence clients, suppliers and collaborators (researchers).
- **Level of Responsibility:** The job has specialized work with supervision of others (interns, casual hires) and provides considerable guidance and authority to support others (e.g. students and clients). The position requires the safe operation of a laboratory and field operations, management of work load, training of staff, students and collaborating researchers, and the maintenance of over $1.5M worth of instrumentation. The incumbent will develop new and novel analytical methodologies using advanced techniques and instrumentation (e.g. GC-IRMS); ensure quality (QA/QC) and manage reporting. They will review and manage budgets and prepare invoices for lab services. They will participate in the administration of major training initiatives and programs.
- **Decision-Making Authority:** Although the candidate will answer to the senior researcher for overall scientific direction, they will have considerable leadership for operation of the lab, budgeting, invoicing and purchasing. They will have signing authority on operational accounts related to lab and field management (in the range of $150K/year) and manage research accounts (in the range of $250K-$700K/year). They will: schedule use of instrument and equipment in the lab; direct and hire junior staff (short-term contracts) and temporary help (such as summer and co-op students); and oversee safety and lab/field operations (set priorities and direct work). The incumbent will be required to do considerable problem solving and work independently to address problems and seek solutions on their own and come to the supervisor with options. The position has responsibility for ensuring the operation of instruments worth >$1.5M that require constant care and maintenance. The QA/QC requires considerable problem solving and technical knowledge as well as good judgement. Poor performance would jeopardize these expensive instruments requiring extensive cost and lab down time (operational costs).
- **Physical and Sensory Demands**: Although normal days could result in slight fatigue, some periods of time (field operations) will require moderate to high effort (fatigue and risk). The position requires the person to balance many conflicting demands and priorities. There will be a significant amount of

personal interaction with a wide variety of different infrastructure users and there will be numerous deadlines related to operation of the equipment and reporting. The incumbent will work in laboratories with loud continuous noise where hearing protection may be required. Lab work requires the use of solvents and chemicals. Field work may require long hours and adverse weather conditions and use of boats, driving of small trucks and trailers. The work will require the handling of wastewaters and environmental samples.

- **Working Environment:** The work will be located primarily in the Environmental Geochemistry Laboratory of the Department of Earth and Environmental Sciences and will include working in the Environmental Isotope laboratory as well as field trips often under adverse weather conditions. The position requires work around water (rivers, lakes and in the laboratory) and remote areas. The maintenance and operation of the field infrastructure may require a significant amount of time in the field occasionally requiring irregular and extended work hours during field or laboratory experimentation. There will be some travel required to remote field locations, workshops and conferences. The work is split between laboratory, office management and report writing, etc. There is potential exposure to hazardous chemicals and situations in the laboratory, and field situations.