IDENTIFICATION

Department	Position Title	
Environment and Climate Change	Molecular and Microbiology Section Lead	
Position Number	**Community**	**Division/Region**
23-14268	Yellowknife	Water Monitoring and Stewardship/HQ

PURPOSE OF THE POSITION

The Molecular and Microbiology Section Lead (MMS Lead) is a senior analyst at the Taiga Environmental Laboratory (TEL). This position leads both the day-to-day operations of and long-term planning for the TEL's Molecular and Microbiology Section (MMS). The MMS Lead ensures that test results from their section comply with the criteria and standards required to maintain continued certification with the Canadian Association for Laboratory Accreditation (CALA) and to ensure that the TEL's clients have the test results necessary to manage public health, manage environmental health, and comply with regulatory requirements in the Northwest Territories (NWT).

SCOPE

Located in Yellowknife and reporting to Manager of Taiga Environmental Laboratory, The Molecular and Microbiology Section Lead is responsible for the day-to-day operations of the Molecular and Microbiology Section to ensure that sample analyses are completed accurately and within standard laboratory turnaround times. The MMS Lead trains and supervises Environmental Laboratory Technologists and summer students within the Molecular and Microbiology Section.

The Taiga Environmental Laboratory is the only full-service environmental analytical laboratory in northern Canada. The TEL performs a wide range of chemical and molecular and microbiological analysis on water (freshwater, ground water, drinking water, industrial effluents, and sewage) and soil/sediment samples. Significantly, TEL is accredited by the Canadian Association for Laboratory Accreditation (CALA), and the scope of accreditation includes 248 individual parameters in four distinct sections: Inorganic, Organic, Trace Metals, and Molecular/Microbiology. In addition to standard services, a variety of special services are also offered, including rush sample services, scientific training, quality assurance and quality check (QA and QC) plans, and public education.

The TEL provides approximately $1.4 million of environmental testing services each year to the following clients:

- internal Government of Northwest Territories (GNWT) departments including Environment and Climate Change (ECC), Health and Social Services (HSS), and Municipal and Community Affairs (MACA);
- federal government agencies, including Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) and Environment and Climate Change Canada (ECCC);
- Indigenous governments and community/municipal governments;
- industry (e.g., mines), consultants, and other local businesses; and
- researchers from academic institutions working in the north.

The TEL performs over 40,000 tests a year; analytical results provided by the TEL are used by its clients to:

- ensure the safety of drinking water in all NWT communities;
- track pathogen levels (e.g., SARS-CoV-2) in wastewater to inform public health actions;
- evaluate trends in environmental contaminant levels in freshwater from across the NWT;
- ensure regulatory compliance of communities and government with the *Public Health Act* and *Water Supply System Regulations*; and
- ensure regulatory compliance of communities, remediation projects, and industries with the conditions of their water licences under the *NWT Waters Act* and *Mackenzie Valley Resources Management Act*.

The MMS Lead must be knowledgeable about and understand the theories and science that support the operations of a broad range of laboratory equipment (e.g., quantitative polymerase chain reaction machines, GeneXperts etc.) in order to ensure the day-to-day operations of the unit and to research and develop new procedures. New procedures are often required when technologies change, clients need different detection limits, or TEL collaborators in Health and Social Services require the analysis of new or emerging pathogens.

Generally, the Team Lead works within precedents and well-defined standard operating procedures. However, highly technical and complex issues frequently occur that cannot be resolved within precedents and SOPs. In these cases, the Team Lead is responsible for resolving these issues through equipment repair/replacement, changes to existing procedures, or research into new methodologies. The ability to troubleshoot issues as they arise is particularly important as TEL is in a small, remote community with limited access to specialized equipment service technicians or other expert scientists.

The Molecular and Microbiology Section is involved in a number of collaborative projects with the GNWT's Department of Health and Social Services (HSS) and the Public Health Agency of Canada (PHAC). These projects involve drinking water safety as well as the detection of viruses

(e.g., SARS-CoV-2, Flu) in wastewater. The MMS Lead is the main point of contact for these projects on behalf of TEL.

Water samples collected by GNWT Water Resource Inspectors as part of an investigation are submitted to the TEL for analysis using specific legal chain-of-custody procedures. The MMS Lead will be designated as an Analyst under the *NWT Waters Act* in order to certify and analyze these legal samples. This may require the incumbent to testify in court.

The MMS Lead is responsible for ensuring that analytical results from their section are timely and accurate so that TEL's clients are able to make appropriate decisions about public health, regulatory compliance, and management of natural and contaminated environments. The MMS Lead must also ensure that the laboratory equipment in their section is continuously maintained and calibrated to avoid work shutdowns or costly repairs.

In developing work products, the MMS Lead collaborates with a broad range of individuals, including colleagues within the TEL, within the Department, as well as with other GNWT Departments, federal government departments, academic researchers, and consultants for industry.

The MMS Lead has significant freedom to act within the constraints of GNWT and Departmental legislation, regulations and policies. Tact and diplomacy must be exercised when liaising with clients.

RESPONSIBILITIES

1. **Leads and supervises the day-to-day operations of the Molecular and Microbiology Section to ensure that sample analyses are completed accurately and within standard laboratory turnaround times.**
   - Leads the day-to-day operations of the Molecular and Microbiology Section.
   - Trains and supervises Environmental Laboratory Technologists in the Section to ensure sample analyses are completed accurately and within standard turnaround times.
   - Assigns tasks for the section, distributing the work amongst themselves and the ELTs to optimize sample turnaround times.
   - Troubleshoots unexpected problems that arise with equipment, sample types, or workload.
   - Works collaboratively with scientists at HSS and at the PHAC to ensure that TEL's contribution to jointly run projects meets needs and expectations.
   - Collects and interprets section statistics and quality indicators for management.
   - Keeps an inventory of laboratory supplies for their section and orders supplies as required. This includes exercising a payment of authority up to $10,000 per transaction to maintain supplies and equipment for effective operation within the laboratory.

- Ensures that samples are discarded on a regular basis using the proper method (dictated by the matrix and toxicity of the samples).
- Requests the support of the Manager or other Section Leads when needed to meet turnaround times.

2. **Receives, organizes, and conducts chemical analysis of water and wastewater using standard and CALA-accredited laboratory methods to ensure that TEL clients have the accurate results required to make decisions about public health, regulatory compliance, and environmental contamination levels.**
   - Organizes and prioritizes samples according to sample hold times and due dates to ensure workflow is maintained in a timely manner to meet turnaround times.
   - Uses instrument and test specific software to create sample tables.
   - Prepares samples for analysis using techniques such as decanting, subsampling, filtering, or centrifugation as per test requirement.
   - Prepares calibration and other quality control solutions.
   - Analyzes samples for the detection of viruses in wastewater using qualitative and quantitative polymerase chain reaction techniques.
   - Analyzes samples for the detection of bacteria in water and wastewater using various standard methods.
   - Ensures that work areas are safe, clean, and orderly according to the principles of the Workplace Hazardous Materials Information System.
   - Ensures all results are accurately entered into the LIMS in a timely manner.
3. **Monitors Quality Assurance and Quality Control (QA/QC) procedures and practices in their section to ensure that staff and equipment are performing in accordance with acceptable standards and lab results are accurate and reliable.**
   - Ensures all original test data and derived test data are recorded as per the TEL's Quality Assurance Manual and that records are easily retrievable and stored in a secure manner.
   - Reviews and verifies all the data for samples analyzed in their section and reports any potential QC issues or non-conformances to the Quality Assurance Officer.
   - Submits verified data to the Quality Assurance Officer in a timely manner for approval and reporting to clients.
   - Develops and implements corrective actions when QC issues are identified in collaboration with the Quality Assurance Officer.
   - Works with scientists at HSS and PHAC to implement and monitor QC protocols specific to jointly run projects.
   - Ensures instruments used in the section generate results within established parameters.
   - Participates in internal and external laboratory audits.
4. **Supervises and manages human resources within the section to ensure effective staffing and staff development.**
   - Plans the human resource needs for the section and prepares a monthly schedule.

- Assists the Manager with the recruitment and hiring of new staff.
- Provides orientation and training to new staff for operations, routine duties, procedures, QA/QC systems, and organizational guiding principles.
- Conducts staff performance appraisals in accordance with GNWT policies.
- Initiates corrective actions with section employees as appropriate.
- Evaluates, recommends, and facilitates the educational needs of staff.
- Monitors attendance of ELTs and approves leave requests in PeopleSoft.
- Approves payroll entries in PeopleSoft.
- Acts as a supervisor in the context of the *NWT Safety Act*.

5. **Responsible for ensuring the maintenance of approximately $500K worth of complex laboratory equipment in order to minimize downtime and maintain productivity. This aids in extending the life expectancy of the instruments and avoids costly repairs or replacements.**
   - Reviews, performs and documents routine preventative maintenance on a scheduled basis, initiating follow-up when necessary.
   - Due to the remoteness of the community, troubleshoots and performs complex repairs on instrumentation, either unassisted or in telephone consultation with instrument repair specialists, as required.
   - Follow-up with repairs that are outside the scope of staff, including initiating on-site repair visits.
   - Works with the Manager to ensure equipment service contracts are in place and updated as necessary.
   - Prepares tenders, for approval by the Manager, for new pieces of equipment when required.

6. **Initiates the development of new and/or improved sampling or analytical methods/processes in their section to respond to client needs for lower detection limits, increasing demands for services, new technologies, or to alleviate limitations of working in a cold and remote location.**
   - Identifies the potential need for new or improved methods/processes through interactions with clients or review of scientific literature.
   - Researches and develops new methods, processes, or practices in response to requests from clients, collaborators at HSS and PHAC, the Manager, or from the incumbent's own ideas.
   - Determines the technical specifications to be included in tenders/proposals for new lab equipment.
   - Assists the Manager in procuring new equipment as needed.
   - Works with the Chemist, Quality Assurance to obtain CALA certification for new methods.

7. **Provides support for other sections of the lab on an as-needed basis to ensure standard or rush turnaround times can be met during the peak summer season or whenever there are staff shortages.**
   - Participates in cross-training opportunities to assist with sample reception and for analysis of trace metals, microbiology, molecular biology and/or organics.
   - At the direction of the Manager, analyzes samples or provides other support to analysts in other sections.

8. **Maintains valid certifications for First Aid, Supervisor Safety, Workplace Hazardous Materials Information Systems, fire extinguisher use, and any other certifications specific to the Molecular and Microbiology Section.**

9. **Responds to requests and questions from clients to ensure lab results will be interpreted correctly and used appropriately in decision-making.**

WORKING CONDITIONS

Physical Demands

The position is required to stand for long periods when performing lab work (i.e., up to 7.5 hours per day with standard breaks), typically four to five days per week or more when overtime is required; on average, the incumbent will be either standing or walking for 80% of each working day. As well, the position moves and/or lifts heavy cylinders (up to 25 kg), coolers, and carts daily.

Environmental Conditions

The work is performed in the laboratory and office environments. There is constant exposure to dust, noise and vibrations from freezers, fans, lab instruments and equipment, and daily exposure to substances that require special handling (e.g., using WHMIS) including noxious odors, toxic and corrosive chemicals (including known carcinogens), pathogens (human and animal excrement) and various forms of radiation.

The requirement to use chemical auto-analyzers, hot plates, block digesters, fume hoods, atomic absorption spectrometers, and inductively-coupled argon plasma spectrometers presents exposure to heat, ultraviolet, radio frequency and electromagnetic radiation during normal operation approximately five days a week (or more often during staff shortages).

Due to the work environment, protective clothing (e.g., lab coats, safety eye wear, gloves) and proper use of protective equipment (e.g. fume hood) are required for work in the laboratory at all times. Some sections of the laboratory are not air-conditioned and, because of the presence of running laboratory equipment, can reach temperatures of up to 28^{o}C between the months of April and October.

Sensory Demands

The work requires visual acuity as well as precise manual dexterity and hand-eye coordination to prepare samples for testing, to handle fragile laboratory equipment parts and glassware, and to calibrate and operate a variety of laboratory equipment. The preparation of samples also requires the ability to make the appropriate motor responses at the appropriate time, and with speed to maximize efficiency.

Visual acuity and tactile sensitivity are needed to assess very subtle sample conditions based on overall visual appearance (colour, shade, intensity, clarity) and temperature.

Sensory demands occur approximately 75% of the time.

Mental Demands

The position is subject to tight timelines, fast work pace, and competing priorities, with seasonal increases in volume of work, particularly May to October, when the lab receives at least 80% of its annual sample load; during this time, staff are frequently required to work overtime (nights and weekends) to meet seasonal demands.

There is a requirement to maintain constant mental vigilance with respect to safety protocols around corrosive, damaging toxins and pathogens.

KNOWLEDGE, SKILLS AND ABILITIES

- Knowledge of the principles, theories, methods, techniques and practices of microbiology, molecular biology, chemistry, and environmental science.
- Knowledge of molecular biological techniques including polymerase chain reaction and nucleic acid extraction.
- Knowledge of the concepts, methods, and techniques of health and safety practices and process related to working with, transporting, and storing toxic/corrosive chemicals and bio-hazardous materials.
- Knowledge of chemicals or materials should include toxicology, safe transportation, spillage, disposal, environmental hazards and mitigations, personal protection equipment, routes of exposure, and effects of short- and long-term or repeated exposure.
- Knowledge of International Standards Organization and Canadian Association for Laboratory Accreditation guidelines, standards and quality assurance/quality control theories and principles.
- Knowledge of the use, care and maintenance of analytical equipment.
- Knowledge in sterility practices, good hygiene, and ultra-cleaning techniques.
- Knowledge of and ability to comply with the Canada Labour Code safety requirements, the *NWT Safety Act*, the *NWT Occupational Health and Safety Regulations*, and Workplace Hazardous Materials Information Systems to ensure a safe working environment.
- Knowledge of the *NWT Public Health Act*, the *Water Supply Safety Regulations*, and the

Northwest Territories Waters Act and *Regulations*.
- Ability to use manual and modern instrumentation methods in water analysis.
- Ability to organize and conduct chemical analysis of environmental samples according to set procedure.
- Ability to safely handle pathogenic or carcinogenic material, compressed gas, and organic solvents.
- Ability to develop and implement new analytical testing methods or processes.
- Ability to quickly recognize atypical laboratory findings and initiate the appropriate actions.
- Ability to solve problems through independent conceptual thinking.
- Ability to work cooperatively as a team member with the ability to motivate staff and get them to work together as a team.
- Ability to commit to actively upholding and consistently practicing personal diversity, inclusion and cultural awareness, as well as safety and sensitivity approaches in the workplace.
- Demonstrated technical writing skills for the creating and editing of laboratory methods and procedures.
- Demonstrated interpersonal skills to effectively communicate both verbally and in writing.
- Demonstrated organizational and time management skills, including the ability to plan, coordinate, prioritize activities, and meet deadlines.

Typically, the above qualifications would be attained by:

A diploma from a recognized environmental or chemical laboratory technology program or a degree in a relevant field of science such as chemistry, biology, or environmental science. Applicants must also have at least five (5) years of laboratory experience analyzing water and wastewater samples in addition to experience obtained during a degree or diploma program. Experience must include at least:
- two (2) years of supervisory experience,
- two (2) years' experience using microbiological techniques, and,
- one (1) year experience using molecular biological techniques.

Equivalent combinations of education and experience will be considered.

ADDITIONAL REQUIREMENTS

Position Security (check one)

☒ No criminal records check required
☐ Position of Trust – criminal records check required
☐ Highly sensitive position – requires verification of identity and a criminal records check

French language (check one if applicable)

☐ French required (must identify required level below)

Level required for this Designated Position is:

ORAL EXPRESSION AND COMPREHENSION

Basic (B) ☐ Intermediate (I) ☐ Advanced (A) ☐

READING COMPREHENSION:

Basic (B) ☐ Intermediate (I) ☐ Advanced (A) ☐

WRITING SKILLS:

Basic (B) ☐ Intermediate (I) ☐ Advanced (A) ☐

☐ French preferred

Indigenous language: Select language

☐ Required

☐ Preferred