IDENTIFICATION

Department	Position Title	
Environment and Climate Change	Senior Hydrologist	
Position Number	**Community**	**Division/Region**
23-14241	Yellowknife	Water Monitoring and Stewardship/ HQ

PURPOSE OF THE POSITION

The Senior Hydrologist is the principal scientist accountable for providing authoritative scientific and strategy advice regarding the multiple and diverse hydrological science activities for the Northwest Territories (NWT) and for supervising the Hydrologists and Hydrogeological Scientists within the Division.

The Senior Hydrologist is responsible for ensuring that the water quantity network and programs are reviewed and optimized, and the engagement with northern communities, government agencies and academics is maintained in order to meet the water management goals of the Department of Environment and Climate Change (ECC).

SCOPE

Located in Yellowknife and reporting to the Director, Water Monitoring and Stewardship Division (Director), the Senior Hydrologist is the principal water quantity specialist within the Government of the Northwest Territories (GNWT) and leads and manages a team of staff, contractors, and working groups to develop, implement and coordinate territorial strategies, policies, programs and projects that support the water management goals and objectives of the department. The Senior Hydrologist coordinates, leads, plans, designs and is responsible for overseeing the implementation of all hydrological research and monitoring programs in the NWT. The Senior Hydrologist is the main point of contact for water quantity and hydrological related information requests and inquiries.

The Department of Environment and Climate Change (ECC) works to promote and support the sustainable use and development of natural resources and to protect, conserve and enhance the NWT environment for the social and economic benefit of all residents.

The Water Monitoring and Stewardship Division bears the primary roles and responsibilities related to water-related research and monitoring, providing advice to co-management partners, water quality and quantity data analysis and interpretation, and water stewardship and planning. The Division, in cooperation with Environment and Climate Change Canada (ECCC) and other federal and territorial departments, is responsible for collecting and interpreting information about water quantity and quality in the NWT. The Division works with its water partners on a collaborative approach to water stewardship and planning in the NWT, including transboundary water management agreements.

The Northwest Territories (NWT) is the ultimate downstream jurisdiction in the Mackenzie River Basin (MRB), understanding the hydrology and water movements in the basin and its upstream tributaries is critically important for understanding the availability and health of water in the NWT. The MRB drains an area that consists of a fifth of Canada's land mass and it is one of the largest river basins in the world. The flow of the Mackenzie River plays a significant role in regulating oceanic circulation and maintaining arctic climate systems. The MRB is subject to industrial activity which has the potential to influence water flow and quality and it is experiencing the brunt of climate change as one of the nation's northern watersheds. The Senior Hydrologist is responsible for coordinating and leading research and monitoring programs across the NWT to facilitate a better understanding of the regional hydrology. This includes understanding extreme conditions such a low and high water including flooding within the basin and potential linkages to a changing climate.

The Senior Hydrologist works within a legislative and regulatory framework that includes the: *Waters Act*, NWT Water Stewardship Strategy and Action Plan, 2030 NWT Climate Change Strategic Framework and Action Plan, Strategic Plans, as well as other GNWT and ECC policies and programs, including transboundary water management agreements with neighboring jurisdictions.

The Senior Hydrologist collaborates closely with colleagues in the aquatic quality unit and the Lead Coordinator, as well as other colleagues in the Water Monitoring and Stewardship Division. The Senior Hydrologist also works collaboratively with colleagues within ECC, particularly within the Climate Change Unit of the Environmental Stewardship and Climate Change Division. The Senior Hydrologist regularly collaborates with senior officials at the Northwest Territories Geological Survey, scientists and administrators from ECCC, the Water Survey of Canada and Meteorological Services Canada. The Senior Hydrologist also works with external contacts (e.g., Indigenous governments and Indigenous organizations, federal government departments including Natural Resources Canada and the Geological Survey of Canada, other provinces/territories and academia).

The Senior Hydrologist is often called upon by senior management, community leaders and other GNWT departments to provide analysis and advice based on extensive scientific knowledge and experience. The Senior Hydrologist must keep current on research, science,

new technologies and new methodologies related to water quantity. The Senior Hydrologist is also responsible for overseeing the testing and implementing of new techniques, science and methodologies to assess water quantity and hydrological studies in the NWT. The Senior Hydrologist conducts peer-reviews of scientific papers, presents results and publishes technical report, scientific papers and plain language reports on the water levels, flow and water quantity in the NWT.

The Senior Hydrologist uses sound research and scientific methodology in the development of models and approaches to assess water quantity in the NWT that meets the goals of the ECC's Strategic Plan and supports/reflects the mandate of ECC, the GNWT and the people of the NWT.

The Senior Hydrologist has significant latitude in terms of scientific research, study and applied technologies provided rational approaches including models are used to accurately assess water quantity and general threats to water resources in the NWT, such as from climate change. The Senior Hydrologist would be the lead representative on the federal/provincial/territorial committee responsible for administration of the hydrometric agreement and any other intra- or inter-governmental workings groups. The incumbent would take a lead role in conducting and overseeing data analysis, reporting, data sharing and mentoring staff within the unit.

The Senior Hydrologist is regularly called upon to address local, national, and international media requests including written, oral, and video responses. Work is performed under the general direction of the Director. Sound judgment is required, particularly when speaking on behalf of the GNWT and during interactions with partners, stakeholders and rights holders including Indigenous governments and Indigenous organizations.

RESPONSIBILITIES

1. **Provides strategic scientific oversight and supervision to the design and implementation, evaluation and integration of hydrological and hydrogeological studies in the NWT, including the NWT Hydrometric Network.**
   - Develops, implements, evaluates and adaptively manages long-term strategic and operational hydrometric monitoring and research initiatives as both primary investigator and as a scientific collaborator, often in remote areas.
   - Supports the implementation of the NWT Water Stewardship Strategy and Transboundary Water Management Agreements.
   - Develops and implements annual work plans for the unit that establish short- and long-term objectives.
   - Develop partnerships with governments, universities, industry and others to help advance strategic and operational initiatives.
   - Participates in planning short- and long-term objectives for the Division.
   - Works with GNWT departmental experts to evaluate and prioritize potential research initiatives and to incorporate these into strategic and business planning processes.

- Leads budget and operational planning to ensure NWT Hydrometric Network remains current, cost-effective and appropriate to address research questions and internal and external client needs.
- Represents the GNWT on the National Hydrometric Program Coordinators Committee.
- Acts on behalf of the Director as the representative of the GNWT on the National Administrators' Table of the National Hydrometric Program, as required.
- Oversees the collection and management of data using best-practice guidelines and standards.

2. **Provides specialized advice, as a GNWT subject-matter expert on hydrology and hydrogeology, to internal clients, technical committees and a wide range of external stakeholders.**
   - Departmental lead on hydrology and hydrogeology related programs.
   - Provides technical advice and regular briefings to senior management and other GNWT Departments, including Municipal and Community Affairs (MACA) and NWT Emergency Measures Offices (EMOs) to support emergency planning and management associated with flooding.
   - Drafts and reviews briefing materials, policy and decision papers, and other government documents and requests for information, as required.
   - Represents, provides advice and shares GNWT interests on national and international tables, committees, working groups and forums related to water resource management.
   - Prepares or provides final review of scientific and technical reports outlining the findings from hydrological and hydrogeological monitoring programs and aquatic health research in the NWT, which can include data reports, scientific papers, or plain language summaries.
   - Supported by the Hydrological Modeller, provides assessments on the potential impacts of climate change on water resources and hydrological processes in the NWT.

3. **Develops and implements field- and office-based research programs.**
   - Represents the GNWT on international, federal, territorial/provincial and academic committees that are developing programs in support of hydrological and or hydrogeological research.
   - Manages administrative aspects of research projects, which may include: supervision of field staff, the acquisition of permits and licenses, and consultation with local communities.
   - Leads or participates in field programs that involve collection and analysis of hydro-climatic data.
   - Promotes, develops and supports productive relationships and partnerships with GNWT departments, other governments, academic groups and the private sector for developing, funding and implementing priority research activities.

- Develops funding proposals, including budgetary submissions, to support research and monitoring projects in the NWT.
- Promotes cross-divisional collaboration, particularly within the Department.
- Collaborates and supports work to develop revised flood maps for flood prone communities in the NWT.
- Evaluates collaborative research proposals and makes recommendations on departmental support.
- Coaches, mentors, and provides technical advice to aquatic scientists. Ensures Scientists in the unit have the necessary tools and training to perform their duties safely and effectively.
- Ensures cost-effective, efficient and safe work practices in the field and office.

4. **Develops communications and publishes and presents scientific findings and data from monitoring and research projects across the NWT.**
   - Provides media briefings and responds to media inquiries to provide scientific information and updates about water quantity and water levels in the NWT.
   - Prepares or reviews briefing materials, communication products and media responses related to hydrological or hydrogeological research and monitoring programs and findings in the NWT.
   - Prepares and presents research and monitoring results at professional scientific meetings, conferences, and workshops to various levels of government, communities and groups as part of information sharing and outreach activities.
   - Publishes the results of original scientific work as lead author or co-author in peer-reviewed scientific journals and conducts peer review of scientific papers.
   - Collaborates with scientist within the group to monitor and synthesize available data, including forecasts, imagery and community information to develop spring break up information and generation of daily reports for the EMOs (territorial, regional and local) and the public.
   - Analyzes and synthesizes NWT hydrometric, hydrogeologic and hydro-climatic data to assess and report on regional and local hydrological conditions and trends, including potential impacts of climate change on water resources and hydrological processes.
   - Prepares and oversees production of technical and plain language reports that include high quality figures, maps and images.
   - Develops and implements communications and public outreach strategies in collaboration with the communications unit.
   - Delivers communications for a variety of audiences to support understanding of hydrology and hydrogeology information across the NWT.
   - Ensures consistent use of appropriate standards and protocols related to hydrological and hydrogeological projects, data and analyses.
   - Maintains membership in, and periodically serves on Boards, at the national level.

5. **Manages financial and human resource functions of the unit to provide effective and efficient services within budgeted frameworks.**
   - Manages human resource functions for the group, including staffing processes, development of employee objectives and performance indicators, and review of individual staff goals and training needs.
   - Provides positive leadership and guidance on a broad range research and monitoring activities.
   - Develops and submits funding and human resources proposals should additional human resources be required.
   - Encourages employee development through training plans and professional development opportunities.
   - Manages an annual budget for the Hydrology group (~$1,500,000 O&M) and projects future budget requirements in a fiscally responsible manner.
   - Oversees contract management and procurement for the group, including reviewing terms of reference, and statements of work to direct contractors.

WORKING CONDITIONS

Assumptions are that the incumbent is reasonably suited to the job and performs competently, and that all appropriate measures have been taken to mitigate undesirable working conditions.

Physical Demands

The incumbent will usually work in a normal office environment with intermittent field work. In the summer field season, the incumbent will be hiking over rough terrain with a backpack and collected samples for 8 hours per day, up to 3 weeks per year; will be travelling in small aircraft and helicopters for up to 8 hours per day, up to 3 weeks per year; will be travelling in small watercraft for up to 1 hour per day, up to 3 weeks per year. In the winter field season, work involves travelling by snowmobile and operation of one-person ice augers or other monitoring equipment.

Environmental Conditions

The incumbent will usually work in a normal office environment with intermittent field work. While in the field, the incumbent can be exposed to: rapidly changing weather and to conditions such as cold (hypothermia), intense sun (burn), wind, rain; helicopters, airplanes, ATVs, road vehicles (physical injury, hearing loss, gas/fumes); insects and insect bites; dangerous, unforeseen, uncontrolled field situations such as vehicular accidents, attack by wild animals, falls; and other accidents while hiking (cuts, muscle sprains, broken bones, etc.). The incumbent will be exposed to these environmental conditions every day up to three weeks per year.

The incumbent will be exposed to noise from helicopters, airplanes, ATVs, snowmobiles, and outboard motors as well as other equipment such as ice augers, chainsaws, firearms, and

generators. The incumbent will be exposed to these noise conditions every day up to three weeks per year.

Sensory Demands

The incumbent will usually work in a normal office environment with intermittent field work.

Mental Demands

The incumbent will usually work in a normal office environment with intermittent field work. From May to August there is expectation of some field-based work. While in the field, the incumbent is subject to substantial disruption of family life due to conducting work in remote locations. The incumbent is also responsible for the continuous management of scientific and logistical activities and safe work practices while in the field, including the prediction and mitigation of potentially hazardous situations and managing personality conflicts amongst field staff. The incumbent will be exposed to these demands every day up to three weeks per year.

The incumbent is also required to review and present research or work plans to scientific peers, collaborators, community groups, etc. and may attend workshops or research meetings in southern Canada two to four times per year.

The incumbent is also required to respond to media inquiries and conduct interviews on water quantity and hydrological research including assessments of high and low water conditions including flooding.

KNOWLEDGE, SKILLS AND ABILITIES

- Ability and experience seeking funding from multiple sources to support research and monitoring programs as well as attract partners and develop research partnerships.
- Ability to managing people and managing financial resources and budgeting.
- Ability to lead working groups to establish water quantity interest, priorities and values.
- Ability to lead multi-disciplinary teams, as well as mentor and supervise technical staff and/or students.
- Knowledge of diverse and complex elements of hydrologic and hydrological science, such as surface runoff and fluvial processes; meteorology theory, related earth sciences theory (e.g., geomorphology, hydrogeology, limnology, soil science, climatology, oceanography}; and scientific measurement and analysis techniques.
- Knowledge of current approaches and methodologies used to monitor, assess or predict the nature and extent of impacts on the aquatic environment, to collect and apply hydrological data to studies of the northern environment.
- Knowledge of current NWT water initiatives, such as the NWT Water Stewardship Strategy and Action Plan, Climate Change Strategic Framework and Action Plan, NWT

Cumulative Impact Monitoring Program, Knowledge Agenda and departmental Strategic Plan.

- Knowledge of NWT legislation, Indigenous governments and Indigenous organizations and land claims, institutions, government systems and communities.
- Ability to work in a cross-cultural environment and develop effective communications and working relationships with Indigenous governments and Indigenous organizations and other agencies.
- Knowledge of new and evolving hydrologic data collection methodsincluding remote sensing capability for snow and water from satellite and air photo platforms, remote access data collection procedures, and automated data analysis and assessment methods and geographical information systems.
- Knowledge of statistical methods to review, analyze and interpret data and produce reports.
- Knowledge of technical and plain language report writing and the peer review process.
- Knowledge of water resource management methods and practices.
- Knowledge of current technical and scientific literature on hydrology with particular emphasis on the northern environment to ensure the most current techniques and cost-effective methodologies are used in studies and investigations.
- Knowledge of computer systems and commercial/specialty software applications and statistics packages (e.g., R); spreadsheets; databases and word processors.
- Knowledge of arctic survival, transportation of dangerous goods, first aid. firearms, remote communications, equipment repair and navigation techniques.
- Analytical skills are required to innovate or modify methods, techniques and practices, generate independent research results and/or validate the research findings generated by others.
- Demonstrated track record of hydrological data analysis, data management experience and peer-reviewed scientific report writing/publication.
- Ability to deliver presentations, as well as written and verbal communications, to the knowledge level and needs of the respective audience including relaying technical information to non-technical audiences and explain scientific principles in ways the audience can understand.
- Ability to exercise tact, diplomacy and good judgment.
- Ability to work in an autonomous, flexible, discrete, and trustworthy fashion.
- Ability to develop, implement and evaluate technical and scientific workplans and methodologies to guide hydrologic and hydrogeologic research and monitoring programs for the NWT in a robust and cost-effective way.
- Ability and experience engaging with Indigenous governments and Indigenous organizations and local communities to determine water quantity monitoring priorities and disseminate monitoring results.

- 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.

Typically, the above qualifications would be attained by:

Completion of a graduate degree (M.Sc.) in hydrology, environmental science or engineering with at least five (5) years of progressive experience in the hydrological sciences and relevant experience in a cold climate setting, preferably with field experience in cold regions hydrology.

Equivalent combinations of education and work 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