IDENTIFICATION

Department	Position Title	
Environment and Climate Change	Hydrogeologist	
Position Number	**Community**	**Division/Region**
23-14669	Yellowknife	Water Monitoring and Stewardship /HQ

PURPOSE OF THE POSITION

The Hydrogeologist is responsible for planning, developing and implementing hydrogeological programming which informs effective groundwater resource management and associated water policy decisions in the Northwest Territories (NWT). The Hydrogeologist provides scientific and technical advice, analyses, recommendations and mitigations regarding northern resource development to the Division, Department, government agencies, and external stakeholders, including communities in support of northern water resources management.

The Hydrogeologist also provides knowledge and expert advice on groundwater monitoring and research activities in support of the NWT Water Stewardship Strategy and the Government of Northwest Territories' (GNWT) Bilateral Water Management Agreements.

SCOPE

Located in Yellowknife and reporting to the Senior Hydrologist in the Water Monitoring and Stewardship Division, the Hydrogeologist is the Government of Northwest Territories (GNWT)'s lead contact for matters pertaining to groundwater in the Northwest Territories (NWT) and works closely with permafrost scientists within the Department of Environment and Climate Change (ECC) and in other departments. The position delivers hydrogeological expertise through performance of a variety of expert roles to increase awareness of risks and adoption of best management practices associated with delineating, understanding and protecting the NWT's groundwater resources.

The Hydrogeologist seeks collaborative opportunities with provincial, territorial, federal, and international governments and academic agencies and secures funding, in-kind contributions, equipment, personnel, and intellectual property. This enhances water monitoring programs, improves the NWT's water modeling and interpretation capabilities, and advances the state of

knowledge of science for northern regions. This is relied upon by the GNWT, private decision makers and other governments.

The Water Monitoring and Stewardship Division bears the primary roles and responsibilities related to the collection of water quality and quantity data, and water stewardship and planning. The Division, in cooperation with Environment and Climate Change Canada (ECCC) and other federal and territorial departments, collects and interprets information about water quantity and quality in the NWT. Groundwater data is also collected in the NWT by the Northwest Territories Geological Survey (NTGS) to better determine mineral and oil and gas potential. The Division works with its water partners on a collaborative approach to water stewardship and planning in the NWT.

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 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 Hydrogeologist will identify, prioritize and implement research projects, successfully capturing baseline and trend data, to allow the identification of the NWT areas that are under pressure and where groundwater data is critical to capture because of existing and anticipated developments in other jurisdictions (northern Alberta and British Columbia) and ongoing climate change impacts.

The Hydrogeologist 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, as well as other GNWT and ECC policies and transboundary water management agreements with neighboring jurisdictions. This position regularly works with Hydrologists and the Hydrological Modeller as well as other GNWT colleagues and scientists from the NTGS and NWT Centre for Geomatics.

The Hydrogeologist must have knowledge of scientific monitoring methods and methodologies related to groundwater assessments to lead monitoring programs and assess change over time. The Hydrogeologist presents and publishes results such as technical reports, scientific papers and plain language reports on the groundwater in the NWT.

The Hydrogeologist works to ensure that information collected is analyzed, interpretated and reported on to provide assurance of water quality and the health of NWT ecosystems to meet the goals of the departments Strategic Plan and supports/reflects the mandate of the Department, the GNWT and the people of the NWT. The incumbent regularly meets with the

Senior Hydrologist and Senior Aquatic Quality Scientist and the Manager, Watershed Partnerships and Agreements to receive assignments and provides professional advice and expertise on aquatic health for decision making.

The Hydrogeologist has significant latitude in terms of developing, coordinating and implementing groundwater monitoring and research program provided reasonable approaches and scientific standards are followed.

RESPONSIBILITIES

1. **Facilitates the development, evolution, and integration of hydrogeology programming within Department operations.**
   - Provides technical support to operational program plans and associated financial and community-based contracted resources to bring about achievement of annual and strategic goals for the hydrogeology program.
   - Leads the development and application of guidelines and protocols associated with the management of groundwater resources.
   - Provides technical support in the development of a regulatory framework and enforcement regime to manage groundwater responsibly within the NWT in collaboration with partners.
   - Provides technical support in the development and implementation of contingency planning to ensure appropriate responses to limit/minimize damage to groundwater sources that may result from various sources of contamination and other events.

2. **Plans and implements groundwater research projects, as well as works with external researchers, to establish baseline data and predict, manage, and evaluate the impacts of development on groundwater.**
   - Prepares Request for Proposals and Terms of Reference for projects and performs contract administration responsibilities (e.g., evaluating contract bids and awarding contracts, defining and managing project deliverables, schedules, budgets and payments, etc.).
   - Contributes to the development of scientific understanding of NWT's aquifer characteristics by mapping, modeling and testing to determine the existence of contaminations and vulnerability to further contamination and/or risks to predictable supply.
   - Explores climate change impacts on groundwater systems (e.g., holistically examining the linkages between groundwater and surface water systems and determining the success of climate change adaptation and mitigation strategies, etc.).
   - Supervises project team members, casual employees, students, and others on a project-by-project basis.

- Participates in reviews of surficial geology to better understand aquifer characterization.
- Works with partners to facilitate data compilations and interpretation, including academics, grad students and researchers.
- Works with the Senior Hydrologist to finalize and publish technical reports.

3. **Reviews information provided as part of development projects (e.g. mining, hydroelectric, oil and gas, etc.) and provides expert advice concerning risks associated with proposed projects.**
   - Reviews groundwater models, technical reports, plans and data to determine feasibility of development projects from a hydrogeological perspective and whether there is adequate information to proceed.
   - Provides expert advice to enforcement personnel within GNWT respecting compliance with groundwater quality and quantity components of industry water licences.

4. **Plans and implements enhancement to the NWT's currently limited groundwater monitoring network capacity.**
   - Identifies knowledge gaps in NWT groundwater data.
   - Plans, conducts, and/or oversees contracted and in-house technical resources involved in data collection from existing monitoring stations, wells, and other sources to capture baseline data and compile information on geometrics of aquifers and their flow properties, groundwater usage, area and susceptibility to contamination.
   - Prepares Calls for Proposals (RFP) and Statements of Work, reviews submissions, establishes the rating systems and selection criteria for the evaluating processes and awards contracts and track project-related expenses.

5. **Contributes to division-level operational and strategic planning and collaborates across divisions to ensure seamless integration of hydrogeology with the other distinct scientific responsibility areas of the Department.**
   - Participates on working groups within the Department to assure groundwater programs align with the goals and objectives of the NWT Water Stewardship Strategy.
   - Prepares briefing materials, communication products and responds to media requests related to groundwater monitoring.

6. **Develops and delivers public education initiatives to foster groundwater protection and encourage the use of best management practices with respect to groundwater to protect the integrity of groundwater sources.**
   - Delivers presentations on groundwater initiatives at public meetings, session and workshop.

- Responds to information requests from boards and agencies in which are seeking technical advice to support regulatory decision making that may impact groundwater in the NWT.

7. **Documents, shares, and presents the results of scientific work (e.g., maps, peer-reviewed journal articles, State of Environment reports) for the benefit of management, professional, scientific, and lay public audiences.**
   - Travels to national meetings, develop and deliver presentations.
   - Participates on national and international tables on strategic groundwater initiatives, as required.
   - Represents NWT on national and regional committees as GNWT's hydrogeologist (e.g. standing committees responsible for delivering on Ministerial interests such as Canadian Council of Ministers of the Environment).

WORKING CONDITIONS

Physical Demands

Position works mostly in a normal office environment with intermittent field work and site investigations up to three weeks per year, one week at a time, up to eight hours per day.

During the field season, the incumbent travels over challenging steep, rugged, wet, or slippery terrain and weather via float planes, helicopters, ATVs, boat, snowmobile, or by foot. While conducting field work or a site investigation, considerable physical effort is often required when moving heavy equipment, coolers of samples, camping equipment, and survival gear, transporting, launching and operating boats, ATVs and snow machines, and unloading of planes, helicopters and other vehicles, and installing/ calibrating monitoring equipment and instruments as well as sensors and props. The incumbent drives an all-terrain vehicle or boat for extended period of time.

Environmental Conditions

Position works mostly in a normal office environment, with intermittent field work and site investigations up to four weeks per year.

Field work might involve exposure to unpredictable extreme weather conditions such as -40C cold, rain, and wind. Usually, field work occurs in the spring, summer and fall, however, it could happen in the winter and the incumbent might have to camp in a wilderness area. Use of cumbersome and heavy protective clothing may be required in the filed. The incumbent gets exposed to noise and vibrations from helicopters, airplanes, ATVs, snowmobiles, and outboard motors as well as other equipment such as drills, ice augers, chainsaws, firearms, and generators, and to dust and excessive noise when visiting industrial sites such as contaminated

sites, landfills, oil and gas plant and mines. Exposure to these unpleasant and/or hazardous conditions may occur every day up to four weeks per year.

Sensory Demands

Dexterity, strength and equilibrium and hand eye co-ordination and precision are required to install and/or calibrate equipment, or take accurate measurements in fast moving streams or river ice, as well as calibration and use of instruments while in a boat, from a float plane or helicopter. Concentrated senses are required when collecting samples, installing monitoring designs into the wells, installing sensors and props for in-situ water quality measurements, investigating geological/geomorphological site for aquifer mapping, running geophysical and remote sensing tools, checking water levels and temperatures and conducting pumping tests. Use of other equipment such as firearms, communications equipment, and cameras also requires sensory efforts.

Use or calibration of equipment and instruments occurs approximately 10 hours per year.

Mental Demands

Outcomes are frequently challenged due to conflicting stakeholder interests. Position works with deadlines set by others, and there are shifting managerial priorities. There is absence of colleagues to discuss specific technical issues, while new technologies are continuously coming available. As such, the incumbent must adjust and prioritize workload accordingly and be ready to independently make decisions that may involve substantial budget. This is particularly challenging with groundwater science where everything is an approximation based on professional judgment and estimate for the best path forward.

The position may be required to travel for meetings approximately three times per year for two to three days per trip, in addition to the requirement of intermittent field work and site investigations up to four weeks per year.

KNOWLEDGE, SKILLS AND ABILITIES

- Comprehensive knowledge of diverse elements of environmental science and the application of knowledge in a range of physical science disciplines including water chemistry, groundwater hydrology, geology, aquatic biology and ecology.
- Knowledge of federal and territorial legislation relevant to northern water management, such as the *Waters Act, Mackenzie Valley Resource Management Act, Canadian Environmental Assessment Act* and associated regulations.
- Knowledge of current NWT water initiatives and policies, such as the NWT Water Stewardship Strategy, Cumulative Impact Monitoring Program, Conservation Area Strategy and the Mackenzie Valley Land and Water Board Guidelines and Policies.
- Knowledge of Aboriginal land claim agreements in context of water management.

- Knowledge of transboundary water management agreements to contribute technical and scientific input to assist negotiators.
- Knowledge of statistical methods (including techniques and data manipulation) to review, analyze and interpret data and produce reports.
- Knowledge of technical and plain language report writing methods, practices and standards to produce detailed scientific study/survey reports in the field of groundwater science (e.g., groundwater movement, geo chemistry, hydrology).
- Knowledge of water resource management methods and practices to provide advice on approaches to resolve problems and issues pertaining to groundwater.
- Knowledge of records management procedures to secure, maintain and archive files.
- Knowledge of computer systems and various commercial software applications including specialty software such as Geographic Information Systems (GIS), statistics packages, graphics and spreadsheets and various databases and word processors to generate reports.
- Some knowledge of public administration and general management concepts, methods and techniques in the planning, financial and human resources management.
- Knowledge of arctic survival, transportation of dangerous goods, first aid, firearms, remote communications, equipment repair and navigational techniques are required to safely carry out field work programs.
- Skills are required for financial and human resources management, superior writing and verbal skills are essential to relaying scientific information to clients in a succinct yet detailed fashion. As clients range from the public to academia, the incumbent must be able to tailor the delivery of their presentations to the knowledge level and needs of the respective audience.
- Ability to establish and maintain productive working relationships. Good interpersonal communication skills are required to form these relationships with a wide range of internal and external clients.
- 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 hydrogeology, environmental or resource management and at least two (2) years relevant experience in groundwater research or monitoring, including groundwater governance matters and experience in a cross-cultural environment.

Equivalent combinations of education and experience will be considered.

Field experience conducting cold regions hydrogeology or hydrology is an asset.

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