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May 17, 2023

File: MV2018X0017

Amanda Pierce
University of Guelph – G360 Institute Groundwater Research
50 Stone Road East
Guelph ON N1G 2W1

Sent by email

Dear Amanda Pierce,

Re: University of Guelph – G360 Institute for Groundwater Research – Amendment Issuance Package – Land Use Permit MV2018X0017 – Miscellaneous – Fort Liard area, NT

The Mackenzie Valley Land and Water Board (Board) met on May 11, 2023 and considered University of Guelph – G360 Institute for Groundwater Research’s (G360 Institute’s) request to amend Land Use Permit (Permit) MV2018X0017 for the groundwater monitoring project (Project) in accordance with the *Mackenzie Valley Resource Management Act* (MVRMA).

The Board has approved the amended Permit (attached). These documents are posted on the Board’s Public Registry.¹

Submission Requirements

Management Plans – Approved

The Board has approved the following Plans:

Condition Number and Title	Title of Plan (Version)
29, WASTE MANAGEMENT PLAN	Waste Management Plan (V4) ²
48, ENGAGEMENT PLAN	Engagement Plan (V6) ³

¹ See MVLWB Online Registry www.mvlwb.com for [MV2018X0017](#).

² See MVLWB Online Registry for [University of Guelph – G360 Institute for Groundwater Research – Waste Management Plan – Version 4 – April 3 23](#).

³ See MVLWB Online Registry for [University of Guelph – G360 Institute for Groundwater Research – Engagement Plan and Log – Version 6 – April 3 23](#).

Inspectors

The Inspectors referred to in the Permit can be contacted at the regional GNWT-ECC offices.⁴

Permit Processes and Additional Information

Sections 5 and 6 of the Land and Water Board (LWB) *Guide to the Land Use Permitting Process*⁵ (Guide) contain detailed information on permit enforcement and potential post-issuance processes, such as amendments to conditions, and assignment to another company. Please be familiar with these sections of the Guide and reach out to Board staff with any questions about LWB processes related to the Permit.

Full cooperation of G360 Institute is anticipated and appreciated. Please contact Kim Murray via [email](#) or at (867) 766-7458 with any questions or concerns regarding this letter.

Yours sincerely,



Tanya MacIntosh

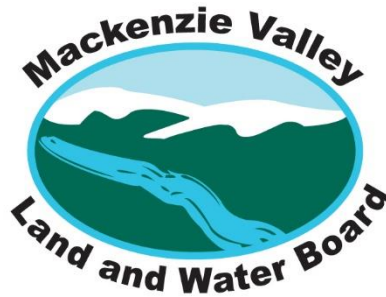
Chair, Mackenzie Valley Land and Water Board

BCC'd to: Dehcho Distribution List
 Isabelle de Grandpré, GNWT-ECC
 Danielle Rogers – Inspector, GNWT-ECC

Attached: Land Use Permit MV2018X0017

⁴ See GNWT-ECC Regional Offices webpage (<https://www.ecc.gov.nt.ca/en/regional-offices>) for regional contact information.

⁵ See MVLWB Policies and Guidelines webpage for LWB [Guide to the Land Use Permitting Process](#).



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**University of Guelph – G360 Institute for Groundwater Research
Land Use Permit MV2018X0017**

Pursuant to the *Mackenzie Valley Resource Management Act* and Mackenzie Valley Land Use Regulations, the Mackenzie Valley Land and Water Board grants this Land Use Permit to:

University of Guelph – G360 Institute for Groundwater Research

(Permittee)

of _____ 50 Stone Road East Guelph, Ontario N1G 2W1

(Mailing Address)

hereinafter called the Permittee, to proceed with the following land-use operation, subject to the annexed definitions and conditions contained therein:

Location:	Fort Liard area, NT
Purpose:	Miscellaneous
Type:	Type A
Effective Date:	December 10, 2018
Expiry Date:	December 9, 2023

Amendment:	May 17, 2023
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Handwritten signature of Tanya MacIntosh in blue ink.

**Tanya MacIntosh, Chair
Mackenzie Valley Land and Water Board**

Handwritten signature of Amanda Gauthier in blue ink.

Amanda Gauthier, Witness

Conditions Annexed to and Forming Part of Land Use Permit # MV2018X0017

Part A: Scope of Permit

1. This Permit entitles the Permittee to conduct the following land-use operation:
 - a) Drilling Boreholes for long-term groundwater monitoring;
 - b) Use of drill equipment and vehicles; and
 - c) Brush clearing and disposal.
2. This Permit is issued subject to the conditions contained herein with respect to the use of land for the activities and area identified in Part A, item 1 of this Permit.
3. Compliance with the terms and conditions of this Permit does not excuse the Permittee from its obligation to comply with the requirements of any applicable Federal, Territorial, Tłchq, or Municipal laws.

Part B: Definitions (defined terms are capitalized throughout the Permit)

Act - the *Mackenzie Valley Resource Management Act*.

Board - the Mackenzie Valley Land and Water Board established under Part 4 of the Act.

Borehole - a hole that is made in the surface of the ground by drilling or boring.

Drilling Fluids - any liquid mixture of water, sediment, drilling muds, chemical additives or other wastes that are pumped down hole while drilling and are specifically related to drilling activity.

Drilling Waste - all materials or chemicals, solid or liquid, associated with drilling, including drill cuttings and Drilling Fluids.

Engagement Plan - a document, developed in accordance with the Board's *Engagement and Consultation Policy* and the *Engagement Guidelines for Applicants and Holders of Water Licences and Land Use Permits*, that clearly describes how, when, and which engagement activities will occur with an affected party during the life of the project.

Flowing Artesian Well - a well in which water:

- a) Naturally rises above the ground surface or the top of any casing; and
- b) Flows naturally, either intermittently or continuously.

Fuel Storage Container - a container for the storage of petroleum or allied petroleum products with a capacity of less than 230 litres.

Habitat - the area or type of site where a species or an individual of a species of wildlife naturally occurs or on which it depends, directly or indirectly, to carry out its life processes.

Inspector - an Inspector designated by the Minister under the Act.

Minister - the Minister of Indian Affairs and Northern Development Canada or the Minister of the Government of the Northwest Territories – Department of Lands, as the case may be.

Ordinary High Water Mark - the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands, or marine environments, it refers to those parts of the Watercourse bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs, this refers to normal high operating levels (full supply level).

Permittee - the holder of this permit.

Secondary Containment - containment that prevents liquids that leak from Fuel Storage Tanks or containers from reaching outside the containment area and includes double-walled Tanks, piping, liners, and impermeable barriers.

Sewage - all toilet wastes and Greywater.

Spill Contingency Plan - a document, developed in accordance with Aboriginal Affairs and Northern Development Canada’s *Guidelines for Spill Contingency Planning* (April 2007, that describes the set of procedures to be implemented to minimize the effects of a spill.

Sump – a human-made pit or natural depression in the earth’s surface used for the purpose of depositing Waste that does not contain Toxic Material, such as non-toxic Drilling Waste or Sewage, therein.

Toxic Material - any substance that enters or may enter the environment in a quantity or concentration or under conditions such that it:

- a) Has or may have an immediate or long-term harmful effect on the environment or its biological diversity;
- b) Constitutes or may constitute a danger to the environment on which life depends; or
- c) Constitutes or may constitute a danger in Canada to human life or health.

Waste - any garbage, debris, chemical, or Toxic Material to be used, stored, disposed of, or handled on land, and also as defined in section 51 of the Act.

Waste Management Plan - a document, developed in accordance with the Board’s *Guidelines for Developing a Waste Management Plan*, that describes the methods of Waste management from Waste generation to final disposal.

Watercourse - a natural body of flowing or standing water or an area occupied by water during part of the year, and includes streams, springs, swamps and gulches but does not include groundwater.

Part C: Conditions Applying to All Activities (headings correspond to subsection 26(1) of the Mackenzie Valley Land Use Regulations)

	Condition	Category
	26(1)(a) Location and Area	
1.	The Permittee shall not conduct any part of the land-use operation within 300 metres of any privately owned or leased land or structure, unless otherwise authorized in writing by the Board, or at or adjacent to Reserve 095B03034.	PRIVATE PROPERTY
2.	Prior to the commencement of drilling, the Permittee shall submit the drill target locations on a 1:50,000-scale map with coordinates and map datum to the Board and an Inspector.	DRILL LOCATIONS
3.	The Permittee shall not conduct this land-use operation on any lands not designated in the complete application.	LOCATION OF ACTIVITIES
4.	The Permittee shall not conduct this land-use operation within 100 metres of a known fuel cache at Reserve 095B06006.	DRILLING NEAR A FUEL CACHE
5.	The Permittee shall not locate any Sump within 100 metres of the Ordinary High Water Mark of any Watercourse, unless otherwise authorized in writing by an Inspector.	SUMP SETBACK
6.	Prior to the commencement of the land-use operation, the Permittee shall accompany an Inspector during an inspection of the proposed land use area.	INSPECT LOCATIONS
	26(1)(b) Time	
7.	At least 48 hours prior to the commencement of the land-use operation, the Permittee's Field Supervisor shall contact an Inspector at (867) 695-2626 Ext. 205.	CONTACT INSPECTOR
8.	At least 48 hours prior to the commencement of the land-use operation at Reserve 095B06006, the Permittee's Field Supervisor shall contact the Government of the Northwest Territories -- Department of Environment and Natural Resources -- Regional Duty Officer at (867) 695-7485.	CONTACT GNWT-ENR
9.	At least 48 hours prior to the commencement of the land-use operation at Reserve 095B03017, the Permittee's Field Supervisor shall contact the Government of the Northwest Territories -- Department of Infrastructure -- Regional Superintendent at (867) 695-7651.	CONTACT GNWT-INF
10.	At least 48 hours prior to the commencement of the land-use operation adjacent to Reserve 095B03034, the Permittee's Field Supervisor shall contact the Government of the Northwest Territories -- Department of Infrastructure-- Highway Operations Manager at (867) 695-7660.	CONTACT GNWT-INF

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| 11. | At least 48 hours prior to the commencement of the land-use operation at Reserve 095B03034, the Permittee’s Field Supervisor shall contact NorthwesTel, at (867) 874-2360, (867) 393-7712, or (867) 668-5351. | CONTACT NORTHWESTEL |
| 12. | At least 48 hours prior to commencement of the land-use operation, the Permittee shall provide the following information, in writing, to the Board and an Inspector:
a) the name(s) of the person(s) in charge of the field operation;
b) alternates; and
c) all methods for contacting the above person(s). | IDENTIFY AGENT |
| 13. | At least ten days prior to the completion of the land-use operation, the Permittee shall advise an Inspector of:
a) the plan for removal or storage of equipment and materials; and
b) when final cleanup and reclamation of the land used will be completed. | REPORTS BEFORE REMOVAL |
| 26(1)(c) Type and Size of Equipment | | |
| 14. | The Permittee shall not use any equipment except of a similar type, size, and number to that listed in the complete application. | ONLY APPROVED EQUIPMENT |
| 26(1)(d) Methods and Techniques | | |
| 15. | Prior to the expiry date of this Permit, the Permittee shall replace all excavated material, unless otherwise authorized in writing by an Inspector. | EXCAVATED MATERIAL |
| 26(1)(e) Type, Location, Capacity, and Operation of All Facilities | | |
| 16. | The Permittee shall ensure that the land use area is kept clean at all times. | CLEAN WORK AREA |
| 26(1)(f) Control or Prevention of Ponding of Water, Flooding, Erosion, Slides, and Subsidence of Land | | |
| 17. | The Permittee shall minimize erosion by installing erosion control structures as the land-use operation progresses. | PROGRESSIVE EROSION CONTROL |
| 18. | The Permittee shall, where flowing water from a Borehole is encountered:
a) plug the Borehole in such a manner as to permanently prevent any further outflow of water; and
b) immediately report the occurrence to the Board and an Inspector. | FLOWING ARTESIAN WELL |
| 19. | The Permittee shall suspend overland travel of equipment or vehicles at the first sign of rutting. | SUSPEND OVERLAND TRAVEL |

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| 20. | The Permittee shall not move any equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging. | VEHICLE MOVEMENT FREEZE-UP |
| 26(1)(g) Use, Storage, Handling, and Ultimate Disposal of Any Chemical or Toxic Material | | |
| 21. | At least seven days prior to the use of any chemicals that were not identified in the complete application, the MSDS sheets must be provided to the Board and an Inspector. | CHEMICALS |
| 22. | When drilling within 100 meters of the Ordinary High Water Mark of any Watercourse, and when drilling on ice, the Permittee shall contain all drill water and Drilling Waste in a closed circuit system for reuse, off-site disposal, or deposit into a land-based Sump. | DRILLING NEAR WATER OR ON ICE |
| 23. | The Permittee may deposit Drilling Waste that does not contain Toxic Material in a Sump. Any Sumps used to deposit Drilling Waste must be located at least 100 metres from the Ordinary High Water Mark of any Watercourse, unless otherwise authorized in writing by an Inspector. | DRILLING WASTE |
| 24. | The Permittee shall remove all Drilling Waste containing Toxic Material to an approved disposal facility. | DRILLING WASTE DISPOSAL |
| 25. | The Permittee shall not allow any Drilling Waste to spread to the surrounding lands or Watercourses. | DRILLING WASTE CONTAINMENT |
| 26. | The Permittee shall maintain a record of all spills. For all reportable spills, in accordance with the GNWT <i>Spill Contingency Planning and Reporting Regulations</i> , the Permittee shall: <ul style="list-style-type: none"> a) immediately report each spill to the 24-hour Spill Report Line (867) 920-8130; b) report each spill to an Inspector within 24 hours; and c) submit, to the Board and an Inspector, a detailed report on each spill within 30 days. | REPORT SPILLS |
| 27. | The Permittee shall dispose of all combustible Waste petroleum products by removal to an approved disposal facility. | WASTE PETROLEUM DISPOSAL |
| 26(1)(h) Wildlife and Fish Habitat | | |
| 28. | The Permittee shall take all reasonable measures to prevent damage to wildlife and fish Habitat during this land-use operation. | HABITAT DAMAGE |

26(1)(i) Storage, Handling, and Disposal of Refuse or Sewage

29. The Permittee shall adhere to the **Waste Management Plan**, once approved, and shall annually review the plan and make any necessary revisions to reflect changes in operations, technology, chemicals, or fuels, or as directed by the Board. Revisions to the plan shall be submitted to the Board for approval. **WASTE MANAGEMENT**

30. The Permittee shall dispose of all garbage, Waste, and debris as described in the approved Waste Management Plan, unless otherwise authorized in writing by an Inspector. **REMOVE GARBAGE**

26(1)(j) Protection of Historical, Archaeological, and Burial Sites

31. The Permittee shall not operate any vehicle or equipment within 150 metres of a known or suspected historical or archaeological site or burial ground. **ARCHAEOLOGICAL BUFFER**

32. The Permittee shall not knowingly remove, disturb, or displace any archaeological specimen or site. **SITE DISTURBANCE**

33. The Permittee shall, where a suspected archaeological or historical site, or burial ground is discovered: **SITE DISCOVERY AND NOTIFICATION**

- a) Immediately suspend operations on the site; and
- b) notify the Board at (867) 699-0506 or an Inspector at (867) 695-2626 Ext. 205, and the Prince of Wales Northern Heritage Centre at (867) 767-9347 ext. 71250 or ext. 71251.

26(1)(k) Objects and Places of Recreational, Scenic, and Ecological Value

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26(1)(l) Security Deposit

34. All costs to remediate the area under this Permit are the responsibility of the Permittee. **RESPONSIBILITY FOR REMEDIATION COSTS**

26(1)(m) Fuel Storage

35. The Permittee shall not place any Fuel Storage Containers or Tanks within 100 metres of the Ordinary High Water Mark of any Watercourse, unless otherwise authorized in writing by an Inspector. **FUEL NEAR WATER**

36. The Permittee shall set up all refueling points with Secondary Containment. **SECONDARY CONTAINMENT – REFUELING**

37. The Permittee shall not allow petroleum products to spread to surrounding lands or Watercourses. **FUEL CONTAINMENT**

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| 38. | The Permittee shall adhere to the Spill Contingency Plan , once approved, and shall annually review the plan and make any necessary revisions to reflect changes in operations, technology, chemicals, or fuels, or as directed by the Board. Revisions to the plan shall be submitted to the Board for approval. | SPILL CONTINGENCY PLAN |
| 39. | Prior to commencement of the land-use operation the Permittee shall ensure that spill-response equipment is in place to respond to any potential spills. | SPILL RESPONSE |
| 40. | All equipment that may be parked for two hours or more, shall have a haz-mat/drip tray under it or be sufficiently diapered. Leaky equipment shall be repaired immediately. | DRIP TRAYS |
| 41. | The Permittee shall clean up all leaks, spills, and contaminated material. | CLEAN UP SPILLS |
| 26(1)(n) Methods and Techniques for Debris and Brush Disposal | | |
| 42. | Prior to the expiry date of this Permit, the Permittee shall progressively dispose of all brush and trees and shall complete all brush disposal; all disposal shall be completed. | BRUSH DISPOSAL/ TIME |
| 43. | The Permittee shall not clear areas larger than identified in the complete application. | MINIMIZE AREA CLEARED |
| 26(1)(o) Restoration of the Lands | | |
| 44. | Prior to the expiry date of this Permit, the Permittee shall complete all cleanup and restoration of the lands used. | FINAL CLEANUP AND RESTORATION |
| 45. | The Permittee shall carry out progressive reclamation of disturbed areas as soon as it is practical to do so. | PROGRESSIVE RECLAMATION |
| 26(1)(p) Display of Permits and Permit Numbers | | |
| 46. | The Permittee shall keep a copy of this Permit on hand at all times during this land-use operation. | COPY OF PERMIT |
| 26(1)(q) Biological and Physical Protection of the Land | | |
| 47. | If any plan is not approved by the Board, the Permittee shall revise the plan according to the Board's direction and re-submit it to the Board for approval. | RESUBMIT PLAN |
| 48. | The Permittee shall adhere to the Engagement Plan , once approved, and shall annually review the plan and make any necessary revisions to reflect changes in operations or as directed by the Board. Revisions to the plan shall be submitted to the Board for approval. | ENGAGEMENT PLAN |
| 49. | All revised plans submitted to the Board shall include a brief summary of the changes made to the plan. | SUMMARY OF CHANGES |

Annex A: MV2018X0017 - Table of Revision History

Date	Location of Change	Change
May 17, 2023	Part B: Definitions	Definition of Sump added
May 17, 2023	Condition 5	Condition SUMP SETBACK added
May 17, 2023	Condition 22	Condition DRILLING NEAR WATER OR ON ICE updated
May 17, 2023	Condition 23	Condition DRILLING WASTE updated
March 13, 2020	Condition 1	Condition PRIVATE PROPERTY revised
March 13, 2020	Condition 9	Condition CONTACT GNWT-INF added
March 13, 2020	Condition 10	Condition CONTACT NORTHWESTEL added