

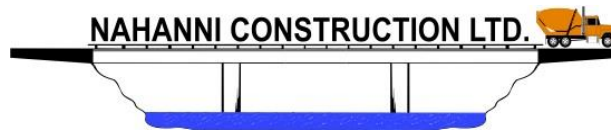
ENVIRONMENT & HERITAGE RESOURCES PROTECTION PLAN

LUPIN WINTER ACCESS

Lac de Gras, NWT to Lupin Mine, NU

December 2018





PLAIN LANGUAGE SUMMARY

This Plan describes what will be done to avoid damaging the land, air, water, wildlife and archaeological sites along the winter road route from Lac de Gras, Northwest Territories, to the Lupin Mine, Nunavut.

REVISION HISTORY

| Revision # | Date | Section | Summary of Changes | Author | Approver |
|------------|----------|---------|--------------------|---------|------------|
| 1 | Dec 2018 | All | New document | S. Hamm | K. Ruptash |

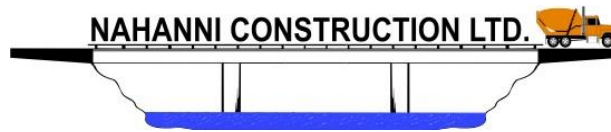


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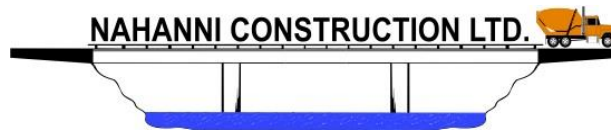
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1.0 INTRODUCTION

This *Environment and Heritage Resources Protection Plan* (the Plan) describes methods for protecting environmental and heritage resources that occur within the Lupin Winter Access project area, and should be read in conjunction with the documents listed in Table 1.

1.1 SCOPE

The purpose of the Program is to construct and operate a portion of the Tibbitt to Contwoyto Winter Road (TCWR) route from the Ekati Mine turnoff on Lac de Gras in the Northwest Territories (NT; Lac de Gras) to the Lupin Mine in Nunavut (NU; Lupin) to mobilize and demobilize equipment and supplies that may be used for ongoing reclamation of Lupin in the Kitikmeot Region of Nunavut (the Program).

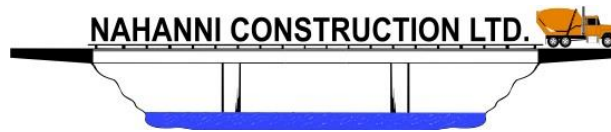
This Plan applies to consideration of and interaction with environmental and heritage resources during all activities occurring in relation to the Program.

This Plan is effective for the duration of the land use operations, commencing upon approval of this Plan and effective through winter road construction, operations and closure activities for a period of up to five (years) or as otherwise permitted.

The Plan considers all phases of the Program, including construction, operation, maintenance and seasonal closure.

Table 1 Relevant guidance documents including legislation, permits and licences.

| Document | Authority |
|--|---|
| Environmental Guidelines for the Construction, Maintenance and Closure of Winter Roads in the Northwest Territories (1993) | Government of Northwest Territories |
| <i>Archaeological Sites Act</i> | Government of Northwest Territories |
| <i>Archaeological Sites Regulations</i> | Government of Northwest Territories |
| <i>Nunavut Act</i> | Government of Nunavut |
| <i>Nunavut Archaeological and Palaeontological Sites Regulations</i> | Government of Nunavut |
| Screening Decision Report | Nunavut Impact Review Board |
| Approval Without a Licence | Nunavut Water Board |
| Land Use Permits | Crown-Indigenous Relations and Northern Affairs Canada Government of Northwest Territories |
| Abandonment and Restoration Plan, Lupin Winter Access, Lac de Gras NWT to Lupin, NU (2018a) | Nahanni Construction Ltd. |
| Spill Contingency Plan, Lupin Winter Access, Lac de Gras to Lupin, NU (2018b) | Nahanni Construction Ltd. |
| Wildlife Protection Plan, Lupin Winter Access, Lac de Gras NWT to Lupin, NU (2018) | EDI Environmental Dynamics Inc. |
| Community Engagement Plan, Lupin Winter Access, Lac de Gras to Lupin, NU (2018c) | Nahanni Construction Ltd. |



1.2 OBJECTIVES

The objectives of this Plan are to:

- Ensure employees and contractors are aware of their responsibilities regarding protection of environmental and heritage resources;
- Outline appropriate mitigation measures for resource protection.

1.3 SITE DESCRIPTION

The Program occurs along an existing winter road route established in the 1970's and since used intermittently to service the Lupin Mine and the Jericho Mine (the Winter Road). The Winter Road route predominantly traverses lakes, with few portages where the road occurs overland. Of the 213 km, 95 km occur in Northwest Territories and 118 occur in Nunavut. Seven (7) portages occur in Northwest Territories and there is one (1) portage in Nunavut.

The Program occurs within the Southern Arctic Ecozone and the Takijuk Lake Upland Ecoregion. Much of this region is composed of unvegetated rock outcrops and vegetative cover is characterized by shrub tundra, consisting of dwarf birch, willow, northern Labrador tea, *Dryas* spp. and *Vaccinium* spp. Organic Cryosols are the dominant soils in the lowlands and permafrost is deep and continuous. The proposed winter road is located north of the treeline.

Characteristic wildlife includes caribou, muskoxen, grizzly bear, wolverine, hare, arctic fox, and wolf. Small mammals (e.g., Arctic ground squirrel, voles, and lemmings) are distributed throughout the region and provide an important food source for predators. Many species of migratory birds are present in the area during the summer season, including waterfowl, upland birds, and shorebirds, while some bird species are present year round (e.g., ptarmigan, gyrfalcon, and common raven).

The Winter Road is accessed in mid- to late-winter only. At this time, ground is frozen and snow-covered, and ice thickness on lakes is up to 2 m thick.

1.4 PLAN MANAGEMENT

The Plan is reviewed annually by the Project Manager and updated as needed following receipt of or amendments to licences and permits, to ensure alignment with relevant terms and conditions. When material changes occur, the updated document will be provided to parties in accordance with the *Community Engagement Plan* (NCL 2018c).

1.5 PLAN IMPLEMENTATION

This Plan is effective upon approval and is valid throughout all phases of the Program.

The Project Manager or designate is responsible for Plan implementation.

A copy of this Plan is maintained in NCL's office in both Yellowknife and on site at Lupin.

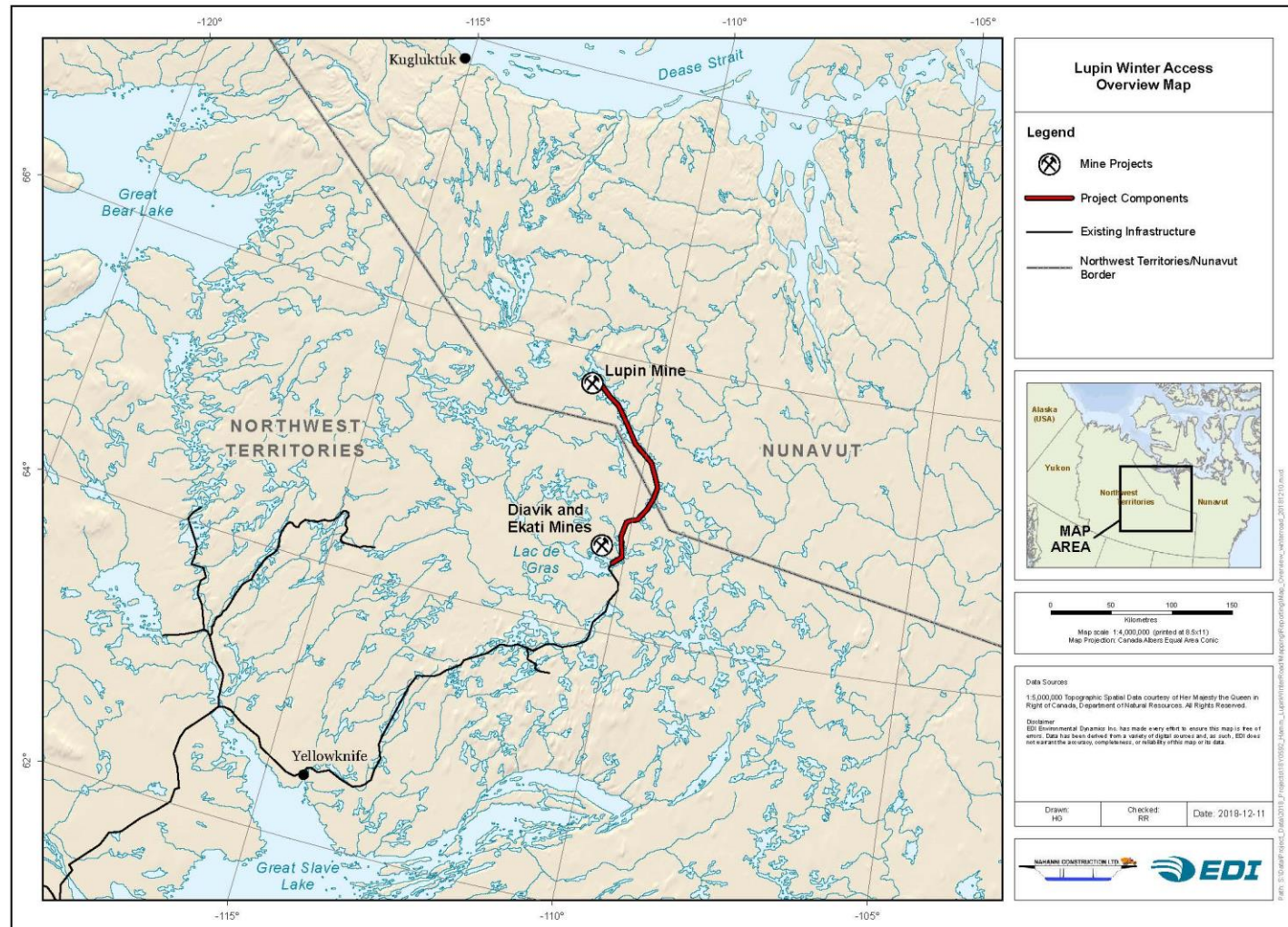
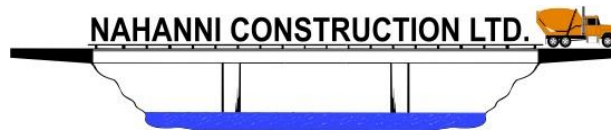


Figure 1 Lupin Mine Winter Access Program location.



2.0 ROLES AND RESPONSIBILITIES

NCL is responsible for activities associated with Lupin winter access, including implementation and management of this Plan. NCL's contact information is provided below.

Nahanni Construction Ltd.

P.O. Box 2076
100 Nahanni Drive
Yellowknife, NT
X1A 2P6
Phone: 867-873-2975
Fax: 867-873-9620

2.1 STAFF, CONTRACTORS, SUPPLIERS AND VISITORS

All personnel conducting activities on site, including staff, contractors, suppliers and visitors, are required to implement this Plan as it pertains to their activities on site. Specifically, these responsibilities include:

- Taking all necessary steps to minimize negative effects to water, land and air;
- Cooperating fully with your supervisor and/or NCL management to implement an environmental protection program;
- Carrying out only those duties and tasks that you are experienced at and trained to perform;
- Where there is uncertainty, asking questions and bring concerns to the attention of your supervisor when working with products or conducting tasks that may pose potential environmental risks;
- Maintaining confidential the location of found archaeological sites;
- Ensuring found archaeological sites remain undisturbed;
- Reporting wildlife observations, archaeological finds, spills and emergency situations in accordance with relevant management plans.

2.2 MANAGERS AND SUPERVISORS

Managers and supervisors have a responsibility to ensure that staff, contractors, consultants and visitors have been trained in NCL environmental and heritage resource protection expectations and procedures. Additional supervisor and manager responsibilities include:

- Maintaining a no blame work environment in implementing mitigation measures and follow-up actions;
- Ensuring site-, task- and material-specific training is provided to all departments and staff;
- Ensuring there are appropriate and sufficient supplies on site to support implementing mitigation measures and follow-up actions;
- Providing assistance in responding to environmental hazards;
- Maintaining confidential the location of known and found archaeological sites;
- Engaging the project archaeologist in accordance with this Plan;
- Maintaining records regarding inspections, personnel training, equipment testing and maintenance; and
- Engaging with relevant parties in a timely and transparent manner, where appropriate.

3.0 PHYSICAL RESOURCES

Protection measures pertaining to the physical environment are outlined below.

3.1 AIR QUALITY

Air quality can be affected through emissions from equipment operation. Negative effects to air quality arising from project activities can be mitigated by conducting routine preventative maintenance on generators and engines.

3.2 GROUND STABILITY

Ground stability can be affected through excavating, rutting or otherwise disrupting the tundra and permafrost. Negative effects to ground stability arising from project activities can be mitigated by moving equipment overland only when conditions are such that rutting or gouging will not occur and snow cover is sufficient to prevent interaction with surface materials.

3.3 HYDROLOGY

Hydrology can be affected through unapproved water use that may occur in relation to camp operation, or winter trail construction, or flow disruption during freshet due to snow fill and ice bridge remnants. Hydrologic effects are mitigated through compliant water use, in accordance with Nunavut Water Board approvals and licences, and abandoning portages in accordance with the *Abandonment and Restoration Plan* (NCL 2018a).

3.4 NOISE

Ambient noise levels can be affected by operation of Project equipment. Negative effects to noise levels can be mitigated by:

- Conducting routine preventative maintenance on generators and engines;
- Ensuring mufflers are in use, as required by manufacturers; and
- Adhering to the *Wildlife Protection Plan* (EDI 2018).

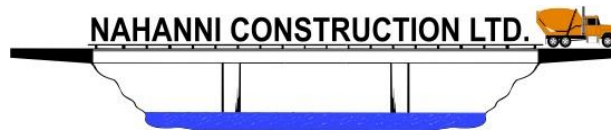
3.5 WATER QUALITY

Water quality can be affected by unplanned or non-compliant discharges to the aquatic environment. Negative effects to water quality can be mitigated by adhering to the *Spill Contingency Plan* (NCL 2018b) where required.

4.0 BIOLOGICAL RESOURCES

Protection measures pertaining to vegetation are outlined below.

Refer the *Wildlife Protection Plan* (EDI 2018) for general and species-specific wildlife protection measures.



4.1 VEGETATION

Vegetation can be affected by on land activities such as portage use. Negative effects to vegetation can be mitigated by:

- Moving equipment overland only when conditions are such that rutting or gouging will not occur;
- Utilizing existing trails where possible; and
- Adhering to the *Spill Contingency Plan* (NCL 2018b) where required.

5.0 HERITAGE RESOURCES

Heritage resources, such as archeological sites, can be affected by on land activities such as site access. Heritage resources such as archaeological sites, have previously been characterized along the entire TCWR route. Potential negative effects to heritage resources arising from Program activities can be mitigated by:

- Minimizing land disturbance outside of existing winter road corridor;
- Avoiding construction of new inukshuks or rock piles unless otherwise approved;
- Where possible, avoiding interaction with and disturbance of known or suspected archaeological sites, including rocks that may appear to be in some formation;
- Where not possible to avoid interaction with known archaeological sites, proceeding with direction from the project archaeologist and Territorial Archaeologist;
- If a suspected archaeological site or human remains (structures, artifacts or bones) are encountered during the Program, immediately stopping work in the vicinity and notifying the Project Manager who will notify the Territorial Archaeologist and project archaeologist; and
- Keeping confidential the location of known and found archaeological sites.

6.0 WASTE MANAGEMENT

Managing waste in an effective and compliant manner is a key part of protecting environmental resources in the Program area.

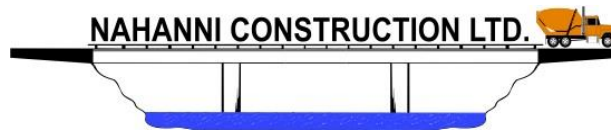
There are three possible waste streams that may be created during the life of the Program:

- Food waste from workers and drivers constructing, maintaining and transiting the road;
- Spent spill response materials generated through the course of a spill response;
- Domestic waste generated during use of the emergency shelter.

Waste, if generated, will be managed as follows:

- Domestic and food waste will be contained indoors or inside the vehicle until the arrival the mine, where proper disposal may occur.
- Spent spill response materials will be placed in suitable container and backhauled off site for disposal at a suitable facility.

There are no waste management facilities associated with the Program.



7.0 TRAINING

All attendees to site participate in a site orientation which outlines environmental and heritage resources that may be encountered over the course of the Program, and identifies personnel roles and responsibilities regarding protection of these resources.

Wildlife-specific roles and responsibilities are outlined in the *Wildlife Protection Plan* (EDI 2018).

Any activities undertaken on site in relation to archaeological surveys, finds or mitigations are done so by or under the direction of the project archaeologist.

8.0 REPORTING AND DOCUMENTATION

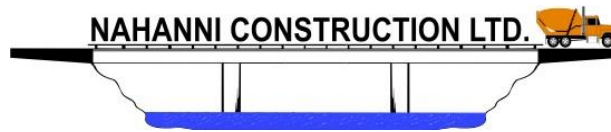
8.1 REPORTING

Reporting will occur in accordance with regulatory requirements and the *Community Engagement Plan* (NCL 2018c).

8.2 DOCUMENTATION

Documentation supporting protection of environmental and heritage resources includes:

- Maintaining equipment preventative maintenance logs and required follow-up actions;
- Documenting water use in accordance with the water use authorizations;
- Logging wildlife observations;



9.0 REFERENCES

Archaeological Sites Act, S.N.W.T. 2014,c.9

Archaeological Sites Regulations, R-024-2014

Nunavut Act S.C. 1993, c.28

Nunavut Archaeological and Palaeontological Sites Regulations SOR/2001-220

Government of Northwest Territories. 1993. Environmental Guidelines for the Construction, Maintenance and Closure of Winter Roads in the Northwest Territories.

Environmental Dynamics Inc. (EDI). 2018. Wildlife Protection Plan, Lupin Winter Access, Lac de Gras, NWT to Lupin Mine, Nunavut.

Nahanni Construction Ltd. (NCL). 2018a. Abandonment and Restoration Plan, Lupin Winter Access, Lac de Gras, NWT to Lupin Mine, Nunavut.

NCL. 2018b. Spill Contingency Plan Response Plan, Lupin Winter Access, Lac de Gras, NWT to Lupin Mine, Nunavut.

NCL. 2018c. Community Engagement Plan, Lupin Winter Access, Lac de Gras, NWT to Lupin Mine, Nunavut.