WEST KITIKMEOT RESOURCES CORP

GRAYS BAY ROAD AND PORT PROJECT

ENVIRONMENTAL MANAGEMENT PLAN

EARLY PERMITTING/IMPACT ASSESSMENT PHASE

WKR MP 02

Version 1

Summary

This *Environmental Management Plan* describes what West Kitikmeot Resources Corp. will do to protect the environment and heritage resources in its work areas. Specific measures to protect caribou are included.

Revision Table

Version	Author/Reviewer	Notes	Date	Sent To
1.0	SHC	Internal. First draft sent to WKR	October 11, 2024	WKR

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Abbreviations

DFO ..... Department of Fisheries and Oceans Canada
ECCC ..... Environment and Climate Change Canada
GIS ..... Geographic Information System
GN ..... Government of Nunavut
GNWT ..... Government of Northwest Territories
KIA ..... Kitikmeot Inuit Association
km ..... kilometer
m ..... meter
NT ..... Northwest Territories
NU ..... Nunavut
QP ..... Qualified Professional
The Company ..... West Kitikmeot Resources Corp
The Plan ..... Environmental Management Plan
The Project ..... Grays Bay Road and Port Project
WKR ..... West Kitikmeot Resources Corp

Glossary

Environment Manager	Designated WRK staff responsible for the Implementation of this Plan.
Environmental Monitor	Designated and trained field personnel carrying out monitoring-related aspects of impact mitigation, including acoustic monitoring, water quality sampling and fish observations.
Kitikmeot Inuit Association	A not-for-profit designated Inuit organization with community-elected leadership representing the Inuit of the Kitikmeot Region of Nunavut. Their goal is to support Kitikmeot Inuit, providing them with more educational, employment, and business opportunities (KIA 2024).
Kitikmeot Region	The most western region of the Nunavut territory. It consists of the southern and eastern parts of Victoria Island with the adjacent part of the mainland and includes five permanent communities of: Cambridge Bay, Gjoa Haven, Kugaaruk, Kugluktuk and Taloyoak.
Orange Zone	Caribou mobile protection threshold 20 km from the Work Site.
Professional Engineer	Engineer registered with Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists.
Qualified Professional	Designated and qualified professionals such as Registered Professional Biologists, Professional Engineers or other environmental professionals, and the Project Archaeologist, responsible for developing adequate procedures for impact mitigation measure implementation, evaluating data collected or results arising from monitoring and mitigation measure implementation, and recommending adaptive management if indications are that existing mitigations are not effective.
Red Zone	Caribou mobile protection threshold 3 km from Work Site
Registered Professional Biologist	Registrant of the College of Applied Biology
Restricted Access Site	The delineated area surrounding an important environmental or heritage resources feature where Project worker access is restricted

Territorial Archaeologist	Designated archaeologist for the Government of Nunavut
Wildlife Monitor	A designated and qualified worker responsible for carrying, keeping safe, and documenting and reporting the use of wildlife deterrents; confirming wildlife-sensitive areas (dens, nests, lairs etc.) and establishing appropriate Restricted Access Sites; responding to wildlife sightings and implementing recommended mitigation measures; responding to wildlife interactions and conducting related internal and external wildlife reporting; managing wildlife-related documentation; and carrying out site surveillance monitoring and confirming presence/absence of caribou, marine mammals and other wildlife of special concern within the vicinity of Project activities, and documenting accordingly.
Work Site	Project activity or work area
Yellow Zone	Caribou mobile protection threshold 50 km from Work Site

1 Introduction

West Kitikmeot Resources Corp. (WKR; the Company) is an Inuit-owned, Inuit-led company, based in Cambridge Bay, Nunavut. WKR is primarily focused on the advancement of the Grays Bay Road and Port Project (the Project). The Company's largest shareholder is a wholly-owned subsidiary of the Kitikmeot Inuit Association (KIA).

The Project is proposed as multi-user, multi-use transportation infrastructure to be located on a combination of Inuit Owned Land and Crown land in the Kitikmeot Region of western Nunavut. Subject to approval, the Project would result in the establishment of the first deep-water port in the Canadian Central Arctic at Grays Bay, as well as a 230 kilometre (km) all-season access road between Grays Bay and Jericho station near Contwoyto Lake. The Project will connect to the already approved Tibbitt to Contwoyto Winter Road (TCWR). The multi-user, multi-use Project would allow for the establishment of shared infrastructure with many potential users including the federal and territorial governments, communities, community members, resource companies, and defence agencies.

In support of advancing the design of the Project and assessing the impacts of the Project on the biophysical and socio-economic environment, WKR commenced field studies in July of 2024. These studies are a continuation of, or are supplemental to, baseline studies screened and undertaken historically. This includes collecting biophysical environmental data, maintaining existing and installing new scientific instrumentation required to support environmental data collection, and undertaking design-related studies. These studies occur concurrently with Project impact assessment and early permitting.

1.1 Purpose

The purpose of this *Environmental Management Plan* (the Plan) is to support environmental and heritage resource protection during field studies associated with Project impact assessment and early permitting.

Plan objectives include:

- Identifying sensitive and/or important areas and ecosystem components that may be encountered during field studies;
- Identifying impacts on environment and heritage resources that may occur during field studies;
- Outlining mitigation measures that may be applied;
- Identifying applicable reference materials, including legislation and guidance documents.

This Plan considers the guidance and requirements provided in the documents listed in Table 1.1, which may be updated from time to time.

1.2 Scope

This Plan applies to activities occurring in the field during the early permitting/impact assessment phase of the Project, including baseline field studies on land, in freshwater and in the marine environment, and geotechnical drilling, predominantly in the port area.

1.3 Plan Management

This Plan is reviewed annually at minimum by the Environment Manager or designate and revised as needed to reflect the terms and conditions of Project authorizations, outcomes of ongoing engagement, acquisition of Inuit Knowledge, and needs of both community members and WKR.

This Plan is effective upon approval, is valid throughout the early permitting/impact assessment phase of the Project, and may be updated from time to time.

A copy of this Plan is maintained on the corporate server in a manner such that it is accessible to workers. A copy is also maintained in any field office locations.

Table 1.1 Related Project documents and authorizations

Document	Authority
Bathurst Caribou Range Plan (2019)	Government of Northwest Territories
Guidelines to Reduce Risk to Migratory Birds (ECCC 2018a, 2021)	Government of Canada
Northern Land Use Guidelines, Northwest Territories Seismic Operations	Government of Northwest Territories
Mobile Caribou Conservation Measures – Operational Guidance (Preliminary Draft Report; 2022)	Government of Northwest Territories
Nunavut Archaeological and Palaeontological Sites Regulations (2001)	Government of Nunavut
Nunavut Wildlife Act (2003)	Government of Nunavut
Fisheries Act (1985)	Government of Canada
Species at Risk Act (2002)	Government of Canada
Migratory Birds Convention Act (1994)	Government of Canada
Canada Wildlife Act (1985)	Government of Canada
Screening Decision	Nunavut Impact Review Board
Water Licence	Nunavut Water Board
Land Use Licence	Kitikmeot Inuit Association
Land Use Permit	Government of Canada
Archaeology Permit	Government of Nunavut
Fish Collection Permit	Government of Canada
Wildlife Research Permit	Government of Nunavut
Scientific Research Licence	Nunavut Research Institute
Mobile Caribou Conservation Measures for the Kivalliq Region, Nunavut (2015)	Poole & Gunn

1.4 Roles and Responsibilities

WKR is responsible for the implementation of this Plan. Table 1.2 outlines how to connect with the WKR team.

All workers, including staff, contractors, suppliers and visitors, are required to implement this Plan as it pertains to their field activities, including:

- Completing site orientation, including wildlife awareness training;
- Taking all necessary steps to minimize negative impacts to water, land and air;
- Maintaining confidential the location of found archaeological sites;
- Ensuring found archaeological sites remain undisturbed;
- Reporting wildlife observations and interactions, archaeological finds, spills and emergency situations to the Environment Manager or designate;
- To the extent possible, try to stay out of sight of wildlife or redirect travel away from wildlife;
- If caribou cows and calves, muskoxen groups, or other wildlife aggregations are observed foraging or migrating within a work area as crews approach, avoid the work area until the animals have moved on;
- Avoid deliberate destruction or disruption of bird nests, eggs, wildlife dens, burrows, seal lairs and other sensitive habitat features;
- Record and report all wildlife sightings in the Wildlife Incidental Observation Log (Appendix A);
- Remove any wildlife attractants such as garbage;
- Notify the crew leads/managers/supervisors immediately upon observation of any mitigation measures are not working effectively.

Additional responsibilities may be assigned to designated persons including the Environmental Manager, qualified professionals (QP), crew leads/managers/supervisors (including drill foreman), pilots, wildlife monitors and environmental monitors. Workers may occupy various roles, depending on the activity and program scope.

The **Environmental Manager** is responsible for overall implementation of this Plan. Specific duties include verifying that adequate communication and training occur, that adequate procedures are developed for environmental and archaeological protection, and that monitoring activities are adequately recorded, reported and adaptively managed; allocating adequate resources and retaining competent personnel to carry out the work; directing and reviewing incident investigations and related corrective action planning; implementing an assurance program to verify contractor compliance to this Plan.

Qualified Professionals (QP) include environmental professionals such as a Registered Professional Biologists, Professional Engineers or other, and the Project Archaeologist. QPs are responsible for developing adequate procedures for impact mitigation measure implementation, evaluating data collected or results arising from monitoring and mitigation measure

implementation, and recommending adaptive management if indications are that existing mitigations are not effective.

Crew leads, managers and/or supervisors have a responsibility to ensure that workers on their team have been trained in WKR environmental and archaeology protection expectations and procedures, and to adhere to mitigation measures. In addition, crew leads, managers and/or supervisors provide assistance and leadership in response to incidents and hazards, carry out relevant reporting, notifications and investigations, and maintain relevant records, including inspections, personnel training, equipment testing and maintenance.

Except in emergency situations, **pilots** (helicopter and fixed-wing) are responsible for avoiding touching down in areas where wildlife are present, avoiding raptor nests, and enforcing flying height limits (except during take-off and landing).

Workers designated, trained and qualified as **Wildlife Monitors** are responsible for: carrying, keeping safe, and documenting and reporting use of wildlife deterrents; confirming wildlife sensitive areas (dens, nests, lairs etc.) and establishing appropriate Restricted Access Sites; responding to wildlife sightings and implementing recommended mitigation measures; responding to wildlife interactions and conducting related internal and external wildlife reporting; managing wildlife-related documentation; and carrying out site surveillance monitoring and confirming presence/absence of caribou, marine mammals and other wildlife of special concern within the vicinity of Project activities, and documenting accordingly.

Environmental Monitors are field personnel carrying out monitoring-related aspects of impact mitigation including acoustic monitoring, water quality sampling and fish observations. The Environmental Monitor works closely with the Wildlife Monitor, QP and Environment Manager to evaluate data collected during monitoring, recommend adaptive management, and record and report non-conformances and incidents.

Table 1.2 Proponent Contacts and Information

Item	Detail
Project Name	Grays Bay Road and Port Project
Proponent	West Kitikmeot Resources Corp.
Address	Head office: P.O. Box 6, 30B Mitik Street, Cambridge Bay, NU X0B 0C0 Project office: Suite 2110, 500 4 Ave SW, Calgary, AB T2P 2V6
Responsible Executive	Elliot Holland, Chief Operating Officer eholland@westkit.ca 867.446.0309
Principal Contact	Gavin Law, Environment Manager & Engagement Lead glaw@westkit.ca 403.837.5677
Website	www.westkit.ca

2 Site Description

As shown in Figure 2.1, the Project is entirely located within the Kitikmeot Region of Nunavut. Project. The northern extent of the Project area at the proposed port site and road terminus is located approximately 180 km east of Kugluktuk, NU at 505441.56 E / 7521154.57 N, while the southern extent of the Project area and proposed road terminus is located at the Jericho Mine site, approximately 400 km northeast of Yellowknife, Northwest Territories (NT) at 479617.47 E/ 7319795.35 N. Main points of access include Kugluktuk, NU, Cambridge Bay, NU and Yellowknife, NT, as well as existing regional mineral project camps site, when operational. The Project Area is primarily accessed by helicopter, while areas can be reached by fixed wing aircraft, boat or snowmobile.

The Project occurs above the tree line in the low arctic tundra, in an area of continuous permafrost extending to depths of 400-500 meter (m), with talik zones occurring beneath large watercourses (GBEEC 2017). The terrestrial portion of the Project area along the entire extent of the proposed road is located within the Southern Arctic Ecozone; the majority of the proposed road is within the Takijuq Lake Upland Ecoregion, while the terminus of the proposed road and the port site occur in the Bathurst Hills Ecoregion (ESWG 1995a).

The upland Project area is incised by three major river valleys: Kennarctic River/*Qurluqtuaryuk*, James River, and Hood River/*Hivuraqhit* valleys. Undulating bedrock is overlain by thin layers of till, felsenmeer and colluvium; small eskers and esker complexes occur (GBEEC 2017). Lakes fill ecoregion lowlands while massive Archean rocks form broad, sloping uplands and plateaus. Soils are permafrost-affected; turbic and static cryosols can be found in the uplands, while organic cryosols are predominantly found in the lowlands (ESWG 1995a); marine sediments occur on lower slopes and valley bottoms near the coast (GBEEC 2017).

Mean monthly temperature reaches a maximum in July (17°C) and minimum in January (-33°C). August sees the greatest amount of precipitation as rain, while the greatest amount of snow falls in October; precipitation decreases northward, towards the Coronation Gulf/ *Qalgiuyap Taryunga*. Freshet flows typically occur in June, with flows decreasing to minimums in August, with a secondary peak sometimes observed in late August or September due to fall rains. Maximum ice thickness on lakes ranges from 1.8 to 2 m (GBEEC 2017).

Vegetation is strongly influenced by underlying bedrock systems; to date, 84 species of plants have been documented in the Project Area. Characteristic shrub tundra vegetation found inland is comprised of dwarf birch, willow, northern Labrador tea, avens and huckleberry, with willow, moss and sedge tussocks in depressional sites. Vegetation in the coastal area is similarly characterized by shrub tundra vegetation wherein dwarf birch, willow, and alder occur on warm, dry sites while moss and sedge tussocks are found in poorly drained areas (ESWG 1995a).

Thirteen key wildlife species have been observed, comprised of large migratory mammals, large predators, furbearers and small mammals. Caribou/*tuktuit* have historically dominated the landscape (GBEEC 2017); Several herds, including the Bathurst, Dolphin and Union, Bluenose-East, Ahiak, and Beverly herds have been identified in the western Kitikmeot Region. The Project is most likely to regularly interact directly with the Bathurst and Dolphin and Union herds. The

majority of the proposed road corridor also occurs within Area 1 of the Bathurst Caribou Range Planning Area, within the centre of habitation. Bathurst caribou may use the Project area all year, with highest use occurring between April and September for migration, calving, post-calving and summer range (GNWT 2019). Dolphin and Union are unique caribou found only on Victoria Island and the adjacent mainland (Government of Nunavut and Government of Northwest Territories 2018). They are distinctive in appearance, genetics and behaviour (Government of Nunavut 2024, Government of Northwest Territories 2018). Dolphin and Union Caribou seasonal migrations follow a general pattern of moving south in the fall across the sea ice at Coronation Gulf and Dease Strait to winter on tundra of the northern mainland, and returning north across the sea ice to calve and summer on Victoria Island (GN & GNWT 2018). Spring migration occurs in April and May (ECCC 2018b). The herd migrates north toward the coast in late March and April (ECCC 2018b). Based on collar data and considering crossings west of Bathurst Inlet, caribou start arriving at the mainland coast on their migration to Victoria Island in late April, with the last caribou leaving the coast by late May.

Muskoxen/*Umingmait* may be found through the Study Area, while moose/*tuktuvait* are fewer and found closer to the coast. Grizzly bear/*akhait*, wolves/*amaqqut* and wolverine/*qalviit* are relatively few, while red fox/*kayuqtut* and Arctic fox/*tiriganniat* may also be encountered. Fifty-nine bird species have been documented, 27 of which have been confirmed breeding. Nesting typically begins in June and continues through July, while fall bird migration typically begins in July and extends through mid-September (GBEEC 2017).

Federally listed species at risk previously identified in the Program Area include short-eared owl, ivory gull, Ross's gull, red knot rufa subspecies, buff-breasted sandpiper, red-necked phalarope, bank swallow, barn swallow, and barren-ground caribou.

Intermittent, small permanent and large permanent water courses are observed through the Project Area, with permanent streams providing some spring spawning, migration and seasonal rearing habitat for fish. Slimy sculpin and Arctic grayling/*ihulukpaukkait* are the most widespread freshwater fish species observed to date in the Project area (GBEEC 2017).

The marine portion of the Project area comprising the proposed port site is located within the Arctic Archipelago Marine Ecozone. During the winter, sea ice island-fast, with the ice reaching its maximum thickness in May. In the brief spring and summer periods of the northwestern parts of the ecozone, sea ice normally shatters into massive sheets. The ice persists through summer with the ice sheets separated by narrow channels of open water. Mean daily temperatures range from 10°C in July to -30°C in winter (ESWG 1995b).

Various species of fish, plankton and benthic invertebrates occur in Grays Bay/*Kogloktoakyok* year round; the proposed port area provides feeding habitat for Arctic char/*iqalukpiit* in summer. Arctic benthic invertebrate communities provide a direct food source for many fish species, marine mammals and seabirds. Twenty-one fish species were caught in the nearshore waters of the Coronation Gulf/*Qalgiuyap Taryunga*, including marine, anadromous and amphidromous species; Arctic char/*iqalukpiit*, saffron cod, Arctic flounder and fourhorn sculpin/*kanayuit*, Pacific herring, starry flounder and capelin/*angmagiat*. Five species of marine mammal are known to occur in the Grays Bay/*Kogloktoakyok* area: ringed seal/*nattiiq*, beluga/*qilalukkat*, bowhead whale/*arviat*, narwal/*tuugaaliit* and polar bear/*nanuit*, with ringed seal/*nattiiq* being most abundant and present

year-round in Grays Bay/*Kogloktoakyok*. Two beluga/*qilalukkat* populations occur in Grays Bay/*Kogloktoakyok*: Eastern Beaufort Sea Stock and the Eastern High Arctic -Baffin Bay Stock. Beluga/*Qilalukkat* migrate in from the east in late April-May, with peak movement in June and July, while the outwards migration varies from year to year depending on ice conditions. Berring-Chukchi-Beaufort and Eastern Canada-West Greenland populations of bowhead whale/arviat are found in the Grays Bay/*Kogloktoakyok* area. Polar bear/*Nanuit* occur in the Grays Bay/*Kogloktoakyok* area during much of the year; their distribution is variable and strongly influenced by the presence and quality of sea ice (GBEEC 2017).

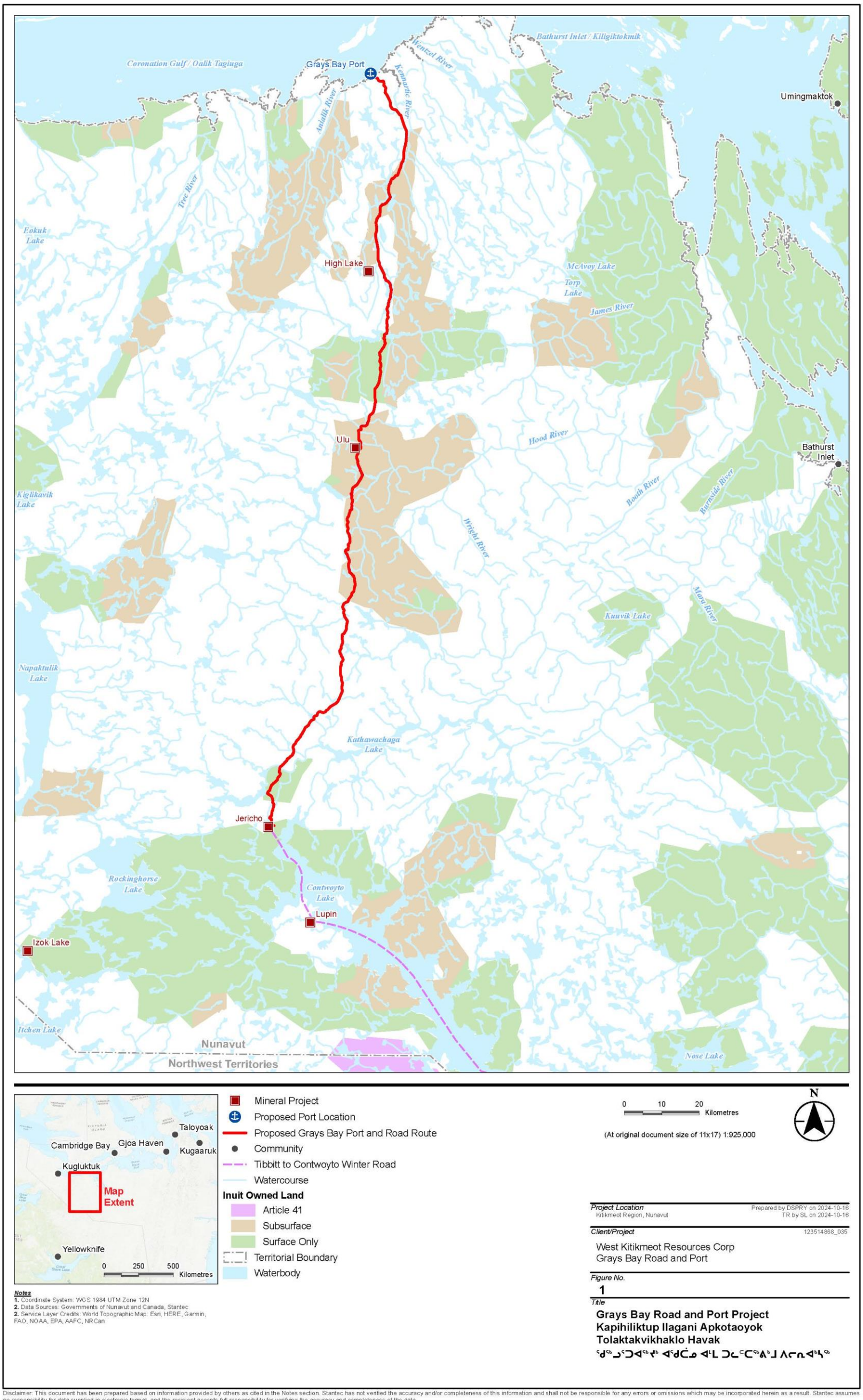

Figure 2.1 Grays Bay Road and Port Project

3 Physical Resources

Potential impacts to land, water, atmosphere and marine environments and related protection measures are outlined below.

3.1 Land, Sediment and Soil

Impacts to land arising from Project activities may affect permafrost, ground stability and fragile ecosystem components such as eskers. Impacts may arise through work on the land associated with drilling, fuel storage and waste disposal (i.e. drill cuttings) activities, and can result in subsidence, rutting and permafrost thaw.

Measures to reduce or avoid impacts to land include the following:

- Restrict heavy equipment operation and activities where possible to existing disturbed areas.
- Establish fuel caches and set up and transport land-based drills on a durable surface in areas that are not known unique or fragile ecosystems.
- Move equipment overland only when conditions are such that rutting or gouging will not occur and with adequate snow or ice cover, as applicable.
- To the extent possible, use natural depressions for sumps.
- If a sump needs to be excavated, cover when not in use to avoid water accumulation and resulting permafrost thaw, and stage soil for use in reclamation.
- Capture drill cuttings at the collar.
- Backfill and cap drill holes on land prior to the end of each field season.
- Ensure cuttings sumps are stable prior to the end of each field season.
- Managing drill sites and sumps in accordance with the *Closure and Reclamation Plan*.

Sediment and soil quality can be affected by poor drilling practices and spills. Negative impacts to soil and sediment quality can be mitigated by:

- Establishing fuel caches, setting up drills, refueling and locating sumps >31 m above the high water mark of any watercourse, or otherwise in accordance with Authorization terms and conditions.
- Using only inert drill additives when drilling in water.
- Implementing erosion control where necessary, to prevent sediment from entering any waterbody.
- Storing fuel and hazardous materials in adequate secondary containment.
- Providing worker education on safe material handling.
- Implementing the *Spill Contingency Plan*.

3.2 Water, Aquatic and Marine Environments

Water quality can be affected by unplanned or non-compliant discharges to freshwater and marine environments, erosion, in-water work and spills. Negative impacts to water quality can be mitigated by:

- Establishing fuel caches, setting up drills and locate sumps >31 m above the high water mark of any watercourse, or otherwise in accordance with authorization terms and conditions.
- Implementing erosion control where necessary, to prevent sediment from entering any waterbody.
- Discharging effluents in accordance with authorization terms and conditions.
- Providing worker education on safe material handling.
- Ensuring equipment use is clean, free of leaks and subject to inspection.
- Storing fuel and hazardous materials in adequate secondary containment.
- Implementing the *Spill Contingency Plan*.
- Equipment maintenance, fuel storage and refueling occurs >31 m beyond the high water mark of any watercourse [1].
- Where available, using biodegradable hydraulic fluid in heavy equipment working in and around water and ice.
- Employ best drilling practices including
  - Capturing drill cuttings at the collar.
  - Minimizing salt use during diamond drilling where possible.
  - Minimizing drill water discharge to land.
  - Depositing inert drill water in a suitable sized upland sump.
- Managing drill sites in accordance with the *Closure and Reclamation Plan*.
- Manage drill waste and cuttings arising from marine drilling in accordance with authorizations.
- Monitoring water quality during in-water work (drilling)[2] in accordance with best practices, and adjusting practices as needed, in response to monitoring results.
- Allowing settling to occur prior to discharge of recirculated water (during drilling).

Hydrology can be affected through unapproved water use that may occur in relation to drilling. Hydrologic impacts are mitigated through compliant water use and water reuse during drilling.

Tidal process and bathymetry can be affected by activity on the sea floor or lake bottom. Impacts are mitigated though proper drill positioning, drill set ups on shore, on a barge or on ice, and where

[1] Site-specific procedures for safe refueling during marine drilling are developed with the drilling contractor.
[2] Applicable monitoring parameters and objectives to be determined during licencing and permitting.

possible, removal of the drill string and steel casing from offshore marine boreholes, allowing the overburden soils to collapse into the drilled hole and close it naturally.

3.3 Atmosphere

Air quality can be affected through emissions from incineration, open burning and equipment operation. Negative impacts to air quality arising from project activities can be mitigated by:

- Conducting routine preventative maintenance on generators and engines.
- Using low emission vehicles where possible (i.e. use of a drone instead of aircraft for aerial surveys).
-

Ambient noise levels can be affected by operation of Project equipment such as generators, helicopters, heavy equipment (i.e. drills) and snow machines. Negative impacts to noise levels can be mitigated by:

- Conducting routine preventative maintenance on generators and engines.
- Ensuring mufflers are in use, as required by manufacturers.

Marine noise can be created by drilling and boat operation. Equipment-specific measures to mitigate marine noise impacts are developed on a case by case basis.

4 Biological Resources

Potential impacts and protection measures pertaining to plants and animals, including terrestrial, freshwater aquatic and marine life are outlined below. Protection measures are considered adequate to protect species at risk.

4.1 Vegetation

Impacts to vegetation may arise through work on the land associated with drilling, fuel storage and waste disposal (i.e. drill cuttings) activities, and can result in damage to plants and plant communities.

Measures to reduce or avoid impacts to vegetation include the following:

- Set up drills and establish fuel caches of a temporary nature, and on a durable surface.
- Restrict heavy equipment operation and overland activities where possible to existing disturbed areas or designated confined areas.
- Move equipment overland only when conditions are such that rutting or gouging will not occur, and with adequate snow or ice cover, as applicable.
- Store fuel and hazardous materials in secondary containment.
- To the extent possible, use natural depressions for sumps.
- Employ best drilling practices including
  - Capturing drill cuttings at the collar.
  - Minimizing salt use during diamond drilling where possible.
  - Minimizing drill water discharge to land.
  - Depositing inert drill water in a suitable sized upland sump.

4.2 Wildlife, Habitat & Migration

Project activities may affect wildlife, including marine and terrestrial mammals, birds and their habitat, in a variety of ways including:

- Habituation and attraction to personnel, activities and/or facilities;
- Indirect habitat loss;
  - Avoidance or reduced use of areas near a disturbance.
  - Increased energy expenditure due to a response to sensory disturbance.
- Direct habitat loss through land clearing or disturbance;
- Disruption of movement
  - Delayed crossing, migration or other avoidance of Project area.
- Mortality
  - Direct, through collision with vehicles or equipment;
  - Indirect, through increased hunter knowledge of animal locations that may arise through informal and social communications.

Mitigation measures presented below are designed to be practicable, effective, relative to the Project scope and responsive to wildlife use of the Project area. General measures are presented below. Species-specific measures are presented for those species that are reasonably expected to be encountered during field studies.

4.2.1 General Measures

Various wildlife species occur in the Project area and may be encountered year round. Impacts can be mitigated by all workers by:

- Ensuring wildlife are given the right of way at all times.
- Avoiding harassment of any wildlife for any purposes, including photographing from the ground or air.
- Avoiding any contact with wildlife including approaching, disturbing and feeding wildlife.
- Prohibiting all project personnel from hunting while on site.
- Ceasing terrestrial activities in the vicinity of active sensitive habitat features and life stages (i.e. denning, calving; discussed further below) immediately to avoid disturbance, establish a buffer[3] around the site by flagging or other means, document and designate as a Restricted Access Site.
- Carry out research activities in accordance with authorization terms and conditions.
- Providing worker education and wildlife awareness training.
- Fly at a minimum height of 300 m when wildlife are observed to be present.
- Reporting nuisance and problem wildlife to, and work with, relevant authorities to maintain wildlife and worker safety.

[3] Varies with species, activity and proximity. Buffer distance can be determined in accordance with GNWT guidelines (Northern Land Use Guidelines, Northwest Territories Seismic Operations), GN advice, or in consultation with the Canadian Wildlife Service.

Mitigation through Project design involves consideration of potential impacts prior to commencing Project activities and factoring mitigation measures in to how the Project is planned, built and/or otherwise carried out. Mitigation of wildlife impacts by project design includes:

- Designing work areas in a manner that avoids wildlife entrapment and attraction.
- Minimizing the footprint of drill pads by utilizing a small drill where possible, maintaining a consolidated work area, and drilling multiple holes from one set-up where feasible.
- Choosing drill pad locations in a manner that considers known sensitive wildlife areas and maximizes the drilling to occur from each pad, thus reducing the number of drill set-ups.
- Utilizing air access only in summer, avoiding the establishment of new roads and trails.
- Locating sumps, fuel caches, and equipment >31 m from the high water mark of any waterbody, unless otherwise approved, to avoid impacts to aquatic and marine life and habitat.
- Planning drilling activities outside of known seasonal habitat use, to the extent possible based on available conditions.
-

Proper waste management minimizes wildlife attraction to work areas. The following waste management measures, as documented in the *Waste Management Plan*, are employed:

- Garbage, including all food wastes, is stored in covered, metal containers;
- Food waste and sewage is securely stored for backhaul;
- Wastes and materials are stored in accordance with the *Spill Contingency Plan*;
- Open top vessels containing waste products are not left unattended.

Nesting and denning are vulnerable life stages sensitive to disturbance, protected by legislation in many instances, and may occur in the Project area from late winter through to mid-summer, depending on habitat and wildlife. If active nesting or denning is observed:

- Cease activities in the vicinity immediately to avoid disturbance;
- Establish a buffer around the site by flagging or other means, document and designate as a Restricted Access Site, as listed in Table 4.1;
- Ensure the Restricted Access Site is maintained until the nest or den is no longer in use.

Table 4.1 Buffers around valued wildlife habitat components.

Species	Habitat Component	Buffer Distance
Migratory birds	Nest	10 m – 1 km*
Wolf	Den	800 m
Wolverine	Den	800 m
Grizzly Bear	Den	1 km

*Varies with species, activity and proximity. Buffer distance can be determined in accordance with GNWT guidelines (undated) or in consultation with the Canadian Wildlife Service at cwsnorth-scfnord@ec.gc.ca or GN-Department of Environment

4.2.2 Grizzly Bear

Should a grizzly bear be in the vicinity of a drill, all personnel will remain in the drill shack to the greatest extent possible until the grizzly bear has moved a safe distance away.

Should crews conducting land-based surveys on foot encounter a grizzly bear at a safe distance, they divert their course to stay away from the bear. In the event that a human-bear encounter is imminent, a helicopter may be used to assist in deterring bears from entering the vicinity of the drill shack if necessary, and from the immediate vicinity of field crews. A helicopter may subsequently evacuate field personnel from potential bear encounter situations.

4.2.3 Moose & Muskox

During times when muskoxen or moose are visible from a drill, all personnel will remain in the drill shack to the greatest extent possible until the animals have moved out of sight.

4.2.4 Caribou

As mentioned in Section 2, the Project is most likely to regularly interact directly with two main caribou herds, Dolphin and Union, and Bathurst. Bathurst caribou are known to occur in the southern extents of the Project area, while Dolphin and Union caribou may occur around the port site at the Project's northern extent.

Caribou and their associated habitats can be affected by various factors associated with project activities:

- Sensory disturbance
  - Avoidance or reduced use of areas due to sensory disturbance from drilling activities, helicopter use, and/or human presence.
  - Increased energy expenditure due to a response to sensory disturbance from drilling activities, helicopter use, and/or human presence.
- Disruption of migration and movement
  - Delayed crossing or avoidance of drill sites and flight response to overhead helicopter flights.

The primary means of mitigating impacts to caribou is the application of mobile protection measures. Mobile protection measures are actions taken in a staged manner based on caribou activity in proximity to Project activities. Mobile protection measures involve implementing nested buffer zones around Project activities with increasing levels of surveillance and corresponding response actions based on caribou numbers, activity and proximity thresholds. Monitoring is initiated when pre-determined thresholds are exceeded, and increases as specified numbers of caribou (documented collars or observed animals) move from the outermost buffer zone (Yellow Zone) to the innermost buffer zone (Red Zone), which is closer to Project activities. If thresholds are not exceeded, the general caribou mitigation measures presented in Table 4.2 apply. Mitigation measures are focused on reducing sensory disturbance of caribou near Project activities and allowing unimpeded and unaltered movement.

Appropriate and effective application of mobile measures is supported by timely caribou collar information from managing authorities, being the Government of Northwest Territories (GNWT) for Bathurst caribou and the Government of Nunavut (GN) for Dolphin and Union caribou. Accordingly, WKR has entered into data sharing agreements with each the GNWT and the GN to obtain caribou collar information, and applies this information to planning activities, based on reasonably foreseeable caribou occurrence in and use of work areas.

Table 4.2 General caribou protection measures (applicable when caribou move into an active work site but mobile protection measure thresholds are not exceeded)

Level	Trigger	Action/Response
1	Caribou are first observed.	• Record details about the observation (numbers, location and behaviour). • Report observation to the pilot, crew lead and/or Wildlife Monitor and workers in the area • Continue regular ground-based work activities. • Suspend all non-essential helicopter activities within the work site until animals have moved beyond line-of-sight. • Pilots avoid flying towards or over any caribou or areas where caribou have been observed and will adjust flight paths accordingly. • Ground crews monitor caribou location and activity periodically while the caribou are within line-of-sight of the work site. Record observations on form in Appendix A. • Report details of the observation to a QP at the end of the day.
2	Caribou persist near a work site during a crew change or for more than one day.	• Continue normal ground-based operations and monitoring for caribou during the work shift. • Continue to reduce helicopter use where feasible and safe – Suspend all non-essential helicopter activities within the work site until animals have moved beyond line-of-sight. – Where it is safe to do so, minimize and adjust crew pick-up and drop-offs adjusted to avoid disturbing. • Record details about the continued presence of caribou (Appendix A form). • Continue activities that were in operation when the caribou first approached, without altering in a manner that would increase disturbance. • If required, the QP will direct a site assessment to collect additional information about the caribou occurrence, including the proximity of caribou to the work site and the behaviour of caribou, to ascertain the reason for the caribou persisting in the vicinity and whether there is any interaction occurring between the work activity and the caribou.

Mobile protection thresholds[4] are described below[5] and illustrated in Figure 4.1, wherein the Work Site is a Project activity or work area such as drill site.

- **Yellow Zone** (50 km from the Work Site)
  - **Monitor**: presence or absence of caribou based on collar data or estimated likelihood of occurrence based on local, Inuit and/or scientific knowledge.
  - **Threshold**: Ten (10) collared caribou or 25 observed[6] caribou.
  - **Action:** Heightened crew awareness and surveillance via collar data or observations during crew transit trips to track caribou numbers and movements.
- **Orange Zone** (20 km from the Work Site)
  - **Monitor**: presence or absence of caribou based on collar data and field observations.
  - **Threshold**: Ten (10) collared caribou or 25 observed[6] caribou.
  - **Action**: Increased crew awareness and daily review of collar locations (as available). If observations indicate caribou movement towards the Work Site, Project personnel prepare to implement mitigation measures.
- **Red Zone** (3 km from the Work Site)
  - **Monitor**: presence or absence of caribou based on collar data and field observations.
  - **Threshold**: One (1) collared caribou or 15 observed caribou.
  - **Action**: Reduce or stop work, or otherwise alter or reduce activities to ensure caribou movements continue unimpeded (neither blocked nor diverted).

If actions taken are deemed ineffective (i.e., the caribou are clearly diverted from the migratory trajectory as observed from behaviour or collar data), a temporary stop work order may be implemented for some time (as directed by the appropriate supervisor) until the caribou have moved far enough away from the work site to resume normal behaviours and movements.

[4] Thresholds presented here are for Dolphin and Union caribou as that is the most likely interaction anticipated. Should activities such as drilling occur in areas used by Bathurst caribou, mobile measures issued by the GNWT (2022) are applied. While generally similar in approach, monitoring distances and thresholds differ somewhat.
[5] Based on Poole and Gunn (2015)
[6] Observed opportunistically during a ferrying flight to the Work Site.

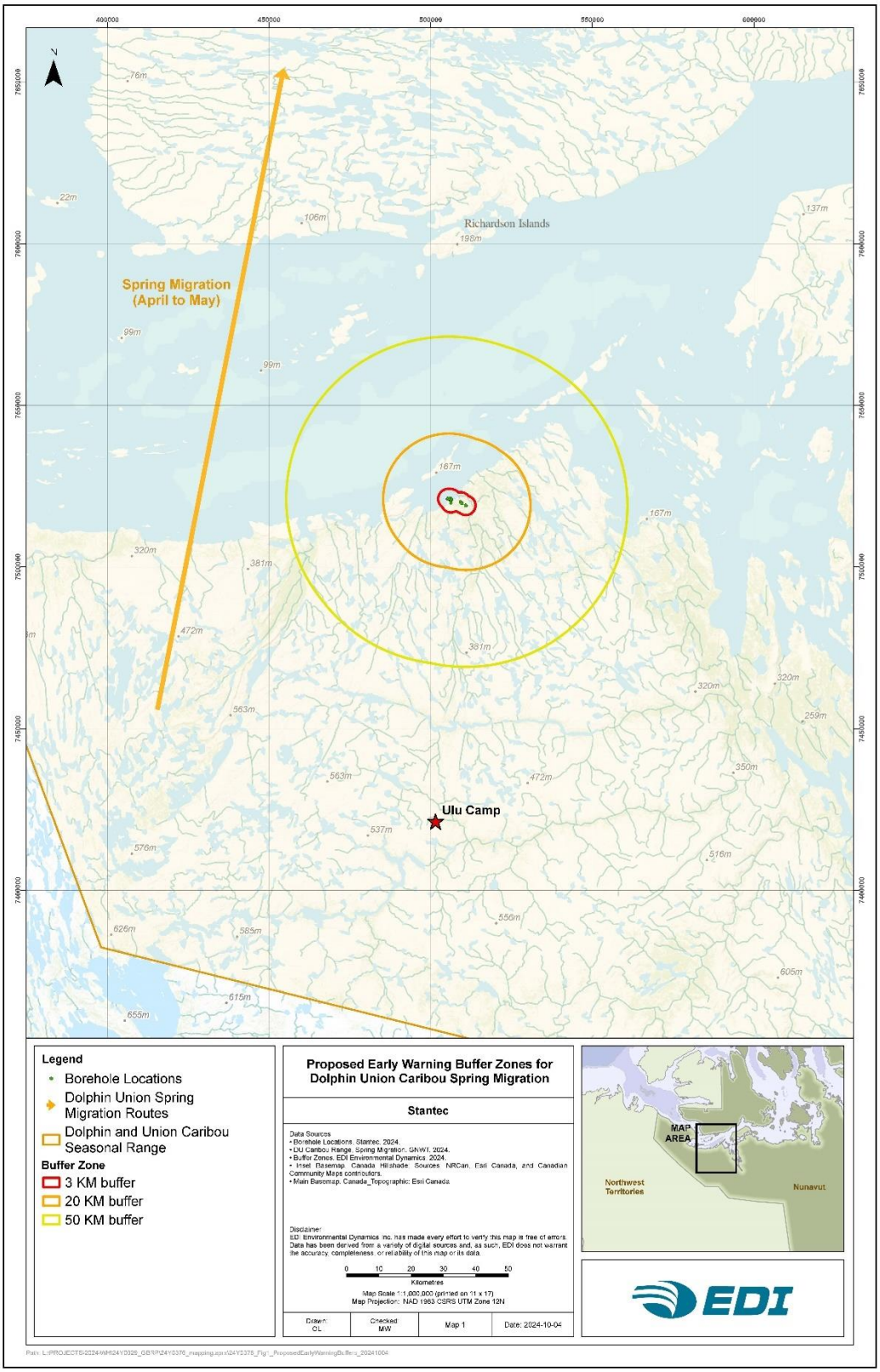

Figure 4.1 Dolphin and Union Caribou Mobile Protection Thresholds

4.2.5 Marine Mammals

Activities occurring in the ocean (watercraft use) and on sea ice (geotechnical drilling) in the vicinity of the port site may create a sensory disturbance, disrupt habitat, or cause injury from direct contact with equipment. Monitoring for marine mammal use of work areas includes:

- Visual assessment of marine mammal presence within 30 m of marine-based drilling activities, using binoculars, portable lights and underwater cameras.
- Visual reconnaissance surveys for seal lairs within the vicinity[7] of in-water drilling activities in advance of drill set-up to prevent lair disruption (e.g., collapsed roofs) and disturbance to seal pups.

Should marine mammals be observed within 30 m of marine-based drilling, activities are modified or temporarily suspended until the mammal leaves the area.

Should active sensitive habitat features (i.e. seal lair) be observed, the feature is immediately avoided, a buffer established[4] by flagging or other means, documented and designated as a Restricted Access Site.

4.3 Fish, Habitat & Migration

Fish and fish habitat are protected by law. Work in and around water can affect fish and fish habitat directly and indirectly:

- Changes in water quality and hydrology can impact the ability for fish to forage, rear, spawn and migrate;
- Physical disturbance to watercourses below the high water mark can physically alter fish habitat;
- Upland activities such as land disturbance and vegetation clearing can result in sediment deposition into water courses, impacting fish health and habitat;
- Winter water withdrawal from shallow fish-bearing watercourses can reduce oxygenated water availability and result in fish mortality.
- Handling fish during research or baseline data collection can result in fish mortality and fish community impacts.
- In-water drilling can result in direct mortality or injury to fish from physical contact with equipment.

[7] Distance to be determined in consultation with QP.

Accordingly, the following mitigation measures are implemented to protect fish and fish habitat throughout the Project:

- Water intakes are screened in accordance with the Department of Fisheries and Oceans (DFO) *Interim Code of Practice* (2020);
- Equipment operating on ice or near water is free of leaks, grease, oil and mud;
- Equipment maintenance, fuel storage and refueling occurs >31 m beyond the high water mark of any watercourse[8];
- On-ice drilling over water utilizes inert drilling muds and a cuttings capture system to avoid cuttings release into the water column.
- Avoid water withdrawal from streams and small lakes.
- Establish fuel caches, set up drills (at upland drilling locations) and locate sumps >31 m above the high water mark of any watercourse, or otherwise in accordance with Authorization terms and conditions.
- Discharge effluents in accordance with authorization terms and conditions.
- Carry out research activities in accordance with authorization terms and conditions.
- During in-water drilling, scan for fish using a submersible drop-camera, prior to setting casing, letting any schooling fish observed leave the immediate work area.
- During in-water drilling, slowly lower the drill casing to the seabed to allow for mobile marine organisms to move away from the drill site and reduce the potential for accidental crushing.

[8] Site-specific procedures for safe refueling during marine drilling are developed with the drilling contractor.

5 Heritage Resources

Heritage resources such as archaeological sites are protected by law and can be affected by activities on land and on shore, such a site access, fuel cache establishment, and drilling. Potential negative impacts to archaeological sites can be mitigated by the following, with any activities undertaken in relation to archaeological surveys, finds or mitigations done so by or under the direction of the Project Archaeologist:

- Provide worker education and awareness training on archeological and cultural historic sites.
- Conduct an archaeological assessment prior to surface disturbance.
- Minimize land disturbance outside of work areas.
- Avoid construction of new stone features.
- Where possible, avoid 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, proceed with direction from the Territorial Archaeologist.
- If a suspected archaeological site or human remains (structures, artifacts or bones) are encountered during Project activities:
  - Immediately stop work in the vicinity and notify the Environment Manager, who will notify the Territorial Archaeologist (867-934-2040);
  - Establish a buffer and designate as a Restricted Access Site all known or suspected archaeological sites, unless otherwise approved;
  - Leave the site undisturbed;
  - Document the occurrence including:
    - Taking several representative photos of the site with an appropriate scale marker.
    - Describe the nature and extent of the site and any artifacts noted.
    - Note the site coordinates and datum used.
    - Mark the location of the site on a 1:50,000 scale topographic base map.
    - Record the date of discovery.
- Keep confidential the location of known and found archaeological sites.

6 Training

The purpose of personnel training and awareness is to demonstrate that it is each person's responsibility to minimize Project impacts on wildlife, archaeological sites and the environment in general and to ensure the safety of all personnel involved with Project activities. As a part of the field program orientation, all workers are engaged in a discussion on local environmental and archaeological resources including:

- Basic local wildlife ecology and possible Project-related impacts on wildlife and wildlife habitat.
- Operating protocols such as incidental observation reporting.
- Awareness of known wildlife-sensitive areas such as breeding areas, den sites, nests and wildlife-sensitive periods and related typical wildlife behaviours.
- Project protocols associated with dealing with aggressive or unusual wildlife behaviour around work areas.
- Wildlife attractant management.
- Wildlife safety including bears and predators, detection and deterrence.
- Wildlife incident reporting and response procedures.
- Archaeological chance find procedures.
- Compliance expectations and non-compliance disciplinary actions that may be enforced.

7 Documentation & Reporting

Compliance reporting and notification occurs in accordance with authorizations, regulatory requirements, and data sharing agreements.

Routine documentation supporting protection of environmental and archaeological resources include:

- Maintaining equipment preventative maintenance logs and required follow-up actions on site.
- Documenting water use and waste disposal in accordance with the water licence.
- Logging and reporting wildlife observations.
- Maintaining a layer in the Project Geographic Information System (GIS) that identifies:
  - Watercourses suitable for, and those previously used for, water withdrawal;
  - Known archaeological sites surrounded by a buffer, the location of which is to be kept confidential, considered, and avoided or mitigated in future program planning;
  - Key habitat features such as dens and nests, the location of which is to be considered in future program planning;
  - Drill cuttings sumps;
  - Fuel caches.

A copy of documents can be made available to an Inspector upon request.

All wildlife incidents are documented including:

- Photographs (if possible);
- Names of people involved;
- Nature of the incident;
- Supporting information such as the time, date, and location;
- Response measures and corrective actions taken.

Depending on the nature of any wildlife incident and species involved, reporting internally occurs to the Environment Manager and may occur externally to the following:

- KIA Lands Department (867-982-3310);
- GN Regional Wildlife Biologist (867-982-7450) for problem wildlife and nest disturbances for non-migratory birds (e.g. raptors, corvids and ptarmigan);
- Environment and Climate Change Canada (ECCC) Canadian Wildlife Service (cwsnorth-scfnord@ec.gc.ca) for migratory birds.

8 References

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Appendix A. Wildlife Incidental Observation Log (example)

Observer Name	Date & Time	Work Site Location (e.g., drill site X)	Work Activity (e.g., drilling, crew change)	# & sex of caribou (see Appendix B)	Distance of caribou from site	Caribou behaviour (see Appendix C)	Changes in caribou behaviour

Appendix B. Protocols for Documenting Caribou Behaviour and Disturbance Responses

Code	Activity	Description	Disturbance Magnitude1
AL	Alert	Activity to detect predators or other perceived threats; e.g., guard or sentry duty or a heads-up stance staring at stressor	Low
AG	Agitated	Exhibiting signs of moderate to high stress such as pacing, staring and head bobbing, jumping, staring at stressor with a rigid stance for >2 minutes	Moderate-High
BE	Bedding	Bedding, sleeping, or resting, including for cud chewing	Nil
BR	Breeding	Rutting, mating and related activities.	Nil
DI-Obs	Disturbed by observer	Behaviour to avoid the observer; use only if the activity before disturbance is not known	Moderate
FD	Feeding/drinking	Consuming water and/or food items	Nil
FL	Fleeing	Hurried movement to avoid conspecifics, other animals, or perceived threats; does not include fleeing to avoid the observer	High
GR	Grooming	Behaviour to arrange and protect the fur, including scratching and rubbing of antler velvet	Nil
RR	Rearing	Adults feeding neonates and juveniles	Nil
START	Startle	Intense, jerking response to sensory disturbance that is short duration (e.g., less than a few seconds and involves travel <20m; otherwise use Fleeing)	Moderate
TW	Travelling, walking	Used when animals travel through an area, the primary activity is walking rather than feeding, etc.	Nil

Appendix C. Caribou Age / Sex Classifications* and Descriptions

Age/Sex	Description
Calf (young-of-the-year)	antlers, if any, are short spikes with velvet; darker bodies and smaller than adults
Adult female (cow)	small antlers 2–3 times the ear length; black vulval patch
Adult male (bull)	young males are similar to females, but no vulval patch; older males have antlers larger than females
Adult (sex unknown)	body size too large to be calf; antlers may be small; but animal too far away or seen too briefly to identify vulval patch

*Classifications are based on Aerial-based Inventory Methods for Selected Ungulates: Bison, Mountain Goat, Mountain Sheep, Moose, Elk, Deer and Caribou (MSRM 2002)