



MEADOWBANK MINE

2019 WILDLIFE MONITORING SUMMARY REPORT

FINAL

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- Appendix L** 2019 Migratory Bird Protection Report
- Appendix M** 2019 Meadowbank Non-Native Plant Monitoring Study

SECTION 1 • EXECUTIVE SUMMARY

As a requirement of the NIRB Project Certificate, the 2019 Wildlife Monitoring Summary Report represents the 14th of a series of annual Wildlife Monitoring Summary Reports for the Agnico Eagle Mines Ltd. (Agnico Eagle) Meadowbank Mine (the project). Baseline and monitoring programs were first initiated in 1999 and will continue through the life of the mine. Details of the wildlife monitoring program for the project are provided in the Terrestrial Ecosystem Management Plan (Agnico Eagle 2019). The 2019 annual report provides the monitoring objectives, methodology, historical and current year results, and management recommendations for each monitoring program. The 2019 Wildlife Monitoring Summary Report builds on data presented in previous reports and incorporates monitoring recommendations from these reports.

The Government of Nunavut's Caribou (*Rangifer tarandus*) collaring program, ongoing for the past 12 years in the Baker Lake area, continued in 2019 with monitoring of existing collared animals. Seasonal Caribou movements within and adjacent to the Meadowbank Regional Study Area (RSA) were tracked and mapped throughout the year. Collared Caribou were present throughout the year but particularly during spring (i.e., April and May), late summer (i.e., August), and fall (i.e., October) migration. No additional collars were deployed on Baker Lake animals in 2019 but by the end of the year, 31 collars from three deployments remained active.

A Hunter Harvest Study (HHS) conducted from 2007 to 2015 was relaunched in 2019. The study included more than 60 participants of which 42 reported harvesting Caribou. Given an estimated 300 to 350 active hunters in the Hamlet of Baker Lake, the HHS represents from 12 to 14% of hunters in the community. With a total reported Caribou harvest of 647, the total Caribou harvest in Baker Lake is estimated to range from 4,621 to 5,392 Caribou. This estimate is likely high because the current study attracted some of the more successful hunters (e.g., Baker Lake Hunters and Trappers Organization members) in the community.

Six active Peregrine Falcon (*Falco peregrinus*) nests were observed and monitored at quarry sites along the AWAR in 2019, with successful nesting confirmed at one nest. Raptor nests were also monitored along the Whale Tail Haul Road and in the vicinity of the Whale Tail Pit in 2019 with occupancy levels similar to 2017 survey results. Raptor nest management plans were not required at any of the active nest sites along the Meadowbank All-Weather Access Road, the Whale Tail Haul Road, or the Whale Tail Pit area since no project-related effects on raptor nesting success were observed and mine-related activities were restricted around sites.

Numerous road closures were implemented on all project roads, particularly in April and May, to ensure safe passage to large groups of migrating Caribou herds. No Caribou fatalities occurred because of activities at the mine or along project roads. With the Authorization of the GN officer, one Wolverine (*Gulo gulo*) needed to be euthanized after attempts to deter the animal were unsuccessful.

SECTION 2 • OVERVIEW

2.1 BACKGROUND

The Agnico Eagle Mines Ltd. (Agnico Eagle) Meadowbank Mine (the project), located in the Kivalliq Region of Nunavut (**Figures 2.1 and 2.2**), received a Project Certificate No. 004 from the Nunavut Impact Review Board (NIRB) in 2006. The subsequent Water License, GN and CIRNAC Land Lease, and KIA Land Use Production Lease, allowed for the construction of a gold mine and ancillary facilities including an All-Weather Access Road (AWAR), barge unloading facilities, lay-down area, and a fuel tank farm near the Hamlet of Baker Lake. The Whale Tail Pit Project, an extension of the Meadowbank Mine, received a Project Certificate No. 008 from NIRB in 2018. The Project Certificates, and subsequent Water License and land leases, allowed development of five gold deposits in the 11 years since the start of operations at Meadowbank and the first phase of the Whale Tail satellite deposit including construction of the Whale Tail Haul Road.

Up to 2017, annual reports were based on the Terrestrial Ecosystem Management Plan (TEMP) developed by Cumberland Resources (Cumberland 2006). The TEMP was a requirement of the Meadowbank Project Certificate No. 004, Condition 54 and Whale Tail Pit Project Certificate No. 008, Condition 28. In 2018, and again in 2019, the TEMP was revised to incorporate the Whale Tail component of the project, and to reflect changes in management and monitoring approaches since 2006 (Agnico Eagle 2019). The revised TEMP also benefitted from collaborative input from the Government of Nunavut Department of Environment (GN), the Kivalliq Inuit Association (KivIA), and the Hunters and Trappers Organization (HTO) of Baker Lake through annual report reviews, technical reviews, workshops, and discussions within the Terrestrial Advisory Group (TAG). The June 2019, Version 7 TEMP provides the basis for the 2019 annual report. The scope of the TEMP is to report on monitoring of the mine during construction, operation, maintenance, reclamation, and closure.

This annual report includes data collected in 2019, the 10th year of operation, and is the 14th of a series of annual Wildlife Monitoring Summary Reports for the project. The purpose of this report is to summarize 2019 data collected from wildlife monitoring programs, and to describe natural variation and potential mine-related changes in wildlife populations within and adjacent to the Meadowbank Gold Mine. The 2019 report describes monitoring objectives and methodology, historical and current year results, mitigation activities, and management recommendations based on 2019 monitoring results.

2.2 PROJECT DESCRIPTION

The Meadowbank Gold Mine, with an operating life of nine (9) years (i.e., until Q3, 2019), is located approximately 90 km north of the Hamlet of Baker Lake, while the Whale Tail Pit extension, with an expected operating life of seven (7) years (2019 to 2025), is located approximately 180 km north of the Hamlet. The Whale Tail Pit extension is a proposed open-pit mine mined by truck-and-shovel operation and will produce 19 M tons of ore. The project is 300 km inland from the northwest coast of Hudson Bay and is above the tree line near the Arctic Circle. The local physiography is characterized by numerous lakes and low, rolling hills covered mainly by lichen/rock complexes, and heath tundra.

**Figure 2.1:
Meadowbank Mine
Project Location Map**

Legend

- Capital City
- Towns/Villages
- Rivers
- Water
- National Parks

Data Sources:
Natural Resources Canada
Geological Survey of Canada
Caslys Consulting Ltd.



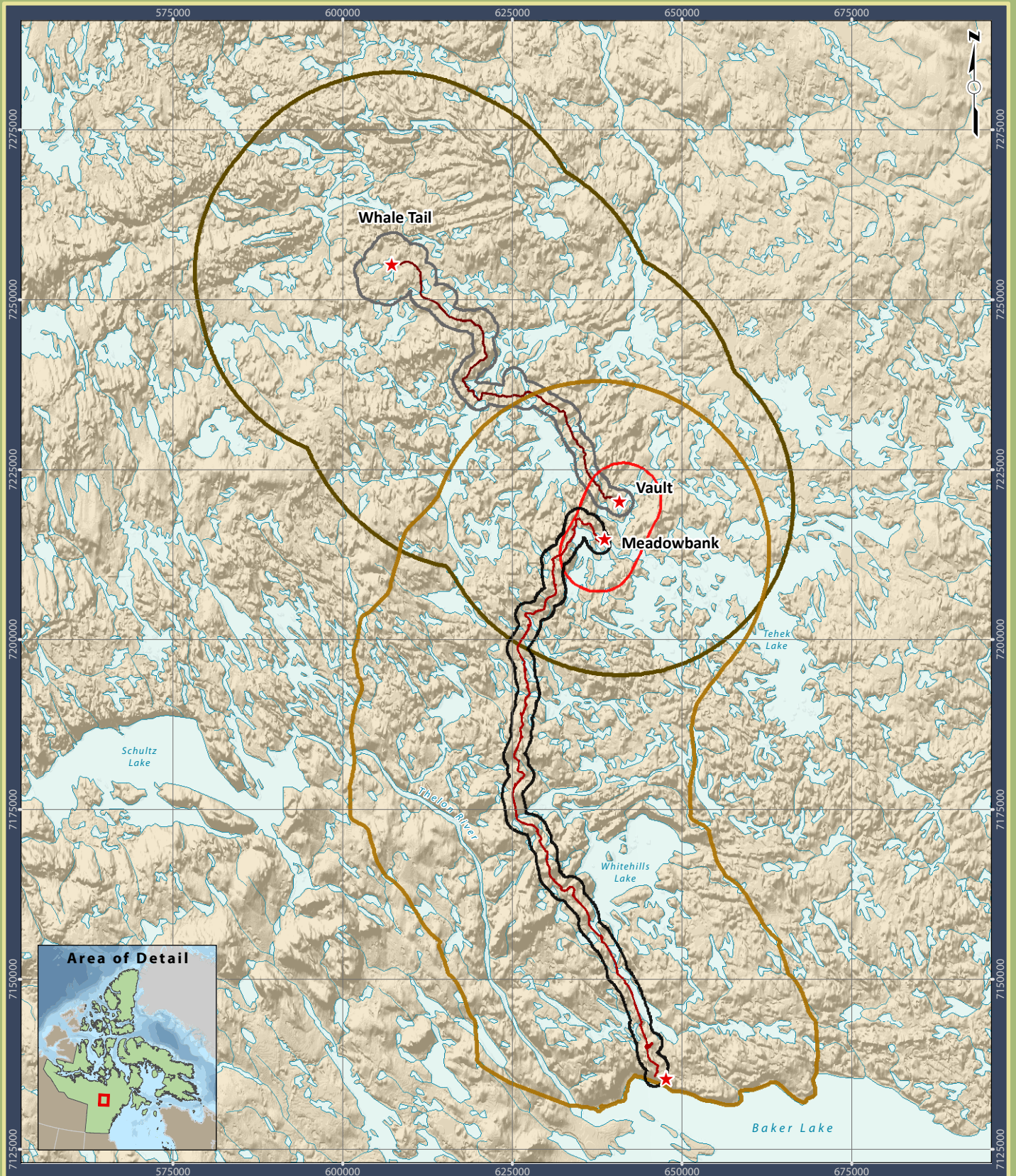
Prepared for:

AGNICO EAGLE

**Nunavut
ENVIRONMENTAL
CONSULTING LTD**

By:

**CASLYS
CONSULTING**



Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Meadowbank All-Weather Access Road Local Study Area (LSA)
- Meadowbank Local Study Area (LSA)
- Meadowbank Regional Study Area (RSA)
- Whale Tail Pit and Haul Road Local Study Area (LSA)
- Whale Tail Pit and Haul Road Regional Study Area (RSA)



Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.

Figure 2.2: Overview of Boundaries for Meadowbank Mine Monitoring Studies

Meadowbank Gold Project

Prepared for:



By:



2019 WILDLIFE MONITORING SUMMARY

Environmental baseline studies were conducted in the project area prior to Meadowbank and Whale Tail mine approvals and integrated into project designs according to the Cumberland (2006) and Agnico Eagle (2019) TEMPs. Wildlife Valued Ecosystem Components (VECs) for the Meadowbank project were identified in consultation with regulatory agencies and Baker Lake residents, and considered criteria such as conservation status, relative abundance within the Project study area, importance in subsistence lifestyle and economy, importance in predator-prey systems, habitat requirement size and sensitivity, and contribution to local area concerns. Based on these selection criteria, key terrestrial VECs determined for the Meadowbank project were Wildlife Habitat, Ungulates, Predatory Mammals, Small Mammals, Raptors, Waterbirds, and Upland Breeding Birds. Because of limited evidence that Small Mammals were affected by the project, this VEC was not included in the Whale Tail extension project or revised TEMP. Further details can be found in the Final Environmental Impact Statements for the Meadowbank Project (Cumberland 2005) and the Whale Tail Pit (Golder 2016).

Construction of a 106.8 km AWAR between the Hamlet of Baker Lake, the nearest community, and the Meadowbank mine was completed in March 2008 and provides mine site access and re-supply, while on-site mine haul and access roads connect open pit areas to ancillary facilities. Meadowbank mine site facilities include a mill, power plant, maintenance facilities, tank farm for fuel storage, water treatment plant, sewage treatment plant, airstrip, and accommodations. Mine components include open pits, waste rock storage facilities, and a tailings storage facility.

In 2008, construction of the AWAR and numerous camp infrastructure facilities was completed, while in 2009, principal mine site construction commenced. Mine operation began in early 2010. Goose Pit was completely depleted in 2015 while Agnico Eagle continued ongoing mining operations at Portage and Vault pits and investigated expansion of the Vault area into Phaser Lake. In 2018, an expansion was made in Pit E (Portage) to extend mining and mill feed to bridge the gap between the end of mining activities in Meadowbank and the start of mining activities at Whale Tail Pit. As a result, mining activities at Meadowbank in 2019 were only ongoing in Pit E but were depleted by Q3 (October), 2019. Mining in the Vault pit continued until Q2 (June), 2019 when the ore had been depleted. The dewatering of Phaser Lake occurred during summer 2016 in preparation for mining activity in Phaser and BB Phaser Pit. Phaser Pit mining activities were completed in Q4 (October), 2018 while BB Phaser mining, which began in early 2018, was completed in Q2 (June), 2019. There are no plans to continue mining in the Meadowbank and Vault areas.

To extend mine operations and milling at Meadowbank Mine, Agnico Eagle has developed the Whale Tail Pit and Haul Road Project, approximately 55 km north of the Meadowbank mine, on a satellite deposit located on the Amaruq property in the Kivalliq Region of Nunavut. The Amaruq Exploration Access Road (AEAR) was built in 2016 and 2017 to access the Amaruq exploration site from the Meadowbank complex. The AEAR was modified into the Whale Tail Haul Road (enlargement) following regulatory approval and was completed in 2018. Construction of the Whale Tail Dike in 2018 allowed for Whale Tail Lake North Basin dewatering in Q1, 2019, the pre-stripping of future Whale Tail Pit, and the construction of major infrastructures including the permanent camp, with accommodation and kitchen facilities for approximately 400 people, sewage treatment plan, tank farm for fuel storage, and freshwater intake. Open pit mining operation at the Whale Tail deposit began in Q3 (September 30th), 2019. Permitting is underway to expand the Whale Tail operation and extend the mine life to 2025.

2.3 STUDY AREA BOUNDARIES

2.3.1 Meadowbank Mine, Vault Pit and AWAR

The Meadowbank Mine Local Study Area (LSA) includes a 5 km radius area centred on the Mine Site and a 5 km radius around the Vault Site creating an elliptical shape with a total area of 194 km². The AWAR LSA consists of a 3 km wide corridor centred on the AWAR between Baker Lake and the Meadowbank Mine. The Regional Study Area (RSA) encompasses an area that includes a 25 km radius area around the Main and Vault sites and a 50 km wide corridor along the AWAR for a total area of 5,106 km² (**Figure 2.3**).

2.3.2 Whale Tail Pit and Haul Road

The Whale Tail LSA is a 3 km corridor centered on the Whale Tail Haul Road and borrow site access roads (i.e., 1.5 km on either side of the road and 1.5 km around borrow areas) and includes an approximate 1.5 km buffer around development areas at the Whale Tail Pit area, for a total area of 282 km². The Whale Tail RSA is a 50 km corridor centred on the Haul Road alignment (i.e., 25 km on either side of the Haul Road and borrow site access roads, and 25 km around borrow areas), with a total area of 5,017 km² (**Figure 2.4**).

2.4 MONITORING APPROACH

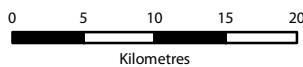
Wildlife monitoring is an essential tool in protecting and maintaining wildlife occurring near the project. A comprehensive monitoring strategy, along with quantitative monitoring indicators, has been implemented and, as required, is adapted to evaluate the accuracy of impact predictions and to meet the objectives of the management strategy set out in the TEMP (Agnico Eagle 2019). Monitoring programs evaluate the effectiveness of mitigation measures and assess mine-related impact predictions. For all wildlife monitoring programs there is a certain level of uncertainty or unpredictability; therefore, residual effects identified during monitoring may require implementation of adaptive management strategies. Adaptive management is an ongoing process that evolves throughout the life of the project as better and more effective ideas are introduced in a process that is designed to be continually improving. Ongoing review of the TEMP and annual Wildlife Monitoring Summary Reports (which provide results of TEMP monitoring programs) by regulatory agencies, technical reviewers, and stakeholders will further ensure that local and regional concerns have been adequately addressed.

Environmental staff monitor wildlife near mine facilities (i.e., Meadowbank Mine and Whale Tail Pit) and along the AWAR, Vault Haul Road, and Whale Tail Haul Road on a regular basis (discussed in detail in **Sections 3** and **4**). Where unacceptable risks to wildlife are observed, mitigation measures are implemented to avert animals from site activities in accordance with the TEMP (Agnico Eagle 2019). Detailed reporting protocols (e.g., a dangerous animal occurrence, monthly wildlife reports submitted to the GN, road closure notification to GN, KIA, HTO, etc.) are established and implemented by on-site environmental staff. During these events, Agnico Eagle representatives communicate any issues directly with the GN Department of Environment (DoE) Conservation Officer, KIA, and the local HTO.



Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Meadowbank All-Weather Access Road Local Study Area (LSA)
- Meadowbank Local Study Area (LSA)
- Meadowbank Regional Study Area (RSA)



Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.

**Figure 2.3: RSA and LSA
Boundaries for the
Meadowbank Mine and Awar**

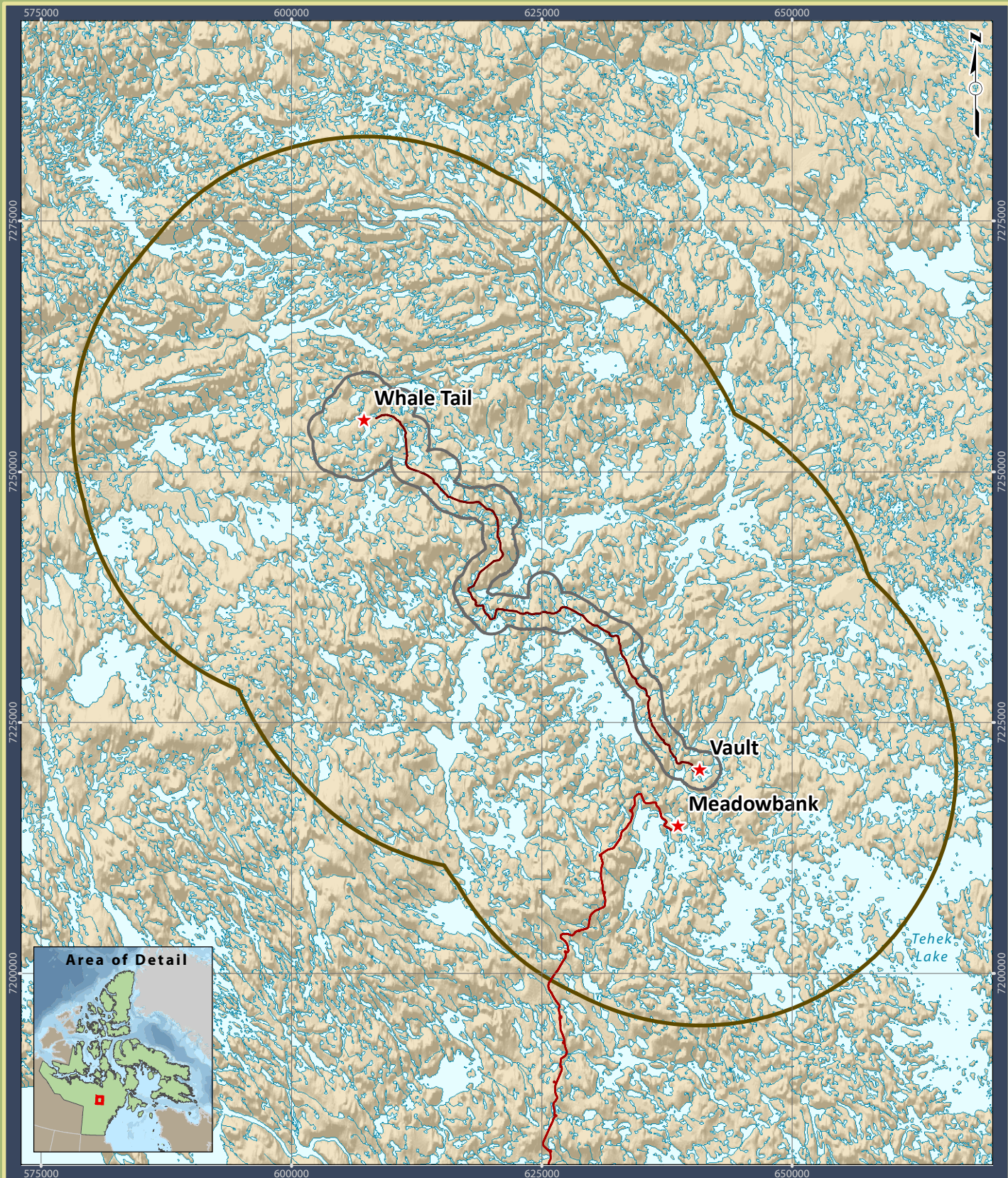
Meadowbank Gold Project

Prepared for:



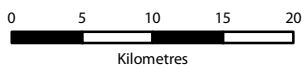
By:





Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Whale Tail Pit and Haul Road Local Study Area (LSA)
- Whale Tail Pit and Haul Road Regional Study Area (RSA)



Projection: UTM Zone 14 NAD83

Data Sources:
 Natural Resources Canada, GeoBase®
 National Topographic Database
 Agnico-Eagle Mines Limited.

**Figure 2.4: RSA and LSA
 Boundaries for the
 Whale Tail Pit and Haul Road**

Meadowbank Gold Project

Prepared for:



By:



2.5 REPORT OBJECTIVES

The primary objectives of the 2019 Wildlife Monitoring Summary Report are to:

- Report the results of the 2019 wildlife monitoring programs;
- Summarize the monitoring strategy implemented over the course of the year;
- Evaluate the function and validity of implemented monitoring strategies;
- Summarize adaptive management strategies;
- Provide management recommendations for 2019;
- Allow regulators to contribute advice for improving wildlife management; and
- Include a summary of all Caribou-related monitoring, mitigation and management in one consolidated section.

2.6 INUIT INVOLVEMENT

Since 1999, local Inuit from the Hamlet of Baker Lake have been involved in all wildlife-related baseline and monitoring surveys. A summary of the various programs and the average number of Inuit involved since 1999 is provided in **Table 2.1**. As required by the IIBA, “Anything done by Agnico in order to implement the TEMP [...] shall incorporate Inuit Qaujimanituaugit”; therefore, traditional knowledge or IQ has been incorporated in this annual report. The projects are also monitored as part of a Memorandum of Understanding by a representative of the Baker Lake HTO consistently during the year.

Table 2.1: Inuit Involvement in Baseline and Monitoring Programs for the Meadowbank Mine.

Survey Description	Years Conducted (# of Years)	Average # of Inuit Involved
RSA Aerial Survey	1999, 2002 to 2008 (8) – discontinued	2
LSA Aerial Survey	1999, 2002 to 2008 (8) – discontinued	2
Breeding Bird Plots	2003 to 2012; 2015 (11)	2 to 3
Breeding Bird Transects	2005 to 2011; 2015 (8) - discontinued	2
Waterfowl Nest Surveys	2004 to 2012 (9) - discontinued	3
Whale Tail Waterbird Nest Surveys	2018 and 2019 (2)	2
Raptor Nest Surveys	2004 to 2007, 2010 to 2019 (14)	3 to 4
AWAR Ground Surveys	2004 to 2019 (16)	2 to 3
Vault Haul Road Surveys	2017 to 2019 (3)	1 to 2
Whale Tail Haul Road Surveys	2018 and 2019 (2)	1 to 2
Height of Land Surveys	2018 and 2019 (2)	1 to 2
Habitat Mapping	2004 to 2005, 2010, 2012, 2014, 2017, 2018 (7)	1
Phenology Plots	2003 to 2005 (3) - discontinued	2

2.7 TERRESTRIAL ADVISORY GROUP

As per Project Certificate No.008, Condition 27 of the Whale Tail Pit Final Environmental Impact Statement (EIS) Addendum (Golder 2016), Agnico Eagle has established a Terrestrial Advisory Group (TAG) consisting of representatives from Agnico Eagle, the Government of Nunavut Department of Environment (GN-DoE), Environment and Climate Change Canada (ECCC), the Kivalliq Inuit Association (KivIA), and the Baker Lake Hunters and Trappers Organization (HTO).

An MOU and Terms of Reference has been developed and signed by all parties in July 2019. Agnico Eagle will provide a summary of TAG meeting outcomes to the NIRB in the annual report beginning in 2019.

The purpose of the TAG is to:

- Measure the relevant environmental effects of the project on terrestrial wildlife;
- Confirm that the project is being carried out within the terms and conditions of the project certificate relating to the protection of terrestrial wildlife;
- Assess the accuracy of the predictions contained in the final environmental impact statement filed by Agnico Eagle with NIRB in respect of the project;
- Identify and select appropriate target species, indicators and linkages for monitoring;
- Evaluate the effectiveness of mitigation measures and to support any required improvement of those measures;
- Identify any unforeseen environmental effects caused by the project;
- Provide an early warning mechanism to identify any environmental effects caused by the project; and
- Determine and identify any cause-and-effect interactions between the project and the environment.

2.8 MITIGATION AUDIT

A mitigation audit is an annual requirement outlined in the 2019 TEMP. Mitigation approaches stem from current practices at existing mines or were suggested during the environmental assessment process; however, an auditing system is required to evaluate the use and effectiveness of the mitigation, following principals of adaptive management, and to identify additional mitigation measures as required. As an example, per Project Certificate No.008, Condition 32, Agnico Eagle engages with the Baker Lake HTO and other relevant parties to ensure that safety barriers, berms, and designed crossings associated with project infrastructure, including the Whale Tail Haul road, are constructed and operated as necessary to allow for the safe passage of Caribou and other terrestrial wildlife.

The audit is to be undertaken annually and summarized in the annual report, and will focus specifically on mitigation listed in Section 2 of the June 2019 TEMP. The audit will evaluate:

- What mitigation has been implemented;
- Which mitigation is perceived to be, or shown to be successful;
- If new mitigation has been implemented in response to new issues; and
- If some mitigation is redundant.

In 2019, Agnico Eagle took a staged approach to the mitigation audit (e.g., review of safety barriers, berms, and designed crossings along the Whale Tail Haul Road). A complete mitigation audit may be conducted in 2020 but this will be part of discussions within the TAG.

SECTION 3 • ROAD SURVEYS

3.1 OVERVIEW

A systematic ground survey monitoring program for the AWAR, and Vault and Whale Tail haul roads has been designed to evaluate sensory disturbance for wildlife, particularly Caribou (*Rangifer tarandus*), Muskoxen (*Ovibos moschatus*), and Predatory Mammals utilizing habitats adjacent to the roads. The program also monitors incidental mortality of species as they are encountered within the mine infrastructure, but particularly near roads.

3.2 OBJECTIVES

The primary objectives of the road ground survey monitoring program are to:

1. Document wildlife utilization along the AWAR, Vault Haul Road, and Whale Tail Haul Road corridors;
2. Evaluate wildlife trends along the road corridors, including identifying areas where higher densities of wildlife are observed;
3. Assess the need for adaptive mitigation, such as temporary road closures during peak Caribou migration periods;
4. Ensure that mortality thresholds for wildlife are not exceeded;
5. Confirm that Caribou are not killed through road-related mortality. The project-wide threshold mortality level for Ungulates is two (2) individuals per year (as per TEMP 2019); and
6. Confirm that Predatory Mammals are not killed through road-related mortality. The project-wide threshold mortality level for Predatory Mammals is two (2) individuals per year (as per TEMP 2019)

3.3 DURATION

The AWAR, Vault Haul Road, and Whale Tail Haul Road systematic ground surveys are ongoing over the operation phase of the mine and are scheduled to be conducted a minimum of once per week throughout the year, twice per week during Caribou migration (i.e., contingent on weather, road access and personnel availability), and every two days if Caribou/Muskox Group Size Thresholds (GST) are exceeded (see Figures 7 and 8 in 2019 TEMP). Agnico Eagle is committed to conducting a minimum of approximately 75 road surveys per year along the AWAR and Whale Tail Haul Road. The number of surveys along the Vault Haul Road is contingent on whether Caribou have been sighted in the area during mine site ground surveys or are known to be in the area based on collaring data. Monitoring of vehicle collisions and wildlife mortality is continual along all road segments.

3.4 METHODOLOGY

Road surveys were expanded beyond the AWAR to include the recently completed Vault Haul Road, beginning in 2017, and the Whale Tail Haul Road, beginning in 2018. For the Whale Tail Haul Road, Agnico Eagle has signed an MOU with the Baker Lake HTO for a wildlife monitor on the road beginning in October 2018.

The survey team typically includes two observers (one can be the driver) in a vehicle. The terrain on both sides of the road (to a maximum horizontal distance of approximately 1 km perpendicular from the road edge) is surveyed as the vehicle progresses at a maximum speed of 30 km per hour. For each sighting, the vehicle is safely parked in a road pullout and UTM coordinates are recorded along with the estimated distance of the animal(s) from the road, nearest road marker, species, number, direction of travel and a variety of other information (e.g., behavior). Where animals are sighted close to roads and a risk of collision with vehicles is possible, the environmental monitor/observers report the number of animals, location, and direction of travel to the mine radio dispatcher who informs all vehicle operators. In addition, all vehicle operators report Ungulates and Predatory Mammals seen along the road to the dispatcher.

Regular data provided to mine site personnel from the Caribou satellite-collaring program (**Section 6**) are also used to track Caribou movement and potential interactions with roads and mine facilities.

3.5 HISTORICAL RESULTS

Ground surveys commenced shortly following the onset of AWAR construction (2007). Sampling intensity has been comparable along the entire length of the AWAR since 2009. Surveys along the Vault Haul Road have been irregular since its completion but were included as part of regular AWAR surveys in 2016 and conducted separately beginning in 2017. Over the past 13 years (to 2018), surveys have been completed along the AWAR every 3.9 to 6.1 days (2.6 days in 2019) (see **Table 3.1**). Surveys at the Vault Haul Road have been completed every 7.8 to 20.3 days (11.8 days in 2019) (see **Table 3.2**). Surveys in 2018 along the Whale Tail Haul Road were completed every 8.6 days (2.6 days in 2019) (see **Table 3.5**).

3.6 2019 RESULTS

3.6.1 AWAR Surveys

The number of AWAR surveys completed each season in 2019 is provided in **Table 3.1**. The number of systematic road surveys completed in 2019 (n=137) is considerably higher than the annual average of 73 surveys over the previous 12 years and the annual goal of 75 surveys. In 2019, surveys were conducted on average every 2.6 days with survey frequency relatively consistent across the seasons, with the exception of winter. By month, the highest numbers of surveys were in April, October and November corresponding with higher numbers of Caribou observed within the LSA. Raw road survey data are provided in **Appendix A**.

Table 3.1: Details of AWAR Wildlife Surveys from 2007 to 2019.

Season	Number of AWAR Surveys												
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*	2017	2018	2019
Spring (Apr 01 to May 25)	13	15	15	9	10	14	9	11	17	10	19	9	37
Summer (May 26 to Sep 21)	24	7	10	9	9	13	13	7	16	14	16	12	39
Fall (Sep 22 to Dec 15)	8	15	8	12	11	12	10	11	11	16	14	16	39
Winter (Dec 16 to Mar 31)	33	57	25	36	33	38	31	38	32	38	36	35	22
Year End Total	78	94	58	66	63	77	63	67	76	78	85	72	137
Duration	Mar 01 to Dec 31	Jan 02 to Dec 29	Jan 09 to Dec 16	Jan 21 to Dec 17	Jan 10 to Dec 30	Jan 04 to Dec 29	Feb 02 to Dec 27	Jan 12 to Dec 30	Jan 03 to Dec 18	Jan 02 to Dec 27	Jan 03 to Dec 29	Jan 03 to Dec 29	Jan 04 to Dec 27
Average Frequency of Surveys (over duration)*	4.1 days	3.9 days	6.1 days	5.6 days	6.0 days	4.7 days	6.0 days	5.5 days	4.7 days	4.7 days	4.3 days	5.0 days	2.6 days

* Frequency refers to the number of days between surveys, on average over the year

Table 3.2: Details of Vault Haul Road Wildlife Surveys from 2017 to 2019.

Season	Number of Vault Haul Road Surveys		
	2017	2018	2019
Spring (April to May)	9	3	20
Summer (June to July)	7	0	1
Fall (August to September)	7	4	4
Winter (Jan to Mar, Oct to Dec)	24	11	6
Year End Total	47	18	31
Duration	Jan 03 to Dec 29	Jan 30 to Dec 16	Jan 25 to Nov 22
Average Frequency of Surveys (over duration)	7.8 days	20.3 days	11.8 days

* Frequency refers to the number of days between surveys, on average over the year

2019 WILDLIFE MONITORING SUMMARY

Cumulative Caribou density along the AWAR for 2019 is provided in **Figure 3.1** (all seasons), **Figure 3.2** (spring and summer Caribou seasons), and **Figure 3.3** (fall and winter). In the 2019 spring Caribou season, the highest Caribou densities were observed south of the Meadowbank mine (i.e., Kms 66 to 90), while in the summer, densities were highest between just north of Whitehills Lake to the Meadowbank Mine (see **Figure 3.2**). In the fall Caribou season, reported densities were highest closest to Baker Lake (i.e., Kms 14 to 20) and in the Whitehills Lake area (i.e., Kms 32 to 54), while densities in winter were very low along the entire AWAR (see **Figure 3.3**).

The 2019 Caribou occurrence data were added to the 2008 to 2018 datasets with the resulting cumulative Caribou numbers presented in **Figure 3.4**. These data illustrate that for over 11 years of surveys, the highest cumulative Caribou abundances along the AWAR continue to be in areas closest to the Hamlet of Baker Lake, and south and north of Whitehills Lake. The 2019 data generally follow this pattern (see **Figure 3.1**).

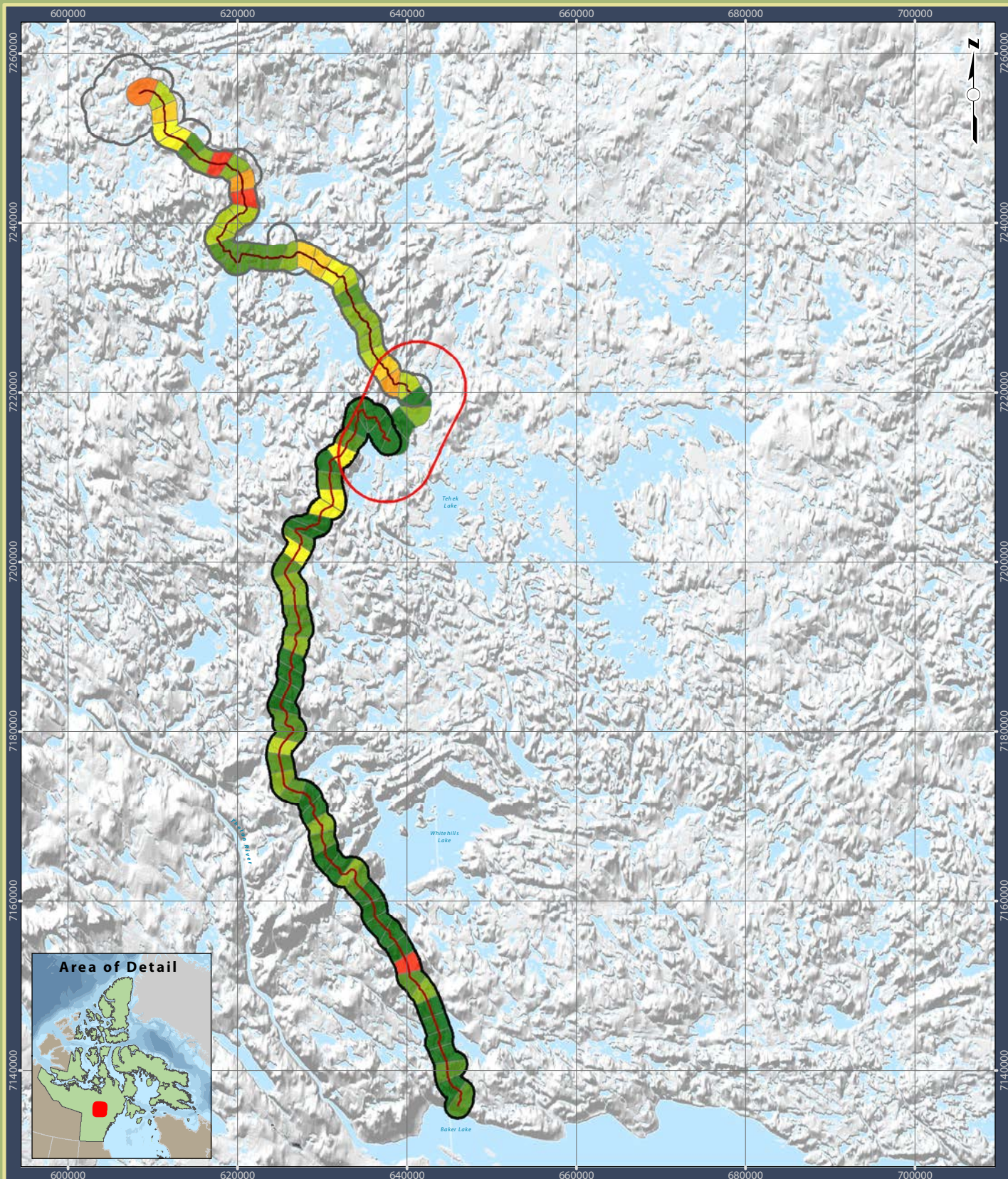
In 2019, Caribou numbers recorded on AWAR surveys were significantly higher than in 2018 and any of the other years that the road surveys were conducted (**Figure 3.5**). The average number of Caribou observed per survey trip in April and October was the highest since surveys began indicating a strong spring and fall migration through the study area (**Table 3.3**). The frequency of Caribou observed during the remainder of the year was relatively consistent with low numbers in midwinter (i.e., December through March) and mid-summer (June to September) (**Table 3.3**).

3.6.2 Vault Haul Road Surveys

The number of Vault Haul Road surveys completed each season in 2019 is provided in **Table 3.2**. The total number of surveys fluctuated from 47 surveys in 2017 (i.e., every 7.8 days) to 18 in 2018 (i.e., every 20.3 days) and to 31 surveys (i.e., every 11.8 days) in 2019. The highest numbers of surveys were conducted in spring, a period of high Caribou activity (**Table 3.2**). The average number of Caribou observed along the Vault Road was significantly higher than in 2018 with the highest average numbers seen in April and September (**Table 3.4**). Raw road survey data are provided in **Appendix A**.

3.6.3 Whale Tail Haul Road Surveys

The number of Whale Tail Haul Road surveys completed each season in 2019 is provided in **Table 3.5**. Surveys were conducted on average every 2.6 days during the year. Survey frequency was lowest during the winter. On a monthly basis, the highest numbers of surveys were conducted in April, May, August and October. The highest average numbers of Caribou were seen in April, May and October, which aligns with surveys results from the AWAR and the Vault Haul Road (**Table 3.6**). Raw road survey data are provided in **Appendix B**.

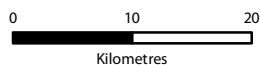


Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Whale Tail Pit and Haul
- Road Local Study Area (LSA)
- Meadowbank Local Study Area (LSA)
- Meadowbank All-Weather Access Road Local Study Area (LSA)

Caribou Density (per km) - 2019

	0 - 250		1,251 - 1,500
	251 - 500		1,501 - 1,750
	501 - 750		1,751 - 2,000
	751 - 1,000		2,001 - 2,250
	1,001 - 1,250		



Projection: UTM Zone 14 NAD83

Data Sources:
 Natural Resources Canada, GeoBase®
 National Topographic Database
 Agnico-Eagle Mines Limited
 Gebauer & Associates Ltd.

Figure 3.1: Caribou Density along the AWAR, and Vault and Whale Tail Haul Roads (2019)

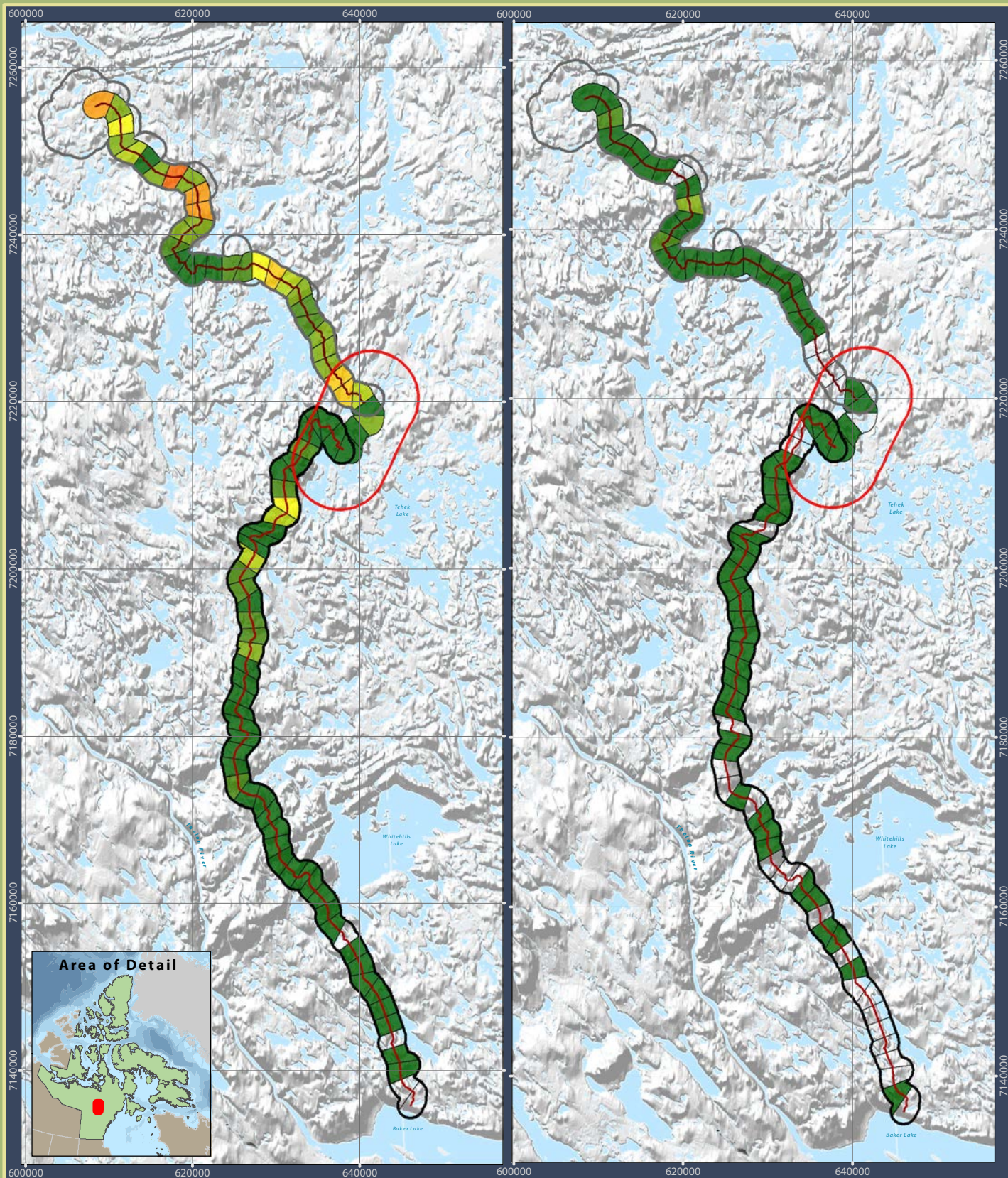
Meadowbank Gold Project

Prepared for:



By:





Legend

- All-Weather Access Road
 - Whale Tail Haul Road
 - Whale Tail Pit and Haul
 - Road Local Study Area (LSA)
 - Meadowbank Local Study Area (LSA)
 - Meadowbank All-Weather Access Road Local Study Area (LSA)
- | Caribou Density (per km) | |
|--|--|
| 0 - 250 | 1,251 - 1,500 |
| 251 - 500 | 1,501 - 1,750 |
| 501 - 750 | 1,751 - 2,000 |
| 751 - 1,000 | 2,001 - 2,250 |
| 1,001 - 1,250 | |

0 10 20
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited
Gebauer & Associates Ltd.

Figure 3.2: Caribou Density along the AWAR, and Vault and Whale Tail Haul Roads in Spring and Summer 2019

Meadowbank Gold Project

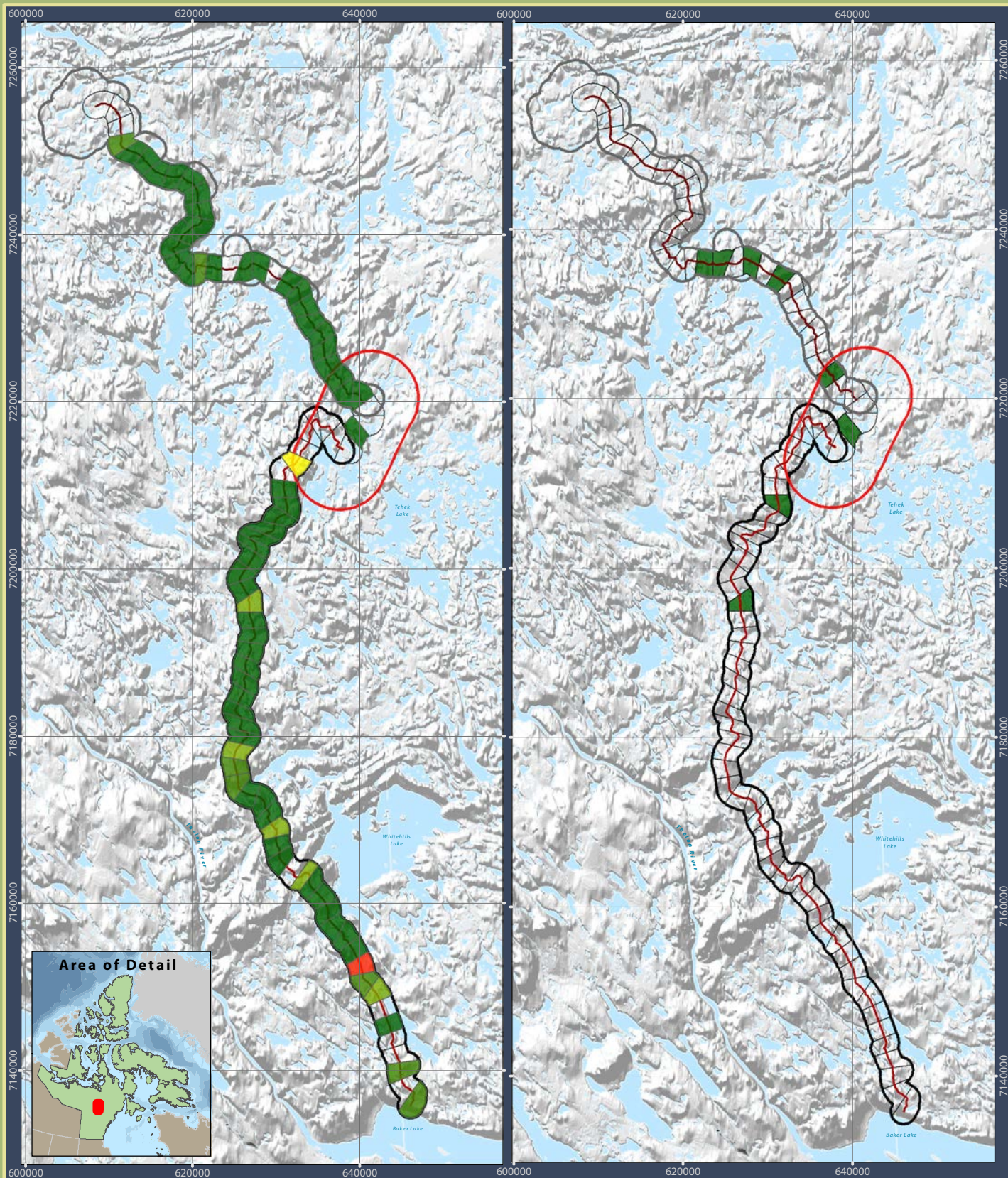
Prepared for:

AGNICO EAGLE

By:

Nunavut
ENVIRONMENTAL
CONSULTING LTD

CASLYS
CONSULTING



Legend

- All-Weather Access Road
 - Whale Tail Haul Road
 - Whale Tail Pit and Haul
 - Road Local Study Area (LSA)
 - Meadowbank Local Study Area (LSA)
 - Meadowbank All-Weather Access Road Local Study Area (LSA)
- | Caribou Density (per km) | |
|--|---|
| 0 - 250 | 1,251 - 1,500 |
| 251 - 500 | 1,501 - 1,750 |
| 501 - 750 | 1,751 - 2,000 |
| 751 - 1,000 | 2,001 - 2,250 |
| 1,001 - 1,250 | |

0 10 20
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited
Gebauer & Associates Ltd.

Figure 3.3: Caribou Density along the AWAR, and Vault and Whale Tail Haul Roads in Fall and Winter 2019

Meadowbank Gold Project

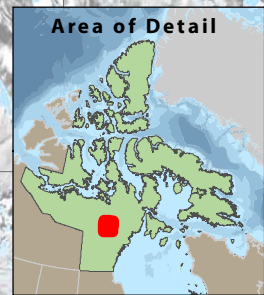
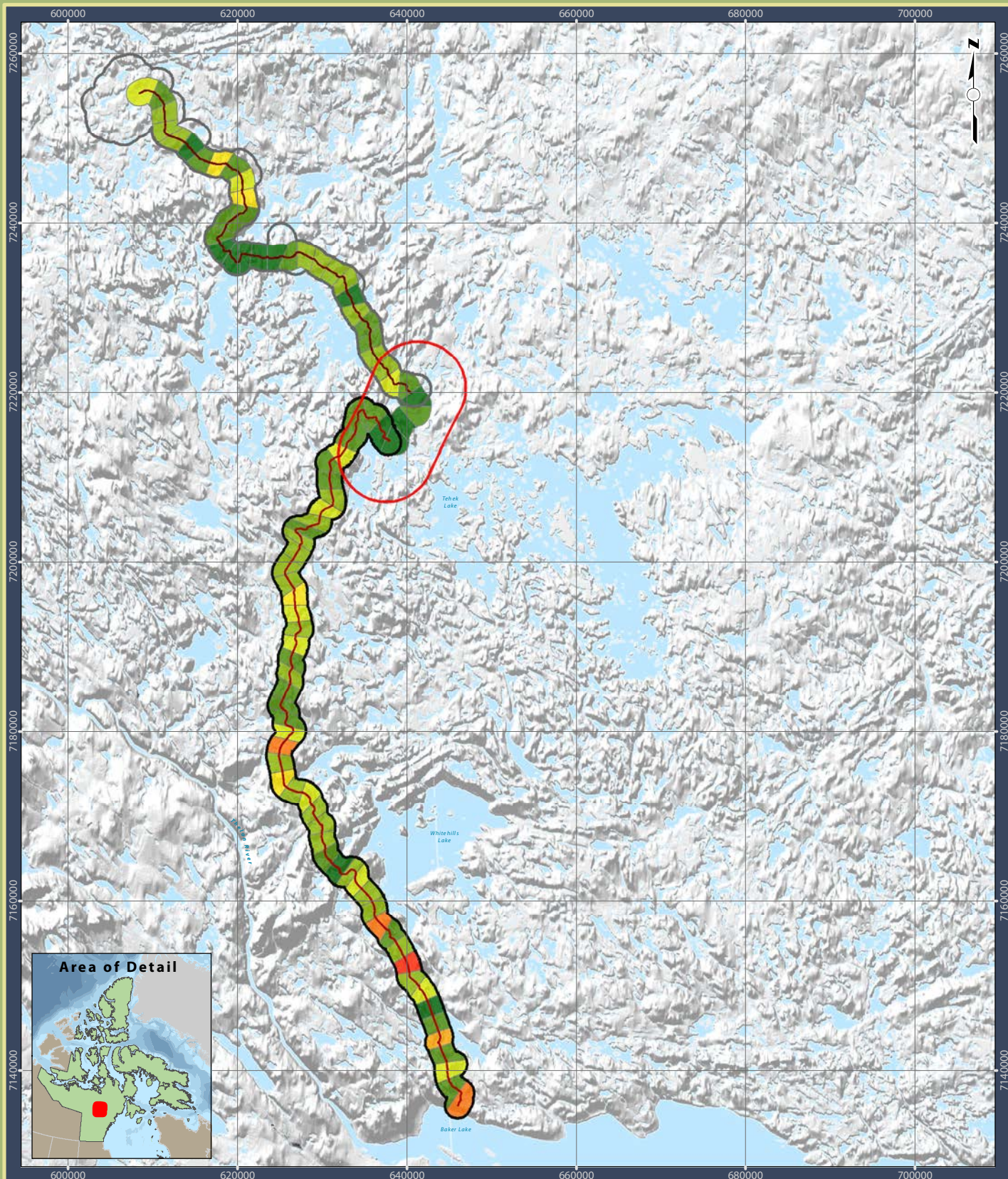
Prepared for:

AGNICO EAGLE

By:

Nunavut
ENVIRONMENTAL
CONSULTING LTD

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CONSULTING

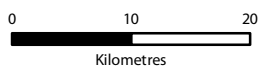


Legend

- All-Weather Access Road
- Whale Tail Haul Road
- Whale Tail Pit and Haul Road Local Study Area (LSA)
- Meadowbank Local Study Area (LSA)
- Meadowbank All-Weather Access Road Local Study Area (LSA)

Caribou Density (per km)

- 129 - 500
- 501 - 1,000
- 1,001 - 1,500
- 1,501 - 2,000
- 2,001 - 2,500
- 2,501 - 3,000
- 3,001 - 3,500
- 3,501 - 4,000



Projection: UTM Zone 14 NAD83

Data Sources:
 Natural Resources Canada, GeoBase®
 National Topographic Database
 Agnico-Eagle Mines Limited
 Gebauer & Associates Ltd.

Figure 3.4: Caribou Density along the AWAR, and Vault and Whale Tail Haul Roads between 2008 and 2019

Meadowbank Gold Project

Prepared for:



By:



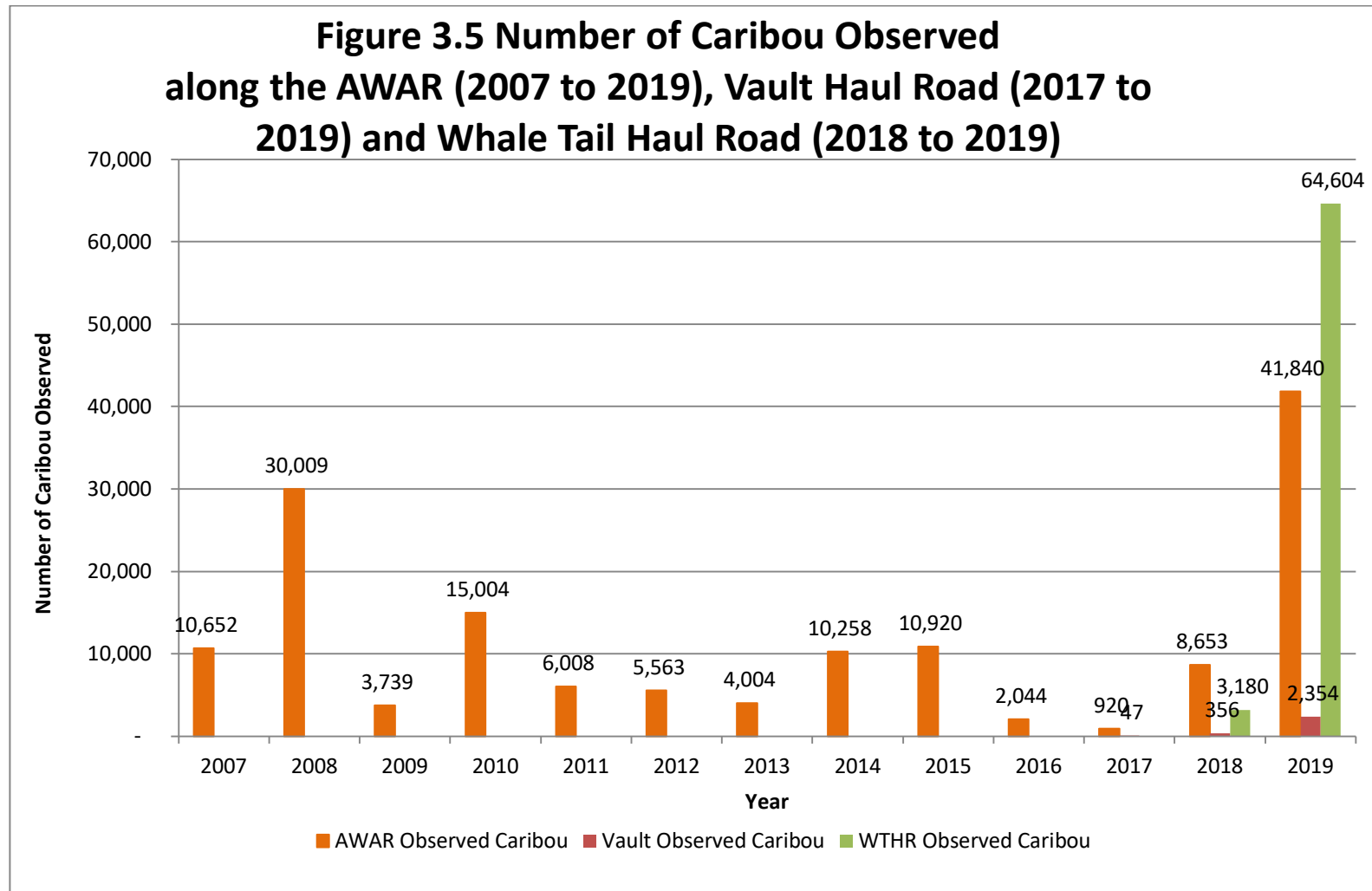


Table 3.3: Average Number of Caribou Observed Per Survey Trip along the AWAR from 2007 to 2019.

Month	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average
January	0	14.3	12.0	5.3	3.0	5.1	0	3.2	5.8	3.7	8.0	6.4	0	51
February	0	11.5	10.7	4.1	1.0	5.3	68.1	10.5	7.0	2.3	0	12.3	0	11.1
March	11.4	11.4	16.7	6.7	6.0	6.0	39.8	10.5	14.4	6.0	3.5	14.4	6.0	11.8
April	14.0	12.7	11.4	10.8	34.0	15.2	0	27.2	22.4	23.8	4.0	51.4	77.6	23.4
May	15.4	12.1	13.0	18.0	25.3	14.2	11.0	8.4	14.1	13.2	0	27.7	22.8	15.0
June	7.1	3.5	8.2	9.0	12.5	3.1	5.3	1.5	6.3	6.9	1.0	12.3	5.7	6.3
July	1.5	13.3	0	1.1	1.0	0	0	0	2.0	0	0	1.0	1.0	1.6
August	1.1	5.4	3.6	5.6	63.0	1.0	1.0	1.0	3.0	2.7	3.4	23.4	1.3	8.9
September	10.8	12.5	8.5	4.8	10.3	1.0	6.5	33.1	12.3	3.3	5.3	23.7	1.0	10.2
October	18.4	44.3	25.4	197.2	71.6	60.0	6.0	101.8	41.5	73.0	63.3	38.8	145.8	68.2
November	72.4	90.7	13.0	106.0	2.3	116.5	455.2	48.4	148.9	2.0	12.6	40.6	79.0	91.4
December	18.4	10.3	11.0	7.9	7.8	169.7	16.8	17.6	275.0	15.7	5.4	1.0	4.0	43.1

Data show the average number of Caribou observed for a month of the year, including data from all surveys done that month. Data are based on the observed number, which might be more inaccurate for larger groups or groups that are further away.

Table 3.4: Average Number of Caribou Observed Per Survey Trip along the Vault Haul Road from 2017 to 2019.

Month	2017	2018	2019
January	0	0	0
February	5	2	0
March	9	5	89.2
April	5	46.3	27.9
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	3	77	0
October	0	10	0
November	6	0	0
December	0	0	0

Data show the average number of caribou observed for a month of the year, including data from all surveys done that month. Data are based on the observed number, which might be more inaccurate for larger groups or groups that are further away.

Table 3.5: Details of Whale Tail Haul Road Surveys in 2018 and 2019.

Season	Number of Whale Tail Haul Road Surveys	
	2018	2019
Spring (April to May)	1	42
Summer (June to July)	1	38
Fall (August to September)	3	41
Winter (Jan to Mar, Oct to Dec)	36	21
Year End Total	41	142
Duration	Apr 19 to Dec 30	Jan 08 to Dec 23
Average Frequency of Surveys (over duration)	8.9 days	2.6 days

* Frequency refers to the number of days between surveys, on average over the year

Table 3.6: Average Number of Caribou Observed Per Survey Trip along the Whale Tail Haul Road in 2018 and 2019.

Month	2018	2019
January	0	4.0
February	0	0
March	0	4.0
April	120.4	80.0
May	0	119.2
June	0	7.5
July	8.4	1.5
August	0	45.0
September	15.2	3.0
October	104.7	75.9
November	18.3	3.7
December	13.5	8.3

Data show the average number of caribou observed for a month of the year, including data from all surveys done that month. Data are based on the observed number, which might be more inaccurate for larger groups or groups that are further away

Cumulative Caribou density along the Whale Tail Haul Road for 2019 is provided in **Figure 3.1** (all seasons), **Figure 3.2** (spring and summer Caribou seasons), and **Figure 3.3** (fall and winter). In the 2019 spring Caribou Season, high Caribou densities were observed along the entire Whale Tail Haul Road but particularly closer to the Whale Tail Mine, while in the summer, densities were much lower and spread along the Haul Road (see **Figure 3.2**). In the fall Caribou season, reported densities were generally low along the length of the Whale Tail Haul Road, while densities in winter were very low (see **Figure 3.3**).

The 2019 Caribou occurrence data were added to the 2018 dataset with the resulting cumulative Caribou numbers presented in **Figure 3.4**. These data illustrate that for the two years of the surveys, the highest cumulative Caribou abundances along the Whale Tail Haul Road are north of the Vault and closer to the Whale Tail Mine site.

In 2019, Caribou numbers recorded on Whale Tail surveys were significantly higher than in 2017 or 2018 (**Figure 3.5**). The average number of Caribou observed per survey trip in May and August was the highest since surveys began indicating a strong spring and late summer migration through the study area (**Table 3.6**).

3.6.4 Traffic Data and Caribou Movements

Monthly traffic data for the AWAR and Whale Tail Haul Road is provided in **Table 3.7** while a chart depicting the changes in total number of vehicle movements is provided in **Figure 3.6**. **Table 3.7** and **Figure 3.6** clearly show lower numbers of vehicle movements during periods when Caribou numbers along the roads were the highest, which reflects the adaptive management efforts (e.g., road closures) when Caribou were observed along the roads. High numbers of Caribou along the Whale Tail Road in April and May (see **Table 3.6**) correspond with fewer vehicle movements (**Figure 3.6**), while high numbers of Caribou along the AWAR in October through December (**Table 3.3**) also correspond with fewer vehicle movements.

Table 3.7: Monthly Traffic Data for the Meadowbank AWAR and Whale Tail Haul Road in 2019.

	Meadowbank All-weather Access Road				Whale Tail Haul Road			
Date (2019)	Haul	Medium Equipment	Light Equipment	Total	Haul	Medium Equipment	Light Equipment	Total
January	0	740	1272	2012	632	92	140	864
February	0	818	1195	2013	762	241	735	1738
March	0	822	1252	2074	760	115	627	1502
April	8	772	1534	2314	148	107	232	487
May	911	1289	1973	4173	522	164	565	1251
June	337	1460	1860	3657	828	187	642	1657
July	33	1909	1529	3471	686	227	353	1266
August	12	2101	1516	3629	1176	169	178	1523
September	4	1947	1641	3592	2958	287	911	4156
October	14	1276	1084	2374	1280	276	448	2004
November	0	1212	1037	2249	2928	496	863	4287
December	0	855	684	1539	2778	318	584	3680
Total	1319	15201	16577	33097	15458	2679	6278	24415

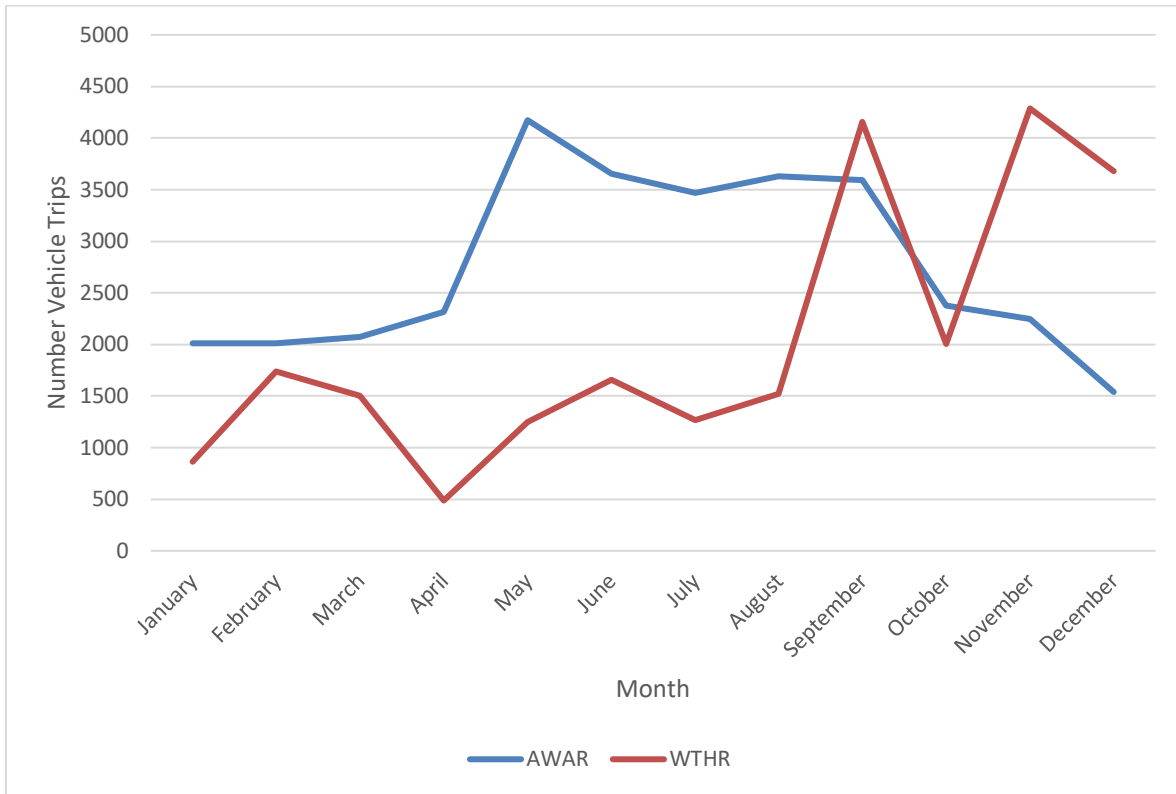


Figure 3.6: Monthly Traffic Data along the AWAR and Whale Tail Haul Roads in 2019.

3.6.5 Wildlife Species Encountered on Road Surveys

Mammal species identified and observed during AWAR, Vault Haul Road, and Whale Tail Haul Road surveys in 2019 are included in **Table 3.8**.

2019 WILDLIFE MONITORING SUMMARY

Table 3.8: Wildlife Species Observed during AWAR, Vault Haul Road, and Whale Tail Haul Road Surveys in 2019.

Common Name	Scientific Name
Mammals	
Arctic Fox	<i>Vulpes lagopus</i>
Arctic Ground Squirrel	<i>Spermophilus parryii</i>
Arctic Hare	<i>Lepus arcticus</i>
Caribou	<i>Rangifer tarandus</i>
Grizzly Bear	<i>Ursus arctos</i>
Muskox	<i>Ovibos moschatus</i>
Wolf	<i>Canis lupus</i>
Wolverine	<i>Gulo gulo</i>
Birds	
American Golden-Plover	<i>Pluvialis dominica</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Cackling Goose	<i>Branta hutchinsii</i>
Canada Goose	<i>Branta canadensis</i>
Common Loon	<i>Gavia immer</i>
Common Raven	<i>Corvus corax</i>
Duck sp.	<i>Anas</i> sp. or <i>Clangula</i> sp.
Dunlin	<i>Calidris alpina</i>
Glaucous Gull	<i>Larus hyperboreas</i>
Goose sp.	<i>Branta</i> sp. or <i>Chen</i> sp.
Green-winged Teal	<i>Anas crecca</i>
Gull sp.	<i>Larus</i> sp.
Herring Gull	<i>Larus argentatus</i>
Iceland Gull	<i>Larus glaucoides</i>
Lapland Longspur	<i>Calcarius lapponicus</i>
Long-tailed Duck	<i>Clangula hyemalis</i>
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>
Loon sp.	<i>Gavia</i> sp.
Northern Pintail	<i>Anas acuta</i>
Owl sp.	<i>Asio flammeus</i> or <i>Bubo scandiacus</i>
Parasitic Jaeger	<i>Stercorarius parasiticus</i>

2019 WILDLIFE MONITORING SUMMARY

Table 3.8: Continued.

Common Name	Scientific Name
Birds	
Ptarmigan sp.	<i>Lagopus</i> sp.
Raptor sp.	<i>Buteo</i> sp., <i>Falco</i> sp, or <i>Haliaeetus</i> sp.
Red-throated Loon	<i>Gavia stellata</i>
Rock Ptarmigan	<i>Lagopus muta</i>
Rough-legged Hawk	<i>Buteo lagopus</i>
Ross's Goose	<i>Chen rossii</i>
Sandhill Crane	<i>Grus canadensis</i>
Semipalmated Plover	<i>Charadrius semipalmatus</i>
Semipalmated Sandpiper	<i>Calidris pusilla</i>
Short-eared Owl	<i>Asio flammeus</i>
Snow Goose	<i>Anser caerulescens</i>
Snowy Owl	<i>Bubo scandiacus</i>

3.6.6 Road-related Mitigation

Collar location maps were instrumental in assessing the need for increased road monitoring. As the number of Caribou increased in some seasons, Caribou location maps were requested on a daily basis. Road-related mitigation related to Caribou presence in 2019 resulted in a high number of road closures and a corresponding reduction in total vehicle movements (see **Section 3.6.4**). In some seasons with high numbers of Caribou, road closures were increased to a daily basis or vehicle movements were severely restricted (e.g., light vehicles only, daily ride and convoy, etc.). In many cases, the daily ride (e.g., crew changes, food deliveries, etc.) or an occasional convoy were escorted by Environment staff in collaboration with the Baker Lake HTO wildlife monitor, which had the training to decide whether vehicles could continue along the road when Caribou were sighted. When necessary, Environment staff stopped convoys to let Caribou pass and, in at least one case, vehicles were turned back after encountering Caribou. In some cases, lower speed limits were set.

As in previous years, the security department assisted the Environment department in preventing wildlife incidences along the AWAR, Vault Haul Road, and Whale Tail Haul Road by dispatching regular wildlife warnings based on observation and monitoring data. The road supervisors and operators also ensured protection of wildlife by assisting in surveillance and closing roads as needed (see **Appendix C**). Radio notices reminding operators of the appropriate speed limit were made frequently by dispatchers. During Caribou peak migration, notices were sent to all road occupants (**Appendix C**), regulatory agencies, local groups and wildlife consultants were notified, and road survey efforts were increased to every two days. A summary of Caribou and Muskox activity and road closure notices for each of the three primary road segments is provided below.

Meadowbank AWAR

Significant movements of Caribou occurred along the Meadowbank AWAR from approximately mid-April to mid-May and from late October through November in 2019, resulted in multiple closures (see **Table 3.9** and **Appendix C**). Traffic on the Meadowbank AWAR was restricted for 27 days during the spring Caribou season and 15 days during the fall Caribou season for a total of 42 days (**Table 3.9**). No road closures were required due to the presence of Muskox herds.

Table 3.9: Summary of Road Restrictions Related to Ungulate Activity Along the Meadowbank All-Weather Access Road in 2019.

Date of Closure	Date Reopened	Cause	Comments
Spring Caribou Season (01 April to 25 May)			
06 Apr	07 Apr	Caribou	Closed at 17:00 to all traffic; Environment staff to reassess in the morning
07 Apr	08 Apr	Caribou	Open during the morning; 1 load of fuel brought then closed for the night
08 Apr	09 Apr	Caribou	Open for 1 convoy of fuel tankers and daily ride; closed for the night
09 Apr	closed	Caribou	Closed at 19:00 to all traffic
10 Apr	closed	Caribou	Closed; convoy daily ride
11 Apr	closed	Caribou	Closed; convoy daily ride
12 Apr	closed	Caribou	Closed; convoy daily ride
13 Apr	closed	Caribou	Closed; convoy 1 fuel tanker to KM 23
14 Apr	closed	Caribou	Closed
15 Apr	closed	Caribou	Closed; convoy for fuel tankers to Meadowbank and back to Baker Lake
16 Apr	closed	Caribou	Closed; convoy daily ride turned around at KM 65 due to Caribou
17 Apr	closed	Caribou	Closed; convoy for daily ride and fuel tankers to Meadowbank
18 Apr	closed	Caribou	Closed; daily ride cancelled
19 Apr	closed	Caribou	Closed; convoy daily ride and fuel tankers to Amaruq after discussion with KIA and HTO
20 Apr	closed	Caribou	Closed; convoy fuel tankers from Amaruq o Baker Lake
21 Apr	closed	Caribou	Closed
22 Apr	closed	Caribou	Closed
23 Apr	closed	Caribou	Closed; convoy daily ride

Table 3.9: Continued.

Date of Closure	Date Reopened	Cause	Comments
Spring Caribou Season (01 April to 25 May)			
24 Apr	closed	Caribou	Closed; convoy daily ride
25 Apr	closed	Caribou	Closed; convoy daily ride and fuel tankers
26 Apr	closed	Caribou	Closed; convoy daily ride
27 Apr	closed	Caribou	Closed; convoy with operators and fuel tankers
28 Apr	closed	Caribou	Closed; convoy with emulsion trucks, equipment and fuel tankers
29 Apr	closed	Caribou	Closed
30 Apr	01 May	Caribou	Closed; convoy operators and fuel tankers
01 May	01 May	Weather	Reopening authorized by Environment staff (fewer Caribou); closed for weather in the morning; reopened in the afternoon after snow removal
04 May	05 May	Caribou	Closed; convoy daily ride and fuel tankers
09 May	10 May	Caribou	Closed; Environment staff to reassess in the morning
11 May	13 May	Weather	Closed
15 May	16 May	Weather	Closed; slippery conditions; E&I to escort daily ride
Fall Caribou Season (22 September to 15 December)			
26 Oct	closed	Caribou	Closed at 18:00 due to Caribou presence close to Baker Lake; road crew to maintain the road; no convoy
27 Oct	closed	Caribou	Closed; Caribou close to Baker Lake; road crew to maintain the road; no convoy
28 Oct	closed	Caribou	Closed; road crew to maintain the road; no convoy
29 Oct	closed	Caribou	Closed; road crew to maintain the road; no convoy; daily ride
30 Oct	closed	Caribou	Closed; road crew to maintain the road; no convoy; daily ride
31 Oct	closed	Caribou	Closed; road crew to maintain the road; no convoy; daily ride
01 Nov	closed	Caribou	Closed; convoy organised (tankers and tractor trailer); daily ride
02 Nov	closed	Caribou	Closed; convoy organised (tankers)
03 Nov	closed	Caribou	Closed; convoy organised (tankers)
04 Nov	closed	Caribou	Closed; convoy organised.
05 Nov	05 Nov	Caribou	Reopening authorized by Environment staff and HTO monitor
18 Nov	closed	Caribou	Closed at 19:00; reopened at 12:00 on November 20 th for light vehicle

Table 3.9: Continued.

Date of Closure	Date Reopened	Cause	Comments
Fall Caribou Season (22 September to 15 December)			
19 Nov	closed	Caribou	Closed
20 Nov	closed	Caribou	Closed in afternoon due to Caribou.
21 Nov	21 Nov	Caribou	Closed; convoy organised in morning (daily ride and convoy); road open to all traffic at noon
29 Nov	29 Nov	Weather	

Vault Haul Road

Significant movements of Caribou from approximately mid-April to mid-May 2019 along the Vault Haul Road resulted in several closures (see **Table 3.10** and **Appendix C**). Traffic on the Vault Haul Road was restricted for eight (8) days during the Spring Caribou Season (**Table 3.10**).

Table 3.10: Summary of Road Restrictions Related to Ungulate Activity Along the Vault Haul Road in 2019.

Date of Closure	Date Reopened	Cause	Comments
Spring Caribou Season (01 April to 25 May)			
10 Apr	11 Apr	Caribou	Closed at 18:00 for the night.
11 Apr	12 Apr	Caribou	Closed for the night; reopened at 10:30
15 Apr	15 Apr	Caribou	Closed for 2 hours; Caribou near the Amaruq entrance
16 Apr	17 Apr	Caribou	Closed from 22:00 until 05:00 due to Caribou near the Amaruq entrance
17 Apr	17 Apr	Caribou	Closed from 18:00 until 20:00 due to Caribou near the Amaruq entrance
22 Apr	23 Apr	Caribou	Closed from 18:00
20 May	21 May	Caribou	Closed from 06:00
24 May	24 May	Caribou	Closed from 07:00 to 10:30

Whale Tail Haul Road

Significant movements of Caribou from approximately mid-April to late-May 2019, mid- to late August, and early to mid-October along the Whale Tail Haul Road resulted in multiple closures (see **Table 3.11** and **Appendix C**). Traffic on the Whale Tail Haul Road was restricted for 34 days during the Spring Caribou Season, 11 days during the Summer Caribou Season, and 15 days during the Fall Caribou Season for a total of 60 days (**Table 3.11**).

Table 3.11: Summary of Road Restrictions Related to Ungulate Activity Along the Whale Tail Haul Road in 2019.

Date of Closure	Date Reopened	Cause	Comments
Spring Caribou Season (01 April to 25 May)			
08 Apr	09 Apr	Caribou	Closed at 18:00 for night shift
09 Apr	10 Apr	Caribou	Closed at 18:00 for night shift
10 Apr	closed	Caribou	Closed at 14:30; 1 convoy done from Amaruq to Meadowbank
11 Apr	closed	Caribou	Closed; convoy for daily ride
12 Apr	closed	Caribou	Closed; convoy for daily ride
13 Apr	closed	Caribou	Closed; convoy for vacuum truck from Amaruq to Meadowbank
14 Apr	closed	Caribou	Closed
15 Apr	closed	Caribou	Closed; convoy for daily ride and heavy equipment
16 Apr	closed	Caribou	Closed; convoy for daily ride
17 Apr	closed	Caribou	Closed; convoy for daily ride
18 Apr	closed	Caribou	Closed; convoy for daily ride cancelled
19 Apr	closed	Caribou	Closed; convoy for daily ride and tankers
20 Apr	closed	Caribou	Closed; convoy for empty tankers (Amaruq to Baker Lake)
21 Apr	closed	Caribou	Closed
22 Apr	closed	Caribou	Closed; convoy for daily ride
23 Apr	closed	Caribou	Closed; convoy for daily ride
24 Apr	closed	Caribou	Closed; convoy for daily ride
25 Apr	closed	Caribou	Closed; convoy for daily ride and fuel tankers (6)
26 Apr	closed	Caribou	Closed; convoy for daily ride and empty fuel tanker
27 Apr	closed	Caribou	Closed; convoy of cargo and supplies
28 Apr	closed	Caribou	Closed; no convoy, just HOL and WLS
28 Apr	closed	Caribou	Blast canceled at 12:45; postponed at 18:30 after the situation was assessed

Table 3.11: Continued.

Date of Closure	Date Reopened	Cause	Comments
Spring Caribou Season (01 April to 25 May)			
29 Apr	closed	Caribou	Closed; convoy for daily ride
30 Apr	closed	Caribou	Closed; convoy for daily ride and fuel tanker escorted in the afternoon to Amarug
01 May	closed	Caribou	Closed; convoy for daily ride and fuel tanker escorted back to Meadowbank
02 May	closed	Caribou	Closed; convoy for daily ride
03 May	closed	Caribou	Closed; convoy for daily ride
04 May	closed	Caribou	Closed; convoy for daily ride
05 May	closed	Caribou	Closed; big convoy from Meadowbank (Jeff from KIA)
06 May	closed	Caribou	Closed; convoy for daily ride
09 May	10 May	Caribou	Closed; convoy for daily ride
18 May	19 May	Caribou	Closed; convoy for daily ride; reopened 13:00 on 19 May
20 May	21 May	Caribou	Closed; convoy for daily ride
24 May	24 May	Caribou	Closed from 07:00 to 10:30
Summer Caribou Season (26 May to 21 September)			
16 Aug	17 Aug	Caribou	Closed from 17:30 for the night; road reopened at 08:00
18 Aug	18 Aug	Caribou	Closed from 08:00; road reopened at 13:00
21 Aug	closed	Caribou	Closed at 4pm on the 21st Convoy for the daily ride.
22 Aug	closed	Caribou	Closed all day; convoy organized for the daily ride
23 Aug	closed	Caribou	Closed all day; convoy organized for the daily ride
24 Aug	closed	Caribou	Closed all day; convoy organized for the daily ride
25 Aug	closed	Caribou	Closed all day; convoy organized for the daily ride
26 Aug	closed	Caribou	Closed all day; convoy organized for the daily ride
27 Aug	closed	Caribou	Closed all day; convoy organized for the daily ride, tractor trailer, fuel truck, roll-off and food truck
28 Aug	closed	Caribou	Closed all day; convoy organized for the daily ride, tractor trailer, 3 fuel trucks, 2 Dyno trucks, tow haul and food truck
29 Aug	29 Aug	Caribou	Open only for the light vehicle during day and reopened at 19:30

Table 3.11: Continued.

Date of Closure	Date Reopened	Cause	Comments
Fall Caribou Season (22 September to 15 December)			
01 Oct	closed	Caribou	Closed all day; convoy for daily ride and food truck
02 Oct	closed	Caribou	Closed all day; convoy for daily ride and food truck
03 Oct	closed	Caribou	Closed all day; convoy for daily ride and food truck
04 Oct	closed	Caribou	Closed all day; convoy for daily ride, food truck, vacuum truck, and Dyno truck
05 Oct	closed	Caribou	Closed all day; convoy for food truck
06 Oct	closed	Caribou	Closed all day; convoy for food truck
07 Oct	closed	Caribou	Closed all day; convoy for daily ride and food truck
08 Oct	closed	Caribou	Closed all day; convoy for daily ride and food truck
09 Oct	closed	Caribou	Closed all day; convoy for daily ride and food truck
10 Oct	closed	Caribou	Closed all day; convoy for daily ride and food truck
11 Oct	closed	Caribou	Closed all day; convoy for daily ride and food truck
12 Oct	closed	Caribou	Closed all day; convoy for food truck, Dyno truck, tow haul, and 6 pickups
13 Oct	closed	Caribou	Closed all day; convoy for food truck, tractor trailer, and tanker
14 Oct	closed	Caribou	Closed all day; convoy for daily ride and food truck,
15 Oct	15 Oct	Caribou	Closed all day; convoy for daily ride and food truck; reopened at 12:00 with speed restriction

3.6.7 Caribou Responses to Mitigation

The number and frequency of road surveys in 2019 demonstrate Agnico Eagle's commitment to avoiding impacts to Caribou from the AWAR, Vault Haul Road, and Whale Tail Haul Road. Mitigation measures such as reduced speeds and multiple road closures appear to be minimizing road-related effects including mortality and restricted caribou passage. Incidental sightings in 2019 (see **Appendix E**) and the road survey data (**Appendices A** and **B**) showed that Caribou crossed roads during April and May, and July through November (see **Table 3.12**), which was supported by collar data (**Section 6.6**). A total of 1,542 individual Caribou were observed crossing along the Meadowbank AWAR while 1,696 individuals were observed crossing along the Whale Tail Haul Road. Caribou movement patterns continue to require close monitoring and analysis in 2020.

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Table 3.12: Observations of Caribou Crossing Mine Roads in 2019.

Date	Number	Location	Notes
Meadowbank AWAR and Mine Site, and Vault Haul Road			
17 April	100	KM 69	Crossing the road (Appendix E)
22 April	10	KM 92	Crossing the road (Appendix E)
23 May	6	Diversion ditch near tailings	Crossing the road (Appendix E)
26 May	10	Exploration Camp	Crossing the road (Appendix E)
18 July	1	KM 74	Crossing the road (Appendix E)
10 August	1	KM 113, Vault Haul Road	Crossing the road (Appendix E)
21 August	1	Marginal Y, Mine Site	Crossing the road (Appendix E)
09 October	100	Vault Haul Road	Crossing the road (Appendix E)
22 October	10	AWAR	Crossing the road (Appendix E)
01 November	150	KM 53	Crossing the road (Appendix E)
02 November	200	KM 19	Crossing the road (Appendix E)
02 November	300	KM 50	Crossing Road (Appendix A)
03 November	400	KM 53	Crossing the road (Appendix E)
04 November	52	KM 52	Crossing the road (Appendix E)
11 November	180	KM 113, Vault Haul Road	Crossed the road South bound (Appendix A)
17 November	21	KM 33	Crossed East to West (Appendix A)
Total	1,542		
Whale Tail Haul Road			
12 April	11	KM 123	Crossing road (Appendix B)
12 April	100	KM 121	Crossing road (Appendix B)
12 April	20	KM 123	Crossing road (Appendix B)
14 April	17	KM 138	Crossing road (Appendix B)
14 April	50	KM 136	Crossing road (Appendix B)
15 April	12	KM 126	Crossed (Appendix B)
19 April	8	Not Indicated	Crossing the road (Appendix E)
19 April	3	Not Indicated	Crossing the road (Appendix E)
20 April	30	Not Indicated	Crossing the road (Appendix E)
02 May	100	Not Indicated	Crossing the road (Appendix B and E)
02 May	500	Not Indicated	Crossing the road (Appendix B and E)
03 May	100	Not Indicated	Crossing the road (Appendix B and E)
26 May	7	KM 124	Crossing the road (Appendix E)
27 May	7	KM 124	Crossing the road (Appendix E)
03 July	20	KM 126	Crossing the road (Appendix E)

Table 3.12: Continued.

Date	Number	Location	Notes
Whale Tail Haul Road			
12 July	1	KM 133	Crossing the road (Appendix E)
12 July	1	KM 133	Crossing the road (Appendix E)
15 July	2	KM 140	Crossing the road (Appendix E)
16 July	1	KM 127	Crossing the road (Appendix E)
17 July	1	KM 169	Crossing the road (Appendix E)
17 July	1	KM 133	Crossing the road (Appendix E)
18 July	1	KM 171	Crossing the road (Appendix E)
19 July	1	KM 141	Crossing the road (Appendix E)
21 July	1	KM 145	Crossing the road (Appendix E)
21 July	1	KM 145	Crossing the road (Appendix E)
23 July	1	KM 131	Crossing the road (Appendix E)
14 August	1	KM 155	Crossing the road (Appendix E)
14 August	1	KM 168	Crossing the road (Appendix E)
15 August	1	KM 123	Crossing the road (Appendix E)
15 August	1	KM 154	Crossing the road (Appendix E)
23 August	50	KM 168	Crossing the road (Appendix E)
24 August	1	Not Indicated	Crossing the road (Appendix E)
24 August	200	Not Indicated	Crossing the road (Appendix E)
26 August	11	KM 169	Crossing (Appendix B)
26 August	1	KM 126	Crossing (Appendix B)
26 August	1	KM 170	Crossing (Appendix B)
27 August	3	KM 141	Crossing the road (Appendix E)
27 August	2	KM 167	Crossing the road (Appendix E)
06 September	3	Not Indicated	Crossing the road (Appendix B and E)
22 September	8	KM 142	Crossing the road (Appendix E)
22 September	30	KM 139	Crossing the road (Appendix E)
09 October	100	KM 172	Crossing the road (Appendix E)
09 October	75	KM 150	Crossing the road (Appendix E)
11 October	200	KM 172	Crossing the road (Appendix E)
22 October	10	Not Indicated	Crossing the road (Appendix E)
Total	1,696		

3.6.8 Road-related Wildlife Mortality

The following wildlife mortalities, associated with the Meadowbank AWAR, Vault Haul Road, and Whale Tail Haul Road were recorded in 2019 (**Table 3.13**; see reports in **Appendices A, B and D**). No Caribou mortality was associated with the AWAR, Vault Haul Road, and Whale Tail Haul Road in 2019. Cumulative road-related mortality data are provided in **Table 3.14**. Upon discovery of any unreported roadkill remains, environment staff and/or road supervisors reminded employees of road rules and the need to enforce these rules. All employees were informed that wildlife have a right of way at all times, and that they should stop vehicles and wait for wildlife to cross the road.

Table 3.13: Wildlife Mortalities Related to the Meadowbank AWAR, Vault Haul Road, and Whale Tail Haul Road and Non-Mine Related Mortalities in 2019.

Date	Species	Count	Mine Related	Location	Comments
28 Feb	Arctic Hare	1	Yes	Meadowbank AWAR KM 46	Presumably killed by a vehicle
13 Jul	Arctic Hare	1	Yes	Meadowbank AWAR KM 50	Reported by road dispatch; presumably killed by a vehicle
23 Jul	Ptarmigan	1	Yes	Whale Tail Haul Road KM 161	Presumably killed by a vehicle
03 Sep	Sik Sik	1	Yes	Whale Tail Haul Road KM 116	Presumably killed by a vehicle
11 Oct	Arctic Hare	1	Yes	Meadowbank AWAR	Reported on road survey; presumably killed by a vehicle
04 Nov	Arctic Fox	1	Yes	Whale Tail Haul Road KM 135	Driver documented carcass but Environment staff did not find; presumably killed by a vehicle (see Appendix D)
15 Nov	Caribou	1	No	Meadowbank AWAR KM 94	Carcass was ~50 m E of the road; a wolf was observed on the ground close to the carcass (see Appendix D); presumably killed by wolves

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Table 3.14: Summary of Road-related Wildlife Fatality Records (2007 to 2019).

Year	Caribou	Grizzly Bear	Wolverine	Wolf	Fox	Small Mammals	Small Birds	Unidentified Small Animal
AWAR and Vault Haul Road								
2007	3 ¹	0	0	0	0	3	3	0
2008	10 ²	0	0	2	13	7	17	0
2009	1 ³	0	0	0	1	6	2	0
2010	1	0	0	0	2	6	2	0
2011	2 ³	0	0	1	0	5	4	0
2012	2 ⁴	0	1	0	0	3	1	0
2013	5	0	0	0	1	1	1	0
2014	0	0	0	0	0	0	0	0
2015	0	0	0	0	1	4	2	1
2016	0	0	0	0	2	0	1	0
2017	0	0	0	0	5	3	3	0
2018	0	0	0	0	0	2	0	0
2019	0	0	0	0	0	3	0	0
Whale Tail Haul Road								
2018	0	0	0	0	0	2	0	0
2019	0	0	0	0	1	1	1	0

¹ Two confirmed roadkill cases; ² Two apparent roadkill cases; ³ Cause of death unconfirmed; ⁴ One cause of death unknown

3.7 ACCURACY OF IMPACT PREDICTIONS

Table 3.15 provides a summary of the impact predictions identified in the TEMP (Agnico Eagle 2019). The 2019 AWAR, Vault Haul Road, and Whale Tail Haul Road survey data were compared to the impact prediction thresholds to evaluate adherence to the impact predictions and the provision of adaptive management, as either a necessary or proactive measure. None of the thresholds were exceeded in 2019 (**Table 3.15**).

3.8 MANAGEMENT RECOMMENDATIONS

The AWAR, Vault Haul Road, and Whale Tail Haul Road survey data are important for documenting time periods when the area near the road is utilized by various wildlife species and for evaluating the need, if any, for implementing adaptive management (e.g., temporary road closures and radio announcements). Moreover, Caribou density can be compared graphically across years, which can be used to track changes in density and preferential migration corridors. The road sections with higher use are prioritized for temporary road closures, speed reductions or additional adaptive management strategies. The road survey data are used in conjunction with satellite-collaring and mortality data to successfully manage road operations during heavy wildlife use periods.

Table 3.15: Accuracy of Impact Predictions – Sensory Disturbance and Mortality along the AWAR, Vault Haul Road, and Whale Tail Haul Road in 2019.

Potential Effect	Threshold	Threshold Exceeded (2019)	Adaptive Management Implemented	Status
Sensory Disturbance	No threshold but Decisions Trees followed when Caribou are seen near mine facilities	NA	YES. Multiple road closures and notices. Use of Decision Tree for Management and Monitoring.	AWAR, Vault Haul Road, and Whale Tail Haul Road surveys Satellite-collaring data
Project-related Mortality	Caribou or Muskoxen will not be killed or injured by vehicle collisions. Threshold level of mortality is two (2) individuals per year.	NO	NO	AWAR, Vault Haul Road, and Whale Tail Haul Road surveys Satellite-collaring data surveys
Project-related Mortality	Predatory mammals (i.e., Grizzly Bear, Wolverine, Wolf) will not be killed or injured by vehicle collisions. Threshold level of mortality is two (2) individuals per year.	NO	NO	AWAR, Vault Haul Road, and Whale Tail Haul Road surveys Security surveys
Project-related Mortality	Raptors or Waterbirds will not be killed along project roads. Threshold is one (1) individual due to vehicle collision per year.	NO	NO	AWAR, Vault Haul Road, and Whale Tail Haul Road surveys