Via Email

Mr. Mason Mantla
Chair
Wek'èezhìı Land and Water Board
1-4905 48 STREET
YELLOWKNIFE NT X1A 3S3

May 31, 2024

Dear Mr. Mantla:

Submission of the Water Licence (W2020L8-0001) Annual Report 2023 for the Tłı̨chǫ Highway (Tłı̨chǫ All-Season Road).

The Government of the Northwest Territories' Department of Infrastructure (GNWT-INF) is pleased to submit the attached Tłı̨chǫ Highway Type A Water Licence (WL) Annual Report 2023 for WL W2020L8-0001, which was issued by the Wek'èezhìı Land and Water Board on November 19, 2020. The WL Annual Report 2023 was prepared in compliance with Part B, Condition 14 and Schedule 1, Part B, Conditions 1, 2 and 3 of the WL. This report includes information on Operations and Maintenance-related activities from January 1 to December 31, 2023. NorthStar Infrastructure, GNWT-INF, and GNWT Environment and Climate Change contributed to the report.

In accordance with Part B, Condition 23 and Schedule 1, Part B, Condition 1, Item P of the Water Licence W2020L8-0001, where necessary, summaries of activities used as sources of information for Traditional Knowledge have been included in the Annual Report.

Should you have any questions or concerns please contact me at (867) 767-9086 ext. 31117 or by email at Ziaur_Rahman@gov.nt.ca at your earliest convenience.

Sincerely,

Ziaur Rahman
Manager, Surface Design and Construction
Department of Infrastructure

c. Ms. Bertha Rabesca-Zoe, Tłı̨chǫ Executive Officer
Tłı̨chǫ Government

Document Name: 2023 Water Licence W2020L8-0001 Annual Report	0	61
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Dave Green – Sr. Project Environmental Manager

Signature :  Date : 2024-05-31

Table 1-1: Document Revision History

REVISION	REASON FOR ISSUE	REVISION DATE	DESCRIPTION OF REVISION
0	IFR	2024-05-14	Issued for review

Table 1-2: Document Approval

NAME		SIGNATURE	DATE
Prepared by:	Dave Green, R.T.Bio, R.B.Tech		2024-05-14
Reviewed by: **Environmental Manager**	Caroline Walmsley, R.B.Tech		2024-05-15
Project Manager Approval **Approved by:**	Devon Stephenson		2024-05-16

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GLOSSARY AND ACRONYMS

ASR	All Season Road
CDC	Career Development Coordinator
CCL	Community Coordinator Lead
CWG	Community Working Group
DFO	Department of Fisheries and Ocean Canada
EMPs	Environmental Management Plans
GNWT	Government of Northwest Territories
GNWT -ECC	Government of Northwest Territories – Department of Environment and Climate Change
GNWT-INF	Government of Northwest Territories – Department of Infrastructure
NSMA	North Slave Metis Alliance
RoW	Right-of-way
SAR	Species at Risk
SCP	Spill Contingency Plan
TASR	Tłı̨chǫ̨ All Season Road
TG	Tłı̨chǫ̨ Government
TH	Tłı̨chǫ̨ Highway
WLWB	Wek'èezhìı Land and Water Board
WMP	Water Monitoring Plan
WMMP	Wildlife Management and Monitoring Plan
WRRB	Wek'èezhìı Renewable Resource Board
YKDFN	Yellowknives Dene First Nation

1. INTRODUCTION

Peter Kiewit Sons (ULC) was retained by the Government of the Northwest Territories (GNWT) to construct the Tłı̨chǫ All Season Road (TASR), also known as the Tłı̨chǫ Highway (Highway #9), which is a 97km long, two-lane gravel road connecting KM 196 along Highway 3 near Behchokǫ̀ to the community government boundary of Whatì in the Northwest Territories (see Figure 1-1). Additionally. North Star Infrastructure has been awarded the Operations and Maintenance contract for a 25-year period which began after the opening of the road in November of 2021.

To satisfy reporting requirements outlined in Water License W2020L8-0001 issued October 5, 2020 and amended in June 2023 (replacing W2016L8-0001), Schedule 1, Part B, Condition 14 an annual report will include, but not be limited to:

(i) Measuring and Reporting on Water and Waste

(ii) Management Plan Activities

(iii) Spills and Unauthorized Discharges

(iv) Other Reporting Requirements

(v) Wildlife Management and Monitoring

This report has been structured to clearly summarize the above noted environmental requirements/conditions as well as elements of the applicable Component Environmental Management Plans that were conducted and observed during the Operations and Maintenance period between January 1, 2023 and December 31, 2023.

REV.	DATE	DESCRIPTION / REVISION	AUTH. BY
0	2018.06.25	DRAFT	SJT

Northwest Territories Transportation

NORTH STAR INFRASTRUCTURE

TLICHO ALL SEASON ROAD (TASR)

KEY PLAN

DATE	SCALE (HALF SIZE)	DRAWING No.	SHEET
2019.07.08	N/A	H355788-20-260-SEG0-0101	1 OF 1

DOC: H355788-60-260-SEG0-0101 KEY-101

2. MEASURES AND REPORTING ON WATER AND WASTE

2.1. CALIBRATION AND STATUS OF METERS

Schedule 1- Part B, Condition 1(a): No meters were used during 2023 that required calibration or maintenance. As was the case during the construction of the Tłı̨chǫ Highway, no flow meters or gauges were utilized to track water quantities in 2023. Rather, truck load counts were used to document consumptive water use. These water withdrawal load count records were provided to the Environmental Manager at the end of each day where they were entered into an Excel spreadsheet for tracking and compliance purposes.

2.2. MONTHLY AND ANNUAL WATER QUANTITIES

Schedule 1 - Part C, Condition 1(b): The following tables provides details of the water volumes (m3) that were withdrawn from all approved water sources in 2023.

As outlined in the Type A Water License W2020L8-0001, the WLWB set various requirements for GNWT-INF to comply with to withdraw water and minimize the impact to the environment. The following Conditions were adhered to when withdrawing water for use during project construction:

- The licensee may withdraw up to 299 m^3/day of Water from the sources outlined on Part C, Condition 6, with the exception of the Water use outlined in Part C, Condition 2
- The Licensee may withdraw up to 900 m^3/day of Water for the purpose of calcium chloride application for dust suppression, up to a maximum of 14 consecutive days per year. Water for this purpose may be withdrawn from the following sources: the James River, Whatìdee (LaMartre River), Duport River and Peanut Lake.
- During the application of calcium chloride for dust suppression, as outlined in Part C, Condition 3, no more than a total of 4000 m^3 of Water may be withdrawn from Whatìdee in a given year.
- In any single year, the Licensee shall not withdraw greater than 10% of the available Water volume of any Water Source.
- In any single ice-covered season, the Licensee shall not withdraw greater than 10% of the available Water volume of any Water Source, as calculated using the appropriate maximum expected ice thickness.
- The Licensee shall not withdraw greater than 10% of instantaneous flow.
- Prior to locating a water intake in a fish-bearing watercourse, the Licensee shall obtain written authorization for the location from an Inspector.
- The licensee shall maintain the Water intake(s) with an approved screen to prevent impingement or entrainment of fish.

The monthly and annual quantities of water withdrawn from approved water sources is provided in Table 2-1. The consumptive use of water was only for the purposes of dust suppression including the annual application of calcium chloride. Water volumes extracted from approved sources were tracked and reported (see Appendix A). A breakdown of June daily water withdrawal volumes is detailed below in Figure 2-1 to demonstrate that no exceedance of the allowable limit (900 m^3/per day) and a total of 4000 m^3/year occurred during the 2023 reporting period. It should be noted that while NSI did prepare for and intend to withdraw from multiple water sources during basic dust suppression and the application of calcium chloride, the operational approach to calcium chloride application led to all water withdrawals coming from the LaMartre River.

During the 2023 reporting period, standing ditch water was infrequently used for dust suppression whenever possible to adhere to the Land Use Permit (W2016E0004) condition 26(1)(*f*) to control or prevent ponding of water, flooding, erosion, slides and subsidence of land while simultaneously reducing the volume of water

required from natural sources. All extraction locations within the ditch lines were inspected and approved by the Environmental Department to ensure that there were no impacts to adjacent watercourses, lakes or ponds.

Table 2-1: Monthly and Annual Water Quantities extracted from approved water sources

WATER QUANTITIES EXTRACTED FROM APPROVED WATER SOURCES IN METERS CUBED FOR CONSUMPTIVE PURPOSES													
Source	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Annual Total Volume (m^3)**
LaMartre River	-	-	-	-	140	1,303	-	-	-	-	-	-	1,956
Duport River	-	-	-	-	-	-	-	-	-	-	-	-	0
James River	-	-	-	-	-	-	-	-	-	-	-	-	0

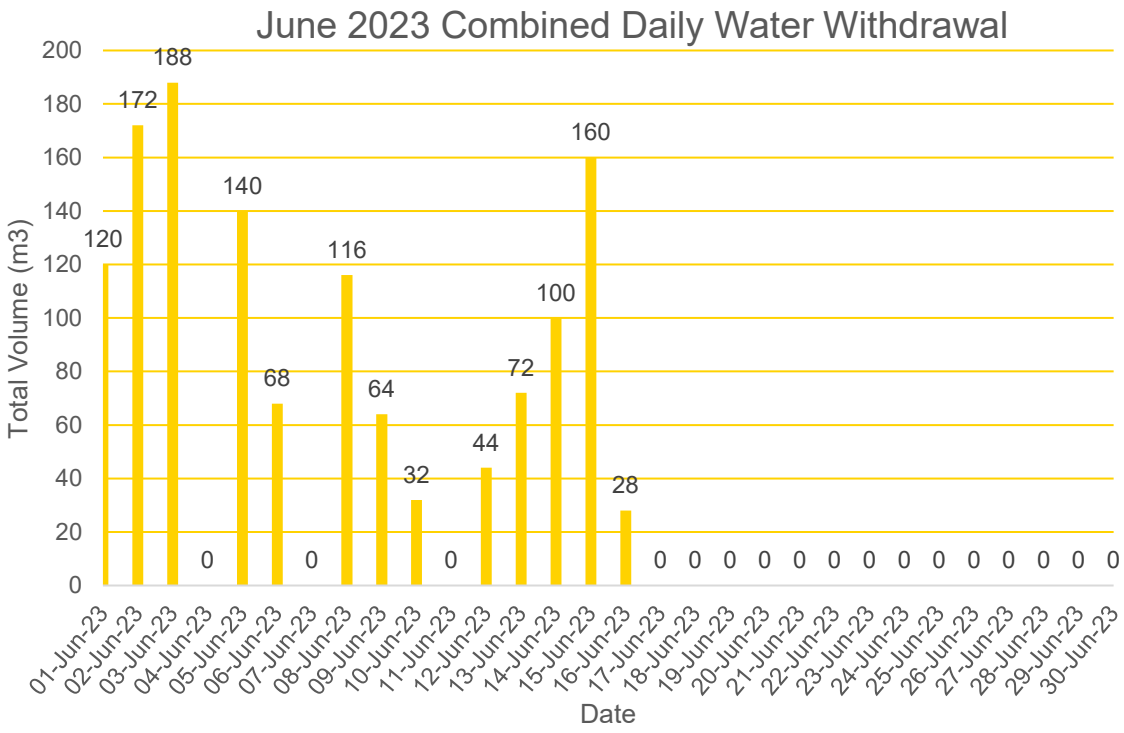

Figure 2-1: June 2023 Duport, James, and LaMartre Rivers Combined Water Withdrawal Volumes

3. WASTE STREAM MANAGEMENT AND QUANTITIES

The Waste Management Plan (Revision 1.3) developed for the TASR project was drafted to guide site personnel on the waste management goals, objectives and procedures to follow during construction and ultimately operation of the road. Adherence to the plan ensures the protection of the environment as well as aesthetic and land use values, ultimately meeting the regulatory requirements for the project. During the Operations and Maintenance phase, the plan requires the segregation of various waste streams and provides direction on how each of the streams should be managed and ultimately disposed of. As part of the Water License reporting requirements these waste streams are to be segregated and reported. The following sections detail the segregated waste streams (by type) generated during the reporting period.

3.1. TOTAL SOLID WASTE

Schedule 1 - Part B, Condition 1(c): Figure 3-1 shows the overall solid waste generated for the year 2023 during the Tłı̨chǫ Highway operations and maintenance program. The graph below illustrates the waste generated from all waste streams which are not associated with hazardous waste or sewage. These waste streams currently being landfilled have been characterized as solid mixed waste (including domestic) and construction and demolition waste. A total of 5.02 MT of all solid waste was generated or collected during the 2023 reporting period. Quantities for each of the waste stream applicable to Operations and Maintenance that is classified as solid waste are discussed in more detail below:

Figure 3-1: 2023 Monthly Construction Waste Quantities

3.2. SOLID MIXED WASTE

Schedule 1 - Part B, Condition 1(c): Figure 3-2 illustrates the mixed solid (including domestic) waste generated during the Operation and Maintenance of the Tłı̨chǫ Highway during the 2023 reporting period. A total of 0.6 MT of mixed solid waste was generated or collected during the 2023 reporting period. The primary source of domestic and mixed waste was from the office facilities and from the garbage collected from the roadside pull outs.

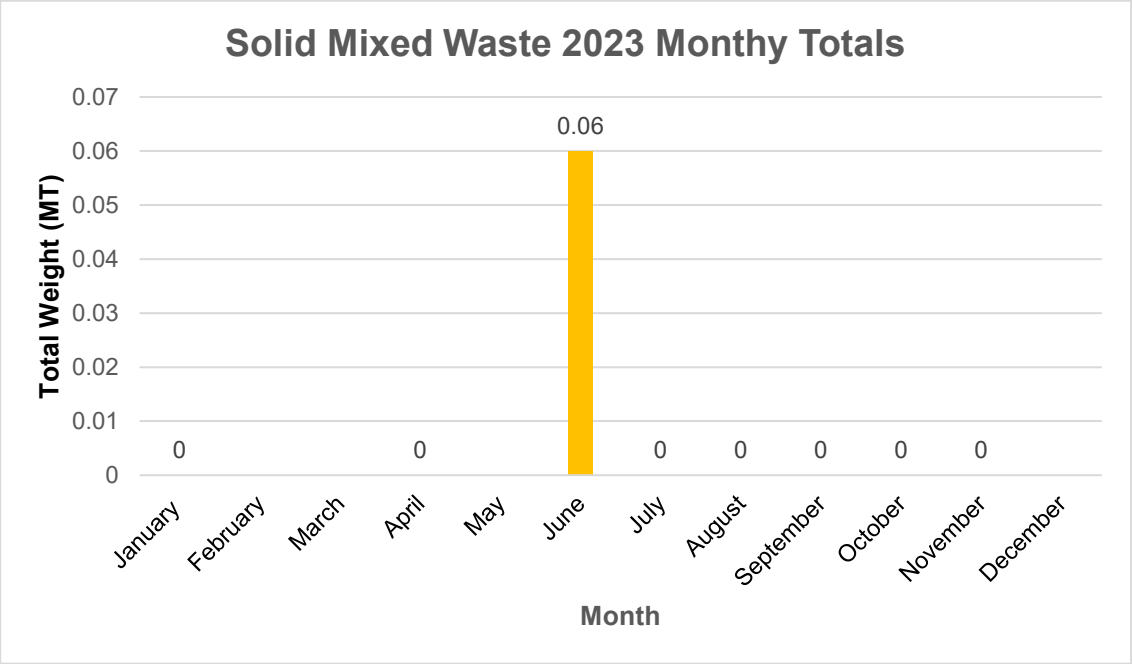

Figure 3-2: 2023 Monthly Solid Mixed Waste Quantities

3.3. CONSTRUCTION WASTE

Schedule 1 - Part B, Condition 1(c): Please refer to Figure 3-1 which illustrates the overall construction waste generated during the operation and maintenance of the Tłı̨chǫ Highway during the 2023 reporting period. A total of 4.96 MT of construction waste was generated or collected during the 2023 reporting period.

3.4. WOOD WASTE

Schedule 1 - Part B, Condition 1(c): No wood waste was generated during the Operations and Maintenance of the Tłı̨chǫ Highway during 2023.

3.5. RECYCLING

Schedule 1 - Part B, Condition 1(c): There was no hauling of recycled material from the Tłı̨chǫ Highway during 2023. The extremely small quantities of recyclable materials (plastics, cans, paper) were managed internally with this material being taken to Yellowknife as required.

3.6. HAZARDOUS WASTE

Schedule 1 - Part B, Condition 1(c): Figure 3-3 confirms that very little 4,500 kg hazardous waste was generated during the 2023 Operations and Maintenance program. All hazardous waste generated during the 2023 reporting period was collected by KBL Environmental Ltd, a registered hazardous waste carrier. The waste was transported and disposed at their approved facility for treatment/disposal.

Figure 3-3: 2023 Hazardous Waste Quantities

3.7. SEWAGE

Schedule 1 - Part B, Condition 1(c): Figure 3-5 shows the approximate volumes of sewage generated during the 2023 reporting period. Wastewater was collected by Kavanaugh Brothers and hauled to the sewage treatment facility in Yellowknife.

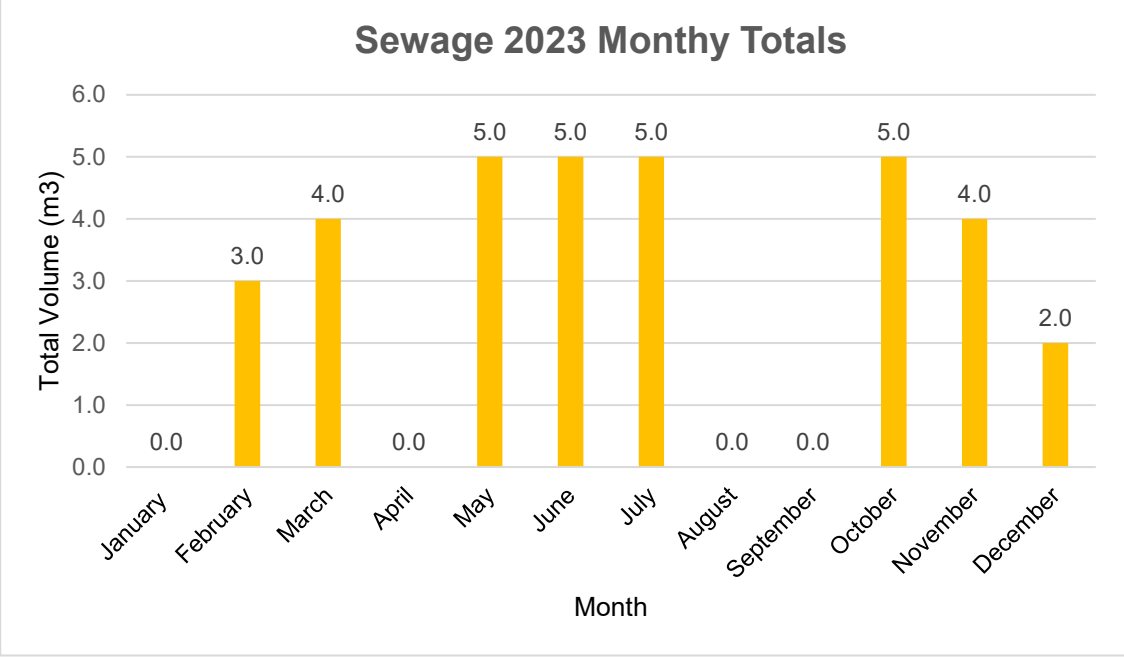

Figure 3-4: 2023 Sewage Monthly Quantities

3.8. WASTE MANAGEMENT METHODS

Schedule 1 - Part B, Condition 1(d), various waste streams are generated during the Maintenance and Operation of the Tłı̨chǫ Highway. It is essential that the waste is handled, stored and managed in a safe and environmentally responsible manner. The waste management program implemented during Operations and Maintenance of the Tłı̨chǫ Highway follows the principles of reducing the use of materials, reusing materials (whenever possible), recycling materials and recovering value from used materials. The management methods for each of the different waste streams that are generated on site are discussed in more detail below:

3.8.1. SOLID WASTE

The solid waste streams that are generated on site consist of:

- domestic waste,
- wood,
- metal,
- recyclables and
- construction waste

All the solid waste streams were stored in a designated location at Kilometer 19+800 (Maintenance Laydown) as outlined in Section 26 (1) Condition 57 of the Land Use Permit. Each waste stream is segregated and stored in 25 yd or 30 yd roll-off bins that are clearly labeled. The waste types are removed from site by Kavanaugh Brothers and offloaded at the City of Yellowknife Landfill or the recycle depot and Precision North Recycling (metal).

3.8.2. HAZARDOUS WASTE

Potentially hazardous waste generated at the site during Operations and Maintenance comes from various waste streams that under various categories including:

- Contaminated soils
- Waste oils
- Used oil filters
- Oily absorbent rags
- Contaminated plastic containers
- Antifreeze
- Solvents
- Batteries

These various hazardous waste streams are actively segregated and stored within the maintenance laydown area. All hazardous waste containers are covered from the elements and each container is clearly marked noting content and date of generation. The containers are inspected regularly to ensure waste is properly segregated and no leaks are detected in the containments. Secondary containment for storage containers is either integrated or supplemented externally and are also inspected and maintained to ensure effectiveness and maximum volume is available.

As noted in Section 3.0, the waste is removed from the laydown as requested by site and transported by KBL Environmental Ltd and Kavanaugh Brothers Ltd who are registered hazardous waste carriers. The waste is transported and disposed at their approved facility for treatment/disposal.

3.8.3. SEWAGE

The storage of sewage at the TASR project is primarily at the Maintenance Laydown or in porta-potties stationed throughout the sites if and when they are required. Sewage waste is removed by Kavanaugh Brothers on an as-needed basis. Sewage was hauled to the City of Yellowknife sewage treatment facility for treatment/disposal. As per **Schedule 1 - Part B, Condition 1(e)** the sewage generated on the TASR project are not sent to the local communities of Whatì and Behchokǫ̀ for disposal. Kiewit continued to use its established vendor to collect and dispose of the sewage generated from the project to the City of Yellowknife.

3.8.4. SOLID WASTE ACCEPTED BY LOCAL COMMUNITIES

Schedule 1 - Part B, Condition 1(e): The solid waste streams generated from the Tlicho Highway Operations and Maintenance are not sent to the local communities of Whatì and Behchokǫ̀ for disposal. Kiewit continued to use its established vendors to collect and dispose of the waste generated from the project to the City of Yellowknife.

3.9. WATER QUALITY AND ARD/ML TESTING

Schedule 1 - Part B, Condition 1(g): There are no water quality or acid rock drainage/metal leaching results arising from the operation and maintenance of the Tłı̨chǫ Highway.

3.10. SURVEILLANCE NETWORK PROGRAM

Schedule 1 - Part B, Condition 1(h): There has been no data or information collected during the operation and maintenance of the Tłı̨chǫ Highway during the reporting period.

4. MANAGEMENT PLAN AND ACTIVITIES

4.1. ENGAGEMENT

4.1.1. SUMMARY OF ENGAGEMENT ACTIVITIES

Schedule 1 - Part B, Condition 1(i): Throughout the reporting period, INF and NSI have conducted engagement on a variety of subjects with affected parties in accordance with the approved Engagement Plan. Engagement efforts have been centered around informing potentially affected parties of Water License cancellations and amendments. Additionally, NSI attends and contributes to the review and approval of management plans, collaboration on various plans as required by the Report of Environmental Assessment Measures, and the annual Tłı̨chǫ Highway Corridor Working Group meetings. Engagement methods have included written notification, telephone calls, face-to-face meetings, and workshops. Full details of the engagement undertaken can be found in Engagement Records found on the Wek'èezhìi Land and Water Boards website.

Face-to-face or virtual meetings and workshops that have taken place include:

- The Tłı̨chǫ Highway Corridor Working Group Meeting was on January 29, 2024, in the Behchokǫ̀. Representatives from organizations, departments and groups that attended the meeting included the YKDFN, NSMA, CGW, CGB, TG, WLWB, WRRB, GNWT-ECC, GNWT-FIN, ECE, DFO ECCC, and the GNWT-INF.
- Due to the 2023 evacuation order and its associated implications, the only meeting convened was on January 29, 2024 for the reporting period.
- NSI and GNWT-INF submitted a request and extended the Land Use Permit (LUP) W2016E0004 for two years. Affected parties were engaged through written notification between November 21 and December 11, 2023, with a follow-up on December 18-19, 2023. An engagement log was submitted with the LUP extension.

4.2. DETAILS OF WORK COMPLETED

Schedule 1 - Part B, Condition 1(j-k): The operations and maintenance of the Tłı̨chǫ Highway involves (as seasonally required):

- snow removal
- scarification of the road surface
- broadcasting winter grit
- cleaning and repairing/replacing signage and delineators
- collection of garbage from the roadside pullouts along with the right-of-way (RoW)
- managing debris arising from the collection of firewood and natural tree fall
- road grading and shoulder repairs
- loose material removal from bridge decks
- dust suppression activities including annual, calcium chloride application
- erosion and sediment control enhancements at Duport River crossing

4.3. MODIFICATIONS OR MAJOR MAINTENANCE WORK

Schedule 1 - Part B, Condition 1(l): The only major maintenance work that was completed during the reporting period was completed at the Duport River (Stations ~ 39+200 to 40+700). During the spring of 2023, evidence of erosion and sedimentation along with sediment controls reaching capacity at the river valley, necessitated enhanced erosion control measures and the creation/maintenance of sediment controls. A robust erosion and sediment control plan for the Duport River was presented to GNWT-DOL for review and upon acceptance of the plan proceeded to implement the changes. Unfortunately, the full erosion and sediment control enhancements were not fully completed prior to the onset of winter. However, critical enhancements were made and diligent monitoring during the melt period in the spring of 2024. Further details on this work can be found in Section 4.5 below.

4.4. CLOSURE AND RECLAMATION SUMMARY OF ACTIVITIES

Schedule 1 - Part B, Condition 1(m): All closure and reclamation activities were completed prior to the Tłı̨chǫ Highway opening in November of 2021. No activities occurred in 2023.

4.5. EROSION AND SEDIMENT PLAN ACTIVITY SUMMARY

Schedule 1 - Part B, Condition 1(n)(i): No updates or changes to the process or facilities required for the management of erosion and sedimentation occurred in 2023.

Schedule 1 - Part B, Condition 1(n)(ii): The back slopes of the ditch lines (east and west sides) on the south approach of Duport River showed evidence of localized erosion in 2023. This along with evidence of sedimentation, prompted the development of the ESC Enhancement Works at Duport River which has been described in greater detail below. It is important to note that the Tłı̨chǫ Highway culverts and structure crossings/approaches at James River and LaMartre River, along with road shoulders and slopes in the Highway RoW were all stable throughout 2023.

Schedule 1 - Part B, Condition 1(n)(iii): Erosion protection and some sediment control measures were implemented on the south approach to Duport River (east and west sides) during the late fall of 2023. These measures were implemented after erosion and sedimentation risks were noted in the spring of 2023. An ESC enhancement plan was developed in July of 2023 and submitted to GNWT-DOL for review and approval. ESC enhancement works began in October 2023 and continued until the onset of winter in the middle of November which halted the full execution of the plan. An update of the erosion and sediment control works was provided to GNWT-DOL in November of 2023 along with the commitment to diligently monitor freshet conditions in the spring of 2024 and to fully complete the erosion and sediment control improvements by the end of summer of 2024.

Figure 4-1: Looking south at slope preparation activities for installation of erosion control matting at ~Station 46+220

Figure 4-2: Looking south at the progression of erosion control matting installation on the east side south approach.

Figure 4-3: Looking south at the progression of erosion control matting installation on the west side, south approach to Duport River.

Figure 4-4: Looking north at ditch re-instatement work on the east side, south approach to Duport River.

Figure 4-5: Looking south at rock check dam installation on the east side, north approach to Duport River.

Figure 4-6: Drone view looking south at rock check dam features installed in late 2023.

Schedule 1 - Part B, Condition 1(n)(iv): As noted above, no assessment of performance of mitigation measures can be offered in 2023 as no work occurred.

Schedule 1 - Part B, Condition 1(n)(v): As noted above, no monitoring results were collected and therefore a summary/interpretation of results and Action Level exceedances cannot be provided in 2023.

Schedule 1 - Part B, Condition 1(n)(vi): As noted above, there were no Action Level exceedances and therefore no description can be offered for 2023.

5. WILDLIFE MANAGEMENT AND MONITORING PLAN

Schedule 1 - Part B, Condition 1(o): The following section reports on the GNWT's activities undertaken with respect to Measures 6-1, 6-2, 6-3, 7-1 and 7-2 of the Report of Environmental Assessment (REA).

5.1. MEASURES 6-1, PART 1: DEVELOP AND IMPLEMENT RANGE PLANS

Schedule 1 - Part B, Condition 1(o)(i-ii):

Please refer to section 5.6

5.2. TRADITIONAL KNOWLEDGE

Schedule 1 - Part B, Condition 1(o)(iii): Please refer to section 5.9. Additionally, and as part of the CWG meetings, TK is always sought. However, no TK was provided during the reporting period at those forums. However, during the CWG meetings in 2022, it was agreed that monitoring of Bison movement along the alignment should continue, and if the need arises, GNWT-INF/ECC will seek TK during formal engagement with the communities to manage Bison movement into the Whatì Community.

5.3. TŁĮCHǪ HARVESTERS AND METHODS TO MONITOR THE STATE OF BARREN-GROUND CARIBOU WINTER HABITAT

Please refer to Section 5.9 reporting on Measure 7-1.

5.4. TŁĮCHǪ GOVERNMENT MONITORING PROGRAM

Please refer to Section 5.9 reporting on Measure 7-1.

5.5. RECREATIONAL, TRADITIONAL, OR NON-TRADITIONAL ACTIVITIES

Timber harvesting:

In early 2022, timber cutting permits for personal use became available on the Tłı̨chǫ Highway. No commercial harvesting is allowed off the Tłı̨chǫ Highway. From KM 0-5, any timber cutting permit holder is permitted to harvest timber. No timber harvesting is permitted from KM 5-8. From KM 8-12, a limited number (40 at any one time) of permits are available to non-aboriginal harvesters with a 2-month expiry date from issue date, and a 5-cord limit. KM 8-75 are open to all indigenous people with a permit for timber harvesting. All areas past KM 75 require Tlicho Lands Authorization for timber harvesting. Timber cutting permit guidelines did not change in 2023. The GNWT passed a new Forest Act in October 2023, but regulations still need to be built to bring the Act into force.

Schedule 1 - Part B, Condition 1(o)(iv): No training sessions related to quarry operations were conducted in 2022 as all the pits and quarries had been closed prior to the Tłı̨chǫ Highway opening in November of 2021.

Schedule 1 - Part B, Condition 1(o)(v): In the WMMP, traffic levels were estimated at 20 to 40 vehicles per day, including potential traffic from a proposed mine north of Whatì. Monitoring and measuring changes in distribution and abundance of moose, bison, and caribou for up to five years after completion of road construction was required, and possibly longer if traffic levels increase substantially beyond predicted levels. If traffic levels averaged over a three-year period indicate a 100% increase (40-80 vehicles per day) above the predicted annual average (20-40 vehicles per day), or maximum daily traffic levels during sensitive periods exceed 200 vehicles per day, the need for extending or reinstating programs in the WMMP beyond the first five years of the operational phase of the road will be considered (WMMP 5.2.1).

Traffic Monitoring Results:

Traffic counter data from the TASR alignment (now Tłı̨chǫ Highway) are downloaded in the spring after the ground thaws, and data is then compiled for the previous year.

The Department of Infrastructure has two traffic counters on the Tłı̨chǫ Highway at KM 18 and KM 60. Daily traffic totals at those locations in 2022 and 2023 are shown in Figure 5-1. From January 1 to December 31, 2022, traffic at KM 18 averaged 37 vehicles per day (range 4-131 vehicles). During the same period, the traffic at KM 60 averaged 22 vehicles per day (range 3-82 vehicles). These traffic counts are of vehicles travelling in both directions.

From January 1 to December 31, 2023, traffic at KM 18 averaged 38 vehicles per day (range 8-96 vehicles). During the same period, the traffic at KM 60 averaged 20 vehicles per day (range 2-76 vehicles). These traffic counts are of vehicles travelling in both directions.

Higher daily traffic counts in late winter are associated with the open winter road to Gamètì and further on to Wekweètì, which continues northward from the Tłı̨chǫ Highway near Whatì. In 2022 the winter road to Gamètì opened February 16 and closed April 22, and the winter road to Wekweètì opened March 11 and closed April 22. In 2023, the winter road to Gamètì opened February 27 and closed April 13, and the winter road to Wekweètì opened March 20 and closed April 14 (Figure 5-2). Figure 5-3 shows the variation in monthly traffic in each year at KM 18 and KM 60.

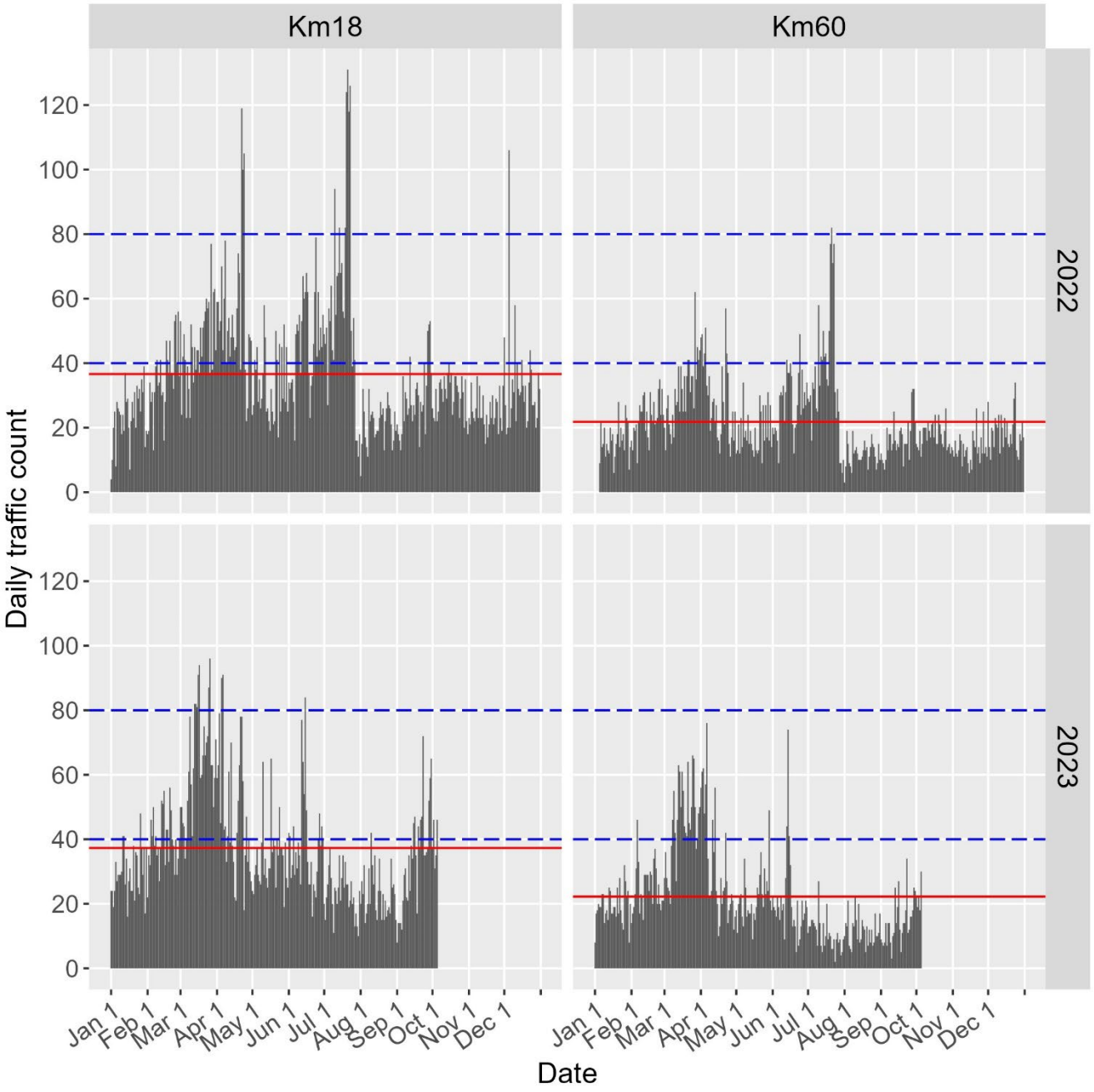

Figure 5-1. Daily traffic counts in 2022 and 2023, recorded at two Department of Infrastructure traffic counters on the Tłı̨chǫ Highway at KM 18 and KM 60. The red lines show the annual average daily traffic at each counter for each year (Jan1-Oct 5 only for 2023). The blue lines indicate the threshold of an annual average of 40-80 vehicles per day that would trigger the need to continue or reinstate wildlife monitoring programs under the Wildlife Monitoring and Management Plan.

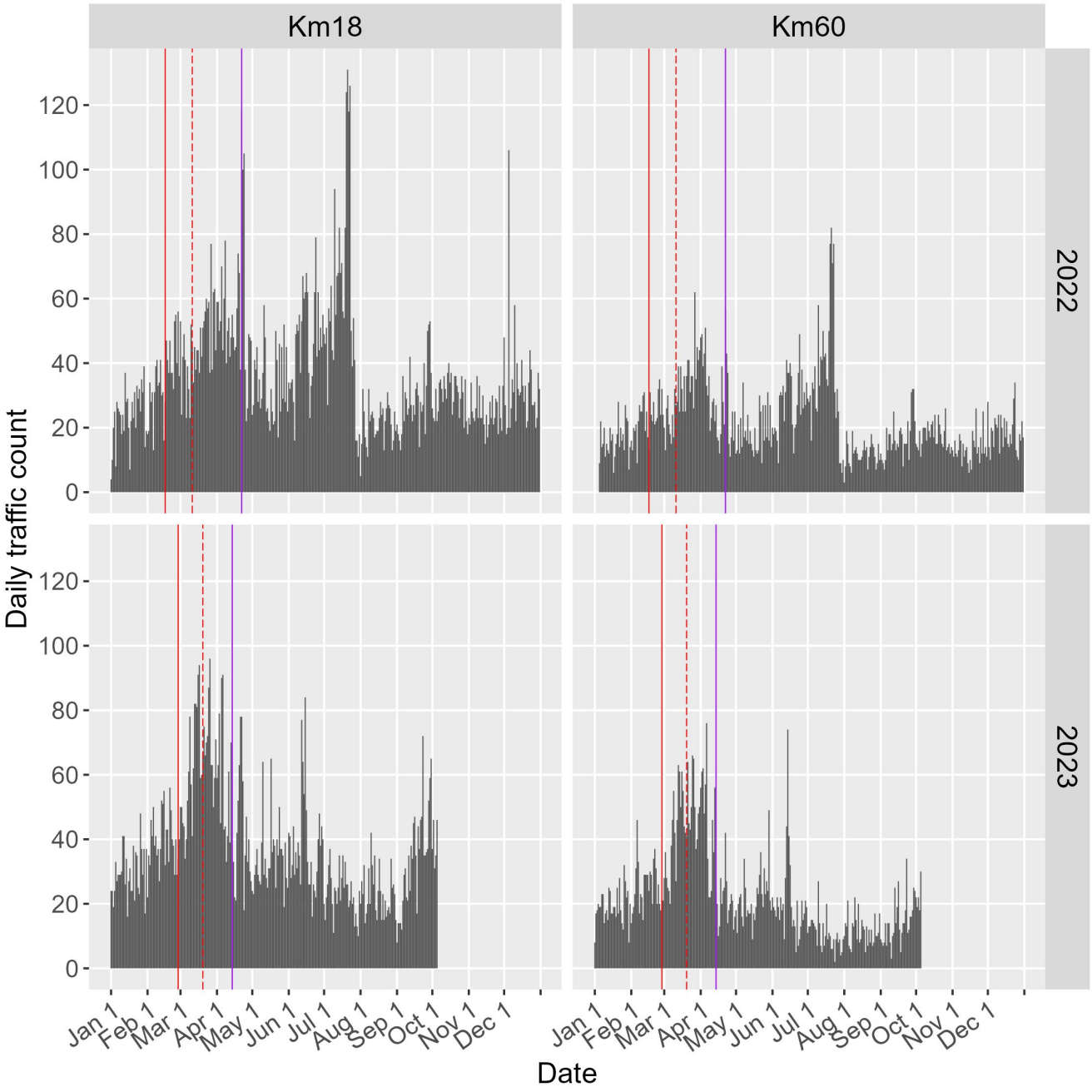

Figure 5-2. Daily traffic counts in 2022 and 2023, recorded at two Department of Infrastructure traffic counters on the Tłı̨chǫ Highway at KM 18 and KM 60, and the time period the winter road continuing north from the Tłı̨chǫ Highway was open for travel to Gamètì and Wekweètì. The solid red line indicates the Gamètì winter road open date, the dashed red line indicates the Wekweètì winter road open date, and the purple line indicates the close date of both winter roads each year.

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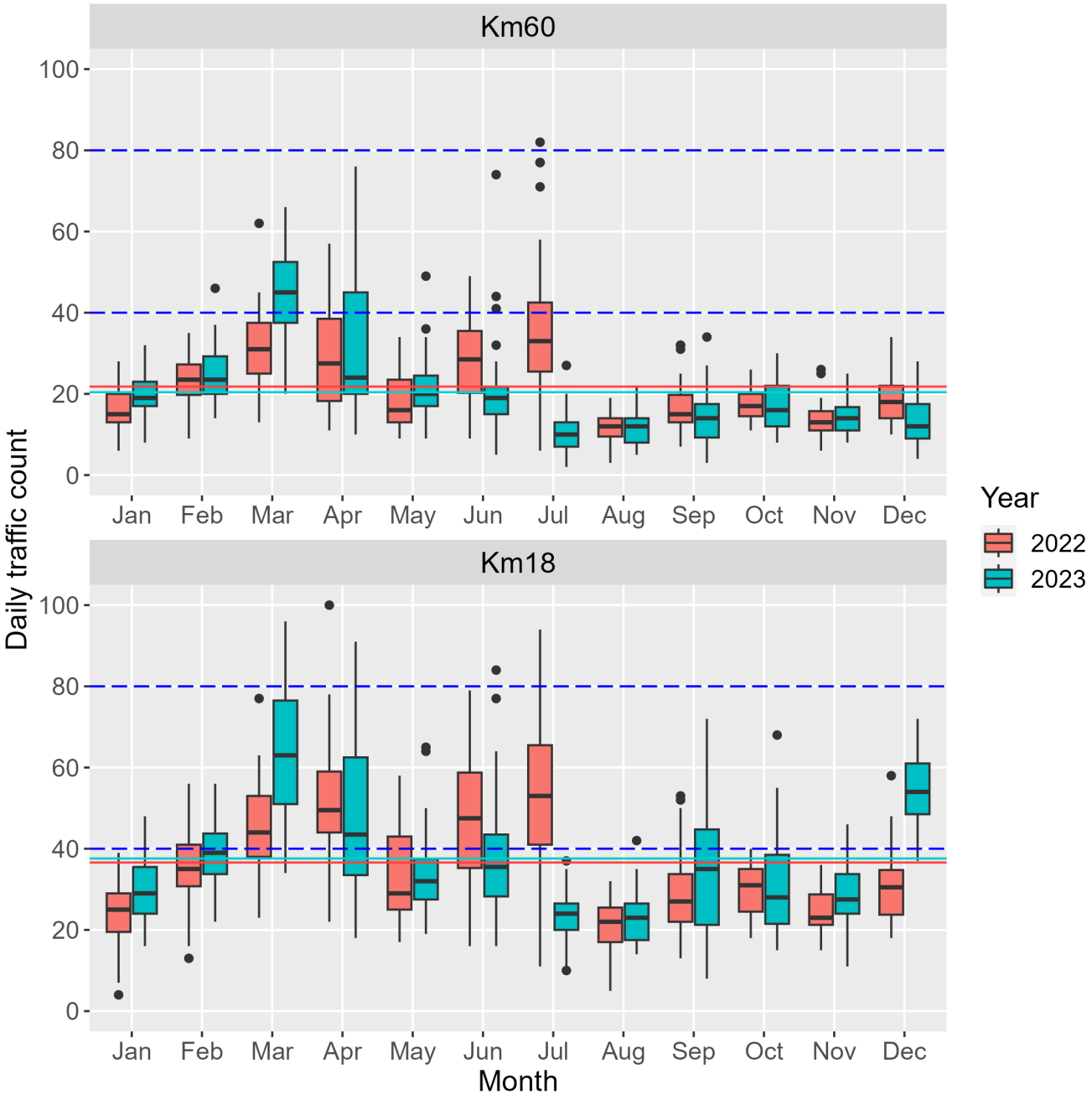

Figure 5-3. Box plots of daily traffic each month recorded at two Department of Infrastructure traffic counters on the Tłı̨chǫ Highway at KM 18 and KM 60. Each data point (coloured box) shows the monthly traffic at that location each year (2022 and 2023). The bottom and top of the box represents the 25th and 75th percentiles, the black line shows the median (middle) value, and the bars represent the 10th and 90th percentiles. Dotted blue lines indicate the threshold values (40-80 vehicles/day) indicating a 100% increase from predicted average daily traffic levels of 20-40 vehicles per day. Solid horizontal lines indicate the annual mean daily traffic at each location for each year (red for 2022; blue for 2023). Seven outliers of daily traffic in 2022 above 100 vehicles/day are not visible on the graph: 2 in April, 4 in July, 1 in December. Traffic did not exceed 100 vehicles/day in 2023.

Wek'èezhìi Boreal Caribou Range Plan:

Participants of the Wek'èezhìi range planning working group include the Wek'èezhìi Renewable Resources Board (WRRB), Tłı̨chǫ Government (TG), Yellowknives Dene First Nation (YKDFN), North Slave Métis Alliance (NSMA), Environment and Climate Change Canada (ECCC) and the GNWT departments of Environment and Climate Change, Industry, Tourism and Investment, Lands and Executive and Indigenous Affairs. A final draft of the interim Wek'èezhìı range plan was completed by the working group at the end of June 2021, and following a public review period, was approved by the WRRB on December 09, 2021. The final interim Wek'èezhìı range plan is available at:

https://www.enr.gov.nt.ca/en/interim-wekeezhii-boreal-caribou-range-plan-plan-provisoire-pour-laire-de-repartition-du-caribou

The working group continued to work in 2023 on completing the full Wek'èezhìı range plan. On February 23, 2023, the working group met to review the management class map options with the intention of selecting a consensus map, and to review items for consideration for the full Wek'èezhìı Boreal Caribou Range Plan such as triggers for an earlier 5-yr review of the range plan, and incomplete sections of the full range plan such as forecasting future habitat disturbances. The working group made revisions to the management class area boundaries to incorporate additional Traditional Knowledge presented at the December 2022 working group meeting.

5.6. MEASURE 6-1, PART 2: INFORMATION AND ADAPTIVE MANAGEMENT REQUIREMENTS:

a) Monitoring to determine population trends, abundance, and distribution [of boreal caribou]

Boreal Caribou Population Trend

ECC initiated a boreal caribou monitoring program in the North Slave region focused on the TASR corridor in March 2017, with the deployment of 20 GPS collars on adult female caribou. Additional collars were deployed in subsequent years to replace collars scheduled to drop off, any mortalities, any premature collar releases, and to bring the target sample size up to 30 collars. Five additional collars were deployed in March 2018, seven were deployed in March 2019, there were no deployments in 2020, and 23 were deployed in March 2021. The 2021 deployment was larger than typical because the collars deployed in 2017 were scheduled to drop off in March 2021. Ten collars were deployed in February 2022, and seven collars were deployed in February-March 2023. Six collars deployed in 2019 released as scheduled in March 2023 and were retrieved during the spring classification survey. There were 34 active collars in the TASR study area as of December 2023, with no collars scheduled to drop in early 2024. GNWT-ECC intends to maintain the number of collared females within the TASR (North Slave Tłı̨chǫ Highway) study area at 30 individuals annually for at least 5 years during the operational period of the road, to obtain more precise estimates of female survival. The current sample size is higher than 30 because 18 collars are scheduled to drop in April 2025, and it is better to replace those collars over multiple years rather than in a single year.

Annual survival rates of collared female caribou, as well as spring classification surveys used to estimate calf: cow ratios conducted in February or March each year, are used to estimate annual rates of population trend (λ =adult female survival/[1-female calf recruitment]) following Latham et al.'s (2010) modification of Hatter and Bergerud's (1991) equation. The 2023 spring classification survey took place March 3-5, 2023. Table 5-1 below provides the annual adult female survival rate, calf: cow ratios and population trend index for the first 6 years of the monitoring program. To date ECC has observed high annual female survival rates, and an increasing population trend in all years, with the lowest population trend index in 2021-22.

Table 5-1: Adult female survival and calf: cow ratios are used together to estimate the annual population growth rate, or lambda (λ). A value of 1.0 indicates a stable population; a value less than 1 indicates a declining growth rate; values higher than 1 indicate an increasing growth rate.

YEAR (APRIL 01-MARCH 31)	ADULT FEMALE SURVIVAL	CALF:COW RATIO	POPULATION TREND (LAMBDA)
2017-18	0.95	32.6 : 100	1.10
2018-19	1.00	37.2 : 100	1.19
2019-20	0.97	26.2 : 100	1.09
2020-21	0.96	31.0 : 100	1.11
2021-22	0.89	27.3 : 100	1.01
2022-23	0.92	33.2 : 100	1.07

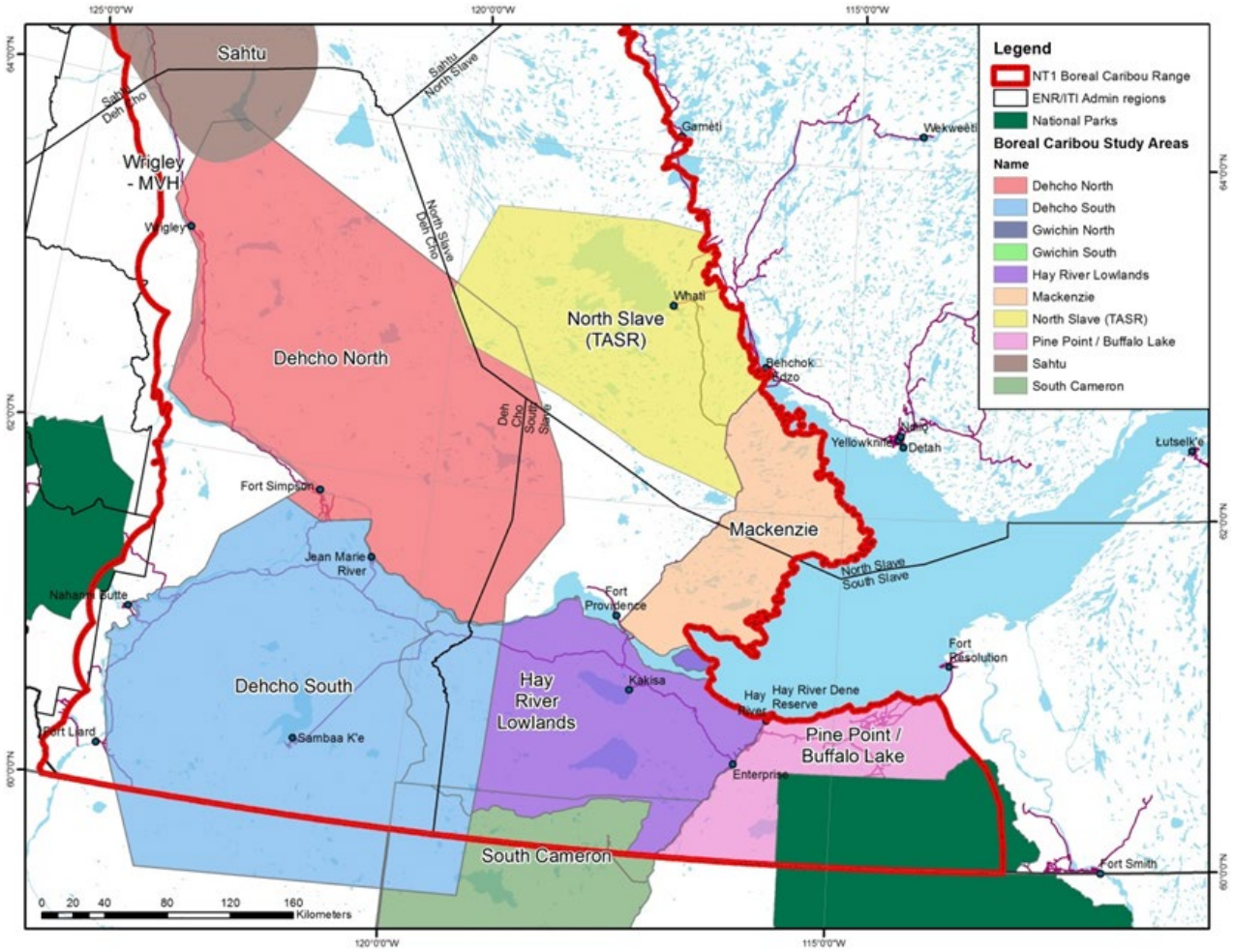

Figure 5-4: Boreal Caribou North Slave (TASR) Study Area, and other adjacent boreal caribou study areas in the southern NWT.

No boreal caribou abundance surveys took place in 2023.

b) Determination of population thresholds and triggers to inform adaptive management.

No updates

c) Harvest monitoring and reporting

The Tłı̨chǫ Government developed a proposal for a monitoring program to address Measures 7-1 and 9-1 of the Report of EA. In August 2020, GNWT-INF committed funds to support the Tłı̨chǫ Government to undertake this program. Measure 9-1 relates to the development of a non-mandatory harvest monitoring and reporting program. The information from this program will provide information that will also support implementation of Measures 6-2 and 7-2, as well as inclusion of traditional knowledge as required by Measures 9-3 and 10-2. Further information on implementation of this program is provided in Section 13.5 of this report.

In addition to the program led by the Tłı̨chǫ Government, GNWT-ECC Renewable Resources Officers (RROs) from Whatì and Behchokǫ̀ conducted an estimated 75 patrols on the Tłı̨chǫ Highway in 2023. The number of estimated patrols was fewer than in 2022 for several reasons. There was a higher focus on monitoring the Tłı̨chǫ Highway during first year the road was open to the public. There were also increased patrols associated with the timber licenses that were issued along the Tłı̨chǫ Highway for the first time in 2022. In 2023, the number of patrols was also lower due to the 2023 wildfire season, and the resulting wildfire response and community evacuations that pulled RROs into other duties. Typically, the highest frequency of RRO patrols is late August to mid-October when hunting seasons open and people are cutting firewood, however, RROs had additional wildfire-related duties until mid-October 2023.

d) Determining sustainable harvest levels

See Measure 6-2 regarding activities related to determination of sustainable harvest levels.

e) Identifying critical habitat

GNWT-ECC completed a range-wide (NT1) habitat selection analysis (resource selection functions) project using boreal caribou collar data from across the NWT to model and generate predictive maps of boreal caribou habitat selection during different seasons (NWT CIMP Project #202). The predictive habitat selection maps are being used to assist with identifying important areas for boreal caribou to support range planning and were also used in the draft TASR habitat offset plan for boreal caribou.

f) Ongoing habitat disturbance monitoring

ECC measures and updates fire disturbance on an annual basis and contributes this data to the National Burn Area Composite (NBAC) and Canadian National Fire Database (CNFDB) datasets maintained by Natural Resources Canada (NRCan). ECC uses a combination of the NBAC (1986-2020) and CNFDB (pre-1986) datasets to calculate fire disturbance within the NWT boreal caribou range.

Including preliminary fire polygons from the 2023 fire season, the NT1 range as a whole had 24.3% fire disturbance (≤40 yrs old; 1984-2023), 9.9% human disturbance (including 500 m buffer; data current to 2020 [source ECCC]) and 31.7% total disturbance. As of fall 2023, the Wek'èezhìı portion of the boreal caribou range had 32.9% fire disturbance (≤40 yrs old; 1984-2023 fires), 1.01% human disturbance (including 500 m buffer; data current to 2020 [source ECCC]), and 33.5% total combined fire/human disturbance. These regional numbers include the footprint of the cleared right of way of the TASR project that was visible on 2020 satellite imagery used by ECCC (road alignment and borrow sources plus a 500 m buffer).

Disturbance mapping within 10 km of the Tłı̨chǫ Highway

During the development of the Tłı̨chǫ Highway Boreal Caribou Habitat Offset Plan in 2021, using imagery dated prior to any Tłı̨chǫ Highway construction disturbance, GNWT-ECC began mapping the amount of existing disturbance on the landscape within 10 km of the proposed Tłı̨chǫ Highway alignment and the existing Highway 3 corridor. Mapping was completed using ESRI ArcMap and included ECCC's Cumulative Impact Monitoring Program (CIMP) land and water board permit registry data to ensure no data duplication occurred from what has already been mapped. All existing disturbance, including the Old Airport road route, logging operations, linear corridors, and polygonal disturbances such as borrow sources or clearings were delineated at map scales between 1:5,000 and 1:1,000, where imagery was of sufficient resolution to do so. Spatial data attributes for the existing disturbance mapping were as follows:

- Linear feature (roads, trails)
- Polygonal feature (landings, cutblocks, quarries)
- Old Airport Road (existing Old Airport route alignment)
- Hwy 3 (existing Highway 3 corridor including cleared right-of-way)

In 2023, following construction, the as-built disturbance was mapped using the same methods as the pre-disturbance mapping (Associated Environmental 2023). Initially, GNWT-ECC began mapping with Planet Labs imagery that was expected to have 3.0 m resolution. The available image resolution from Planet Labs was not sufficient to map at as fine a scale as the pre-disturbance mapping; however, ESRI incidentally updated their available imagery to be higher resolution and better quality than previously. The ESRI imagery was used instead of Planet Labs because the updated version included the entire Tłı̨chǫ ASR alignment following construction (i.e., the as-built disturbance was visible along the entire length). Some shifts in the imagery between the Planet Labs and ESRI imagery used for pre-construction, and the post-construction ESRI imagery was evident when comparing the two products; in these instances, the ESRI imagery took precedent over the Planet Labs imagery. Once the as-built disturbance of Tłı̨chǫ Highway was completed, GNWT-ECC mapped any new trails or disturbance that was visible in the imagery and coded these new disturbances separately from the as-built disturbance (to meet one of the monitoring requirements of Section 5.2.2 of the WMMP – Access and Harvest Monitoring).

Spatial data attributes for the as-built disturbance mapping were as follows (Table 5-2, Figure 5-4):

- As-Built (the total new disturbance, including quarries/borrow sources, resulting from the Tłı̨chǫ Highway construction).
- Highway 3 (existing Highway 3 corridor including cleared right-of-way).
- Linear disturbance (all roads and trails existing pre-construction of the Tłı̨chǫ Highway).
- New trail (any new trails created since construction began).
- Old Airport road (existing Old Airport road route pre-construction of the Tłı̨chǫ Highway).
- Polygonal disturbance (all landings, cutblocks, quarries existing pre-construction of the Tłı̨chǫ Highway.

In total, the Tłı̨chǫ Highway cleared right of way and borrow sources resulted in 550.0 ha of new footprint development to previously undisturbed habitat. This was less than the estimated footprint of 784 ha in the Report of Environmental Assessment (page 1): "The estimated footprint of the proposed road corridor is approximately 564 hectares, with an additional 220-hectare footprint estimated for the borrow sources and access roads (PR#7)."

As of 2023, new trails originating from the Tłı̨chǫ Highway were not extensive, based on the imagery available, and only 0.3 ha (2,968.5 m^2) new trails were identified in the updated mapping. It appears that the new trail may have been used as access to water sources and it is not clear if these new trails were a component of construction or a result of other human activities. In reviewing the disturbance footprint data, GNWT-ECC noticed some minor disturbance features that were not captured in the dataset, and based on the date of the

underlying imagery (2021), it is likely that these features were associated with the Tłı̨chǫ Highway project. These additional features will be captured in the next annual reporting cycle.

Table 5-2. Breakdown of disturbances mapped within 10 km of the Tłı̨chǫ Highway.

Disturbance Footprint Type	Area (ha)
Tłı̨chǫ Highway As-Built	549.97
HWY 3	555.62
Linear Disturbance	386.28
New trail	0.30
Old Airport Rd	73.48
Polygonal Disturbance	305.56

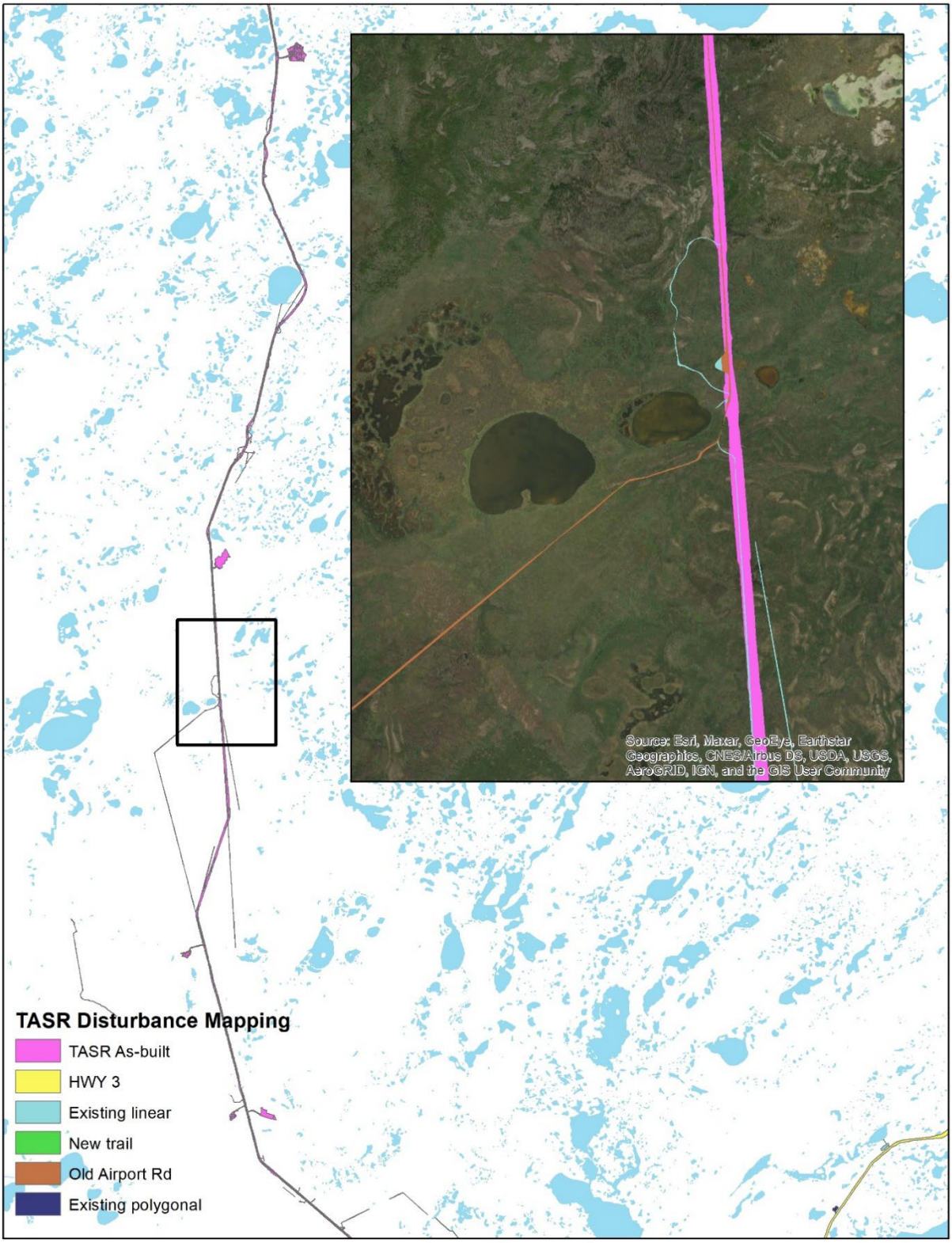

Figure 5-5. Example of disturbance mapping completed within 10 km of the Tłı̨chǫ HWY corridor. The inset map displaying satellite imagery in the background corresponds to the area within the black rectangle on the map.

g) Setting disturbance thresholds for critical habitat and, to the greatest extent possible, managing habitat towards meeting these disturbance thresholds for each range planning region

Disturbance limits and human disturbance management thresholds have been defined for each boreal caribou range planning region within the NWT Framework for Boreal Caribou Range Planning.

h) Monitoring predator populations including densities, movements and predation rates

As part of the TASR WMMP and a research program in partnership with Laval University (funded by the Sentinel North program), ECC deployed 2 GPS collars on black bears in the study area between Fort Providence and Behchokǫ̀, and along the TASR corridor, in 2022. A total of 7 bears were captured and fitted with GPS collars in the study area in 2021. The purpose of this program is to evaluate the influence of the TASR and Highway 3 on black bear movements and to assess predation rates of black bears on boreal caribou, moose and bison calves. The broader purpose of the Sentinel North project is to study food web dynamics between boreal caribou, moose, bison, wolves and bears and to understand how the food web is influenced by natural and human landscape disturbance as well as climate change. The black bear collars are equipped with a video camera to capture short video clips at regular intervals to document black bear predation events as well as to learn more about their behaviour and food habits. Both bear collars deployed in 2022 were retrieved in 2023. One bear slipped its collar off at its den site in the spring, and the collar on the other bear released on schedule in July 2023. There were no collars on bears at the end of 2023.

In 2022, GPS collars were used to begin monitoring wolves to assess predator movements. GPS collars allow for monitoring the movements, distribution and habitat selection of wolves, including their use or avoidance of the Tłı̨chǫ Highway and of other linear features. Wolf collars are programmed to release approximately 1.5 years after deployment. In March 2022, four wolves were captured and fitted with GPS collars (Telonics model TGW-4577-4) in the boreal caribou range of the North Slave area. Two of those collared wolves were still wearing active collars at the beginning of 2023 and both collars released on schedule in June 2023. An additional two boreal wolves (one male and one female from the same pack) were captured and fitted with GPS collars in March 2023, near the Highway 3 / Tłı̨chǫ Highway junction. The project objectives were to collar up to 5 wolves in the study area, but due to weather delays the crew was not able to spend time searching for additional wolf packs to deploy the remaining collars. Both of these collared wolves were still active at the end of 2023.

5.7. MEASURE 6-2: DETERMINE SUSTAINABLE HARVEST LEVELS FOR BOREAL CARIBOU (TǪDZI) AND IMPLEMENT MEASURES TO ENSURE HARVEST IS SUSTAINABLE IF REQUIRED

ECC hired a contractor to conduct population modeling to evaluate sustainable harvest levels using available demographic data from boreal caribou monitoring programs in the Dehcho, South Slave and North Slave regions. The report was completed as of March 31, 2020. On September 27, 2021, GNWT circulated the report to Indigenous Governments and Organizations (IGOs) and released the report on ECC's website. The findings of the report were presented on November 10, 2021 at the *Wildlife Act* Section 15 meeting, as well as at specific meetings with the Tłı̨chǫ Government and North Slave Métis Alliance on October 28, 2021. ECC also held meetings to discuss the report with four other Indigenous Governments and Organizations from the South Slave and Dehcho regions in fall 2021. Copies of the full report, plain language summary and fact sheet can be found at:

https://www.enr.gov.nt.ca/sites/enr/files/resources/gnwt_boreal_caribou_population_model_report_final_bil_1.pdf

https://www.enr.gov.nt.ca/sites/enr/files/resources/plain_lanugage_summary_boreal_caribou_sustainable_harvest_report_sep2021_0.pdf

https://www.enr.gov.nt.ca/sites/enr/files/resources/boreal_caribou_sustainable_harvest_fact_sheet.pdf

There are no updates for the reporting period.

5.8. MEASURE 6-3: HABITAT OFFSET AND RESTORATION PLAN

A Final Caribou Habitat Offset Plan (The Final Plan) was completed and submitted to the WRRB on July 16, 2021 prior to opening of the road to the public as directed by Measure 6-3. The WRRB approved the Final Plan on September 2, 2021, paving the way for opening the road to the public on November 30, 2021 after completion of construction.

Funding has been secured for an Implementation Plan development in 2024. Currently, an RFP has been issued, and work is expected to start on the Implementation Plan development in the summer of 2024 following an award of contract to a successful bidder.

5.9. MEASURE 7-1: INCORPORATE TRADITIONAL KNOWLEDGE INTO MONITORING OF BARREN-GROUND CARIBOU (ʔEKWǪ̀)

The following update was provided by the Tłı̨chǫ Government:

Regarding the implementation of Measure 7-1 from the Tłı̨chǫ Highway (formerly known as the Tłı̨chǫ All Season Road) EA, incorporating Traditional Knowledge into monitoring of ʔekwǫ̀ (barren-ground caribou), the following key actions were undertaken by the Tłı̨chǫ Government in 2023 and are described in greater detail below:

Tłı̨chǫ Tı̨lı̀ Deè Committee Meetings

A meeting was held on October 18-19, 2023. The purpose of the meeting was to share the results of ongoing monitoring work, decide if the activities continued to be appropriate for the measures, and identify other concerns, and share information about other research programs occurring along the Tłı̨chǫ Highway. The committee expressed their concern about the amount of litter left behind by campers and suggested restarting a harvester monitoring program to better understand harvesting along the highway and in Tłı̨chǫ land.

Vegetation Surveys

The summer of 2023 was the third year of collecting vegetation data, and the second year of data after the Tłı̨chǫ Highway opened to the public. An additional year of sampling allowed for comparisons across 2022 and 2021 (baseline) data. The surveys focused on collecting species abundance and composition data from established transects along the highway and at different distances from the road. In addition to sampling vegetation, site health and arboreal lichen loads were measured and recorded. The analysis and report were completed in October 2023 and shared with the Tı̨lı̀ Dee Committee during the meeting.

Ongoing Monitoring

Tłı̨chǫ monitors continue to monitor the highway daily for wildlife and harvesting events. To enhance and automate data collection, monitors were trained on how to collect data on survey maps using an electronic device (iPad). With this methodology, data flow to an online repository allows for a better streamlined protocol. In February 2024, monitors were retrained on data collection with the electronic device to ensure high-quality datasets. Wildlife observations continue to be reported quarterly.

Dust Monitoring

A dust monitoring program is currently underway. Two different dustfall collectors, a canister dust collector and a passive dust monitoring unit, are being used to monitor dust at different distances from the highway. Canister

dust collectors are replaced monthly and sent to ALS laboratory for analysis. The passive dust collectors are replaced every three months and are sent to NRCan for analysis under the current Memorandum of Understanding between NRCan and the Tłı̨chǫ Government.

This program has had some setbacks due to the 2023 summer wildfires and collecting protocols. Tłı̨chǫ Highway monitors were retrained in February 2024 on how to collect, replace, and handle the canisters and passive units for accurate results. A dustfall report will be completed once a year of data has been collected.

Harvesting Program

Based on direction from the Tłı̨chǫ Tı̨lıì Dee committee, the Tłı̨chǫ government is working on developing and implementing a comprehensive harvesting program. The program aims to interview Tłı̨chǫ community members who actively hunt on the land to understand how this activity has changed over time. The interviews will also address whether the Tłı̨chǫ Highway has impacted harvesting activities for community members and will provide a Traditional Knowledge perspective of the population size of key species.

In addition to the interviews, the Tłı̨chǫ government is working on incentivizing voluntary reporting by harvesters. To do so, the Tłı̨chǫ government is working on social media and traditional media campaigns and reward programs to encourage harvesters to report their harvests.

5.10. MEASURE 7-2: BARREN-GROUND CARIBOU MITIGATION AND POLICY CHANGES

5.10.1. MEASURE 7-2, PART A: COMPLETE THE BATHURST CARIBOU RANGE PLAN

The Bathurst Caribou Range Plan (BCRP) was released on August 21, 2019. The BCRP was developed by a multi-stakeholder working group and will help decision-makers manage activities on the land in a way that supports the recovery of the Bathurst herd, while providing clarity on land use and access for developers, regulators and residents of the Northwest Territories (NWT). It includes guidance for managing the overall amount of disturbance on the land, as well as seven management tools to reduce and manage impacts to caribou and caribou habitat. Actions are currently underway to support implementation of the recommendations contained in the BCRP. The BCRP is available on ECC's website at

https://www.enr.gov.nt.ca/sites/enr/files/resources/bathurst_caribou_range_plan_2019_-_plan_pour_laire_de_repartition_des_caribous_de_bathurst_2019.pdf

In 2022, GNWT-ECC finalized a draft Implementation Framework and Operational Guidance for the implementation of Mobile Caribou Conservation Measures (MCCMs). The Implementation Framework describes the intent of the MCCMs and how they would operate, whereas the Operational Guidance clearly sets out the methodology, monitoring, and reporting expectations for land use operators to implement MCCMs at their project site. In 2023, GNWT-ECC worked with Mountain Province Diamonds (Kennady North Regional Exploration Project), Rio Tinto (Diavik Diamond Mine), and Blue Star Gold Corp (Ulu Gold Project) to conduct pilot projects using the MCCMs. Mineral exploration at the Kennady North Regional Exploration Project was cancelled, but mineral exploration near Diavik Diamond Mine was completed in April/May 2023. Outcomes and feedback of the pilot project was provided by Rio Tinto. Blue Star Gold Corp provided data and feedback on the implementation of MCCMs for 2019-2022. Results of the pilot projects will be included in the draft Operational Guidance and will show how often caribou interacted with the sites, how long they resided nearby, what type of mitigation measures was triggered and for how long.

In 2023, GNWT-ECC hired WSP to conduct a literature review of industry reports and scientific articles on the impacts of roads on barren-ground caribou and the mitigation measures currently applied to mitigate these impacts. This literature review is part of a draft report on best management practices for roads. GNWT-ECC also hired Associated Environmental Consultants Inc. to draft guidelines for offsetting and compensatory mechanisms for both boreal caribou and barren-ground caribou habitat. This document will guide the application, design, implementation, and management of offsetting as a conservation tool for barren-ground caribou and boreal caribou in the NWT.

In 2023, the Bathurst Caribou Advisory Committee (BCAC) held a workshop in January 2023 and agreed to a 2-year workplan to identify key caribou habitat as conservation areas. GNWT-ECC supported Tłı̨chǫ Government, Athabasca Denesuline Néné Land Corporation, and Deninu Kų́ę́ First Nation to continue their work on identifying key caribou habitat areas (such was water crossings and land bridges). A 3-year funding proposal to further habitat conservation was submitted to Environment and Climate Change Canada and is pending approval.

5.10.2. MEASURE 7-2, PART B: CONSIDER PROTECTING BARREN-GROUND CARIBOU HISTORIC WINTER HABITAT FROM FIRES:

The BCRP contains a recommendation to: “On an annual basis, identify large, strategically-located patches of forest in the central Bathurst winter range for the GNWT fire management “Values at Risk” database. Response to fires in these areas would be based on an analysis of the current fire load, fire environment, resource availability and similar considerations of the management options at the time of the fire event.”

ECC has been exploring ways to identify areas as values at risk for boreal and barren-ground caribou based on habitat selection models, areas identified as important habitat by communities, availability and location of fire management resources, and logistical constraints. ECC staff met in summer and fall 2019 to discuss different options and this work is ongoing. The Tłı̨chǫ Government held a workshop to identify areas of critical winter habitat for boreal and barren-ground caribou and shared the spatial data from the workshop with ECC in late summer 2019 (Figures 5-6 and 5-8).

Priority areas for fire management for boreal caribou were identified in the interim Wek’èezhìı plan in 2021. Priority areas were identified based a late-winter habitat selection model and predictive map to target patches of highly selected habitat >60km^2 in size (Figures 5-7 and 5-9). These maps of key late-winter habitat patches were provided to GNWT-ECC Forest Management Division, along with the priority areas identified by Tłı̨chǫ Government in 2019 and the map of Basic, Enhanced and Intensive management areas defined in the interim range plan, for incorporation into their fire management decision mapping support tool called “SPARCS” (Spatial Precipitation and Risk Calculation System).

Data for the 2022 reporting period was not available for the 2022 Annual Report, so information for both 2022 and 2023 are reported in this 2023 Annual Report.

2022 Wildfire Activity and Responses

In 2022, 80 fires were reported in the North Slave Region, with a total area burned of 201,750 ha (Figure 5-6 and 5-7). 2022 was a relatively average year for wildfire: the number of fires exceeded the 10-year average of 57 fires, but the area burned was smaller than the 10-year average of 294,000 ha.

There were 12 fires that burned within Tłı̨chǫ Government fire protection priority 1 areas. ZF008 was the largest, burning approximately 27,000 ha 50 km southwest of Wekweètì. ZF027 burned nearly 4000 ha 45 km west of Wekweètì. ZF056 was 30 km southeast of Wekweètì and burned just under 12,00 ha. ZF069 and ZF070 were 1 ha and 20 ha respectively and occurred about 45 km south of Wekweètì. ZF072, ZF073 and ZF074 were

another cluster of fires about 80km south of Wekweètì, burning 700 ha, 0.5 ha and 63 ha respectively (Figure 5-6).

On the Taiga Plains, ZF034, ZF035, ZF036 and ZF037 burned within Tłı̨chǫ Government fire protection priority 1 areas in a cluster around Ezǫdzìtì, though none burned within Ezǫdzìtì. Cumulatively these fires burned 4000 ha. Two fires occurred in areas identified by the Tłı̨chǫ Government as extreme priority caribou habitat of cultural importance: ZF036 already mentioned, and ZF017, which burned about 32,000 ha of the culturally important area identified north of Ezǫdzìtì (Figure 5-6).

There was one fire that burned within Tłı̨chǫ Government fire protection area priority 2 areas. ZF048 was 100 ha and it burned 100 km southwest of Ezǫdzìtì (Figure 5-6).

In total, 25 fires burned in areas identified by the Tłı̨chǫ Government as forested caribou habitat, burning a cumulative area of about 70,000 ha. This includes fires noted above in areas that were identified as being within both forested habitat and another priority protection area.

All these fires were identified as being in caribou habitat, but all received a fire response of 'being monitored' as fire fighting resources were dedicated to protecting human life and property in other higher risk areas of the region.

An additional consideration in the Taiga Plains are areas identified as key late-winter boreal caribou habitat (Figure 5-7). For the fires already mentioned (ZF034, ZF035, ZF036, ZF037 and ZF048 west of Gamètì, and ZF016 and ZF017 that occurred between Hottah and Great Bear Lakes and eventually grew into a single fire (ZF017)), the majority or entirety of the fire fell inside identified key late-winter boreal caribou habitat. Three additional fires burned areas identified as key late-winter boreal caribou habitat. ZF060 occurred between Whatì and Behchokǫ̀. Approximately 15,000 ha of its total size of 16,700 ha burned in key-late winter boreal caribou habitat, and limited action was taken to protect some structures in the area. ZF044 was southwest of Whatì and burned about 20 ha of key late-winter boreal caribou habitat. ZF009 occurred on the west side of the north arm of Great Slave Lake and burned 36,700 ha, the majority of which was key late-winter boreal caribou habitat. Limited action was taken on this fire to protect a cabin (Figure 5-7).

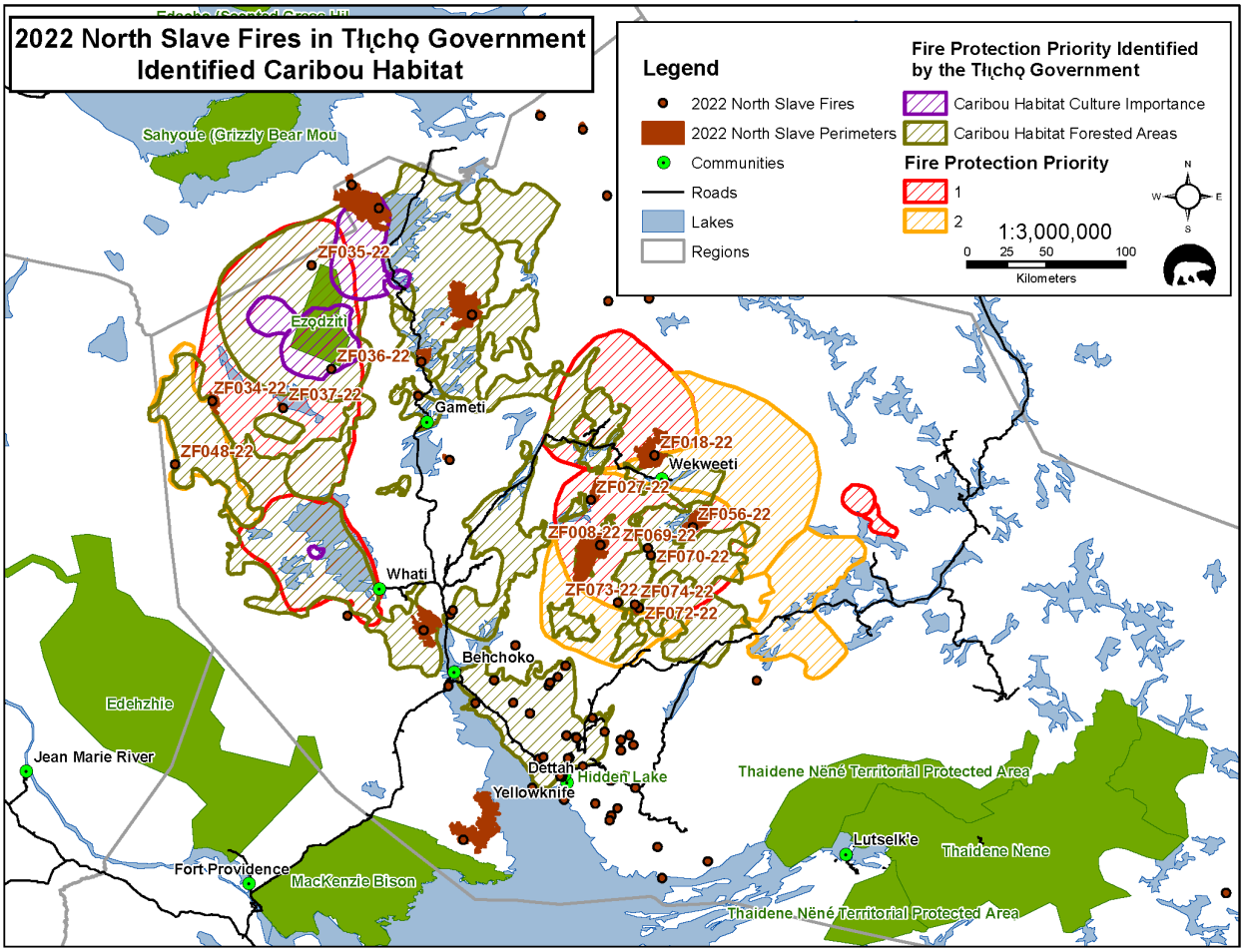

Figure 5-6 Forest fires within the North Slave region in 2022, and fire protection priority areas identified by the Tłı̨chǫ Government in 2019.

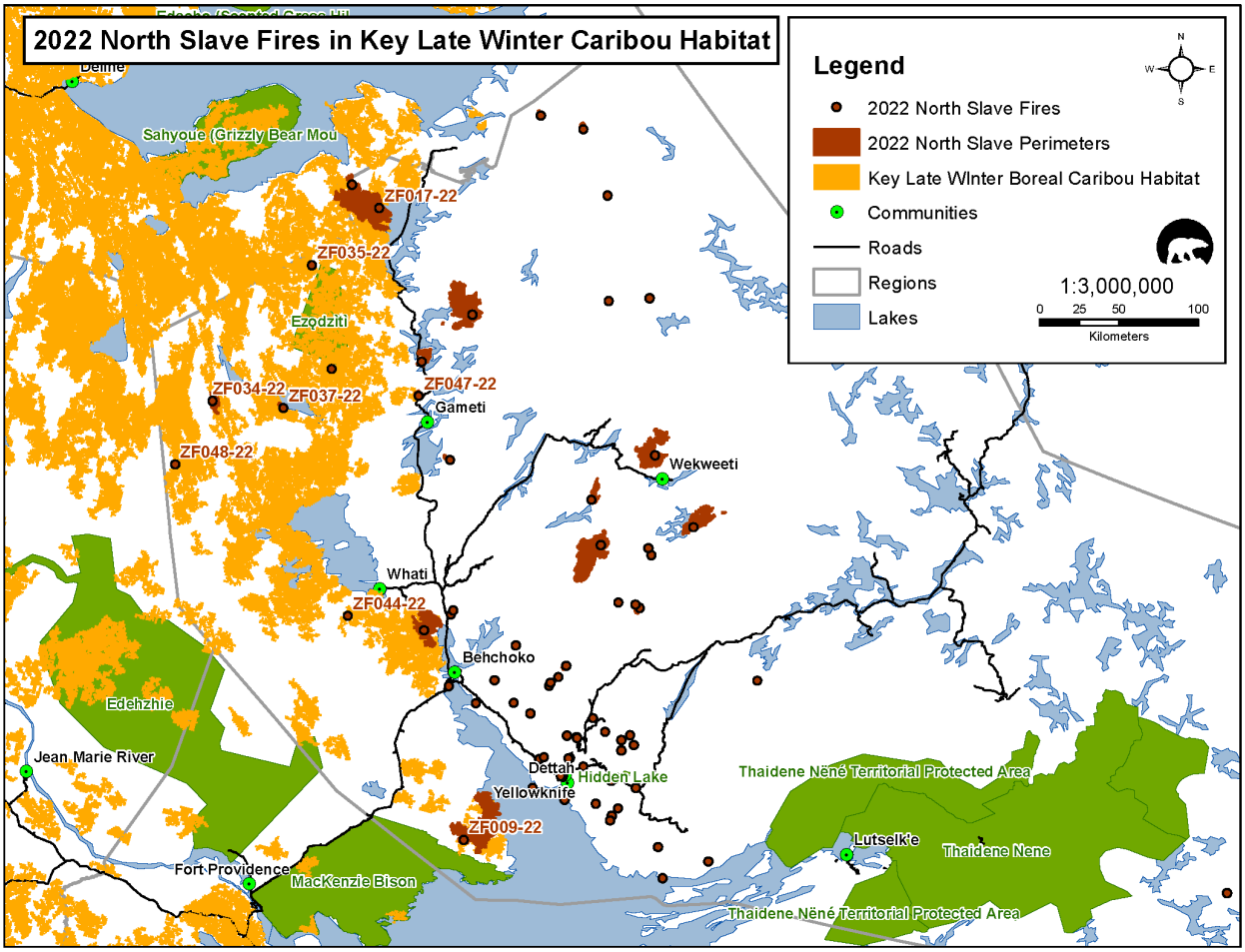

Figure 5-7. Forest fires within the North Slave region in 2022, and key late-winter boreal caribou habitat identified in the interim Wek'èezhìı boreal caribou range plan.

2023 Wildfire Activity and Responses

In 2023, 104 fires were reported in the North Slave Region, with a total area burned of 669,578 ha (Figure 5-7). Both the number of fires and the area burned significantly exceeded the 10-year averages of 62 fires and 351,821 ha. Many fires received a fire response of 'being monitored' as firefighting resources were dedicated to protecting human life and property in other higher risk areas of the region.

On the Taiga Shield, there were 11 fires that burned within Tłı̨chǫ Government fire protection priority 1 areas. ZF007 was 6 km south of Wekweètì and did not grow beyond 1 ha. ZF046 was 35 km south of Wekweètì and grew to 5300 ha. ZF069, ZF070 and ZF071 were 35 km northwest of Wekweètì and grew to 4800 ha, 1700 ha and 400 ha respectively. ZF080 was 55 km northwest of Wekweètì and grew to 11,000 ha. ZF088 and ZF089 were about 90 km north of Wekweètì and burned 1600 ha and 2300 ha respectively. ZF100 was 39 km southwest of Wekweètì and burned 2400 ha. ZF101 was 50 km northwest of Wekweètì and burned 1300 ha. ZF102 was 70km southeast of Wekweètì and burned 20 ha.

On the Taiga Plains, there were 4 fires that occurred within Tłı̨chǫ Government fire protection priority 1 areas. ZF038 was 5 km to the west of Ezǫdzìtì and grew to 8900 ha. ZF041 was north of Ezǫdzìtì, mostly in the Sahtu region (but also mostly in Priority 1 area) which grew to 19,000 ha. ZF083 and ZF098 burned almost entirely within Ezǫdzìtì reaching 5700 ha and 300 ha respectively.

There were 12 fires that occurred within Tłı̨chǫ Government priority 2 areas. ZF008 was 31 km west of Wekweètì and grew to 25 ha. ZF009 was 2.5 km northeast of Wekweètì and received suppression limiting its size to 60 ha. ZF013 started 28 km east of Wekweètì but grew to within 4 km of Wekweètì reaching a size of 91,000 ha. ZF014 was 95 km east of Behchokǫ̀ and grew to 140 ha. ZF019 was 85 km east of Behchokǫ̀ and grew to 52,000 ha. ZF022 and ZF023 were about 80 km southeast of Wekweètì and grew to 1 ha and 90 ha respectively. ZF049 and ZF092 were 115 km southeast of Wekweètì and grew to just over 900 ha and 5900 ha respectively. ZF050 started 10 km northwest of Wekweètì and received suppression limiting its growth to 33 ha. ZF067 was 60 km east of Wekweètì and grew to 750 ha. ZF086 was 85 km south of Wekweètì and grew to 7200 ha.

In areas identified by the Tłı̨chǫ Government as extreme priority caribou habitat of cultural importance, ZF083 and ZF098 (already mentioned as fires also in areas identified as priority 1 by Tłı̨chǫ Government), burned a total size of 8000 ha. ZF094 (labelled on Figure 5-9) also burned within an area identified as extreme priority caribou habitat of cultural importance.

In total, 17 fires burned in areas identified by the Tłı̨chǫ Government as forested caribou habitat, for a total area of 310,000 ha. This includes fires noted above in areas that were identified as being within both identified forested habitat and another priority protection area.

An additional consideration in the Taiga Plains are areas identified as key late-winter boreal caribou habitat (Figure 5-9). On the Taiga Plains, five fires occurred within identified key late-winter boreal caribou habitat, all clustered together south of Great Bear Lake. ZF038 grew to 21,500 ha, with the majority of that area in key late-winter boreal caribou habitat. ZF041 started in the North Slave but most of its burned area was in the Sahtú Region. This fire grew to be 36,000 ha, with most of that area in key late-winter boreal caribou habitat, although only 1100 ha of that was in the North Slave Region. ZF083 was 11,400 ha, with the majority of this area in key late-winter boreal caribou habitat (label for this fire appears on Figure 5-8, located just to the east of fire ZF098). ZF094 was 3800 ha and occurred mostly in key late-winter boreal caribou habitat. ZF098 was approximately 200 ha and occurred in key late-winter boreal caribou habitat. All five of these fires were monitored (i.e., not actioned) as firefighting resources were dedicated to protecting human life and property in other higher risk areas of the region.

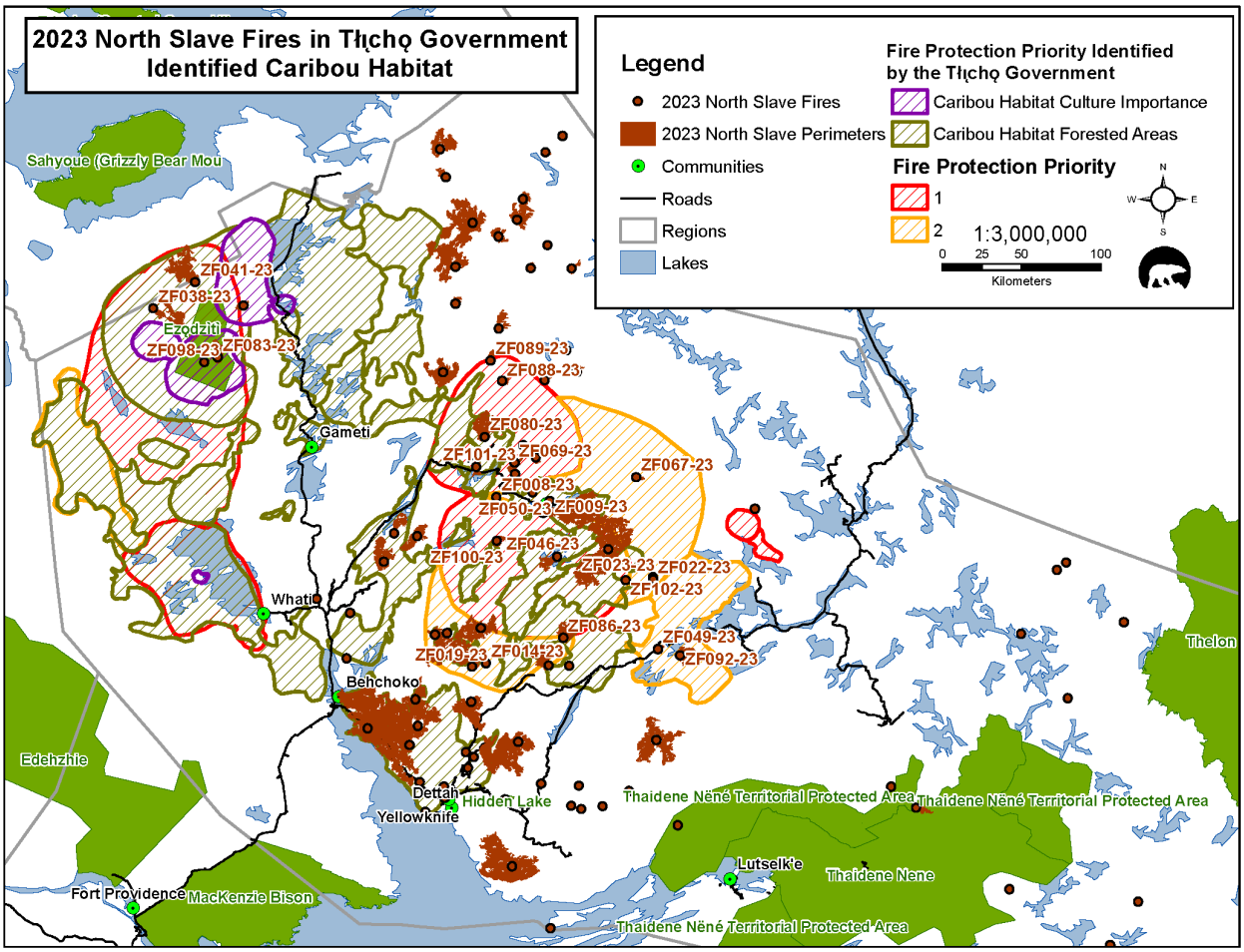

Figure 5-8 Forest fires within the North Slave region in 2023, and fire protection priority areas identified by the Tłı̨chǫ Government in 2019.

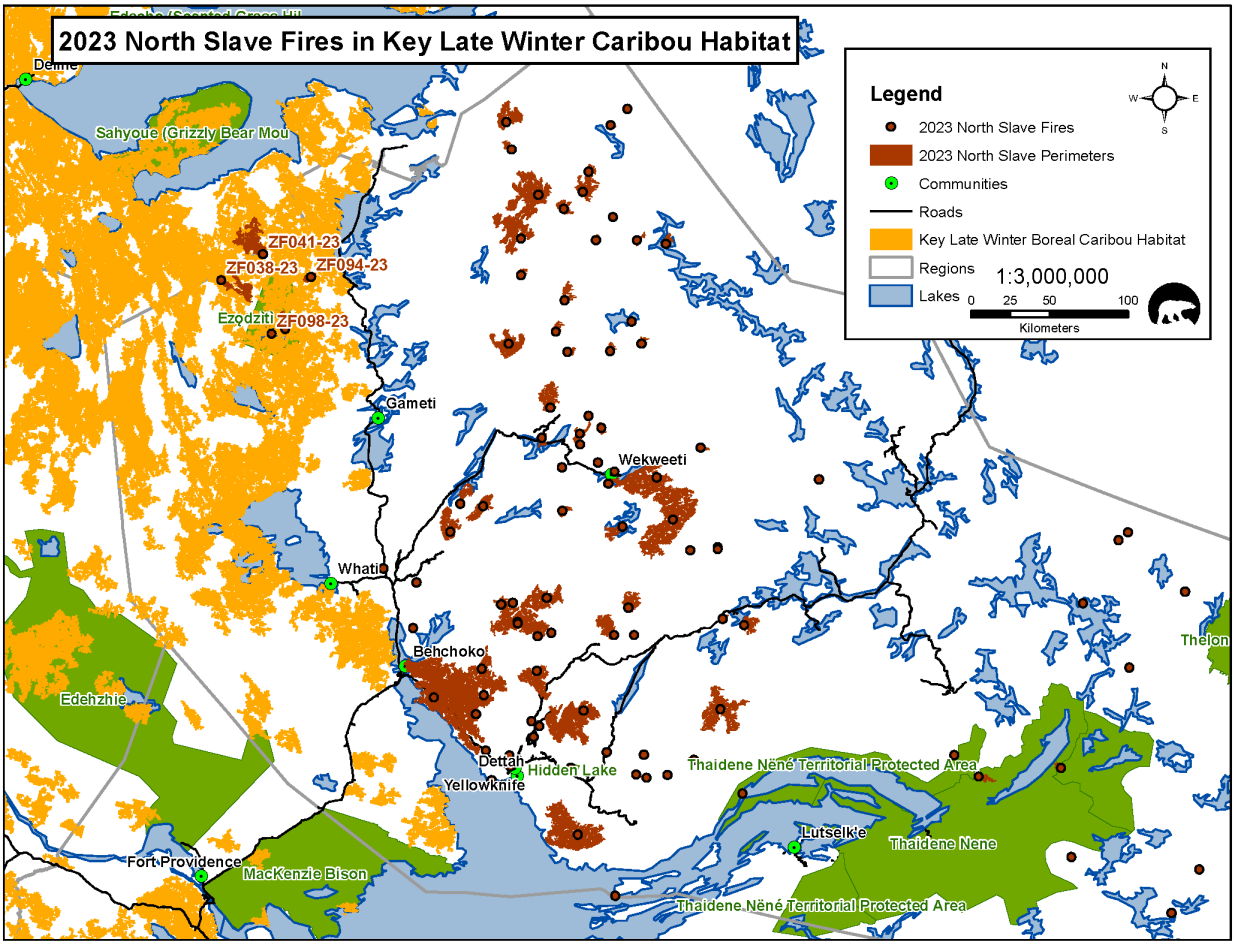

Figure 5-9. Forest fires within the North Slave region in 2023, and key late-winter boreal caribou habitat identified in the interim Wek'èezhìı boreal caribou range plan.

6. MANAGEMENT PLAN UPDATES AND REVISIONS

Schedule 1 - Part B, Condition 1(p): Updates were required to one (1) of the plans guiding the Tłı̨chǫ Highway Operation and Maintenance during the 2023. The list below details the primary and pertinent management plans for the Tłı̨chǫ Highway and revisions completed and approved in 2023.

- **Engagement Plan** - updates/revisions are currently ongoing. Revision 1.3 will be submitted to the Board in June 2024 following a directive from the Board
- **Erosion and Sediment Control Plan** – updates/revisions not required to Revision 1.2 in 2023.
- **Waste Management Plan** – Version 1.3 remained unchanged for 2021 but the authorization from the City of Yellowknife to allow for the continuation of solid waste and wastewater to their facilities was extended to December 31, 2023.
- **Spill Contingency Plan** – updates/revisions not required to Revision 1.0 in 2023
- **Water Monitoring Plan** – updates/revisions not required to Revision 1.2 in 2023.
- **Quarry Operations Plan** – updates/revisions not required to Revision 5.0 in 2023.
- **Permafrost Management Plan** – updates/revisions not required to Revision 2.0 in 2023.
- **Fish and Fish Habitat Management Plan** – updates/revisions not required to Revision 1.1 in 2023

- **Wildlife Management and Monitoring Plan** – Version 6.1 of the WMMP was approved by WRRB on April 13, 2023. Version 6.2 was approved by the WLWB and ECC on October 16, 2023 and February 19, 2024, respectively.
- **Archaeological Chance Find Protocol** - updates/revisions not required to Revision 1.0 in 2023
- **Closure and Reclamation Plan** - updates/revisions not required in 2023

6.1. WMMP UPDATES

For the reporting period and in compliance with EA Measure 10-2, Part 3, the WMMP was revised and updated in collaboration with ECC and submitted to the WLWB and ECC for public review. A 30-day public review period was undertaken, with submissions made to the WLWB's Online Review System by Environment and Climate Change Canada, North Slave Metis Alliance, and WRRB. In consultation with ECC staff, INF developed responses to comments received, revised the WMMP to address the comments.

Version 6.0 was submitted to the WLWB and ECC on January 20, 2023, respectively to commence the public review process. Version 6.0 was posted to the WLWB's Online Review System (ORS) for public comments. Following the public comment period, Version 6.1 was submitted to the WRRB on April 13, 2023 for their review and approval. The WRRB posted Version 6.1 to their website for public comments. The public comment period ended on May 15, 2023, and the WRRB indicated its approval of Version 6.1 on April 13, 2023 and the WRRB indicated its approval of Version 6.1 on April 13, 2023. Version 6.2 was submitted to the WLWB and ECC on June 12, 2023 for final approval. Version 6.2 of the WMMP was approved by the WLWB and ECC on October 16, 2023 and February 19, 2024, respectively.

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6.2. WASTE MANAGEMENT PLAN

The Waste Management Plan (Version 1.3) remained unchanged during the reporting period. Authorization from the City of Yellowknife to continue receiving waste at the Yellowknife Solid Waste Facility was extended until December 31, 2023 and further extended till December 31, 2024 at the time of this reporting.

6.3. QUARRY OPERATIONS PLAN

During the reporting period, the Quarry Operations Plan Version 5.0 not updated nor required as part of the Operations and Maintenance phase of the project.

6.4. PERMAFROST MANAGEMENT PLAN

No update to the Permafrost Management Plan was required during the reporting period.

7. SPILLS AND UNAUTHORIZED DISCHARGES

As required in Part 1 of the Water Licence (2020L8-0001), a Project specific Spill Contingency Plan (SCP) including prevention planning and response of hazardous material spill and unauthorized discharge of waste was developed for the Tłı̨chǫ Highway. The SCP was developed in accordance with the Guidelines for Spill Contingency Planning prepared by Indian and Northern Affairs Canada (INAC 2007) and the Spill Contingency Planning and Reporting Regulations issued under the Environmental Protection Act (EPA).

The purpose of the SCP is to provide a guide to all site personnel in the event of an accidental release of fuel or other materials during the operation and maintenance of the Tłı̨chǫ Highway. All Project personal and contractors are required to read and be familiar with the SCP, which is required to meet the minimum standards set out in the Project specific SCP.

All reporting, remediation and documentation of hazardous material releases and unauthorized discharges of waste is carried out as per the requirements outlined in the Project specific SCP.

7.1. SPILLS

Schedule 1 - Part B, Condition 1(q): A total of six (6) spills were documented since the start of the Operations and Maintenance phase of the Tłı̨chǫ Highway in 2023. The releases were a result of human-error or mechanical failure. All impacted soils resulting from these releases were fully remediated and the contaminated materials were disposed offsite at a licensed facility. These spills (EIR-SP-003 to EIR-SP-005 were small volume spills (<10L) of hydraulic fluid (1) and engine oil (2). There was also one diesel spill (EIR-SP-006) observed near the diesel fuel tank at the Maintenance Yard, but cleanup was not possible until the tank could be moved. This spill remains on the project deficiency log and is required to be remediated by August 1, 2024 at the latest (per GNWT-DOL Inspector).

7.2. UNAUTHORIZED DISCHARGES

Schedule 1 - Part B, Condition 1(q): There was no unauthorized discharge of materials that were reportable to the 24-Hour NWT – Nunavut Emergency Spill Reporting Line during the reporting period (January 1st – December 31, 2023).

7.3. SPILL TRAINING AND COMMUNICATION

Schedule 1 - Part B, Condition 1(r): Spill training was limited to remote support provided by the Environmental Manager and Operation and Maintenance staff familiarity with the Spill Contingency Plan.

8. OTHER REPORTING REQUIREMENTS

Schedule 1 - Part B, Condition 1(s): No annual inspection was conducted during the 2023 Operation and Maintenance period.

Schedule 1 - Part B, Condition 1(t): No studies required by the Board related to this water license were required during the 2023 Tłı̨chǫ Highway Operation and Maintenance period.

Schedule 1 - Part B, Condition 1(u): No construction activities occurred during the 2023 Operation and Maintenance period that required a schedule update.

9. WATER MONITORING PLAN REPORTING

Schedule 1 - Part B, Condition 1(v)(i): All watercrossing activities that represented a risk of sedimentation to watercourses were completed during the construction season in 2020. No inwater or near water activities occurred during the reporting period and therefore no further water quality monitoring was required.

Schedule 1 - Part B, Condition 1(v)(ii): Discussed in Section 2.1 of this report, no calibration of meters and devices were required during the 2023 Operation and Maintenance period as there was no water quality data collected.

Schedule 1 - Part B, Condition 1(v)(iii): Please see Section 2.2 of this report for the annual quantity of water (m^3) obtained from each of the approved sources.

Schedule 1 - Part B, Condition 1(v)(iv): No actions under the response framework of the Water Monitoring Plan were required during the 2023 Tłı̨chǫ Highway Operation and Maintenance period.

Schedule 1 - Part B, Condition 1(v)(v): No water sampling was required during the 2023 Tłı̨chǫ Highway Operation and Maintenance period as all the inwater or near water construction activities were completed by November of 2021.

Schedule 1 - Part B, Condition 1(v)(vi): There were no changes to any procedures related to water sampling as no sampling was required in 2023.

Schedule 1 - Part B, Condition 1(v)(vii): As discussed above, no water sampling was conducted and therefore QA/QC interpretation was not required in 2023.

10. SUMMARY OF WILDLIFE MONITORING

Schedule 1 - Part B, Condition 2(a): Please refer to section 5.9.

Schedule 1 – Part B, Condition 2(b): Survey and monitoring results haven't triggered additional mitigation measures that requires updating the applicable sections of the WMMP.

Schedule 1 - Part B, Condition 2(c): There was no active management or protection of migratory birds and bird species at risk required during the 2023 Tłı̨chǫ Highway Operation and Maintenance period.

Schedule 1 - Part B, Condition 2(d): With a financial support from GNWT-INF, TG has put in place a daily monitoring program with monitors patrolling the Tłı̨chǫ Highway, but the hasn't been any TK recommendations for harvesting, mitigation, monitoring, and adaptively management.

Schedule 1 - Part B, Condition 2(e): There were no construction activities during the 2023 Tłı̨chǫ Highway Operation and Maintenance period that occurred during any sensitive periods for wildlife**.**

Schedule 1 - Part B, Condition 2(f): No relevant monitoring plans were updated for the reporting period. The Engagement Plan is expected to be updated before the next report is due.

10.1. WILDLIFE ROAD SURVEYS

No wildlife road surveys were conducted by NSI during the 2023 Tłı̨chǫ Highway Operation and Maintenance period.

10.2. WILDLIFE SIGHTINGS

The maintenance of a wildlife sighting log is not a requirement of the Operation and Maintenance of the Tłı̨chǫ Highway. With a financial support from GNWT-INF, TG has put in place a daily monitoring program with monitors patrolling the Tłı̨chǫ Highway. All sightings are documented by the TG.

10.3. WILDLIFE SURVEILLANCE SURVEY

Wildlife surveillance monitoring is not a requirement of Operation and Maintenance of the Tłı̨chǫ Highway as there are no active camps.

10.4. WILDLIFE INCIDENTS / MORTALITIES

During the annual reporting period a total of one (1) wildlife incidents occurred on the Tłı̨chǫ Highway during the 2023 Operation and Maintenance period. Details of this incident can be found in Table 10-1 below. This incident was reported to the appropriate regulatory agency following the established protocol. It is important to note that Wildlife Incident Reports (EIR-WL-003, EIR-WL-004, and EIR-WL- 005) were documented in 2022 when 3 separate moose carcasses had been left within the Tłı̨chǫ Highway RoW by hunters after field dressing. However, these reports were not required to be provided to GNWT-ECC and therefore not reportable in 2022 Water Licence Annual Reporting

Table 10-1: Wildlife Incidents

DATE	INCIDENT ID	DISCHARGE TYPE	DESCRIPTION	ACTION TAKEN
21 Dec 2023	EIR-WL-006	Bison Mortality	A male bison was found at KM17 lying on the Highway shoulder with both hind legs broken. It was determined that the bison was struck by an unknown road user.	The injured bison was reported to ECC. ECC officer dispatched the bison due to injury. The bison was butchered, and the bison meat was donated to Whatì and Behchokǫ̀. A Wildlife Collision Report was completed by the officer.

10.5. MITIGATIONS TRIGGERED BY BOREAL CARIBOU COLLAR DATA MAPS

Procedures to mitigate impacts to boreal caribou from construction of the TASR is not a requirement of the Operation and Maintenance of the Tłı̨chǫ Highway.

11. TASR CROSSINGS BY COLLARED BOREAL CARIBOU

The 97km Tłı̨chǫ All-Season Road (Tłı̨chǫ ASR), was divided into 1 km segments to help characterize clusters of boreal caribou crossings. Hourly boreal caribou collar locations from April 01, 2017, to December 31, 2023, that occurred within the 10 km “geofence” around the Tłı̨chǫ ASR alignment and HWY3 were converted into movement paths, and the intersections between movement paths and the Tłı̨chǫ ASR alignment were converted to points to count the number of crossings per 1 km segment (Figure 11-1).

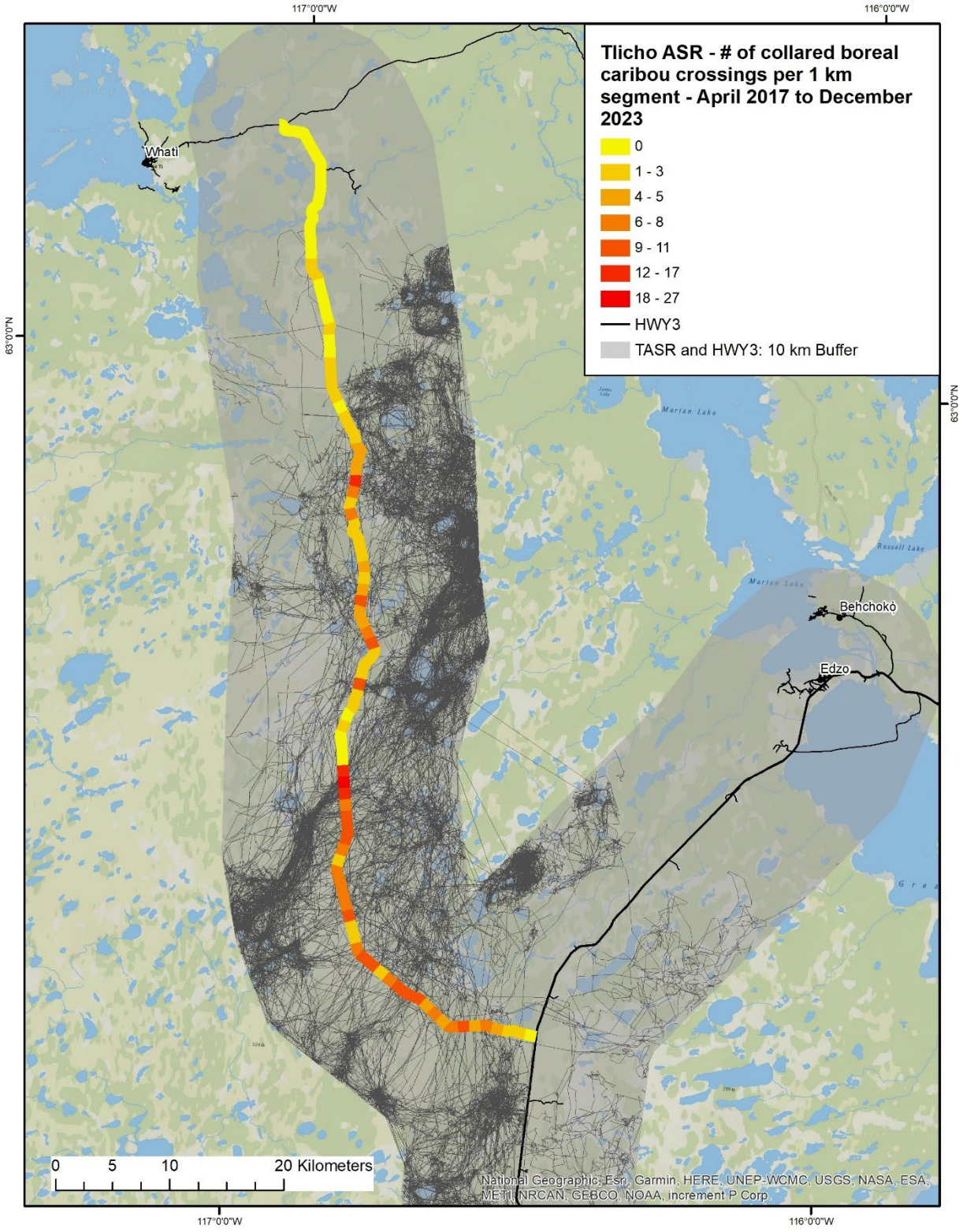

Figure 11-1: Number of collared boreal caribou road crossings along the Tłı̨chǫ ASR alignment broken down into 1 km segments, which occurred between April 01, 2017, and December 31, 2023.

The total number of crossings by collared caribou occurring between April 01, 2017, and December 31, 2023, is 398, with 49 crossings occurring from 11 different collared caribou during the 2023 calendar year. Generally, most caribou crossings have occurred between kilometers 5 and 37, and fewer crossings are occurring along the northern half of the road (Figures 11-1 & 11-2). In 2023, crossings occurred in 27 of the road segments, and the maximum number of crossings in any segment was 6.

Table 11-1 provides a summary of the number of crossings by collared caribou during each phase of the project, and the number of individual collared caribou that crossed the road on at least one occasion during each project phase. Table 11-2 provides a breakdown of the number of crossings by each individual collared caribou by project phase. One individual has crossed the road 32 time since it opened for public use.

Table 11-1. Number of crossings by GPS collared boreal caribou, and number of individual collared caribou that crossed the road on at least one occasion, during the pre-construction, construction, and operations ("road open") phase of the Tłı̨chǫ ASR.

Project phase	Total number of crossings by collared boreal caribou	Number of Collared Caribou that crossed the road at least once
Pre-construction (April 01, 2017 – August 31, 2019)	101	15
Construction (September 1, 2019 - November 30, 2021)	172	24
Road open (December 01, 2021 - December 31, 2023)	125	21
Total	**398**	**36**

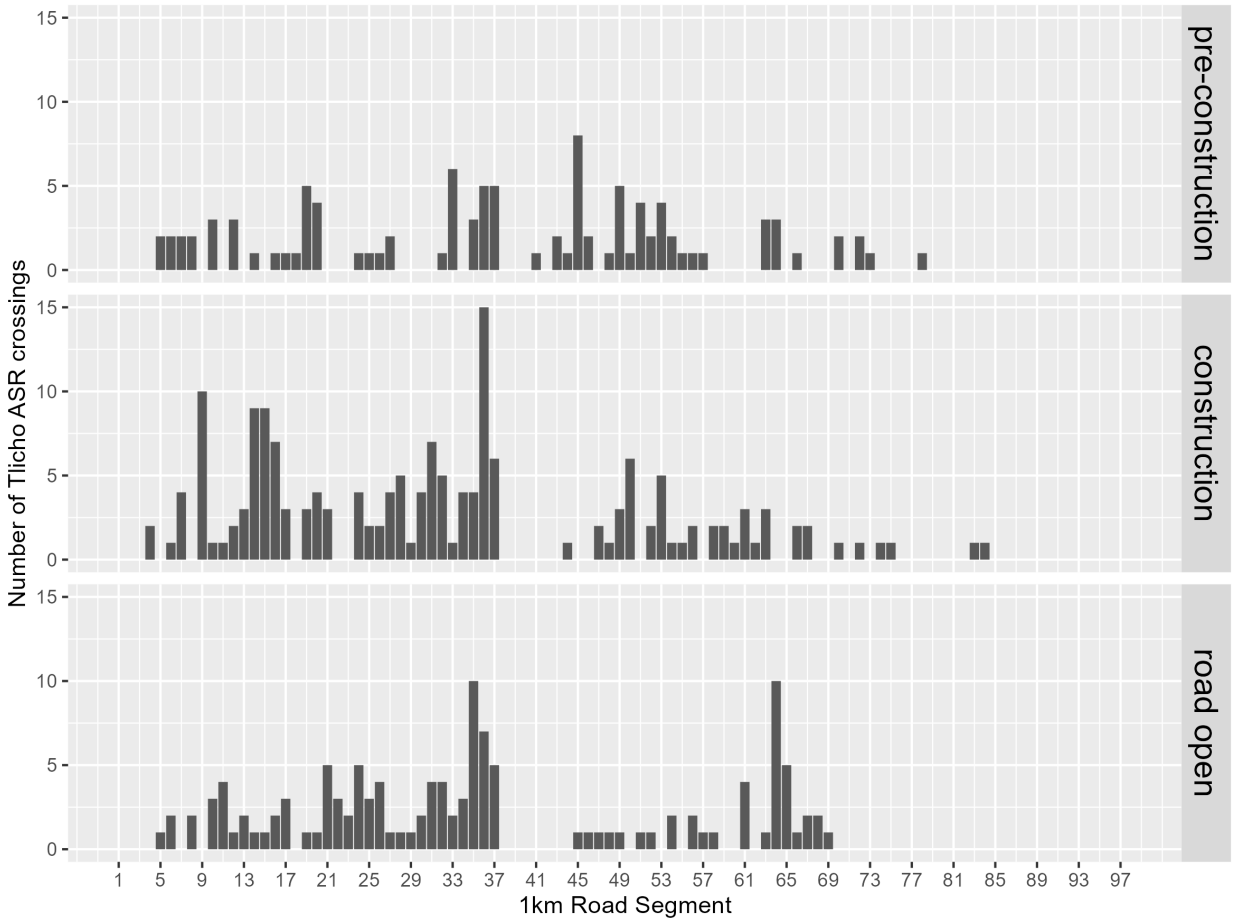

Figure 11-2. Number of crossings by collared boreal caribou within each 1-km segment of the Tłı̨chǫ ASR, during each phase of the project.

Figure 11-3 shows the number of the Tłı̨chǫ ASR crossings from April 01, 2017, to December 31, 2023, as a function of month to assess whether there are times of year that boreal caribou cross the road more frequently. When looking at the pre-construction, construction, and operations phase combined, boreal caribou appear to cross the alignment more frequently during the months of April to May and October to December, and less frequently during March, and June to September. However, when looking at the three phases separately, there appears to have been a shift in the timing of crossings during the operations phase of the road, with more crossings now occurring in August and September, and fewer during May, when compared to the pre-construction and construction phases (Figure 11-4).

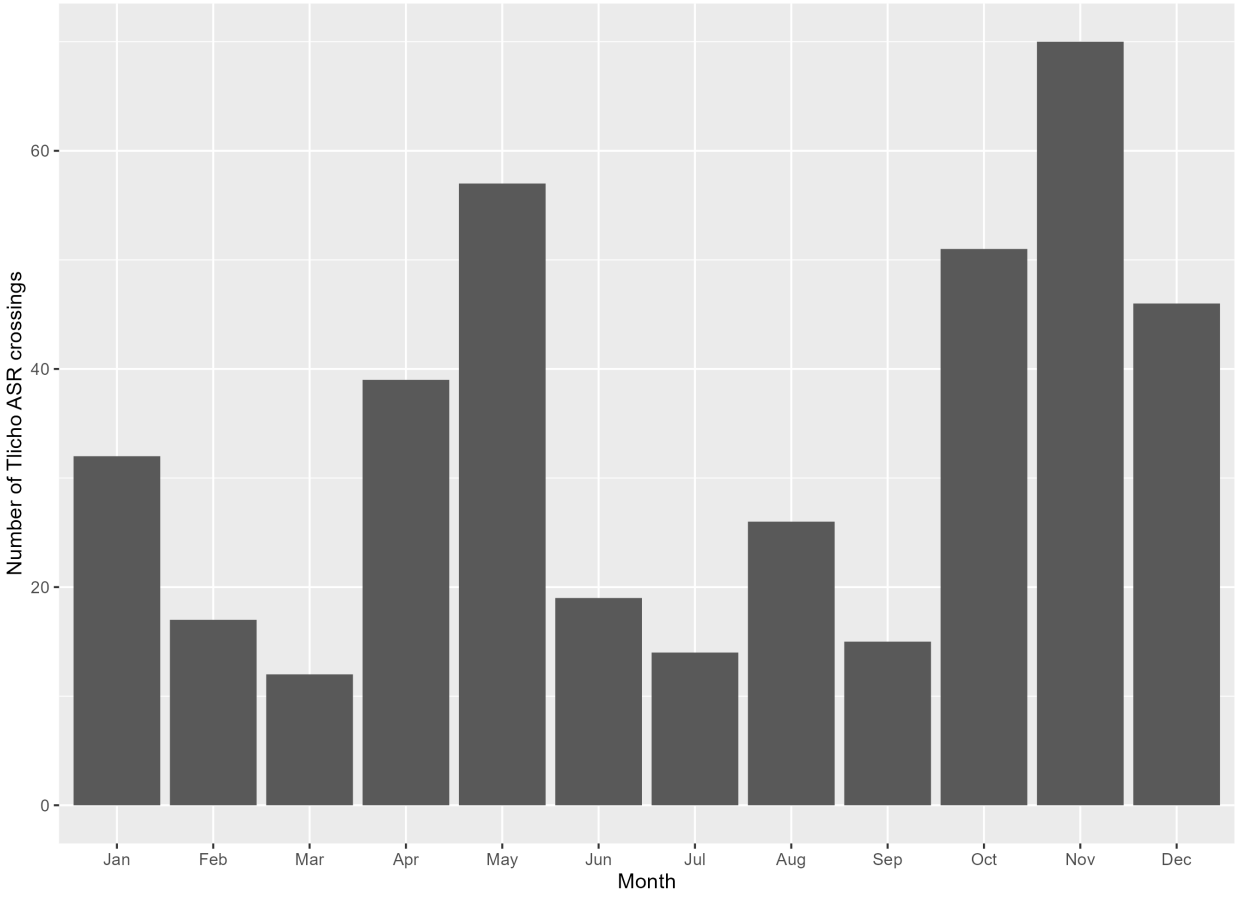

Figure 11-3. Total number of collared boreal caribou Tłı̨chǫ ASR crossings during each month, based on movement paths from collar data collected between April 01, 2017 to December 31, 2023.

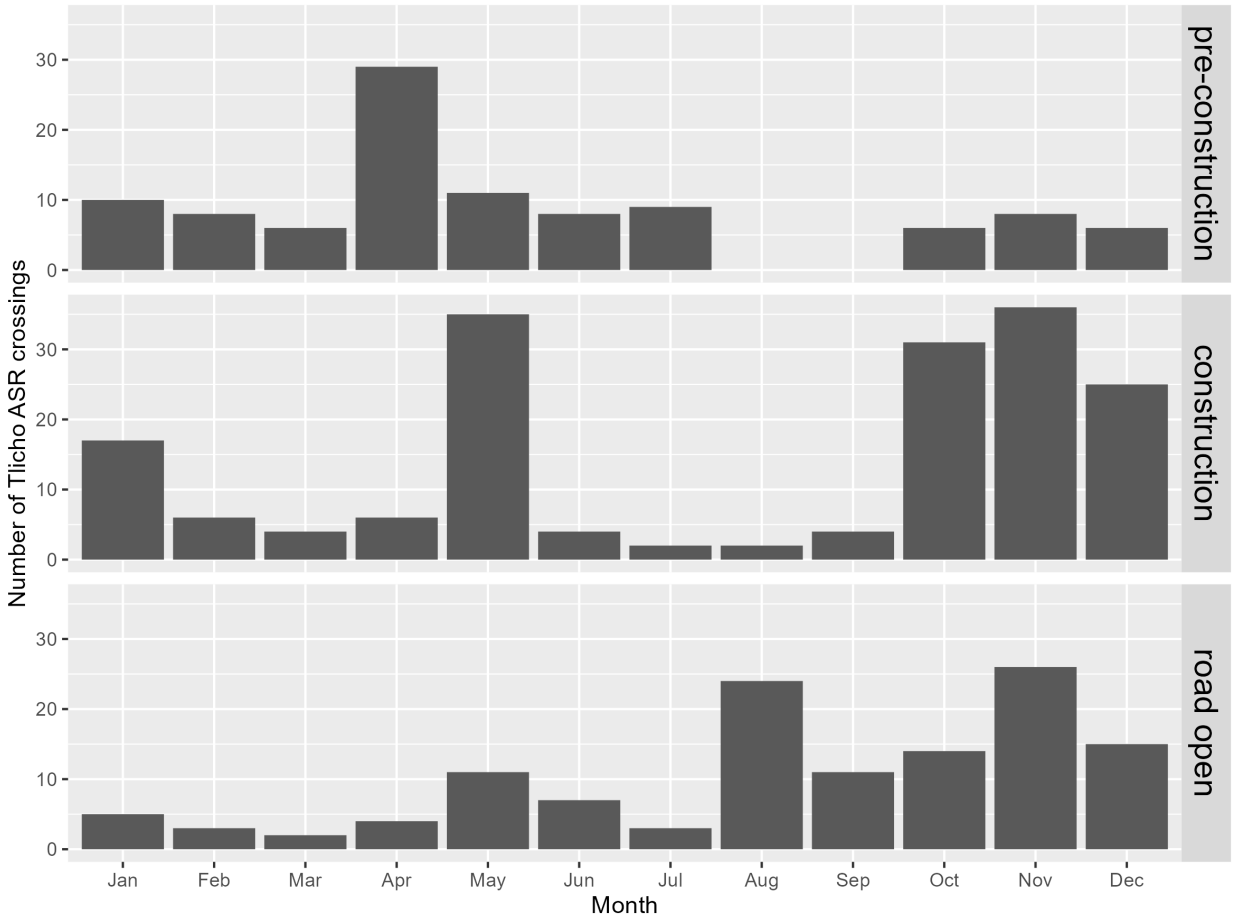

Figure 11-4. Total number of collared boreal caribou Tłı̨chǫ ASR crossings during each month, based on movement paths from collar data, broken down by project phase.

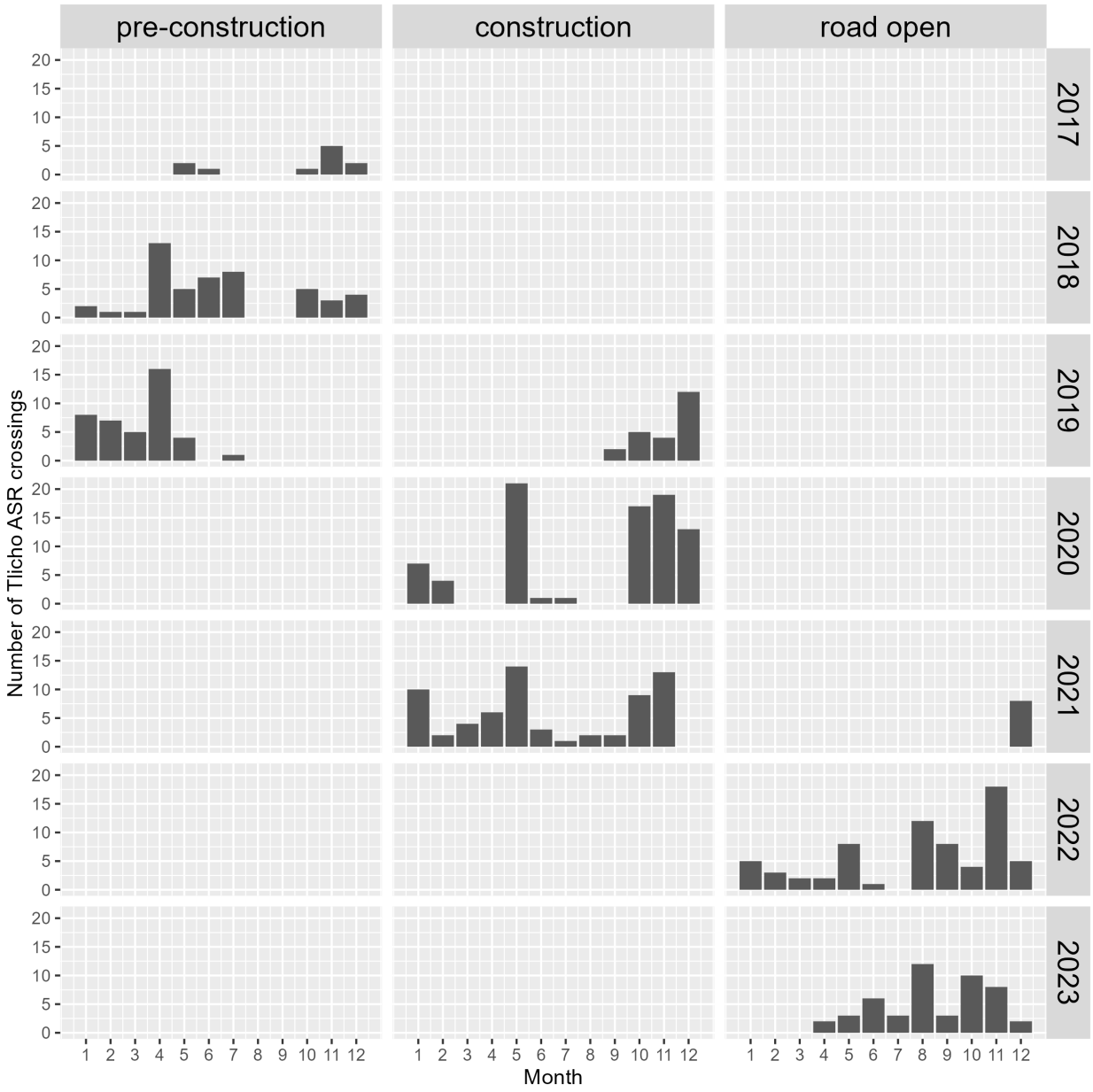

Figure 11-5. Total number of collared boreal caribou Tłı̨chǫ ASR crossings during each month, broken down by Year and Project Phase, based on movement paths from collar data.

Table 11-2. Tłı̨chǫ ASR crossings by collared boreal caribou during pre-construction (April 01, 2017 – August 31, 2019), construction (September 1, 2019 - November 30, 2021), and after the road opened for public use (December 01, 2021 - December 31, 2023). The first two digits of the Animal ID number denote the year the collar was deployed.

	Number of Tłı̨chǫ ASR		
Animal ID	Pre-construction	Construction	Road open
BWCA17602		3	
BWCA17605	2		
BWCA17606	21	10	
BWCA17616	3		
BWCA17618	10	9	
BWCA17620	4		
BWCA17622	8	11	
BWCA17623		5	
BWCA18600	8	6	
BWCA18602	22	9	
BWCA18603	7	7	
BWCA18604	4	4	
BWCA19600	2	12	4
BWCA19601		6	
BWCA19602	2	17	2
BWCA19603	2	7	7
BWCA19604		4	
BWCA19605	2	18	2
BWCA19606	4	18	3
BWCA21600		2	6
BWCA21601		2	
BWCA21604		6	6
BWCA21605		5	9
BWCA21606		5	3
BWCA21607		3	13
BWCA21610		1	8
BWCA21615		2	3
BWCA22601			2
BWCA22602			32
BWCA22603			7
BWCA22604			1
BWCA22605			7
BWCA23601			2
BWCA23602			3
BWCA23603			2
BWCA23607			3
TOTAL	**101**	**172**	**125**

12. BISON ABUNDANCE SURVEY

The WMMP Version 4.0 (2020) recommended that bison aerial surveys in the Tłı̨chǫ ASR alignment area be combined with the Mackenzie bison population surveys which occur every 3-4 years. ECC conducted an abundance survey of the Mackenzie bison population in February-March 2023. This survey was designed to estimate the density and abundance of the entire population (Figure 12-1) and overlapped with the southern extent of the Tłı̨chǫ Highway area. The 2023 population estimate was 1945 bison (95% confidence interval 1327-2849), up from the 2019 population estimate of 1468 (95% confidence interval 914-2359).

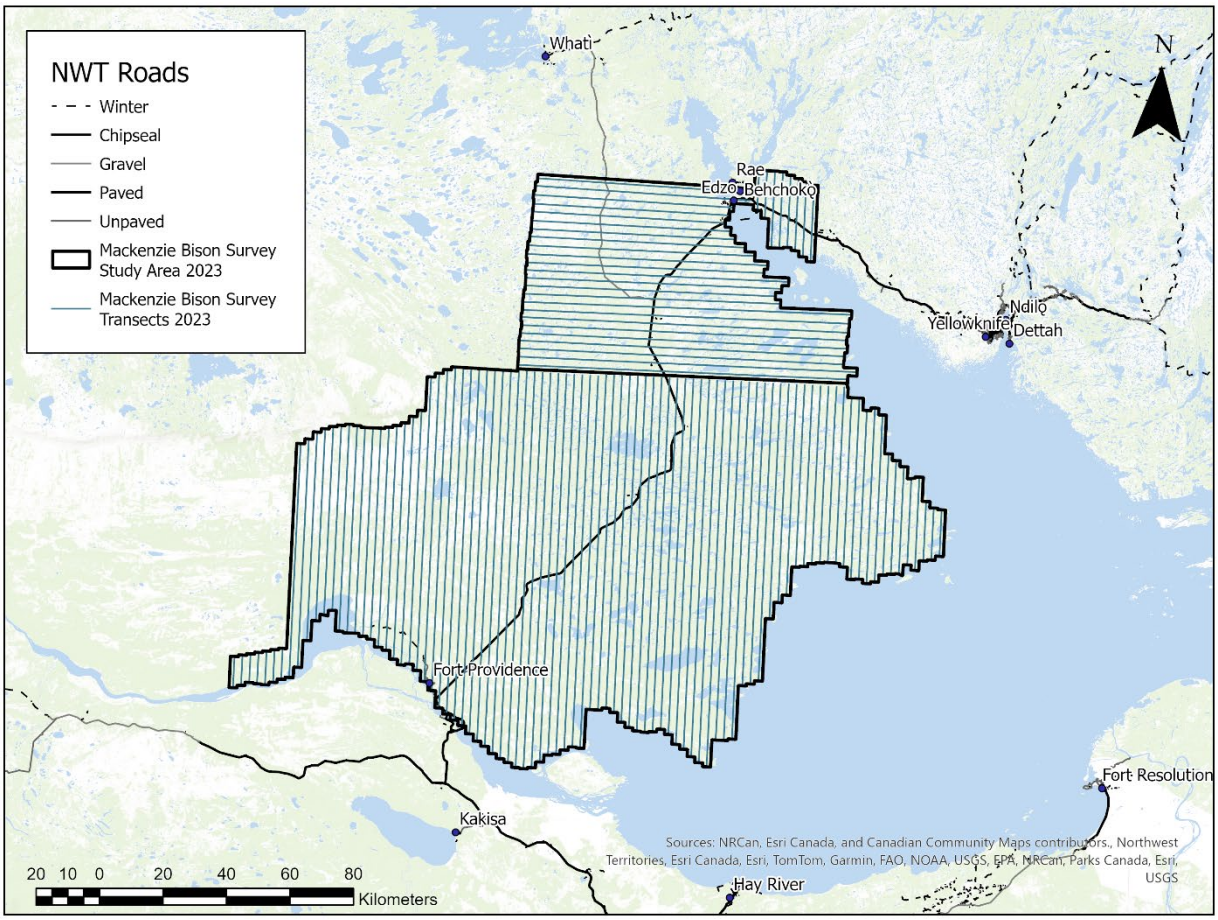

Figure 12-1. Makenzie bison population abundance survey area conducted in February-March 2023. Results are reported for the entire survey area, not just the area encompassing the Tłı̨chǫ Highway.

13. EA MONITORING RESULTS

Measure 10-1, Part 2: Use of results from pre-construction bird surveys required under Measure 10-1, Part 1 to inform mitigations.

Results from the pre-construction bird surveys did not require additional mitigation measures, and therefore, no updates during the current reporting period were made.

13.1. MEASURE 10-2, PART 2: WILDLIFE MANAGEMENT AND MONITORING PLAN UPDATE DURING PERMITTING

During the permitting, the developer worked collaboratively with Environment and Climate Change Canada, GNWT-ECC, Wek'èezhìı Renewable Resources Board, Tłı̨chǫ Government and Indigenous groups and harvesters to develop an updated WMMP.

Traditional knowledge (TK) was provided by The Tłı̨chǫ Government and the Yellowknives Dene First Nations. The TK was incorporated into the WMMP with respect to caribou and will also be incorporated into a Caribou Habitat Offset Plan.

GNWT-ECC approved version 3.3 of the WMMP on August 30, 2019, following review and approval of the WMMP by the Wek'èezhìı Renewable Resources Board under Section 12.5.1 of the Tłı̨chǫ Agreement which included a period of public review.

The WMMP version 4.1 was submitted to the WRRB on November 6, 2020 for review and approval. Following the approval of version 4.1 by the WRRB, version 4.2 was submitted to the WLWB and ECC, respectively for their review and approval. The WLWB approved the version 4.2 on February 25, 2021 while ECC approved its version on March 1, 2021.

For the reporting period and in compliance with EA Measure 10-2, Part 3, the WMMP was revised and updated in collaboration with ECC and submitted to the Wek'èezhìı Land and Water Board (WLWB). A 30-day public review period was undertaken, with submissions made to the WLWB's Online Review System by Environment and Climate Change Canada, North Slave Metis Alliance, and Wek'èezhìı Renewable Resources Board (WRRB). In consultation with ECC staff, INF developed responses to comments received, revised the WMMP to address the comments.

The WMMP version 5.1 was submitted to the WRRB on November 6, 2021 for review and approval. Following the approval of version 5.1 by the WRRB on December 9, 2021, it was submitted to the WLWB and ECC, respectively for their review and approval. The WLWB approved the version 5.2 on February 09, 2022 while ECC approved its version on March 21, 2022.

The WMMP Version 6.0 was submitted to the WLWB and ECC on January 20, 2023, respectively to commence the public review process. Version 6.0 was posted to the WLWB's Online Review System (ORS) for public comments. Following the public comment period, Version 6.1 was submitted to the WRRB on April 13, 2023, for their review and approval. The WRRB posted Version 6.1 to their website for public comments. The public comment period ended on May 15, 2023, and the WRRB indicated its approval of Version 6.1 on April 13, 2023. Version 6.2 was submitted to the WLWB and ECC on June 12, 2023 for final approval. Version 6.2 of the WMMP was approved by the WLWB and ECC on October 16, 2023 and February 19, 2024, respectively.

14. REFERENCES

Hatter, I.W., and W.A. Bergerud. 1991. Moose recruitment, adult mortality, and rate of change. Alces 27: 65-73.

Latham , A.D.M., Latham, M.C., McCutchen, N.A. and S. Boutin. 2011. Invading white-tailed deer change wolf-caribou dynamics in north-eastern Alberta. Journal of Wildlife Management 75(1):204-212.

Serrouya, R., van Oort, H., DeMars, C., and Boutin, S. 2016. Human footprint, habitat, wolves and boreal caribou population growth rates. https://www.nwt-esrf.org/sites/default/files/2016-10/Human%20Footprint%2C%20Habitat%2C%20Wolves%20and%20Boreal%20Caribou%20Population%20Growth%20Rates_2016.pdf. Accessed December 12, 2018.

APPENDIX A WATER TRACKING SPREADSHEETS

Tlicho Highway
(Water Volume Tracking)

Record No. KWT-TASR-ENV-TBL-001

SOURCE: LaMartre River

WATER TRACKING:	Max # of loads per Day = 10	UTM Location	11V 0501229 6997761		Permit No.
	Max (L) Taken per Day* = 280,000				W2020L8-0001

Date	Location	Number of Tanker Loads (28000 L/tanker)	Volume Taken (L)	Comments
01-May-23			0	
02-May-23			0	
03-May-23			0	
04-May-23			0	
05-May-23			0	
06-May-23			0	
07-May-23			0	
08-May-23			0	
09-May-23			0	
10-May-23			0	
11-May-23			0	
12-May-23			0	
13-May-23			0	
14-May-23			0	
15-May-23			0	
16-May-23			0	
17-May-23			0	
18-May-23			0	
19-May-23			0	
20-May-23			0	
21-May-23			0	
22-May-23			0	
23-May-23			0	
24-May-23			0	
25-May-23			0	
26-May-23		3	84000	
27-May-23		2	56000	
28-May-23		3	84000	
29-May-23			0	
30-May-23		3	84000	
31-May-23				
Total		**11**	**224000**	

* max L/day based on 10% available instaneous flow

Approved By: Dave Green

Tlicho Highway
(Water Volume Tracking)

Record No. KWT-TASR-ENV-TBL-001

SOURCE: LaMartre River

WATER TRACKING:	Max # of loads per Day = 10	UTM Location	11V 0501229 6997761		Permit No.
	Max (L) Taken per Day* = 280,000				W2020L8-0001

Date	Location	Number of Tanker Loads (28000 L/tanker)	Volume Taken (L)	Comments
01-Jun-23		4	112000	
02-Jun-23		5	140000	
03-Jun-23		5	140000	
04-Jun-23			0	
05-Jun-23		5	140000	
06-Jun-23		1	28000	
07-Jun-23			0	
08-Jun-23		3	84000	
09-Jun-23			0	
10-Jun-23			0	
11-Jun-23			0	
12-Jun-23		1	28000	
13-Jun-23		2	56000	
14-Jun-23		3	84000	
15-Jun-23		4	112000	
16-Jun-23		1	28000	
17-Jun-23			0	
18-Jun-23			0	
19-Jun-23			0	
20-Jun-23			0	
21-Jun-23			0	
22-Jun-23			0	
23-Jun-23			0	
24-Jun-23			0	
25-Jun-23			0	
26-Jun-23			0	
27-Jun-23			0	
28-Jun-23			0	
29-Jun-23			0	
30-Jun-23			0	
			0	
			952000	

* max L/day based on 10% available instaneous flow

Approved By: Dave Green

Tlicho Highway
(Water Volume Tracking)

Record No. KWT-TASR-ENV-TBL-001

SOURCE: LaMartre River

WATER TRACKING:	Max # of loads per Day = 45	UTM Location	11V 0501229 6997761		Permit No.
	Max (L) Taken per Day* = 360,000				W2020L8-0001

Date	Location	Number of Truck Loads (8000 L/truck)	Volume Taken (L)	Comments
01-May-23		0	0	
02-May-23		0	0	
03-May-23		0	0	
04-May-23		0	0	
05-May-23		0	0	
06-May-23		0	0	
07-May-23		0	0	
08-May-23		0	0	
09-May-23		0	0	
10-May-23		0	0	
11-May-23		0	0	
12-May-23		0	0	
13-May-23		0	0	
14-May-23		0	0	
15-May-23		0	0	
16-May-23		0	0	
17-May-23		0	0	
18-May-23		0	0	
19-May-23		0	0	
20-May-23		0	0	
21-May-23		0	0	
22-May-23		0	0	
23-May-23		0	0	
24-May-23		0	0	
25-May-23		0	0	
26-May-23		0	0	
27-May-23		0	0	
28-May-23		0	0	
29-May-23		0	0	
30-May-23		5	40000	
31-May-23		6	48000	
Total		**0**	**88000**	

* max L/day based on 10% available instaneous flow

Approved By: Dave Green

Tlicho Highway
(Water Volume Tracking)

Record No. KWT-TASR-ENV-TBL-001

SOURCE: LaMartre River

WATER TRACKING:	Max # of loads per Day = 45	UTM Location	11V 0501229 6997761		Permit No.
	Max (L) Taken per Day* = 360,000				W2020L8-0001

Date	Location	Number of Truck Loads (8000 L/truck)	Volume Taken (L)	Comments
01-Jun-23		1	8000	
02-Jun-23		4	32000	
03-Jun-23		6	48000	
04-Jun-23		0	0	
05-Jun-23		0	0	
06-Jun-23		5	40000	
07-Jun-23		0	0	
08-Jun-23		4	32000	
09-Jun-23		8	64000	
10-Jun-23		4	32000	
11-Jun-23		0	0	
12-Jun-23		2	16000	
13-Jun-23		2	16000	
14-Jun-23		2	16000	
15-Jun-23		6	48000	
16-Jun-23		0	0	
17-Jun-23		0	0	
18-Jun-23		0	0	
19-Jun-23		0	0	
20-Jun-23		0	0	
21-Jun-23		0	0	
22-Jun-23		0	0	
23-Jun-23		0	0	
24-Jun-23		0	0	
25-Jun-23		0	0	
26-Jun-23		0	0	
27-Jun-23		0	0	
28-Jun-23		0	0	
29-Jun-23		0	0	
30-Jun-23		0	0	
		44	**352000**	

* max L/day based on 10% available instaneous flow

Approved By: Dave Green

Water

Date Shipped	Kavanaugh Invoice #	Waste Source	~Quantity m3*	Site
3-Feb-23	210281	Water	16.00	km19
22-Feb-23	210281	Water	16.00	km19
15-Mar-23	211519	Water	16.00	km19
31-Mar-23	211519	Water	16.00	km19
5-Apr-23	212754	Water	16.00	km19
26-Apr-23	212754	Water	16.00	km19
17-May-23	214004	Water	16.00	km19
7-Jun-23	215282	Water	16.00	km19
28-Jun-23	215282	Water	16.00	km19
19-Jul-23	216576	Water	16.00	km19
30-Sep-23	219076	Water	16.00	km19
11-Oct-23	220369	Water	16.00	km19
1-Nov-23	221620	Water	16.00	km19
22-Nov-23	221620	Water	16.00	km19
13-Dec-23	222851	Water	16.00	km19

Sewage

Date Shipped	Kavanaugh Invoice #	Waste Source	~Quantity m3	Site
22-Feb-23	210281	Sewer Pumping and Disposal	5.00	km19
15-Mar-23	211519	Sewer Pumping and Disposal	4.00	km19
26-Apr-23	212754	Sewer Pumping and Disposal	5.00	km19
17-May-23	214004	Sewer Pumping and Disposal	5.00	km19
28-Jun-23	215282	Sewer Pumping and Disposal	5.00	km19
19-Jul-23	216576	Sewer Pumping and Disposal	5.00	km19
11-Oct-23	220369	Sewer Pumping and Disposal	5.00	km19
22-Nov-23	221620	Sewer Pumping and Disposal	4.00	km19
13-Dec-23	222851	Sewer Pumping and Disposal	4.00	km19

Construction Waste

Date Shipped	Site	Kavanaugh Invoice #	Weight (MT)	Type of Waste
7-Jun-23	km19	215282	0.6	**MSW**
7-Jun-23	km19	215282	2.42	**Construction Waste**
19-Jul-23	km19	216576	0.07	**Construction Waste**
30-Sep-23	km19	219076	2.47	**Construction Waste**

Date Shipped	Site	KBL Manifest #	~Weight (KG)	Type of Waste
29-Jun-23	km 19	NT19394-5	4500	**Hazardous Waste**

*Note - full truck was dispatched to site but not all water was unloaded during delivery