



**Environmental and Social Impact
Assessment for the Troilus Mine Project**

DESCRIPTION OF THE ENVIRONMENT

Environmental and Social Impact Assessment for the Troilus Mine Project

DESCRIPTION OF THE ENVIRONMENT

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Acronyms and Abbreviations

%HA	Percentage of people highly annoyed by noise (Highly Annoyed)
2SLGBTQI+	Two-spirited (and two-spirited), lesbian, gay, bisexual, transgender, queer and intersex people as well as people belonging to sexual and gender diversity communities who use other terminology
AADT	Average annual daily traffic
AMD	Acid mine drainage
AMW	Albanel-Mistissini-Waconichi
APCHQ	Association des professionnels de la construction et de l'habitation du Québec
ARBJ	Administration régionale Baie-James
ASD	Apatisiwin Skills Development
ATV	All-terrain vehicles
CAAQS	Canadian Ambient Air Quality Standards
CAVAC	Crime Victims Assistance Centre
CBHSSJB	Cree Board of Health and Social Services of James Bay
CCME	Canadian Council of Ministers of the Environment
CEC Chibougamau	Centre d'études collégiales à Chibougamau
CFILNQ	Northern Quebec Shortline Railway
CFPBJ	Centre de formation professionnelle de la Baie-James
CHSLD	Long-Term Care Centre
CIE	International Commission on Illumination
CLIC	Intermodal Logistics Centre of Chibougamau
CMC	Community Miyupimaatisiin Centre
CMHC	Canada Mortgage and Housing Corporation
CN	Canadian National
CNWA	<i>Canadian Navigable Waters Act</i>
CO	Carbon monoxide
CPE	Centre de la petite enfance
CRDS	Centre de répartition des demandes de services
CRSSS	Centre régional de santé et de services sociaux de la Baie-James
CSC	Cree School Board
CSI	Crime Severity Index
CVAA	Critère de qualité pour la Vie aquatique - Aiguë
CVAC	Critère de qualité pour la Vie aquatique - Chronique
dBA	A-weighted decibel
DSQAC	Direction de la surveillance de la qualité de l'air et du climat
EC	Quality criteria for drinking water
ECCC	Environment and Climate Change Canada
EDO	Environmental discharge objectives
EFE	Exceptional Forest Ecosystems
ENE	East-northeast

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ESIA	Environmental and Social Impact Assessment
ESMV	Espèce susceptible d'être désignée menacée ou vulnérable Species likely to be designated as threatened or vulnerable)
FEFLOW	Finite Element Subsurface Flow Simulation System
GBA+	Gender-based analysis plus
HLM	Habitation à loyer modique(Low-rental Housing)
IAAC	Impact Assessment Agency of Canada
INMQ	Institut national des mines du Québec
ISO	International Organization for Standardization
ISQ	Institut de la statistique du Québec
LEET	Lieu d'enfouissement en tranchée (Trench Landfill)
LET	Lieu d'enfouissement technique (Engineered Landfill)
LSA	Local Study Area
MAMH	Ministère des Affaires municipales et de l'Habitation
MDAG	Minesite Drainage Assessment Group
MDMER	Metal and Diamond Mining Effluent Regulations
MELCCFP	Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (Ministry of Environment, the Fight Against Climate Change, Wildlife and Parks)
MSDC	Centres de jour multiservices (Multiservice day care)
NNE	North-northeast
NOx	Nitrogen oxides
NRC	National Research Council Canada
NRCan	Natural Resources Canada
PAH	Polycyclic aromatic hydrocarbons
PDA	Project Development Area
PGA	Peak Ground Acceleration
PK	Kilometre Point
PM	Particulate Matter
PM10	Airborne particles with diameter less than or equal to 10 micrometers (µm)
PM2.5	Airborne particles with diameter less than or equal to 2.5 micrometers (µm)
RCMP	Royal Canadian Mounted Police
RSA	Regional study Area
RSW	Quality criteria for resurgence in surface water (Resurgence in surface water)
SHQ	Société d'habitation du Québec
SO ₂	Sulfur dioxide
SOPFEU	Société de protection des forêts contre le feu
SS	Suspended solids
TA	Thermal Amplitude
TNM	Traffic Noise Model
TSF	Tailings Storage Facility
UA	Unité d'aménagement
UGAF	Unité de gestion des animaux à fourrure

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VC	Valued Components
VOCs	Volatile organic compounds

5. Environmental Description

This chapter presents an overview of the existing conditions of the project's receiving environment to provide a context for the Environmental and Social Impact Assessment (ESIA) and a general description of the biological and socio-economic components in which the project will be developed. The information presented is based on a review of available information, inventory results at the project site and information gathered during consultation and engagement activities. A detailed description of the existing conditions of the Valued Components (VCs) selected for impact assessment is presented in Chapters 8 to 24 of the ESIA.

5.1 Study Areas

The spatial boundaries of the assessment were selected on the basis of the geographic extent over which project activities and their impacts on Valued Components (VCs) are likely to occur, as well as other ecological, technical, social and indigenous knowledge considerations.

Three geographical areas were defined for the assessment of the selected VCs:

- Project Development Area (PDA): encompasses the project footprint and is the anticipated area of physical disturbance associated with project construction, operation, closure and reclamation;
- Local Study Area (LSA): area in which project-related impacts (direct or indirect) can be predicted or measured with a significant level of accuracy and confidence. LSAs encompass the PDA and are specific to the VC, as they are based on the likely geographical extent from which project-related impacts can be predicted;
- Regional Study Area (RSA): the area that sets the context for determining the significance of project-specific impacts. It is also the area within which potential cumulative impacts - the residual impacts of the project combined with those of past, present and reasonably foreseeable projects - may extend. RSAs include the PDA and VC-specific LSAs, where applicable.

VC-specific LSAs and RSAs are described and illustrated in each VC chapter (Chapters 8 to 24).

5.2 Physical Environment

5.2.1 Climate

5.2.1.1 Climate before 1996

According to Köppen's interactive climate classification map for Canada, the Troilus mine site lies within a cold, humid continental climate zone, characterized by short, hot, dry summers and long, cold, dry winters.

The data used to describe meteorological conditions prior to 1996 were taken from the 1961-1990 climatnormal requested from service Info-Climat, Direction de la surveillance de la qualité de l'air et du

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climat¹ (DSQAC) of the Ministry of Environment, the Fight Against Climate Change, Wildlife and Parks (MELCCFP, 2024). They are extracted from the Chapais-2 weather station, Quebec ID: 7 091 305, located at latitude 49° 47' 14" N and longitude -74° 51' 26" W at an altitude of 386 m, and approximately 135 km southwest of the Troilus site.

Temperature

The 1961-1990 climatic normal, shown in Table 5.1, indicates that the mean annual temperature during this period was -0.2°C. The coldest month was January, with a mean monthly temperature of -18.5°C. The warmest month was July, with an average monthly temperature of 16.1°C.

Table 5.1 1961-1990 climate normals

Month	Maximum (°C)	Minimum (°C)	Average (°C)
January	-12.9 ^A	-24.0 ^A	-18.5 ^C
February	-10.7 ^A	-23.0 ^A	-16.9 ^A
March	-3.1 ^A	-15.9 ^A	-9.5 ^A
April	5.0 ^A	-6.0 ^A	-0.5 ^A
May	13.2 ^A	1.5 ^A	7.3 ^A
June	19.6 ^A	7.6 ^A	13.6 ^A
July	22.1 ^A	10.1 ^A	16.1 ^A
August	20.0 ^A	9.0 ^A	14.5 ^A
September	13.7 ^A	4.6 ^A	9.1 ^A
October	6.8 ^A	-0.8 ^A	3.0 ^A
November	-1.6 ^A	-8.4 ^A	-5.1 ^A
December	-10.7 ^A	-20.2 ^A	-15.4 ^A
Annual	5.1 ^A	-5.5 ^A	-0.2 ^C

Data status:

A: No more than 3 consecutive years or 5 missing years in total

B: At least 25 years of data

C: At least 20 years of data

Precipitation

Table 5.2 shows the average precipitation (rain, snow and annual total) recorded over a 30-year period (1961-1990) at the Chapais-2 station. Total annual precipitation is 921.3 mm, of which 651.0 mm is rain and 270.1 mm is snow.

Table 5.2 Precipitation in the form of rain and snow (1961-1990)

Month	Rainfall (mm)	Snow (mm)	Total (mm)
January	1.1	53.3	54.4
February	1.7	38.7	40.4
March	8.8	32.7	41.5

¹ Directorate of the Monitoring of Air Quality and Climate

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Month	Rainfall (mm)	Snow (mm)	Total (mm)
April	23.0	21.3	44.3
May	67.6	4.5	72.1
June	102.1	0.4	102.5
July	115.5	0	115.5
August	112.2	0	112.2
September	118.0	1.5	119.5
October	67.2	16	83.2
November	30.0	45.1	75.1
December	3.8	56.6	60.4
Annual	651.0	270.1	921.1

Typical wind speed and direction

Table 5.3 shows the average monthly wind speed values recorded during a year prior to 1996 at the Chapais-2 station, i.e. 1995. It shows wind directions (provenance) in terms of percentage frequencies. These data show that the average annual wind speed is 17.6 km/h, with the highest percentage of winds coming from the west (35%), followed by those from the east (22%). The month with the most violent winds was July, with an average monthly speed of 23.9 km/h, and the calmest month was December, with an average monthly speed of 13.4 km/h.

Table 5.3 Wind speeds and directions (1995)

Month	V (km/h) Avg.	Direction (frequency %)								
		N	NE	E	SE	S	SO	O	NO	C
January	16.9	2	5	35	3	5	0	39	11	0
February	18.4	0	11	16	0	4	14	36	20	0
March	15.8	0	13	27	6	13	8	29	3	0
April	16.7	0	2	23	5	7	7	43	13	0
May	13.7	6	2	27	5	6	6	42	5	0
June	20.3	0	12	8	0	2	32	25	22	0
July	23.9	2	3	15	0	5	30	41	5	0
August	18.0	3	0	15	3	8	29	21	21	0
September	21.1	0	3	13	2	0	37	18	27	0
October	17.5	0	2	21	6	8	21	34	8	0
November	15.2	2	0	35	0	8	15	32	8	0
December	13.4	3	6	24	0	0	5	58	3	0
Annual	17.6	2	5	22	3	5	17	35	12	0

Avg. : Average, **V** : Average speed in all directions, **N** : North, **S** : South, **E** : East, **W** : West, **C** : Calm

The prevailing wind direction is predominantly westerly (west and south-westerly) throughout the year, except for the month of November when the prevailing direction is easterly at a frequency of 35% (Figure 5.1).

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Figure 5.2 shows wind direction by season. Winter, spring, summer and autumn are respectively composed of the following months: December-January-February, March-April-May, June-July-August and September-October-November. We note that all seasons are dominated by winds from the west, except summer, which is characterized by winds from the southwest.

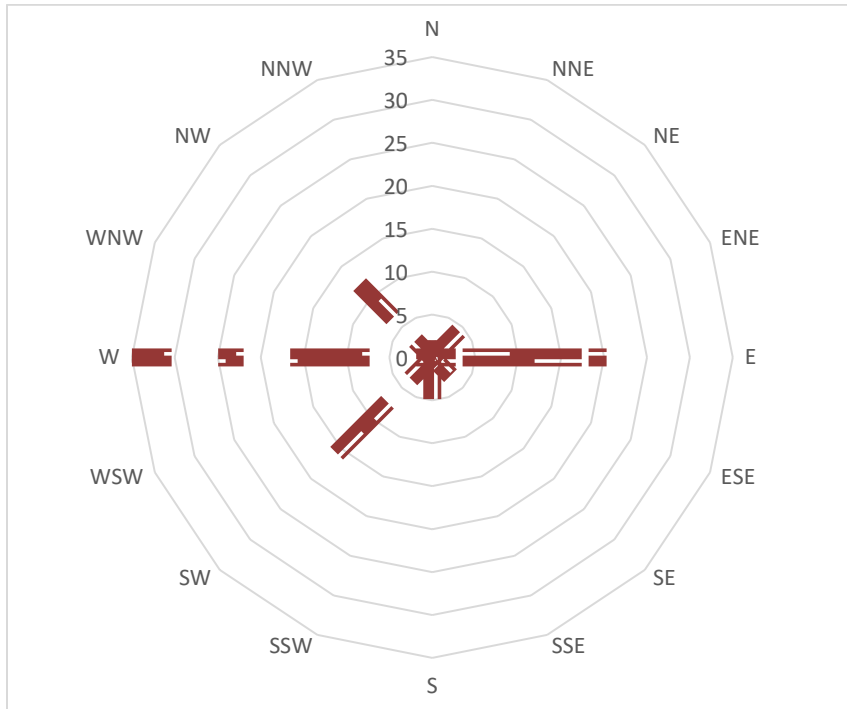


Figure 5.1 Wind direction (1995)

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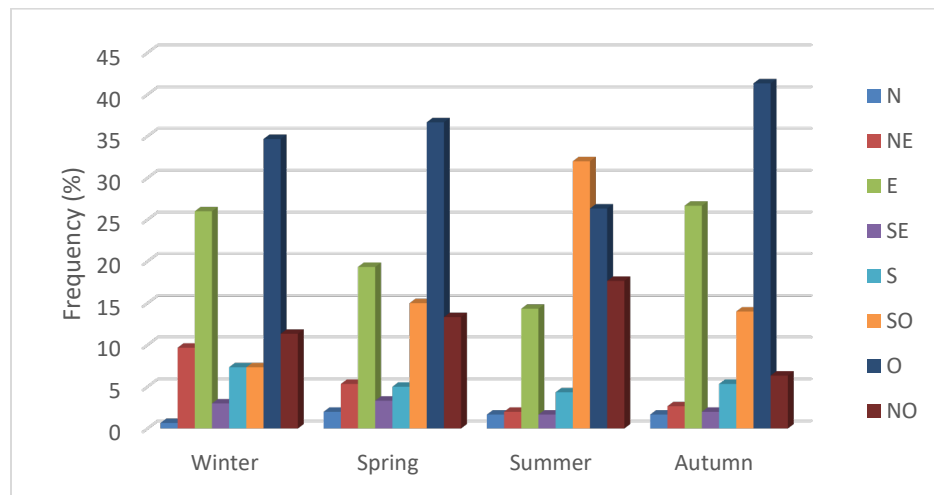


Figure 5.2 Wind direction in different seasons (1995)

5.2.1.2 Existing Conditions

Current environmental weather conditions are described using data from the Chapais-2 weather station, supplied by the Info-Climat service, DSQAC, MELCCFP, including the 30-year climate normal (1991-2020), monthly summaries from January to December 2023 and data from the local weather station at the Troilus site.

Temperature

The 30-year climate normal (1991-2020) indicates that the mean annual temperature is 0.5°C, the coldest month is January with a mean monthly temperature of -18.5°C and the warmest month was July with a mean monthly temperature of 16.7°C (see table 5.4). The greatest thermal amplitude (TA) was observed in March and June, with a value of 13.1°C for both months, reflecting the seasonal transition from winter to spring and from spring to summer. In general, temperature ranges vary between 6.9°C and 13.1°C.

Table 5.4 Minimum, maximum and mean temperatures (1991-2020)

Month	Maximum (°C)	Minimum (°C)	Average (°C)	TA (°C)
January	-12.8 ^A	-24.2 ^A	-18.5 ^C	11.4
February	-9.8 ^A	-22.6 ^A	-16.2 ^A	12.8
March	-2.8 ^A	-15.9 ^A	-9.4 ^A	13.1
April	5.0 ^A	-6.7 ^A	-0.8 ^A	11.7
May	14.5 ^A	1.8 ^A	8.2 ^A	12.7
June	20.8 ^A	7.7 ^A	14.2 ^A	13.1
July	22.8 ^A	10.6 ^A	16.7 ^A	12.2
August	21.0 ^A	9.7 ^A	15.3 ^A	11.3
September	15.9 ^A	5.4 ^A	10.7 ^A	10.5
October	7.3 ^A	-0.3 ^A	3.6 ^A	7.6

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Month	Maximum (°C)	Minimum (°C)	Average (°C)	TA (°C)
November	-0.9 ^A	-7.8 ^A	-4.3 ^A	6.9
December	-8.4 ^A	-17.1 ^A	-12.9 ^C	8.7
Annual	6.1 ^A	-5.0 ^A	0.5 ^C	11.1

Data status:

A: No more than 3 consecutive years or 5 missing years in total

B: At least 25 years of data

C: At least 20 years of data

TA: Thermal amplitude

According to a local weather station at the Troilus site, from December 12, 2019 to November 15, 2023 (Table 5.5), the mean annual temperature is 1.5°C, the coldest month is February with a mean monthly temperature of -17.2°C, and the warmest month is July with a mean monthly temperature of 16.3°C. Temperature ranges vary from 5.4°C to 12.6°C, with the greatest range in July.

Compared with normal data (1991-2020) from the Chapais-2 station, we note the difference in mean monthly temperatures, ranging from -1°C to 3.6°C. The difference between annual mean temperatures is 1°C.

Table 5.5 Minimum, maximum and mean temperatures (2019-2023) from the station at the Troilus site

Month	Maximum (°C)		Minimum (°C)		Average (°C)		TA (°C)
	Average	±N	Average	±N	Average	±N	
January	-11.0	1.8	-21.8	2.4	-15.6	2.9	10.8
February	-10.8	-1.0	-23.3	-0.7	-17.2	-1.0	12.4
March	-2.6	0.2	-13.6	2.3	-7.9	1.5	10.9
April	6.1	1.1	-5.4	1.3	0.3	1.1	11.5
May	14.2	-0.3	1.6	-0.2	7.9	-0.3	12.6
June	21.5	0.7	9.2	1.5	15.5	1.3	12.3
July	22.1	-0.7	10.6	0.0	16.3	-0.4	11.5
August	22.1	1.1	10.5	0.8	16.2	0.9	11.6
September	17.5	1.6	6.5	1.1	11.8	1.1	11.0
October	11.6	4.3	3.5	3.8	7.2	3.6	8.1
November	-1.3	-0.4	-6.7	1.1	-3.9	0.4	5.4
December	-7.6	0.8	-16.2	0.9	-12.0	0.9	8.7
Annual	6.8	0.7	-3.8	1.2	1.5	1.0	10.6

±N: Departure from the 30-year normal (1991-2020)

AT: Thermal amplitude

The Troilus site station also shows that the lowest recorded dew point was -42.2°C in February 2023, and the highest was 22.1°C in July 2020.

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Precipitation

The 30-year climate normal (1991-2020) presented in table 5.6 shows that total annual precipitation corresponds to 1036.1 mm, with 728.5 mm as rain and 299.0 mm as snow. The wettest month is July, with total precipitation of 139.6 mm, all in the form of rain. The 1991-2020 climate normal indicates that there is no snow in July and August, while June and September show very small amounts, tending towards zero snowfall. The least rainy month is February, with total precipitation of 41.8 mm, 92.3% of which is snow.

Table 5.6 Precipitation in the form of rain and snow (1991-2020)

Month	Rain (mm)	Snow (mm)	Total (mm)	Number of days
January	3.2 ^C	58.2 ^C	62.3 ^D	31
February	1.9 ^A	38.6 ^C	41.8 ^C	28
March	5.0 ^A	39.5 ^A	44.8 ^A	31
April	32.8 ^C	20.8 ^C	55.6 ^C	30
May	79.9 ^C	4.6 ^A	83.2 ^C	31
June	97.4 ^A	0.3 ^A	97.7 ^A	30
July	139.6 ^C	0.0 ^A	139.6 ^C	31
August	118.6 ^A	0.0 ^A	118.7 ^C	31
September	121.3 ^C	0.7 ^A	124.0 ^C	30
October	92.6 ^C	17.9 ^C	109.0 ^C	31
November	32.2 ^C	58.2 ^D	93.0 ^D	30
December	4.1 ^C	60.4 ^C	66.4 ^C	31
Annual	728.5 ^C	299.0 ^D	1036.1 ^D	365

A: No more than 3 consecutive years or 5 missing years in total.

B: At least 25 years of data

C: At least 20 years of data.

D: At least 15 years of data

Typical wind speed and direction

The data in Table 5.7 below are taken from the monthly summaries for 2023 from the Chapais-2 station. According to the Beaufort scale, winds in 2023 were light breezy, with an average annual speed of 7.8 km/h.

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Table 5.7 Wind speeds and directions (monthly summary for 2023)

Month	V(km/h) Avg	Direction (frequency %)								
		N	NE	E	SE	S	SO	O	NO	C
January	7.6	23	6	16	15	11	5	15	5	5
February	6.9	18	4	5	29	24	7	5	5	2
March	6.8	18	8	5	3	13	8	32	11	2
April	9.1	7	2	18	20	23	12	8	5	5
May	8.9	19	5	10	2	5	7	22	22	8
June	9.1	36	3	12	0	15	2	12	3	17
July	6.4	24	6	8	19	8	2	10	8	15
August	9.0	41	7	8	5	12	0	8	7	12
September	6.2	46	2	10	3	12	2	5	8	12
October	9.6	43	7	8	17	10	5	2	5	3
November	6.3	19	0	17	14	21	5	14	9	2
December	7.4	33	0	11	18	16	2	15	2	3
Annual	7.8	27	4	11	12	14	5	12	8	7

Avg.: Average, **V:** Average speed in all directions, **N:** North, **S:** South, **E:** East, **W:** West, **C:** Calm

As shown in Figure 5.3, the prevailing wind direction is predominantly northerly, with an annual frequency of 27%, and it is mainly during the months of January, June, July, August, September, October and December that the wind blows from this direction; for the rest of the year, the wind took on a variety of directions.

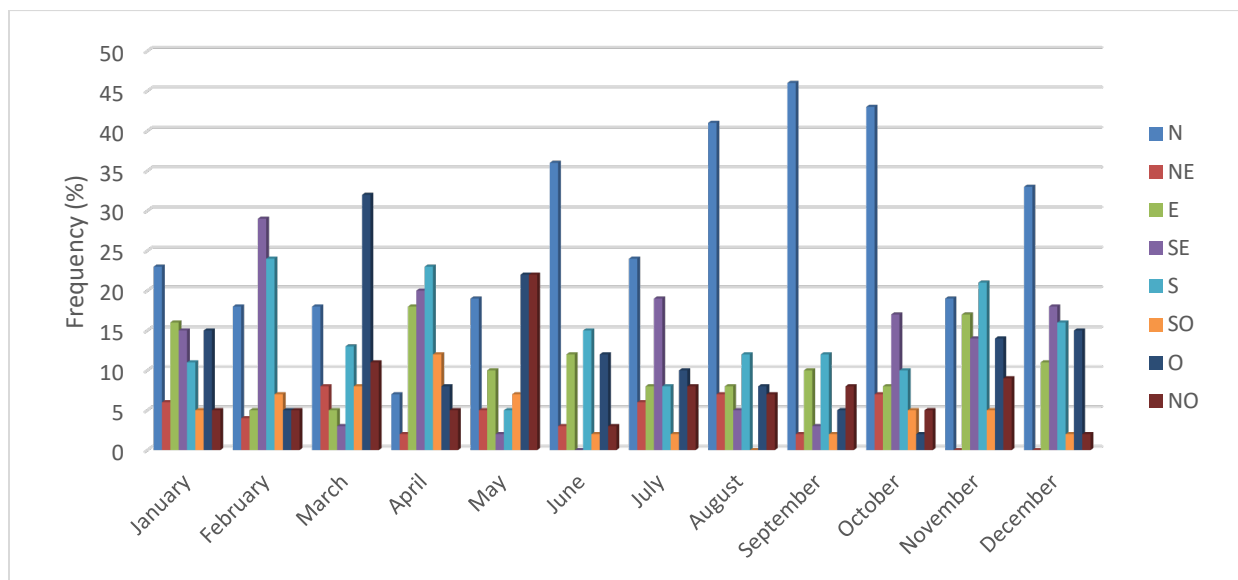


Figure 5.3 Average wind directions from January to December 2023

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This finding is confirmed by data recorded by a weather station at the Troilus site, which shows that from December 12, 2019 to November 15, 2023, the most dominant wind direction is north-northeast (NNE) with a frequency of 10.5%, followed by north with a frequency of 9.34% and then east-northeast (ENE) with a frequency of 9.24% (Figure 5.4).

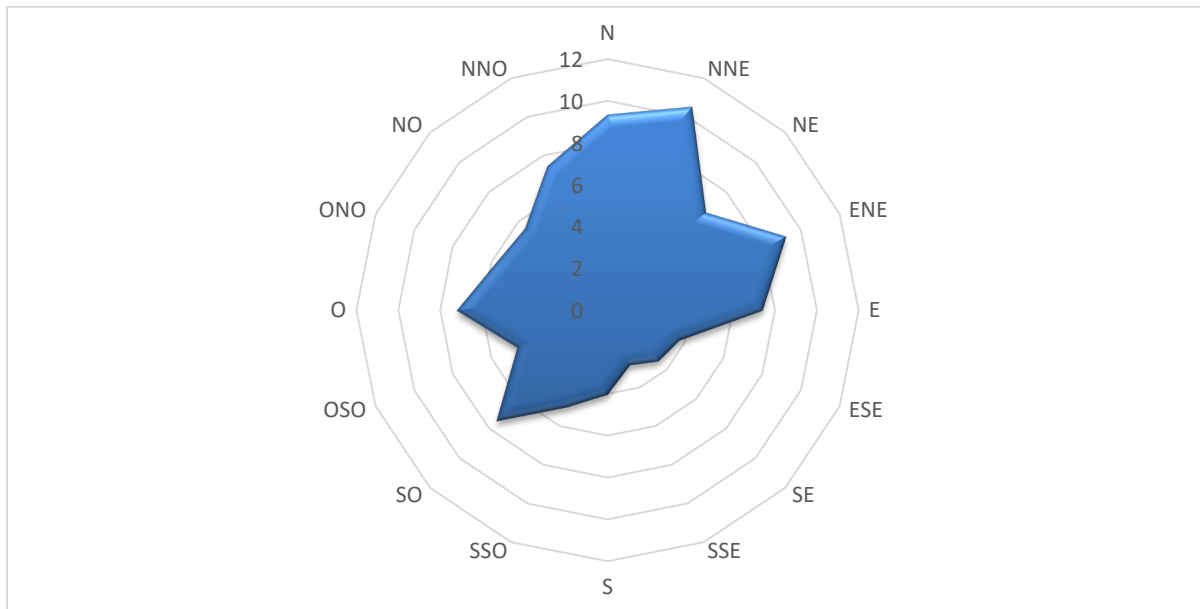


Figure 5.4 Wind direction (source: Troilus weather station, 2019-2023)

Relative humidity

The data recorded at the Troilus site over a four-year period (December 2019 to November 2023) show that the air is humid all year round, since air is considered humid from 65% upwards. On average over the four years, the month with the most water-saturated air is December, with an average relative humidity of 90.45%. The month with the least saturated air is June, with an average relative humidity of 67.96% (figure 5.5).

Monthly potential evapotranspiration estimates

According to the 1991-2020 climate normal (MELCCFP), annual potential evapotranspiration is 482 mm, and varies monthly between 0 and 122 mm. It is highest during the warmer periods of May to September and then drops to 0 mm from November to March (Figure 5.6).

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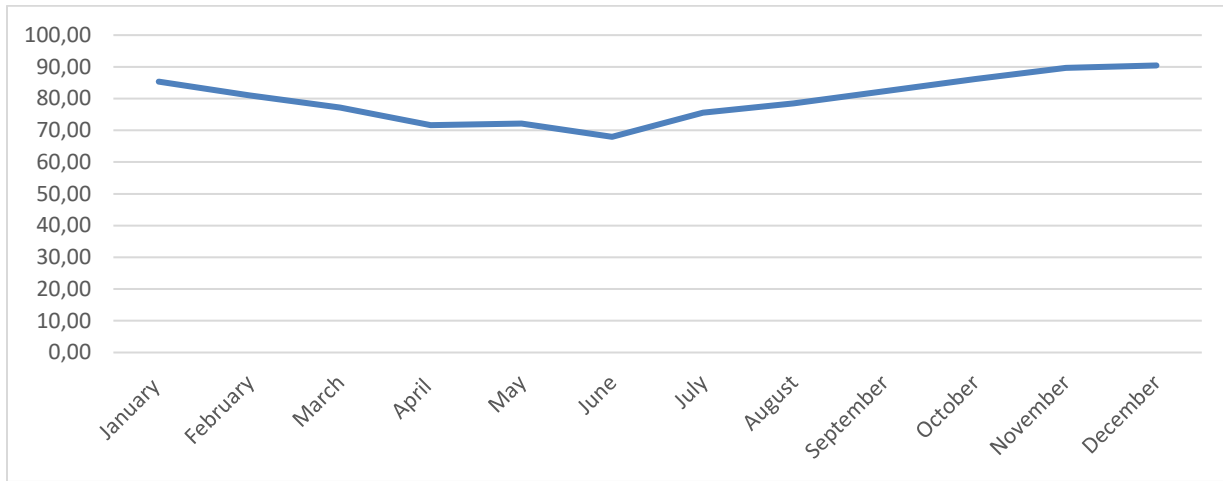


Figure 5.5 Average relative humidity, Troilus site weather station 2019-2023)

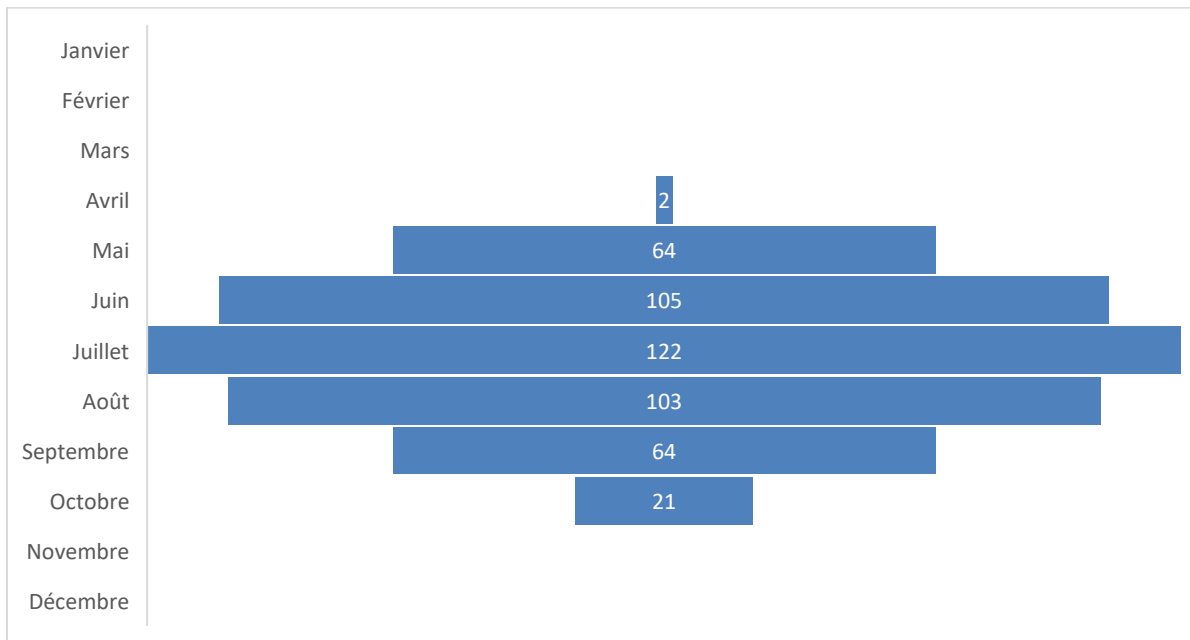


Figure 5.6 Annual evapotranspiration, climate normal 1991-2020 (MELCCFP)

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5.2.1.3 Influence Of Climate Change on the Climate

Regional climate

The impacts of climate change are now evident in Quebec and around the world. They are reflected in phenomena such as increased precipitation, prolonged heat waves, more widespread forest fires, melting permafrost and rising sea levels.

Climate model projections indicate an intensification of these phenomena, as well as an increase in the frequency of extreme hydrometeorological events such as floods and droughts.

Climate change may induce changes in the intensity, frequency and duration of extreme weather events such as winter storms, high winds and torrential rains. These changes are likely to aggravate consequences such as flooding, riverbank erosion, submersion, landslides, urban heat islands, permafrost thawing and the proliferation of invasive exotic species.

According to Hydro-Québec's 2022-2024 Climate Change Adaptation Plan, Northern Quebec could experience a median temperature increase of +4.1°C by 2041-2070, and +7.1°C by the end of the century (compared with 1981-2010), if high GHG emissions continue. These projections suggest an increase in forest fires, precipitation, infrastructure damage and changes to the hydrological regime.

Local Climate

The climate in the Troilus mining project area is subject to a variety of climatic changes, including exceptional temperatures and rainfall such as that observed in May 2023, when there was a 38% increase in normal rainfall with 28 mm in Chapais, Northern Quebec. It was at the end of this month that the first heatwaves of 2023 were observed, with temperatures above normal ranging from 14°C to over 18°C in places in Abitibi-Témiscamingue and other regions of Quebec. The local heat record was also broken in Chapais, where temperatures reached 33.9°C (MELCCFP).

In January 2013, the Abitibi-Témiscamingue and Saguenay-Lac-Saint-Jean regions, as well as the Fauna Reserve of the Laurentians, were hit by intense cold, with temperatures as low as -47.6°C in Abitibi-Témiscamingue (Source: MELCCFP press release, January 24, 2013).

The Société de protection des forêts contre le feu² (SOPFEU) 2023 assessment (SOPFEU, 2024) indicates that communities and municipalities close to the Troilus site, such as Mistissini (about 80 km from the site), Chibougamau and Oujé-Bougoumou (about 123 km from the site), and Chapais (about 140 km from the site), were significantly impacted by the fires, and residents of the latter had to be evacuated under the threat of flames and/or dense smoke.

According to projections, the main impact could be a shorter frost period and more abundant precipitation. The consequences that these events could have on the Troilus project are:

- Difficult access to the territory;

² The Society of Protection of Forests Against Forest Fire's

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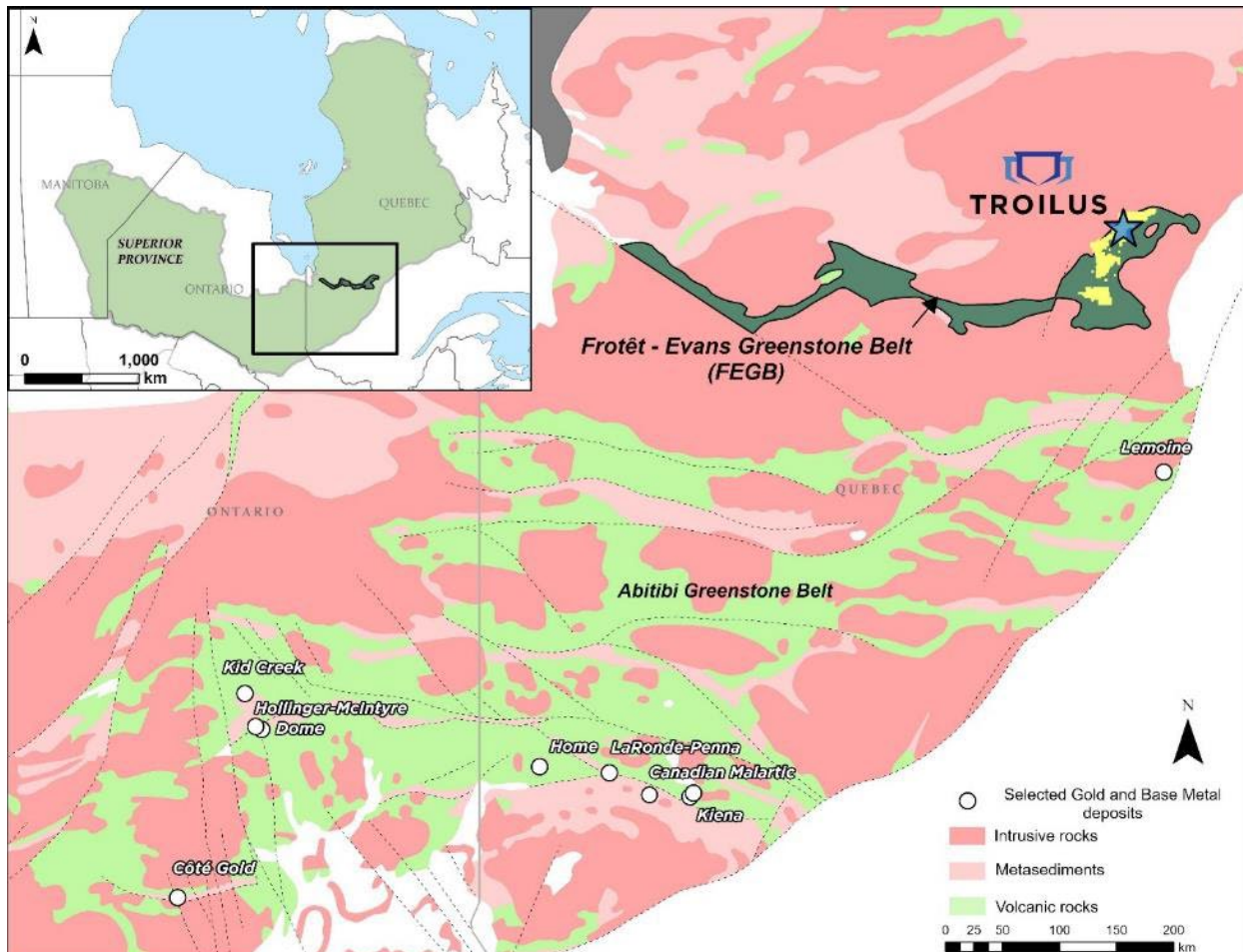
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- Disruption of mine operations;
- Temporary loss of access;
- Risk to future site development and conditions;
- Risk to power supply and transmission network;
- Increased costs.

5.2.2 Geology and Geological Hazards

5.2.2.1 Regional Geology

The Troilus project is located in the Eeyou Istchee Baie-James region, just north of Abitibi. Geologically, the project is located in the northeastern part of the Frotet-Evans greenstone belt, which extends nearly 300 km from west to east (Figure 5.7). The belt is divided geographically into four distinct segments with, from west to east: (1) Evans-Ouagama, (2) Storm-Evans, (3) Assinica, and (4) Frotet-Troilus, which contains the Troilus deposit (Boily and Dion, 2002). This belt of Archean greenstone is part of the Opatica tectonic subprovince, in the Superior Geological Province, which corresponds to the largest Archean craton preserved on Earth.



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Figure 5.7 Location of the Frotet-Evans greenstone belt and the Troilus project, with the position of the company's claims (yellow).

The rocks that make up the eastern part of the Frotet-Evans belt are mainly volcano-sedimentary rocks composed of mafic to intermediate lavas and felsic to intermediate tuffs, separated from the basement rocks by deformation zones. They form a stack of supracrustal rocks encased in a large synformal structure (Simard, 1987). This volcano-sedimentary sequence has been cut by ultramafic to mafic co-magmatic sills up to several hundred meters thick, and in places representing up to 60% of the sequence. Ovoid masses ranging from 2 to 10 km in diameter and composed of syntectonic to post-tectonic granitoid intrusions are also found in large numbers in the region (Figure 5.8), and are particularly visible on aeromagnetic maps.

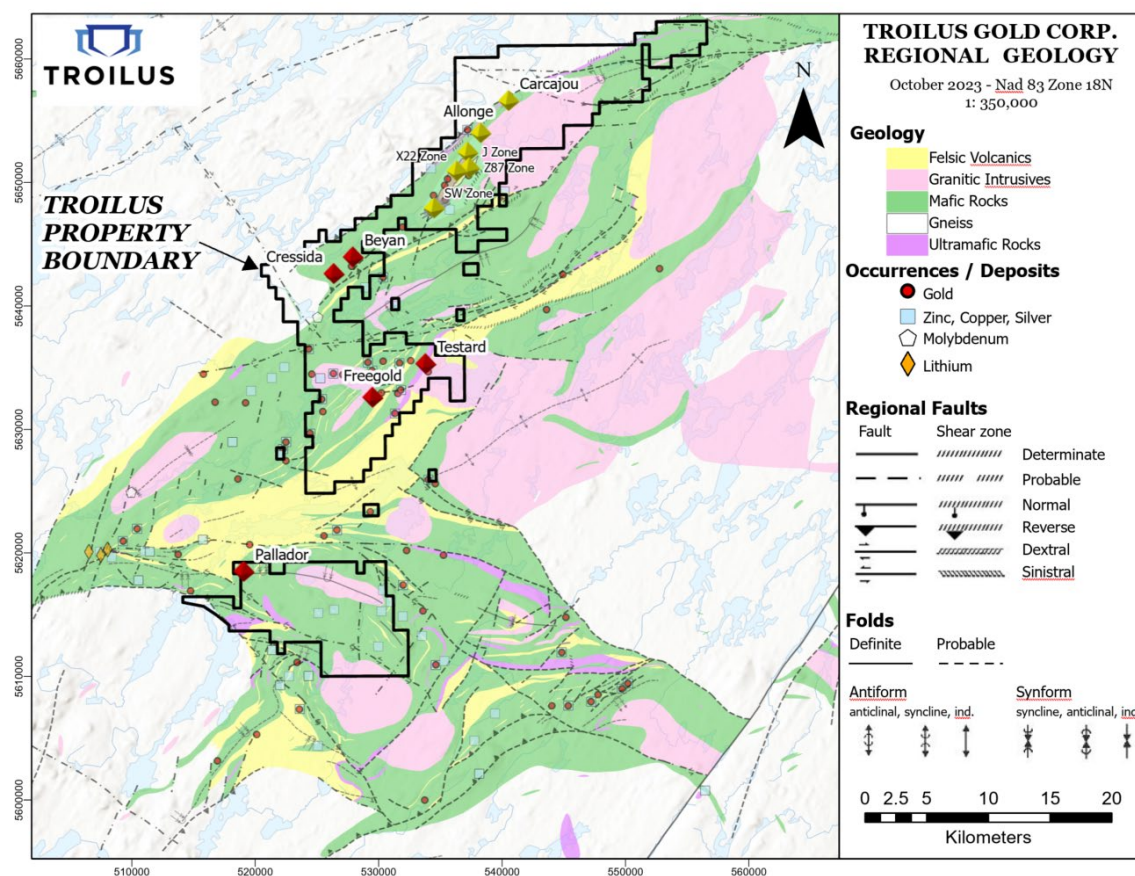


Figure 5.8 Geology of the Frotet-Troilus segment of the Frotet-Evans belt, with location of the main mineralized showings.

The geochronological data available for the Frotet-Evans belt show a spreading of synvolcanic ages with several cycles notably around 2790 Ma (Troilus sector), 2770 Ma (Evans-Ouagama sector), 2750 Ma (Storm-Evans sector) and 2740 Ma (Lac Rocher sector) with ages obtained on volcanic rocks, sediments and dioritic to tonalitic intrusions (Bandyayera and Sharma, 2001; David and Parent, 1997; Davis, unpublished; David, 2018 and 2021). Interestingly, felsic volcanic rocks dated at 2750 Ma have zircons inherited from the older phase (2790 Ma). Older ages are also found in the western part of the belt, testifying to the presence of an older Mesoarchean basement (>2800 Ma), which outcrops locally. This

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synvolcanic period (2790-2740 Ma) is associated with lenses of polymetallic massive sulfides (Zn-Cu± Au± Ag± Pb sometimes enriched in Co-Cd), the development of sometimes extensive horizons of silicate-oxidized iron formation (in the Evans-Ouagama and Storm-Evans sectors), and magmato-hydrothermal Au-Cu-Ag± Mo±Zn±Bi mineralization in and near synvolcanic intrusions (Fraser, 1993; Groulier et al., 2020). In the central part of the belt (Storm-Evans and Assinica segments), a sedimentation phase (Broadback Group) with exhalative horizons (iron formations, ferruginous mudrock and magnetite wacke; [Brisson et al., 1998]) then overlies the volcanic sequences with local conglomerate deposits with a maximum depositional age approaching the volcanic cycle of 2750 Ma indicating sedimentation contemporary with the dismantling of the volcanic edifices (David, 2021). This is followed by several post-volcanic syn-deformation magmatic phases that include felsic and mafic-ultramafic rocks sometimes accompanied by intermediate rocks that are locally mineralized with Ni-Cu± EGP± Au and Au-Cu-Pd and were emplaced between 2705 and 2700 Ma in the western and central part of the belt (David, 2021; Groulier et al., 2020; Davis, 2021). Finally, the last phase of magmatism was emplaced between 2700 and 2629 Ma and is intermediate to felsic in composition, with peraluminous and alkaline signatures. This phase appears to be synchronous with the phases of deformation and peak metamorphism, which are associated with a phase of partial melting of the crust and basement (dated between 2689 and 2670 Ma by Sawyer and Benn, 1993 and Sawyer, 1998) with the emplacement of lithium- and rare-metal-bearing pegmatites for the latest magmatic phases (David, 1999; Davies, 2021; Groulier et al., 2020). All this points to a high-gradient geothermal orogenic style with partial melting of basement and supracrustal rocks, temporally associated with mantle and crustal melting. In the Frotet-Evans belt, metamorphic facies vary from greenschist in the heart of the belt to amphibolite at the edge of the basement and near intrusions (Gosselin, 1993). Major shear zones form or re-form during this phase, allowing the mobilization of gold-enriched hydrothermal fluids and the formation of orogenic gold-type deposits.

5.2.2.2 Local Geology

The Troilus deposit is located in the northeastern part of the Frotet-Troilus segment and is hosted by intrusive volcanic and sub-volcanic rocks of the Troilus Group in a zone of intense deformation also known as the Parker domain (Gosselin, 1996). The deposit is located within the northern flank of the overturned Troilus syncline, which was subsequently transposed by a series of NE-SW trending, NW-dipping thrust faults parallel to the regional fabric and stratigraphy (figure. 5.9). In the vicinity of the deposit, they appear as zones of intense ductile deformation that anastomose to form corridors. In these corridors, the fabric is highly visible and is marked by the alignment of micas (biotite and muscovite) as well as amphiboles and plagioclases, but also fragments in tuffs and breccias and pillows in basalts. It is important to note that the rocks in the Troilus area have undergone significant deformation and relatively high metamorphism (upper greenschist to mainly lower amphibolite facies), and are therefore metamorphosed. For the sake of simplicity, however, the prefix meta- will be dropped. The primary textures of the rocks are relatively well preserved, enabling us to identify a large proportion of the rocks in the deposit.

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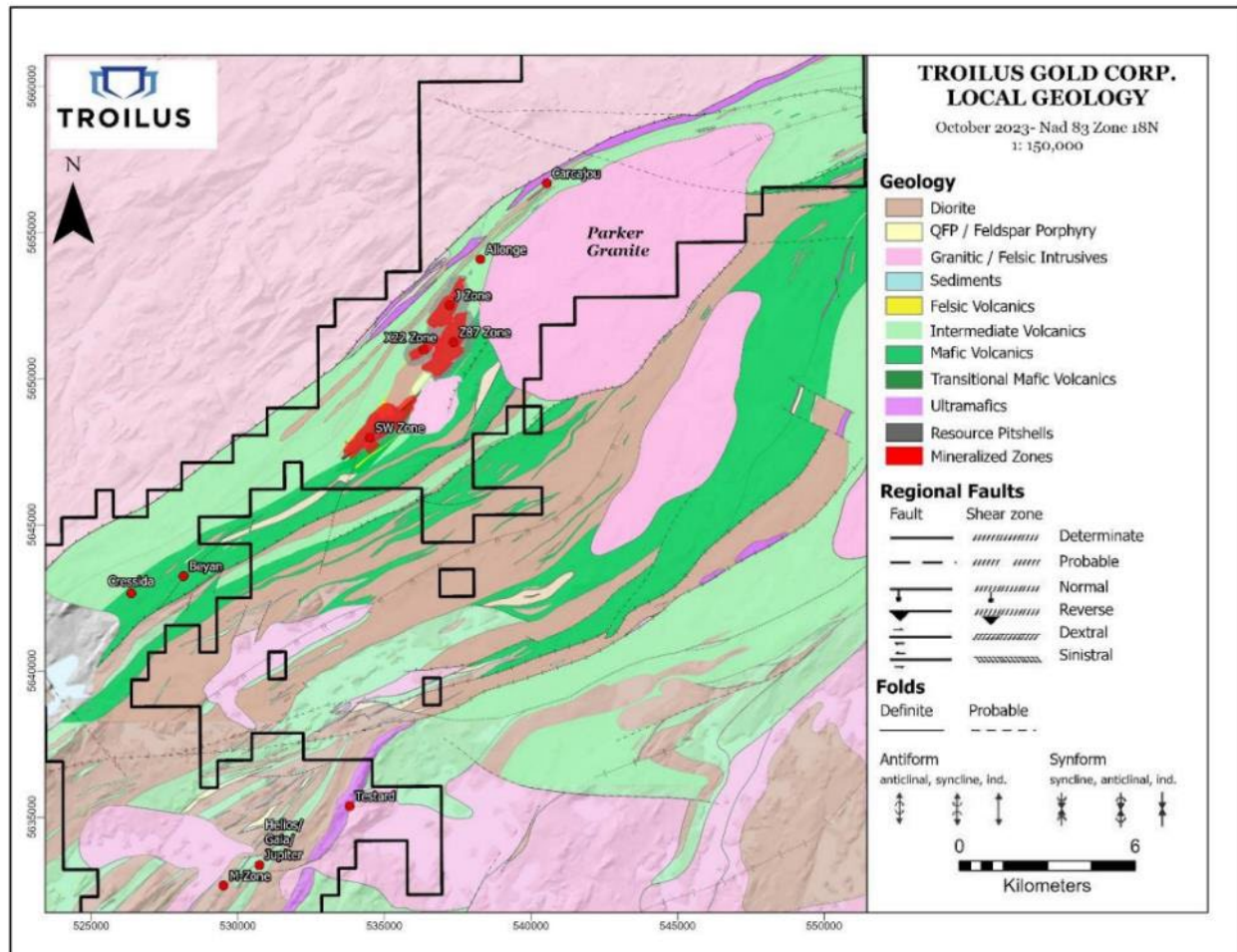


Figure 5.9 Local geology of the Troilus deposit

The Troilus Group consists of a thick sequence of mainly mafic to intermediate volcanic rocks and their feeder intrusions (peridotite-pyroxenite sill and gabbro, diorite, quartz diorite and tonalite as well as dacite-rhyolite dykes). The rocks in the Troilus deposit area are part of the Middle Parker Formation.

The Troilus deposit is located within (zone X22) and bordering (zones SW, 87 and J) a polyphase pluton of gabbroic to tonalitic composition with a dioritic main phase of calc-alkaline signature dated at 2791.2 Ma ± 1.6 Ma (figure 5.10).

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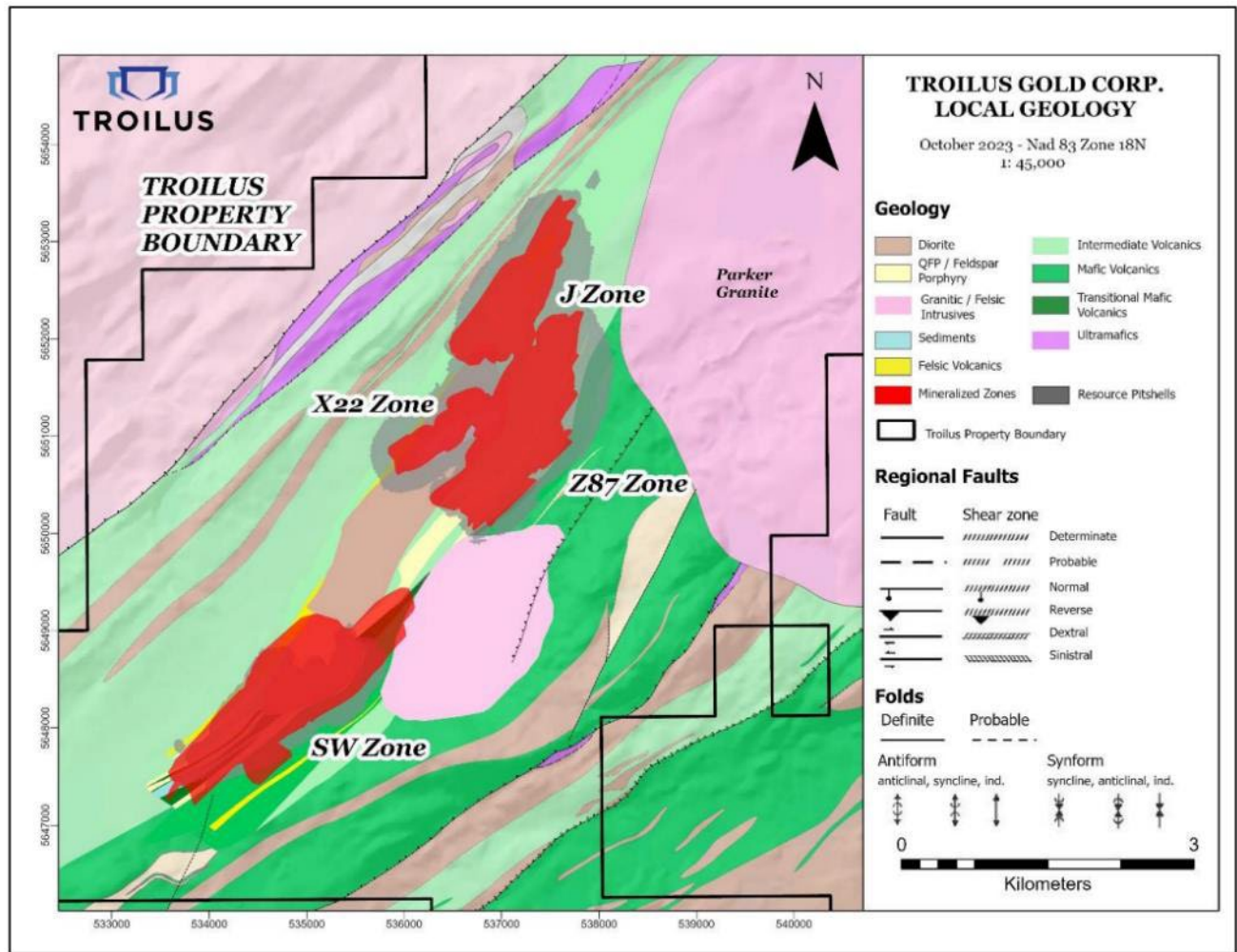


Figure 5.10 Geology of the Troilus deposit with main mineralized zones

5.2.2.3 Landslide Risk

In 2022, Golder et Associés carried out an assessment to map the terrain and geological risks. This study was used to produce Figure 5.11. The main results of this study show that the study site, covering 144 km², is predominantly composed of moraine (60.3%, or 8,687.2 hectares), 56.5% of which has a depth greater than 3 metres. A further 13.7% (1,979.6 hectares) of the site consists of poorly drained organic matter, of which around 40% is more than 3 metres thick. Glaciofluvial sediments account for around 7.1% (1,042.3 hectares) of the study area, of which almost 72% are over 3 metres thick. The remainder of the study area is made up of lakes (12%), anthropogenic areas (6%), rock (0.4%) and finally colluvium (< 0.1%).

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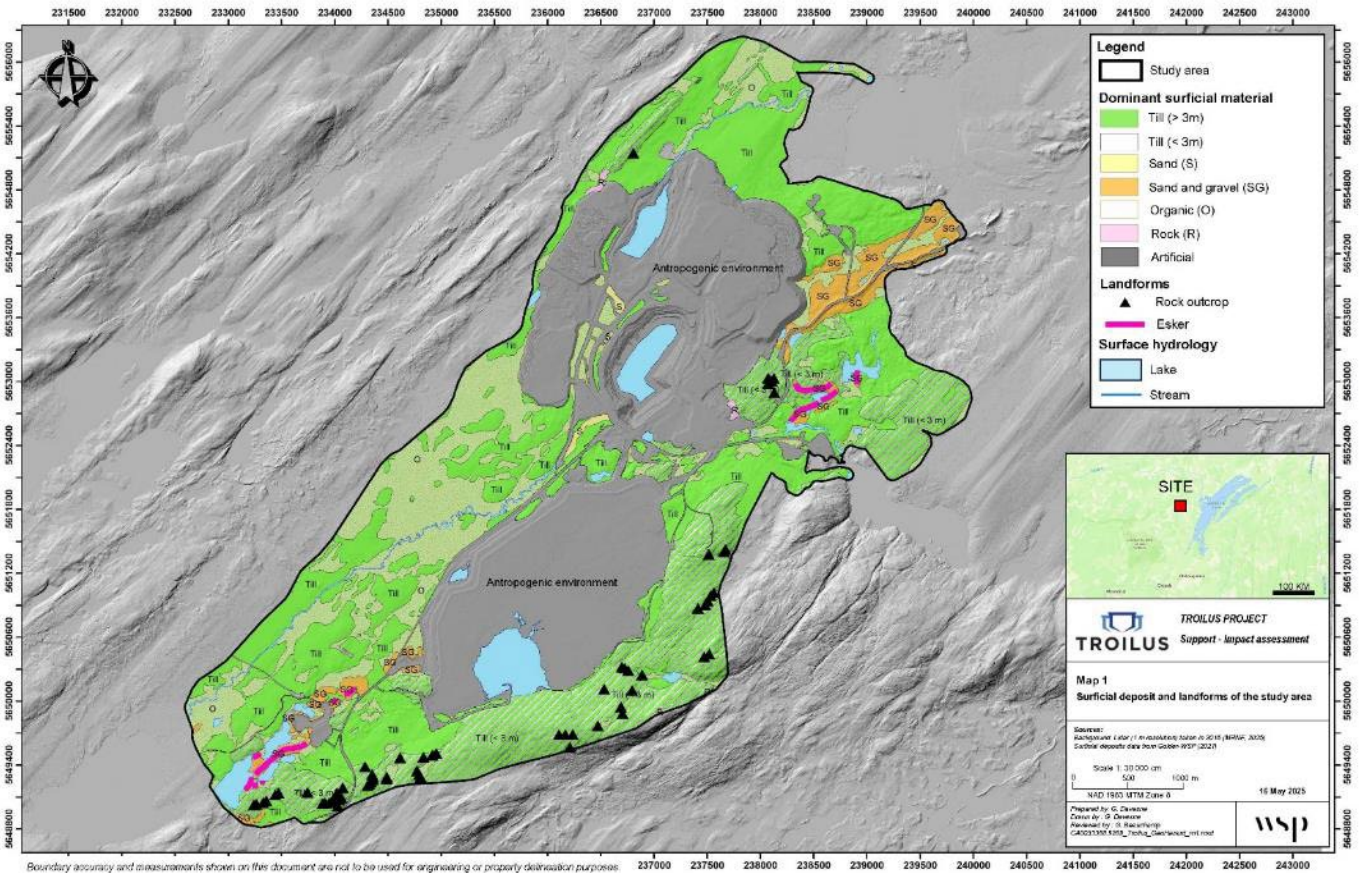


Figure 5.11 Loose deposits in the Project Development Area

The terrain stability analysis carried out as part of this study includes a classification of the areas at risk, divided into different categories according to their level of hazard. These categories are detailed in Table 5.8 below, based on the classification system provided by the British Columbia Ministry of the Environment (1999).

Table 5.8 Categories of ground stability in the study area

Terrain stability category	Interpretation	% of study area
Null	Includes water bodies and anthropogenic areas	17.8 %
I	No existing stability problems	48.2 %
II	The probability of landslides following logging or road construction is very low; minor subsidence is expected along roads, particularly for one or two years after construction.	27.7 %
III	Minor stability problems may occur. Timber harvesting is not expected to significantly reduce ground stability. Landslides are unlikely to occur after timber harvesting. Minor subsidence is to be expected along roads, particularly 1 or 2 years after construction. Landslides are unlikely to occur after road construction.	6.1 %

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Terrain stability category	Interpretation	% of study area
IV	Areas with a moderate probability of landslides following logging or road construction.	0.3 %
V	Areas with a high probability of landslide following logging or road construction.	<0.1 %

The area studied is largely stable, with 99.7% of zones classified as category I, II, III or null. Only 0.3% of the area is potentially or actually unstable. The majority of slopes are between 0 and 20%, although some areas have steeper slopes. The latter are generally associated with rock formations unlikely to be unstable, such as metamorphic and igneous rocks.

Generally speaking, 5 zones of high instability have been identified, but these are mostly natural eskers with minor landslide potential and no major danger to the environment or land users, or the shoulder of an access road that will be backfilled with waste rock during the new project. Other areas of instability that have already been identified by the engineering team will either be avoided altogether, or additional safety measures will be applied when the construction of infrastructure in these areas cannot be avoided, as is the case for the proposed new access road. Figure 5.12 shows the level of landslide risk in the PDA.

Troilus Gold Corp (Troilus) is not aware of any other historical areas of instability or landslides in the study area. However, some waste rock piles in the area have steep slopes and lack benches, making them vulnerable to rock slides. These slopes were observed during operations, but no slides or movements have been reported to date. This concern has been expressed by land users and will be taken into account and rectified in the new operation.

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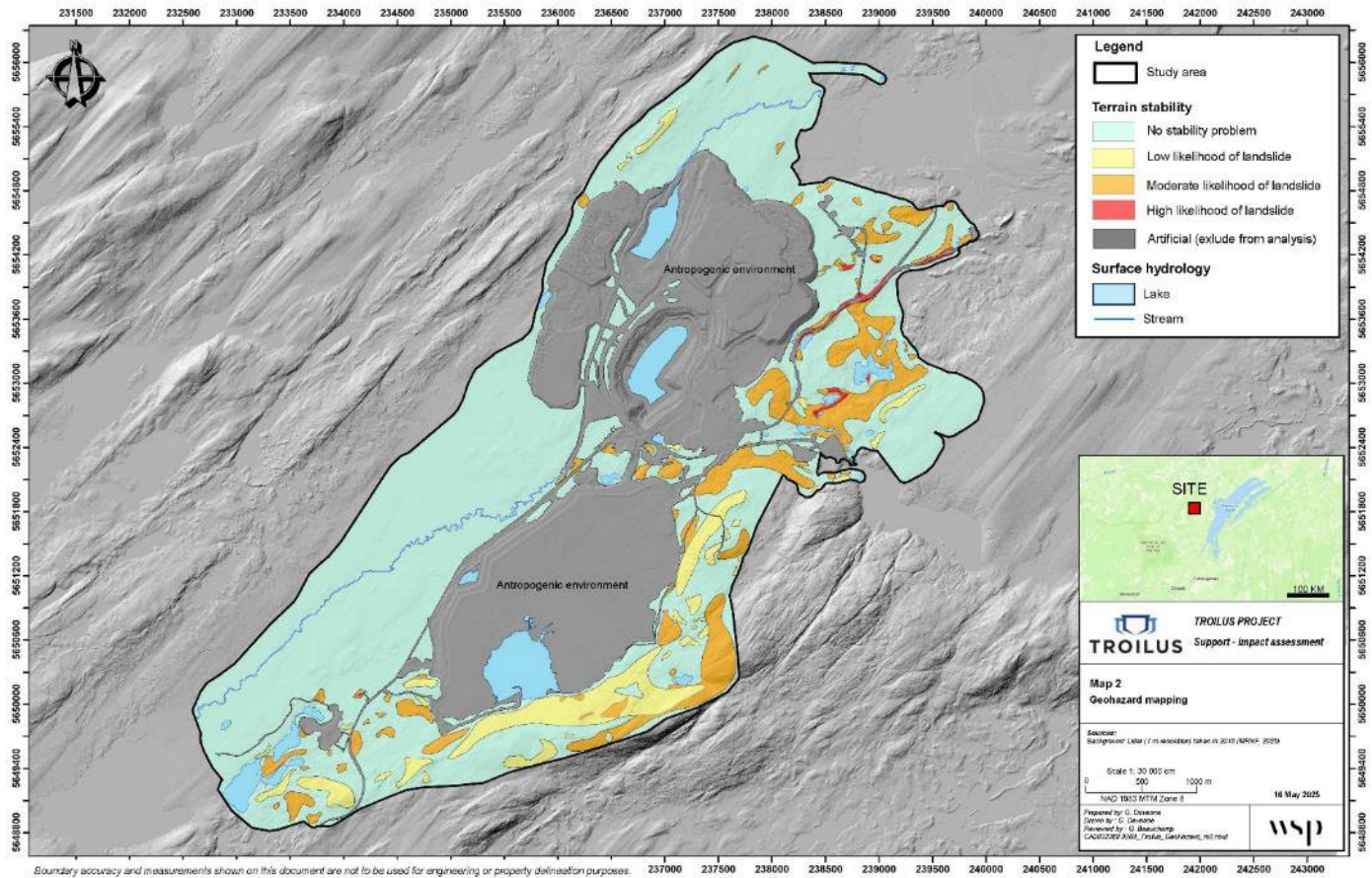


Figure 5.12 Ground stability zones in the Project Development Area

5.2.2.4 Seismic Risk and Activity

According to information available in Natural Resources Canada's (NRC) 2015 National Building Code of Canada Seismic Hazard Calculator, the project area can expect to experience a peak ground acceleration (PGA for Peak Ground Acceleration) PGA of 0.041 g for an event with a 2% probability of being exceeded in 50 years (return period 2,475 years) (WSP, 2024a) based on Natural Resources Canada (NRC, 2016).

The project site is located in the Canadian Shield in eastern Canada, which, according to Natural Resources Canada, is a stable continental region of the North American tectonic plate. Since the majority of earthquakes (~97%) are caused by the continual movement of tectonic plates (<https://www.seismescanada.rncan.gc.ca/hazard-alea/simphaz-fr.php>), the study area has little risk associated with seismic activity.

Figure 5.13 below shows the location of the mine site in relation to the level of earthquake risk.

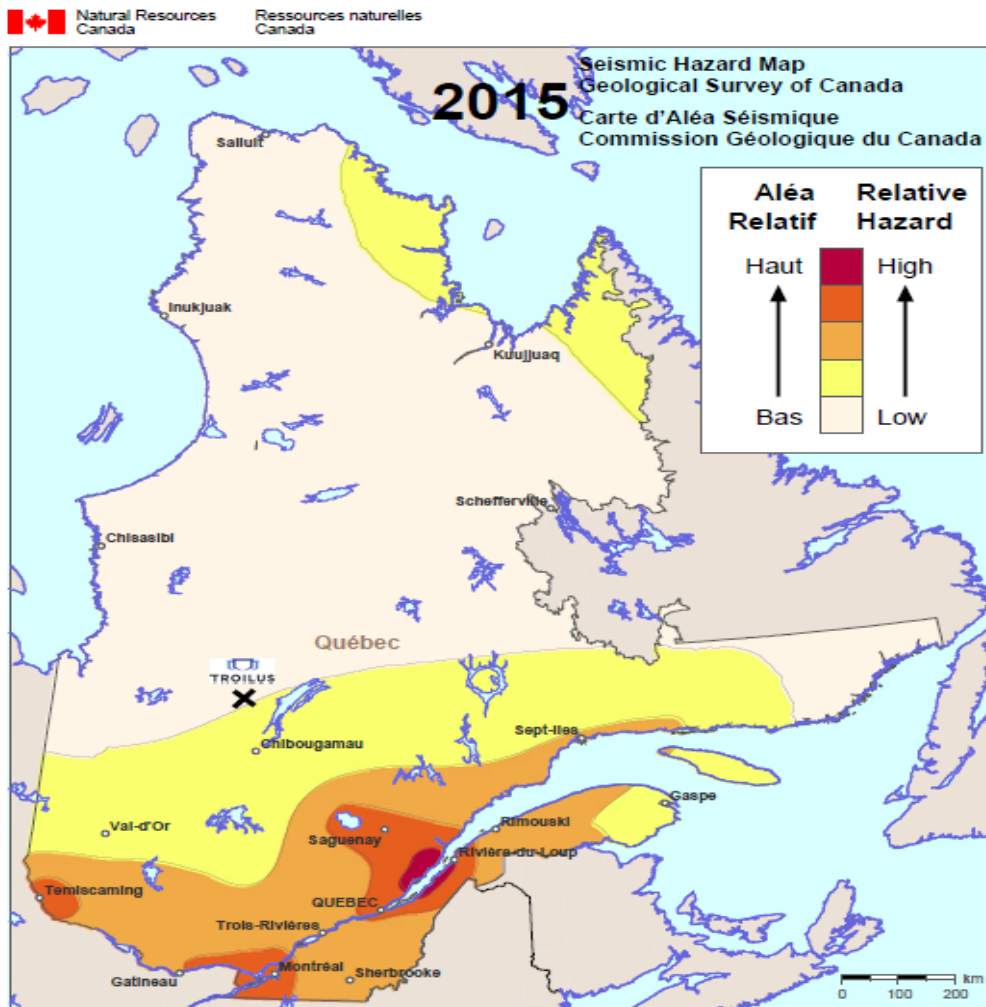


Figure 5.13 Seismic hazard, Geological Survey of Canada

5.2.3 Environmental Geochemistry

Before and during the mine's production start-up in the 1990s, hundreds of analyses were carried out on rock samples (drill core or rock from the stopes) from the 87 and J4 pit waste rock. The results of static acid-generating potential tests on waste rock from pit 87 showed no risk of acid mine drainage (AMD), whereas for waste rock from pit J4, the potential was uncertain (alternating between potentially and non-potentially acid-generating, as well as inconclusive).

Laboratory kinetic tests were then undertaken, without being able to confirm whether the J4 pit waste rock will produce AMD or not. Since the end of mining operations, water in contact with J4 pit waste rock has been sampled and analyzed regularly at STP-9 effluent. Water quality at effluent STP-9 meets all discharge criteria, and there is no indication of acidification or leaching of metals at concentrations above effluent discharge criteria [Directive 019 and Metal and Diamond Mining Effluent Regulations (MDMER)]. This observation is contrary to what the majority of static and sometimes kinetic tests predicted, i.e. a potentially acid-generating landfill.

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For the purposes of reopening the mine, it is important to build a model to predict the quality of the water that will be in contact with the waste rock, tailings and pit walls. It is also necessary to be able to verify whether the rocks that will be extracted will be geochemically similar to those extracted in the past, in order to determine whether what is currently on the surface is representative of the rocks that will be extracted in the future.

A review of previous studies (Appendix A of the report: 'Presentation and analysis of geochemical characterization studies 1990-2024 – Troilus Project' [see Appendix F.1 of this ESIA report]) shows that predictions made by different consultants led to predictions of acid mine drainage ranging from none, to the appearance of AMD after several years, and even to potential AMD only after 1,500 years of exposure. This disparity was partly due to the choice of samples tested, but also to the interpretation of results, which did not follow typical patterns. Almost 30 years after mining began, no AMD has yet been observed at the Troilus site. This observation eliminates the hypothesis that AMD could appear rapidly. In 2010, when mining operations ceased, AMD was expected to be observed within a year or so, but this was not the case. As there were still significant uncertainties regarding the occurrence of AMD at the Troilus site, for both existing and future waste rock, Troilus set up an intensive program involving fundamental studies with the COALIA group (Appendix F.2), the National Research Council (NRC) of Canada (Appendix F.3) and the Minesite Drainage Assessment Group (MDAG) (Appendices F.4 and F.5).

The exploration work at Troilus includes multi-element analysis by ICP (Inductively Coupled Plasma) after four-acid digestion on core samples. The core is systematically read from the start of drilling to depth, and a sample is tested every metre. As of November 2024, the exploration database therefore contains a total of 304,000 multi-element assays. These analyses can be used to build a predictive model of acid-generating potential, as explained below.

To build an AMD potential prediction model, standard static and kinetic tests were performed on 89 samples carefully selected from the exploration database analyses. In addition, further tests were carried out in the laboratories of the NRC and in the field at the Troilus site. To understand the geochemical behavior of the Troilus waste rock, a comprehensive mineralogical study was carried out by NRC in 2023, which identified an average mineralogical composition of the Troilus waste rock. This average composition is presented in Table 5.9. This exercise was carried out to measure the neutralization potential of silicate minerals. Standard prediction tests measure the neutralization potential mainly of carbonate minerals, virtually neglecting any neutralization potential contribution by silicate minerals. As field observations did not correlate with laboratory prediction results, experts suspected that the unaccounted neutralization potential that might result from the silicate minerals in the Troilus rock might play an important role in the determination of AMD potential and in the water chemistry of the Troilus site. Table 5.9 shows the significant presence of silicates from the plagioclase in the tested rock. The minerals that make up the plagioclases have been identified as those that help neutralize the acidity generated by the oxidation of sulfides present in Troilus rocks (MDAG, 2024a). Bytownite and labradorite are the minerals that increase the neutralization potential to confirm that the Troilus rocks will never generate acid (MDAG, 2024a and 2024b [appendices F.4 and F.5]).

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Table 5.9 Average mineralogy of Troilus waste rock (NRC, 2023)

Mineral	% (mass)	Mineral group	% (mass)
Bytownite (80%mol Ca-20%mol Na)	4.32	Plagioclase	54.35
Labradorite (60%mol Ca-40%mol Na)	3.35		
Andesine (40%mol Ca-60%mol Na)	11.69		
Oligoclase (20%mol Ca-80%mol Na)	25.50		
Albite (5%mol Ca-95%mol Na)	9.51		
Quartz	26.56		
Muscovite	1.07	Mica	10.71
Phlogopite	1.39		
Biotite	8.26		
Tremolite	5.29	Amphibole	7.05
Actinolite/tremolite	1.76		
Pyrite	0.60		
Titanite	0.28		
Calcite	0.48		
Other	0.44		

Thanks to the information contained in this exploration database, it is now possible to know the acid-generating potential of 304,000 rock samples from all explored areas, using mainly calcium, sodium and sulphur analyses. As exploration continues, this database contains more analysis results, and each sample sent to the laboratory has the data required to assess its acid-generating and neutralizing potential. Troilus is not only able to make geological models of resources, but can also create a geological model of the distribution of acid-generating potential in future pits, and identify if any areas could be problematic. Troilus can therefore tailor its mining and stockpiling methods to ensure that if areas are found to contain waste rock with higher acid-generating potential, it can be stockpiled, for example, in pits that have already been mined and flooded.

Oxidation of dissolved iron is strongly influenced by pH and oxygen availability. The transition from ferrous iron (Fe^{2+}) to ferric iron (Fe^{3+}) takes place much more rapidly at near-neutral pH than under acidic conditions, provided sufficient oxygen is available (Morgan and Lahav, 2007). Iron hydroxide minerals have a low solubility in water. For example, the solubility product (K_{sp}) of goethite (FeOOH) varies between $10^{-0.02}$ and 10^{-11} , depending on temperature, pH, time, particle size, presence of impurities and ionic strength (Ugwu and Sherman, 2019). Standard kinetic tests and mine effluent monitoring points, from previous mining operations, show aerobic conditions where the majority of Fe^{2+} is probably already

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oxidized, leading to the precipitation of iron oxides or hydroxides. These conditions do not reflect seepage that might occur from the tailings storage facility, where the environment is predominantly anaerobic, favoring Fe^{2+} mobility. As a result, drainage water from the tailings storage area is likely to be enriched in Fe^{2+} . Exposure of seepage to atmospheric conditions will shift the oxygen supply from virtually non-existent to limited by the dissolution of atmospheric oxygen into the seepage solution. The shift in oxygen availability occurring from seepage emerging at the tailings facility will likely drive Fe^{2+} oxidation and iron oxyhydroxide precipitation. The geochemical tests described above do not reproduce or reflect anoxic conditions, and therefore the potential impacts associated with seepage from the tailings facility have not been assessed. It should be noted that existing observations indicate the presence of red-colored waters (characteristic of iron-rich water under aerobic conditions) that would likely originate from seepage from the existing tailings facility, suggesting potentially iron-enriched drainage.

The empirical model presented in the report in Appendix H.5 indicates that, if a mining effluent with a pH of 8 or greater is maintained at the Troilus site, no metal leaching is expected to exceed the criteria of Directive 019 *and* MDMER. This applies not only to the operating phase of the project, but also to the closure and post-closure periods. Water quality should therefore remain comparable to that observed during previous operations.

5.2.4 Topography, Soil and Sediments

The topography of the PDA and LSA/RSA shows rocky valleys and hills oriented approximately N220°, sub-parallel to glacial erosion forms representing the relics of regional northeast/southwest glacial flow. Elevation is between 365 and 520 m above sea level, with an average local relief of around 35 m (between 365 and 400 m between two hills). The local topography is therefore undulating and irregular, with rocky outcrops intersecting loose deposits. Surface drainage water from the study site is discharged by infiltration into the soil and by runoff to streams, wetlands, lakes or pits from the former operation.

Soils in the LSA were formed on superficial geological deposits consisting of:

- Morainic formations (M): moist, black or dark brown organic soil on the surface to a maximum depth of 0.55 m, followed by sand, with a variable proportion of gravel or silt, brown, grey or beige, and moist, to depths ranging from 0.39 to 16.10 m. These are essentially sandy or sandy-silty glacial till deposits with varying percentages of clast inclusions;
- Organic formations (O): black or dark-brown organic soil, generally saturated, with a thickness from the surface ranging from 0.1 to 1.98 m, followed by an occasionally dark-brown, saturated, silty sand. These organic soils are generally found in peat bogs and other wetlands on either side of Bibou Creek and around lakes;
- Fluvioglacial formations (FG): moist, black or dark-brown organic soil on the surface to a maximum depth of 0.75 m, followed by grey, brown or beige sand, with some silt or gravel to depths of over 7 m in boreholes;
- A few rocky outcrops are observed on the SW-NE-trending hills bordering the LSA.

Organic and Gleysolic soils, with a dark A horizon enriched with organic matter, very poorly drained to poorly drained, developed on fluviglacial or morainal materials have been mapped for most of the

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LSA/RSA. Well-drained, coarse-textured, sandy Brunisols with juvenile pedogenesis mapped on colluvial, fluvio-glacial or morainal deposits complete the soil types formed on overburden. Organic soils (an accumulation of organic matter of over 40 cm), especially Mesisols with a profile showing an intermediate level of plant litter decomposition, are also observed in the LSA/RSA.

The risk of surface erosion is very low for the LSA, since the entire area is protected by vegetation cover, with the exception of part of the former industrial zone and the tailings pond. The risk of water erosion is high to severe on the escarpments and along Bibou Creek. The risk of compaction is high for most LSA/RSA soils due to the combination of organic surface textures and imperfect to very poor drainage regimes in places. No permafrost has been reported in the project area.

A zone of soil contamination by airborne dust is delineated within the LSA. Soil and overburden materials appear to be non-acid-generating and non-leachable, with some copper anomalies, higher than background levels, noted at a depth near the contact with bedrock near copper-enriched mineralized zones.

Sediments in the LSA consist mainly of clays and silts, and occasionally sand. These sediments sometimes show high concentrations of metals, comparable to natural concentrations.

5.2.5 Surface Water

5.2.5.1 Hydrological Regime

The summary of current knowledge on the baseline state of the hydrological regime is based on a set of hydrological characterization studies carried out, including the work of Wachih (2019 and 2024a) and WSP (2024), presented in Appendices G1.1, G1.2 and C.14, as well as statistical analyses and results from hydrological modeling (Appendix H.4).

The following elements describe the main hydrological characteristics of the current environment:

- The LSA lies mainly in the Natastan watershed of the Rupert River, with minor drainage into the Broadback River watershed. Surface drainage begins at Lake Amont (PE2) and flows through a series of small lakes, water bodies and streams, then reaches Lakes B (PE29) and A (PE43) before emptying into Lake Boisfort (located approximately 10 km downstream). Bibou Creek (CE2), whose course is partially diverted around historic pits 87 and J, flows into Lake A (PE43);
- A new deviation of Bibou Creek is planned around the PDA to maintain the natural flow of water upstream of the site. The delineation of sub-basins as presented in Chapter 11 (Map 11.5) identified 27 distinct hydrological elements (sub-basins SB-1 to SB-27, as well as the mine and tailings storage facility area (TSF) outlets), each linked to specific stream segments and water bodies;
- In the absence of a long-term gauging station on site, flow data from the Broadback River (Broadback station 080809/03BD002, 1972-2005 & 2008-2024) were used as a proxy: annual peak flow series (1972-2024) were extracted and fitted to various multiple probability distributions to estimate flood quantiles. Trend analysis revealed statistically significant positive trends in annual and seasonal flows. Five hydrometric stations set up by Wachih (2024a) measured flow velocities and water level variations over the period 2023-2024. Data from these stations were used to establish rating curves;

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- Long-term climate normals (1982-2023) from the Chibougamau-Chapais station, located some 135 km south of the PDA, show average monthly precipitation and temperature cycles: mean annual precipitation is 859 mm, with maxima observed in spring (April-June) and autumn (September-November); mean monthly temperatures range from -16.4°C in January to +17.7°C in July;
- A continuous rainfall-runoff model HEC-HMS v4.5 was developed and fitted to the hydrological characteristics of the region. Input data included a digital terrain model (DTM with 1 m accuracy, used to delineate sub-basins, and climate forcing based on 1982-2023 precipitation and temperature data from Environment and Climate Change Canada (ECCC) station 7091405) adjusted to the regional scale. For the initial assessment of environmental reference conditions, a calibration based on observed flows (October 2023-April 2024) and manual and automatic parameter adjustment were carried out.

5.2.5.2 Surface Water Quality

Environmental monitoring of surface water quality was carried out at the site from 1996 to 2023, characterizing the frame of reference for the site's historical and current environment.

Environmental monitoring of surface water quality data collected at the site from 2019 to 2023 (Wachih 2020, 2024b) enabled the description of the current environment. Historical activities, including the operation and closure of the former mine site, have influenced the state of the current environment. A total of 13 surface water quality monitoring stations were sampled from 2019 to 2023, following an established methodology and sampling program. These sampling campaigns enabled the characterization of physico-chemical parameters and surface water constituents in the PDA, LSA and RSA.

Key observations on surface water quality include:

- Several surface water quality issues were raised during the operation and closure of the former mine site. These include the presence of elevated iron concentrations in the tailings storage area of the former mine site, as well as elevated suspended solids (SS) concentrations in the effluent from the tailing storage facility (PR-1), both during operation and after closure;
- The current surface water environment throughout the RSA and LSA is naturally acidic, characterized by a relatively low pH and low dissolved oxygen concentrations, characteristic of an oligotrophic environment;
- The current environment is also characterized by high levels of aluminum, copper, iron, cadmium and lead. Aluminum levels exceeded Canadian Council of Ministers of the Environment (CCME) and MELCCFP surface water quality criteria at all sampling stations. These results reflect naturally high aluminum and iron concentrations in this type of northern environment (Wachih 2024b). No criteria exceedances were noted for TSS in the current surface water environment;
- Pits J and 87 were dewatered between 1996 and 2010. Water quality in pits J and 87 is representative of the receiving environment. This water is mainly composed of the following three sources: infiltration of groundwater, runoff from surrounding pits and precipitation. These three sources, which are mainly the result of historical activities, already influence the current environment;

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- A geochemical model was developed using PHREEQC v3.7.3 software and the thermodynamic database lnl.dat (Parkhurst, 1995) to represent the mass balance of the reference state of surface water quality in the current environment. The technical report presenting the inputs, parameters and assumptions applied to the model is presented in Appendix H5;
- All data collected at the surface water quality monitoring stations of Lac Amont (PE2), Lake A (PE43) and the tributary stream of Lake A (PE43) from 2019 to 2022 show aluminum exceedances according to CCME guidelines. Exceedances of 'critères de qualité pour la Vie aquatique- Aiguë³' (CVAA), 'critères de qualité pour la Vie aquatique – chronique⁴' (CVAC) and MELCCFP for copper are also reported for all data collected at tributary stream of lake A (PE43). These exceedances are also frequent at Lake A (PE43) and Lake Amont (PE2). Total ammonia concentrations exceed the MDMER criterion at the tributary stream of Lake A (PE43);
- Environmental discharge objectives (EDOs) have been developed for the effluent from the dewatering of pits J and 87. These EDOs are based on the current quality of the receiving environment, so that the effluent is not likely to alter the receiving environment. Reference conditions show dissolved concentrations of total ammonia, copper, aluminum, cadmium, arsenic and selenium exceeding CCME regulatory criteria. Uranium concentrations exceed CCME and CVAC criteria. Elevated sulfate and hardness concentrations for the J pit are also noted.

5.2.6 Groundwater

5.2.6.1 Hydrogeology

The summary of current knowledge on groundwater quantity is based on a series of hydrogeological investigations carried out between 2020 and 2024, including work by WSP (2024a, 2024b, 2024c), Golder (2022), and the three-dimensional digital model developed by BluMetric (2025), presented in Appendix H.5. This work is also based on historical data predating mining (Geocon, 1993; Genivar, 2009) and on pumping tests and piezometric measurements carried out in over 280 boreholes.

The following elements describe the main hydrogeological characteristics of the current environment:

- The LSA is characterized by the presence of two main aquifer units: unconsolidated deposits (up to 30 m thick), essentially composed of juxtaglacial sands and glacial till, and the underlying fractured bedrock. These units are locally interconnected, notably due to topography and the presence of structural faults. The bedrock is part of the Frotet-Evans volcano-sedimentary belt. Hydraulic conductivity values vary considerably between units, with geometric averages ranging from 8.9×10^{-5} m/s (juxtaglacial sand) to 1×10^{-5} m/s (till), and from 2×10^{-7} to 2×10^{-5} m/s in bedrock, depending on depth and area involved (WSP, 2022);
- The general direction of groundwater flow follows the topographic slope, oriented broadly north and northeast, towards Lake A (PE43) and Bibou Creek. Local gradients influenced by existing pits (notably pit 87) induce drawdowns of up to 70 m. The southeast sector of the tailings facility represents a recharge zone, while the pits and certain mining infrastructures act as drains;

³ Aquatic Life Quality Criteria - Acute

⁴ Aquatic Life Quality Criteria - Chronic

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- Piezometric measurements taken between 2022 and 2023 in 35 observation wells have documented groundwater levels and validated hydrogeological modelling. These data were integrated into a steady-state flow model (FEFLOW) to characterize the water balance and connections between aquifers and surface hydrosystems. This model showed a significant groundwater contribution to Bibou Creek (1,401.6 m³/d), as well as seepage to pits J4 (1,633.3 m³/d) and 87 (2,197.8 m³/d);
- Particle-tracking analyses confirmed that pits J4 and 87 are hydraulically connected to Bibou Creek, demonstrating a significant interaction between groundwater and surface water in the PDA area. This bi-directional connection could be altered by mining operations, particularly when dewatering the pits;
- In the absence of any significant drinking water wells in the LSA, current groundwater uses are limited to well PU-4 for the temporary camp drinking water supply, and well PO-DET-4 for the Awashish family. The aquifers exploited are classified as MELCCFP Class II, i.e. current and potential sources of water supply;
- The hydrogeological model also incorporates climate data from the Chibougamau-Chapais station for recharge periods (spring/fall), as well as regional topographic and geological data to define boundary conditions and recharge/discharge zones. Maps 12.5 and 12.6 in Chapter 12 illustrate simulated piezometry in unconsolidated deposits and bedrock respectively.

5.2.6.2 Groundwater Quality

The description of current groundwater quality is based on environmental monitoring carried out between 2018 and 2023, including Troilus and WSP work (2024a and 2024b), presented in Appendices G1.10 and G1.12, as well as on historical data collected by Geocon (1993) prior to operation of the initial mine site. This monitoring enabled in-depth characterization of physico-chemical parameters and potential contaminants in groundwater, in compliance with the requirements of MELCCFP Directive 019. The following elements summarize the main characteristics of the current environment:

- Groundwater quality was assessed using biennial analyses of 35 observation wells located upstream and downstream of the site, covering the pit, tailings, camp and former industrial sectors. Wells drilled in overburden and bedrock provided a comprehensive spatial representation of groundwater quality in the LSA defined by the drawdown cone footprint;
- Groundwater naturally has a slightly acidic to neutral pH. Measured values range from an average pH of 6.5 upstream of the site to 7.3 in the camp and industrial sectors. Electrical conductivity is generally lower upstream (south-west of the PDA) than downstream of the site (north-east), reflecting existing geochemical conditions and hydraulic gradients;
- Quality criteria were exceeded, notably for dissolved metals (arsenic, manganese, zinc, mercury), sulfides (H₂S and S²⁻), ammoniacal nitrogen, and certain hydrocarbons (e.g. toluene). These exceedances are mainly concentrated in topographically depressed areas of the site (former pits, dewatering zones), while some regional wells (e.g. MW-21-14, MW-23-25) show quality in line with EC and resurgence in surface water (RSW) criteria, indicating attenuation of concentrations and limited dispersion;
- The assessment also revealed that several parameters exceeded alert thresholds (50% of the quality criteria for resurgence in surface water [RSW]), indicating a diffuse presence of contaminants likely to

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affect connected surface waters. The priority contaminants identified are copper, zinc, arsenic, aluminum, manganese and sulfides;

- A temporal trend analysis using the Mann-Kendall test (2005-2023) indicates an overall decrease in concentrations for several parameters (e.g. copper, zinc, arsenic), except for iron and magnesium, which show a local upward trend, particularly downstream of the tailings facility and in the industrial zone;
- Aquifer vulnerability was assessed using the DRASTIC method. The index obtained for the bedrock aquifer ranges from 46 to 180, indicating zones of moderate to very high vulnerability, located mainly at the north-western limits of the LSA, near Lake Amont (PE2) and south of Lake A (PE43), in connection with topographical slopes and low soil thickness.

In summary, groundwater quality reflects an environment influenced by past mining activities, notably the dewatering of pits and the presence of old tailings. However, recent monitoring shows that impacts are localized and that proper management, including containment and treatment measures, would limit the migration of contaminants to aquifers and surface receptors.

5.2.7 Atmospheric Environment

The assessment of atmospheric conditions enabled us to characterize the potential effects of the Troilus mining project on ambient air quality and the light environment, in accordance with the requirements of the MELCCFP and the guidelines of the Canadian Environmental Impact Assessment Agency (CEIA).

The analysis covered the project life cycle - construction, operation, closure - by assessing the atmospheric dispersion of contaminants of interest, including suspended particulates (PM, PM10, PM2.5), nitrogen oxides (NO_x), sulfur dioxide (SO₂), carbon monoxide (CO), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), as well as several metals and minerals, including quartz, mica, muscovite, tremolite and actinote (the latter two being present in non-asbestiform form).

Contaminant concentrations were modelled using the AERMOD model, based on conservative emission inventories. Results were compared to applicable air quality standards and criteria in Quebec, Ontario and the Canadian Ambient Air Quality Standards (CAAQS).

Simulations show that, of the 132 contaminants assessed, 126 meet all regulatory criteria at sensitive receptors. The exceedances identified concerns:

- Elemental carbon, with a one-off exceedance of 150% over 1 hour;
- Quartz (PM10), mica and muscovite, with rare occurrences (< 0.1% of the time); Mica and muscovite, with values above Quebec thresholds at some receptors;
- non-asbestiform tremolite and actinote, occasionally exceeding Ontario criteria.

In all cases, the exceedances are localized, of short duration, reversible, and without significant impact on human health or the environment, in accordance with Health Canada and IAAC guidelines.

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With regard to the lighting environment, the qualitative analysis based on the guidelines of the International Commission on Illumination (CIE), standard 150:2017, indicates that the project's lighting effects will be negligible. The area is located in a dark zone (E1), which corresponds to a natural or rural environment characterized by very low light pollution. Sensitive receptors, mainly isolated residences, are located at a distance of over 5 km from the project perimeter, which significantly reduces the risk of light intrusion. In addition, the dense forest cover surrounding the site acts as a natural barrier, attenuating the propagation of artificial light outwards from the operating area.

5.2.8 Noise climate

The sound climate of the study area was characterized during a measurement campaign carried out in March 2023. The aim of this assessment was to quantify pre-existing ambient noise levels in an environment already influenced by several anthropogenic activities, such as mining, traffic on forest roads and silvicultural operations. The results were used to establish a baseline for analyzing the potential noise effects of the project on the receiving environment.

The sound climate analysis is based on a spatial delimitation adapted to the scope of the projected noise pollution. Two geographical scales were considered:

- The LSA, which comprises the areas in which the direct effects of the project can be predicted or measured with reasonable accuracy. It comprises three sub-zones:
 - A 2 km perimeter around the PDA;
 - A 300 m strip on either side of the mine access road right-of-way, from the site to the intersection with the Route du Nord;
 - A strip 300 m on either side of the Route du Nord right of way, between this intersection and kilometre 98 of the road.
- The RSA, which extends over a 5 km radius around the PDA. It allows us to situate the site's noise climate within its wider environmental context.

Measurements were taken using a class 1 sound level meter, at several points representative of the area. These data were then integrated into a digital acoustic model, using CadnaA software (version 2025) and the Traffic Noise Model (TNM) module. The modelling was based on ISO 9613-1 and ISO 9613-2 propagation standards, taking into account topography, land use, vegetation and local meteorological conditions. Two representative scenarios were analyzed: year 1 - site preparation activities including drills, excavators, trucks and mobile crusher; and year 6 - intensive operation phase with 41 trucks, use of high-pressure roller mills and operation of the processing plant (Stantec, 2025).

Six reception points (P1 to P6) were selected in the LSA to represent the receiving environments likely to be exposed to noise generated by the project (Figure 5.14). Of these, points P1 to P4 and P6 were classified as quiet zones, in accordance with Health Canada guidelines (2023), due to measured night-time ambient noise levels below 40 dBA. In the application of these guidelines, a corrective term of +10 dBA was added to these receptors to reflect their greater sensitivity to noise variations. The modelling results show that the noise levels projected at the receptor points remain below the regulatory thresholds in force, even after the application of the corrective term in quiet areas. The corrected levels at points P1

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to P4 range from 44 to 47 dBA, which is below the 50 dBA threshold prescribed for sensitive environments at night by the MELCCFP and in line with the high annoyance criteria (%HA) defined by Health Canada (Stantec, 2025).

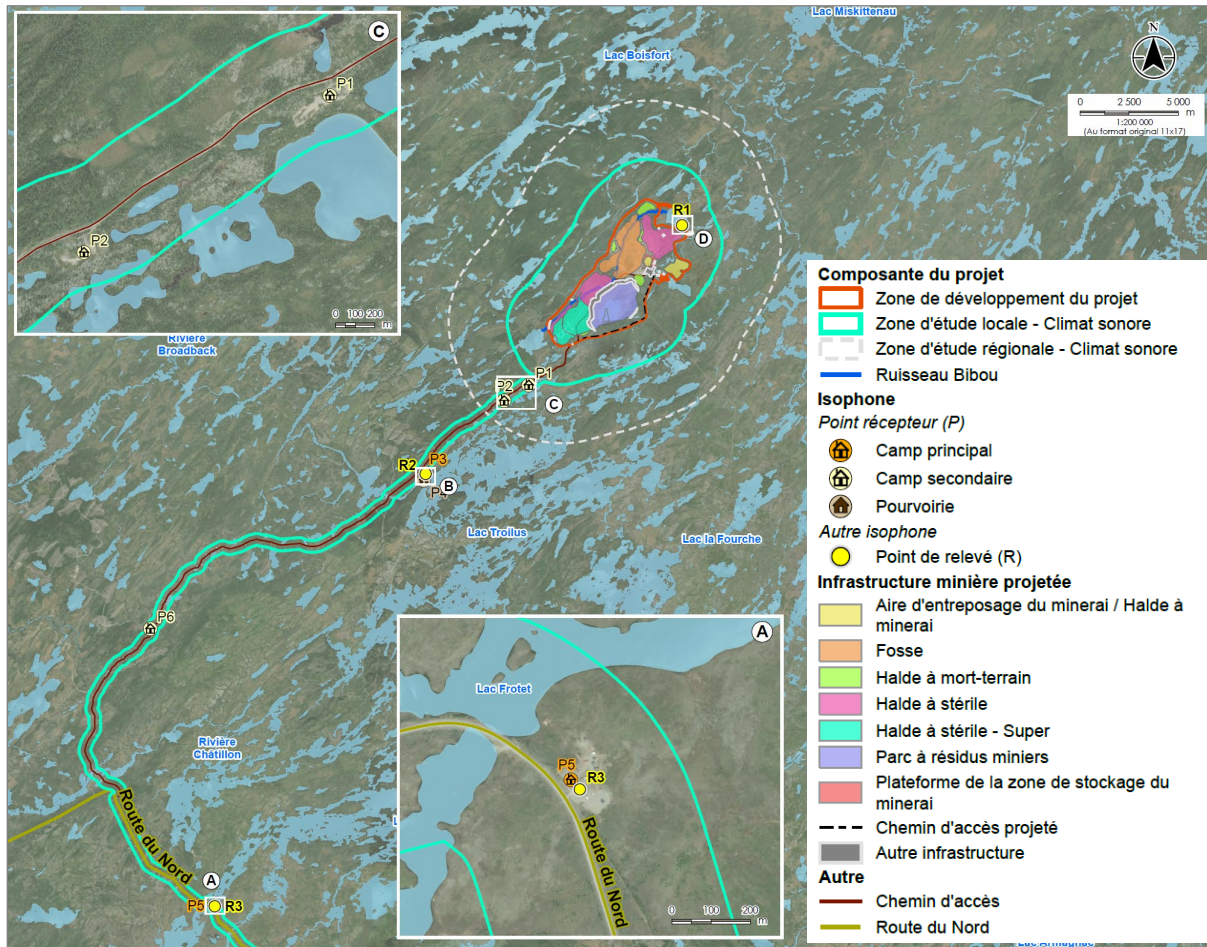


Figure 5.14 Location of receptor points for sound climate assessment

Source: Stantec, 2025

This analysis confirms that the projected noise climate complies with provincial and federal regulatory requirements applicable to mining activities, both during the construction and operation phases. The baseline noise climate is therefore deemed compatible with current environmental standards, and no additional mitigation measures are required at this stage (Stantec, 2025).

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With regard to blasting activities, no quantification of noise levels and associated vibrations could be carried out at this stage of the project (Stantec, 2025). Nevertheless, general mitigation measures have been planned as part of the present impact study, in compliance with applicable regulatory requirements.

5.3 Biological environment

5.3.1 Vegetation, riparian environments and wetlands

The information presented here provides an overview of existing conditions for vegetation, riparian environments and wetlands. A detailed description is available in Chapter 16 of the ESIA.

5.3.1.1 Terrestrial vegetation

The inventoried area covers a surface distributed as follows: 3,923.72 ha of terrestrial vegetation (66.6% of the total area), 1,128.7 ha of wetlands (19.2%) and 838.05 ha of hydric environments (14.2%).

Among terrestrial vegetation formations, softwood stands occupy 1,765.3 ha (30%) of the surveyed area. They are mainly composed of black spruce, grey pine and undifferentiated softwood stands, and are concentrated in the eastern portion of the LSA.

Dry barrens, covering 625.3 ha (10.6%) of the inventoried area, are mainly attributable to the 1962 forest fire. They are located east of the TSF, south of Lake A, north and west of the J4 pit, and around Lake PE50 (A2).

Mixedwood stands cover 346 ha (6%) of the surveyed area and are scattered, with the largest areas, near the western and southeastern boundaries. Their tree layer, of variable density (cover from 20% to 85%; average 60%), is dominated by black spruce and white birch.

Regenerating stands, covering 324.3 ha (5.5%) of the surveyed area, include forest stands and plantations less than 20 years old. They are mainly located in areas of recent logging in the Lake Amont sector (PE2) and are characterized by the virtual absence of a tree layer.

Deciduous stands, mainly consisting of white betula, occupy 27.9 ha (0.4%) of the surveyed area and are concentrated in the southern portion.

Anthropogenic environments cover 14% of the inventoried area and are mainly associated with the former mine site, access roads and borrow pits.

Exceptional forest ecosystems (EFE), in the form of old-growth forest stands, cover 514.51 ha of the study area. They are found mainly south of the TSF, around Lake Amont, and in the western and northern portions of the study area.

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Finally, eight forest stands of phytosociological interest, totalling 27.49 ha, are present along the south-western and eastern boundaries of the inventory area. Five of these, mature white betula stands located in the PDA, have a tree layer dominated by white birch (85% cover), a diversified shrub layer (35-70% cover; average 46%) and an equally diversified non-wood layer (40-75% cover; average 55%). Drainage is good (class 2) and the soil is not hydromorphic.

5.3.1.2 Wetlands

The surveyed area includes a variety of wetlands typical of northern environments, covering an area of 1,230.7 ha (21.5%). Peat bogs account for 99.1% (1,219.44 ha) of all wetlands inventoried. They are divided into open and wooded bogs. Open bogs, which cover an area of 787.3 ha, are mainly ombrotrophic peatlands (bogs), i.e., they receive their main supply of water and mineral elements from atmospheric precipitation. These bogs are found in the southern section, on either side of Bibou Creek, and to the north, in the area of lakes A (PE43), PE48 (A1) and PE50 (A2). Wooded peat bogs cover 432.1 ha and are scattered throughout the survey area.

Marshes, totalling 4.8 ha, are not very abundant in the surveyed area. Mostly of anthropogenic origin, they are concentrated west of the southern end of pit 87, just north of the exploration camp site and in the eastern part of the TSF. Swamps, covering only 4.02 ha in the surveyed area, are divided into shrub swamps and treed swamps. Shrub swamps, covering 3.2 ha, are located within the boundaries of the former mine site, along the eastern edge of the TSF and northwest of pit 87. An arboreal swamp of 0.8 ha is located within the former mine site, between the area of the pits and the TSF.

Finally, ponds cover 2.5 ha. Formed during the operation or reclamation phase of the mine, they are concentrated within or along the boundaries of the former mine site. Aquatic and riparian vegetation is generally poorly developed.

5.3.1.3 Riparian wetlands and riverbanks

The shoreline of watercourses and water bodies covers a total area of 609.6 ha in the inventoried zone, with vegetation varying according to the type of riparian wetland encountered. The shrub layer is mainly composed of speckled alder, calyculate blackcurrant (*Chamaedaphne calyculata*) and balsam myrtle (*Myrica gale*). Labrador tea and black spruce have also been observed. The non-woody stratum is often dominated by sphagnum moss, calamagrostis canadensis, oligosperm sedge (*Carex oligosperma*) and woolly sedge (*Carex pellita*).

The banks of watercourses and bodies of water cover a total area of 223.75 ha in the inventory zone. They are distributed among the following plant communities: shrub swamps, treed swamps, open bogs, wooded bogs, softwood stands, mixed stands and anthropogenic environments, as described in the previous sections.

5.3.1.4 Floristic species with precarious status

According to the specialized documentation and the examination of suitable habitats, 11 plant species in a precarious situation could potentially be present in the inventoried area. However, none of these plant species were observed during inventories carried out in 2019, 2023 and 2024.

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5.3.1.5 Invasive alien plant species

One exotic invasive species (reed canary grass) has been observed in the TSF. Currently low in abundance (a few 1 m clumps²), it is not considered a priority by the MELCCFP (2024b) for control efforts and mitigation measures.

5.3.1.6 Species or communities of importance to the Crees

The study area is used by land users to harvest berries and traditional medicinal plants, mainly on traplines M34 and M39A. Blueberries are harvested near logging roads and throughout trapline M39A, while cranberries are harvested on the southwest shore of Lake Robineau. The vegetation used (mainly grasses) to revegetate the Troilus mine site is not favourable to moose, and willows would be preferable to encourage the return of this species.

5.3.2 Mammals and their habitats

The following subsections provide an overview of existing conditions for mammals, avifauna and herpetofauna. A detailed description can be found in Chapter 17 of the ESIA.

5.3.2.1 Large mammals

Woodland caribou, moose and black bear are the three large mammal species likely to frequent the LSA and RSA. All three were identified as valued wildlife species by the Crees during interviews with tallymen in 2024.

Woodland caribou are threatened in Canada and vulnerable in Québec. The project is located in an area where interim protection measures are in place, and forest harvesting is excluded. Two protected areas lie within the caribou's RSA: the proposed Albnel-Témiscamie-Otish Biodiversity Reserve to the northeast, and the Assinica National Park Reserve to the southwest.

The environments used by caribou vary according to the season: in winter, they prefer mature softwood forests; in spring, dry barrens and softwood forests over 90 years old; and in summer, softwood forests over 50 years old and peat bogs. Females isolate themselves in young, open stands or peat bogs to give birth. Logging is avoided to reduce the risk of predation.

Woodland caribou from the Témiscamie and Assinica herds, whose ranges overlap in the study area, are the most likely to frequent the RSA and LSA. Various inventories carried out in recent decades have revealed the following. In 2003, the Assinica and Broadback herds numbered around 515 individuals (1.5 caribou/100 km²). In 2013, the Assinica herd population was estimated at 580 caribou (2.4 caribou/100 km²). By 2023, the population had grown to 949 individuals (3.2 caribou/100 km²), an increase of 32% in 10 years. Between 2004 and 2024, 65 caribou frequented the RSA, with a density of 4.7 occurrences/km², and 5 individuals frequented an area that roughly corresponds to the LSA. Based on a visual comparison of maps (2004-2019 and 2020-2024), caribou have moved away from the mine area and access road. Between 2020 and 2024, 10 caribou frequented the area between 5 km and 10 km around the mine, mainly in fall and winter. In 2019, an inventory located 109 caribou (5.97 caribou/100 km²), adjusted to 128 individuals (7.01 caribou/100 km²) with a correction rate of 15%, suggesting that

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certain sectors of the inventoried area (1825 km²) are intensively and continuously frequented by this species.

The Cree families have identified several migration zones and corridors used by caribou around the mining project. Three main areas are located along the access road, the Route du Nord and north of Testard Lake. Four migration corridors were identified: one near the Route du Nord, a 51 km² corridor southeast of the LSA, a small 25 km² corridor 15 km southeast of the project, and a large corridor in the eastern sector of the RSA. One family hunts caribou in two areas west of the project, 10 and 20 km from the mine. These areas coincide with the ranges defined by inventory and telemetry data.

Disturbance around the mine is mainly anthropogenic, related to mining activities and logging roads. The level of disturbance has increased by 18.8% between 2019 and 2024, reaching 43.4 km² in 2024, mainly due to the change in buffer zone calculation (from 500 m in 2019 to 750 m in 2024). The main sources of disturbance to caribou habitat are forest fires, logging and major hydroelectric projects.

Moose, for their part, prefer young mixed forests and environments with a dense shrub or aquatic layer. Calving takes place on the banks of lakes, streams and hilltops. In winter, they concentrate in mixed forests and recently disturbed sites, remaining under cover in dense softwood stands to reduce energy expenditure. Moose density in hunting zone 22 is one of the lowest in Quebec, due to the boreal region's low-productivity habitat. In 2023, 84 moose were harvested in this zone, and 72 in 2024. Two trail networks corresponding to moose wintering grounds were observed in the RSA, one of which intersects the LSA west of the mining complex, with an estimated density of 0.40 moose/10 km². An aerial survey located 14 trail networks corresponding to wintering grounds and 11 moose, including six females, four males and one calf. Wintering areas overlap with areas of use identified by Cree families. The Cree identified five areas used by the species in the RSA, three in the LSA and two along the access road. Numerous areas have been identified outside the RSA.

Finally, black bears frequent a variety of habitats depending on their feeding requirements, including deforested or recently burned areas, stream banks, burned areas and along access roads. Their presence has been confirmed in the LSA and RSA, and they are present throughout the territory according to the Cree families consulted. Black bears also frequent the landfill on the mine site and the TSF. The population is said to be stable or even increasing. Recreational bear hunting is prohibited in hunting zone 22, and black bear density is estimated at 0.2 bears/10 km².

Tallymen have observed an increase in the presence of black bears in the LSA following the revegetation of the PDA. A feeding area has been identified north of Lake A (PE 43), where bears are attracted by a sucker spawning ground. In all, 11 areas used by black bears have been identified, two of which overlap the LSA and the others are located to the east, outside the RSA. Bear dens were also mentioned, located more than 20 kilometres east of the project.

5.3.2.2 Small mammals

Little data exists regionally on small wildlife, but trapped furbearers are subject to a trapping registry in Québec. The LSA is located in furbearer management unit number 91, where trapped species include weasel, beaver, snowshoe hare, wolf, otter, lynx, marten, muskrat, red fox and mink. In 2022-2023, marten (94 pelts) and beaver (19) were the most harvested species. Seven species of furbearer or small

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fauna have been observed in the LSA: red squirrel, snowshoe hare and snowshoe marten are the most frequently encountered. Canada lynx, ermine and red fox have also been identified. The presence of beaver has been observed in many places by users of the Cree territory. Two wolf track networks of 3 or 4 individuals were observed in the caribou RSA during the 2019 aerial surveys.

Beavers and snowshoe hares are among the species of interest to the Cree. The tallymen located two beaver lodges in the PDA and mentioned trapping this species north of the access road, but outside the RSA. The same area is also used for hare hunting.

Mixed forests, mature mixed softwoods, mature jack pine forests and mature spruce stands are the habitats with the highest activity indices, with more than six mammal species recorded.

5.3.2.3 Micromammals

Eighteen species of small mammals are likely to be present in the LSA, and nine species have been identified: red-backed vole, field vole, Cooper's lemming vole, phenacomys, individuals of the genus peromyscus (probably deer mouse), flying squirrel, shrew and pygmy shrew.

Sixteen individuals of the Cooper's vole lemming, a species likely to be designated as threatened or vulnerable (ESMV), were counted. This species prefers moss-covered environments and is mainly found in wetlands and mixed forests bordering clearings resulting from logging operations. The rock vole, another ESV, was not observed during the surveys, despite its moderate potential presence in the LSA. It frequents wet slopes, cliff bottoms, rock outcrops, transitional habitats and freshly cut areas.

The rock vole, another ESV, could have been present given its geographical distribution, but was not observed during the two survey campaigns. This species frequents wet slopes between rocks, at the foot of cliffs and on rock outcrops. It also frequents transitional habitats and freshly cut areas. The potential for its presence is moderate, as some of the habitats used by this species are found in the LSA.

5.3.2.4 Chiroptera

Six species of bat could be present in the study area. Surveys carried out in summer 2022 confirmed the presence of three species of precarious status: the silver bat (identified on three occasions), the hoary bat and the little brown bat (both detected at each station). However, the presence of the big brown bat, the red bat and the hoary bat could not be confirmed. These last two species also have a precarious status, with a low and moderate potential presence respectively.

The hoary bat is the most common, followed by the little brown bat and the silver bat. The average activity index for all species is 11.7 passages per night, which is higher than for comparable projects in Northern Quebec.

Little brown bats and northern bats prefer mature forests and avoid deforested areas. Little brown bats are more likely to frequent the edges of water bodies and wetlands. The hoary and silver bats are migratory and use feeding habitats spread over several square kilometres in summer.

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Inspections in the PDA did not identify any shelters for cavity-nesting bats such as little brown and silver bats. Analysis of the maps and Lidar images did not reveal any caves or cavities that could be used as hibernacula.

5.3.3 Birds, migratory birds and their habitat

Between 2019 and 2024, 124 species belonging to 33 families have been recorded in the LSA. Of these, 99 species are migratory birds as defined by the Migratory Birds Convention Act 1994; 36 nest in the LSA and 21 have probable nesting status. No new species have been identified in the regional area in the last 24 years.

The project is located in Quebec's Bird Conservation Region 8 (Boreal Coniferous Forest), which includes 94 priority species due to their vulnerability or representativeness of the regional avifauna. During surveys in the LSA, 45 of these priority species were observed.

For waterfowl, 268 birds of 15 distinct taxa were counted, the Canada goose being the most frequently observed. Black duck and common loon nesting was confirmed, and seven species are likely: Killdeer, Spotted sandpiper, Wilson's snipe, Canada goose, Surf scoter and an unidentified duck species.

The inventory of recording stations detected 104 species. White-throated sparrow, Hermit thrush, Dark-eyed junco and Ruby-crowned kinglet were present at every station, every year and every survey period. Other species were specific to certain migration or breeding periods. This suggests that the LSA's habitats serve as little more than a staging area for birds, as the species composition remains similar from one period to the next.

Listening-point inventories recorded 98 species: 70 land birds, 6 water birds, 9 waterfowl species, 6 shorebirds and 7 birds of prey. Ruby-crowned Kinglet, White-throated Sparrow and Hermit Thrush were heard or seen most often. In the LSA, the average breeding pair density was 50.27 pairs/10 ha in 2022 and 60.6 in 2024. Deciduous and mixed forests, very young cuttings and plantations, and young pine forests showed a higher species richness.

During the winter inventories, 14 avian species were recorded. Ptarmigan tracks were noted in 39 segments, and the common raven and Canada chickadee were most frequently observed. Mixed or deciduous forests showed higher activity than other habitats.

Eight species of special status were observed: short-eared owl, common nighthawk, olive-sided flycatcher, rusty blackbird, bald eagle, bank swallow, grosbeak and lesser yellowlegs. Other protected bird species (Canada warbler, red-necked phalarope, harlequin duck and Barrow's goldeneye) could have been present on the project site due to their range and habitat match. However, they were not observed during the surveys carried out.

Cree tallymen mentioned the presence of other special-status species on their traplines: notably the Evening Grosbeak, Canada Warbler and Red-necked Phalarope. Willow ptarmigan is also among the species valued by the Cree. Tallymen report hunting this species north of the access road, but outside the RSA.

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5.3.4 Herpetofauna and habitat

Surveys have identified several species of amphibians and reptiles in the LSA, including the spring peeper, the American toad, various frogs (wood, northern, green, leopard), two types of salamander (two-lined, blue-spotted) and the garter snake. No endangered herpetofauna species have been identified in the RSA.

5.3.5 Fish and fish habitat

This subsection provides an overview of existing conditions for fish and fish habitat. A detailed description can be found in Chapter 17 of the ESIA.

The main water bodies in the study area are Lake Amont and Lake A. The main watercourse is Bibou Creek, which flows through the study area and is fed by Lake Amont.

The fish and the fisheries productivity they support are highly valued by indigenous nations and recreational anglers. A total of thirteen species of fish were caught in the LSA. None of them is of precarious status. The most widely distributed or abundant large fish species in the lakes are northern pike, walleye, lake whitefish, white sucker, yellow perch and lake cisco. In streams, mottled sculpin is the most abundant species, followed by young burbot and brook trout, the latter being the only large species present at all stages of development. Forage species are generally rare, with the exception of mottled sculpin, also present in the lake.

A total of 17 potential walleye and sucker spawning grounds were identified, mainly in the northeastern part of the study area, in streams CE2 (Bibou) and CE50 at almost every segment of these streams with bedrock. In the case of brook trout, 10 potential spawning grounds were located, five in Bibou stream and the other five in streams CE29, CE35, CE40 and CE43. For northern pike, six potential spawning grounds were identified, including three in lakes PE33, PE51 and PE52, and three others in ruisseaux Bibou (CE2) and CE50.

The benthic communities of the lakes and streams are mainly composed of arthropods, insects and crustaceans. Molluscs and annelids are also well represented. Bryozoans, nematodes and poriferans, when present, are in low proportions. In addition, 29 aquatic grass beds have been inventoried, mainly in lakes, and are considered potential spawning and nursery habitats for yellow perch and northern pike.

In general, the quality of aquatic habitats varies between ponds of the same category. In the majority of ponds, dissolved oxygen concentrations are adequate, but not pH values, which are too acidic. In lakes, dissolved oxygen concentrations are adequate in half the cases, but pH is acidic in a large proportion of cases.

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5.4 Socio-economic environment

5.4.1 Economic conditions

The information presented here provides an overview of economic conditions for populations, education levels and the employment sector. A detailed description is available in chapter 21 of the ESIA.

5.4.1.1 Population

In 2021, Chapais will have a population of 1,470 (52.7% male), down 1.9% since 2016. Chibougamau's population was 7,230 (51.5% male), down 3.7% since 2016. These declines were more pronounced among women.

In contrast, the indigenous communities of Mistissini and Oujé-Bougoumou saw their populations increase. In 2021, Mistissini's population was 3,730 (50.9% female), an increase of 5.9% since 2016. Oujé-Bougoumou's population was 794 (52.2% male), an increase of 7.4% since 2016. These increases were more pronounced among women.

5.4.1.2 Education levels

In 2021, 83.9% of Chapais residents and 89.9% of Chibougamau residents aged 15 and over had a high school diploma or equivalency certificate. In Mistissini and Oujé-Bougoumou, these percentages were 68.9% and 77.1% respectively, below the Quebec average of 81.8%. These lower averages are also observed among indigenous populations in all communities.

5.4.1.3 Workforce

The active allochthonous population, aged 15 and over, is 730 in Chapais, representing 63.7% of its total population (1,130), and 4,015 in Chibougamau, representing 69.2% of the total population (5,805). These proportions are slightly lower in Mistissini and Oujé-Bougoumou, where the active indigenous population represents 60.4% and 56.2% of the population, respectively.

5.4.1.4 Employment by sector

The industrial sectors that will benefit most from the project in terms of job creation are: 1) mining, quarrying and oil and gas extraction, 2) construction, 3) manufacturing, 4) transportation and warehousing, and 5) professional, scientific and technical services.

These sectors are generally dominated by men+, especially in Chibougamau, where the only sector where women+ outnumber men+ is professional, scientific and technical services (4.5% vs. 2.6%). In Chapais, the proportion of women+ is higher in the construction (4.7% vs. 3.8%) and professional, scientific and technical services (4.7% vs. 0%) sectors, with equal participation in the transportation and warehousing sector. In the indigenous community of Mistissini, the presence of women+ is lower in all sectors. In Oujé-Bougoumou, they are absent from all identified sectors.

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5.4.1.5 Workforce by occupation

The most represented occupations are: 1) Business, finance, administration, 2) Sales and service, 3) Trades, transport, equipment operators and related occupations, 4) Education, law, community and government social services, and 5) Health sector. These occupations are present in all four census territories analyzed, with the exception of Chapais, where the "Education, law and community and government social services" category ranks fifth, after "Manufacturing and utilities" and "Business, finance and administration".

5.4.1.6 Estimated labour requirements for the Quebec mining sector 2023-2028

In its latest publication, the Institut national des mines du Québec (INMQ) estimates Quebec's mining sector workforce requirements for the period 2023-2028 and provides an overview of trends up to 2023. As of December 31, 2022, Quebec had 18 operating mines, 5 mines under construction, and 15 advanced and active mining projects with "positive" economic potential, for a total of 38 mines and projects.

The INMQ model forecasts that 25 mines will be in operation in Quebec in 2028, 7 more than in 2022. The projection of mining projects under development by region is as follows: Abitibi-Témiscamingue (9), Côte-Nord (4), Nord-du-Québec (9, including this project), rest of Quebec (3).

The total number of workers in the industry will rise from 17,711 in 2022 to 19,125 in 2028, an increase of 1,414. Between 2023 and 2028, 14,358 positions will be vacant, including 4,552 in Abitibi-Témiscamingue and 5,938 in Nord-du-Québec, due to retirement and migration. INMQ estimates manpower requirements by adding the new positions created by mine openings and closures to the vacancies created by workers leaving the industry.

In Nord-du-Québec, the trades most in demand are: 1) Miner (817 positions to be filled between 2023 and 2028); 2) Diamond driller and helper (465 positions) and 3) Heavy, hydraulic and mobile equipment mechanic (277 positions). The mining workforce for this region is expected to total 12,821 people, including 6,886 employees and 5,935 vacant positions, for a vacancy rate of 46%. Labour requirements for the project are expected to vary between 46% and 53% vacancies. Recruitment from outside the RSA and the Nord-du-Québec region, as well as targeted training plans (including those dedicated to Indigenous) will be able to supplement the workforce.

The majority of mining workers in Quebec are men. In 2022, the average wage in this sector was \$42.52, compared with \$27.30 for all industries. Some 9% of workers in the mining sector identify themselves as indigenous, compared to 2.3% for all industries. Although the exodus of young people may affect the region's work capacity, it is possible that in the future, after leaving their communities to pursue other experiences, they may return to settle in the North.

5.4.1.7 Individual income and income inequality

In 2020, total median incomes for Chapais and Chibougamau were \$43,600 and \$49,200, and average incomes \$47,800 and \$54,900. In Mistissini and Oujé-Bougoumou, median incomes were \$43,200 and \$46,800, and average incomes \$51,200 and \$50,200. Median employment earnings for Chapais and

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Chibougamau were \$42,800 and \$46,800, and average employment earnings were \$45,200 and \$51,400. For Mistissini and Oujé-Bougoumou, median employment income was \$36,800 and average employment income \$44,440 and \$40,000. In Chapais and Chibougamau, women+ had lower incomes than men+ for all types of income. However, in Mistissini and Oujé-Bougoumou, women+ earned more than men+. In Mistissini, the percentage for all income types combined (except average employment income) is +10.8%, and in Oujé-Bougoumou, +7.0%.

5.4.1.8 Services and infrastructure

The information presented here provides an overview of existing conditions in terms of services and infrastructure for housing and public utilities, health and social services, education and childcare, and transportation. A detailed description is available in chapter 20 of the ESIA.

Housing and temporary accommodation

Housing availability

In 2021, the LSA/RSA had 5,080 occupied private dwellings (Statistics Canada, 2021). The town of Chibougamau had the largest number, with 3,190 units (62.8%), followed by Mistissini (20.1%), Chapais (12.8%) and Oujé-Bougoumou (4.3%). Two trends emerge in housing occupancy: in Chapais and Chibougamau, over 70% of dwellings are owner-occupied, and are mainly single-family homes. In Mistissini and Oujé-Bougoumou, over 60% of housing is provided by the local government, First Nation or Indian band (Statistics Canada, 2023).

Access to housing has become an issue in Quebec in recent years, due to high prices and scarcity. In 2023, the provincial vacancy rate was 1.3% (Canada Mortgage and Housing Corporation [CMHC], 2024), and resale property listings fell by 43.3% between 2019 and 2023, despite a recent recovery (Ministère des Affaires municipales et de l'Habitation [MAMH], 2024). New housing construction also declined after peaking in 2021, due to the economic context (Société d'habitation du Québec [SHQ], 2023). However, a recovery was observed in 2024 in urban centres with more than 10,000 inhabitants (Association des professionnels de la construction et de l'habitation du Québec [APCHQ], 2024).

Housing availability remains low in Chibougamau and Chapais. In 2012, the vacancy rate in Chibougamau was 0.93%, well below the break-even point of 3%. In 2019, this rate was close to 0%, and has varied between -3% and -6% in 2021. In the Abitibi-Baie-James-Nunavik-Eeyou riding, residential sales and active listings are below the averages of the past five years. In Chibougamau, sales and new listings fell by 12% and 9% respectively. In Chapais, the number of transactions is too low for a meaningful analysis.

The Quebec government and the City of Chibougamau have launched several projects to improve the availability of housing in the LSA/RSA. Investments have been made to build new housing and develop residential land. The City of Chibougamau is also planning actions to facilitate access to housing, such as subsidies and incentives for the renovation and conversion of existing housing. In Chapais, vacant spaces are available for residential projects.

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Access to home ownership

In 2021, the average price of a home in the LSA/RSA, excluding Mistissini and Oujé-Bougoumou, was \$169,700, an increase of 15% since 2016. Chapais saw the biggest increase in housing values at 22.29%, while Chibougamau saw a 12.03% rise (Statistics Canada, 2023 and 2017). The proportion of Quebec households that own their own home decreased from 61.3% to 59.9% between 2016 and 2021, and the homeownership rate in Nord-du-Québec is 36% (Institut de la statistique du Québec [ISQ], 2023). Fluctuations in the region's real estate market appear to discourage property acquisition (Administration régionale Baie-James [ARBJ], 2024).

Rental market

Between 2016 and 2021, the average rent in Quebec rose by 14.32%, from \$775 to \$886. However, in the cities of Chapais and Chibougamau, the average rent remained below the provincial average, reaching \$637 in 2021, an increase of around 11% compared to 2016. No data are available for the Cree communities. In the study area, there is little information on the number of rental units available. In 2012, Chibougamau had 980 rental units with a vacancy rate of 0.93%. In 2020, a study revealed that the supply of rental housing in Chibougamau was mainly rooms for rent, influenced by employee commuting, which affects housing availability and increases market prices. The housing issue, in terms of availability and affordability, seems to be one of the main reasons for the departure of residents from the region and the loss of workforce (ARBJ, 2024).

Essential housing needs

The housing stock in Chapais and Chibougamau is aging, with over 85% of units in Chapais and 69% in Chibougamau dating from before 1980. It's difficult to find housing that meets pressing needs (affordable, suitable and large) in these towns. In 2021, 18% of households in Chapais were in core housing need, three times the provincial average of 6%. In Chibougamau, the rate was 2.4%, below the provincial average. In Chapais, the main reason for core need in 2021 was housing size, whereas in 2016, it was quality. Affordability was the second factor in both years. In Chibougamau, affordability was the top issue in both 2016 and 2021, followed by housing quality and size.

In the Cree communities of Oujé-Bougoumou and Mistissini, in 2021, approximately 25.6% and 20.5% of dwellings required major repairs, and 23.3% and 19.0% of dwellings were of unsuitable size (Statistics Canada, 2022).

Temporary accommodation

In terms of tourism region, the LSA/RSA includes the communities of Oujé-Bougoumou and Mistissini, as well as the towns of Chapais and Chibougamau. In 2023, the James Bay tourism region had 19 establishments and 387 units available, compared with 15 establishments and 352 units in 2022 (Government of Quebec, 2024a). From January to September 2024, the number of available units was 499, with an occupancy rate of 50.1%, similar to previous years.

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For the Eeyou Istchee tourism region, there were 8 establishments and over 150 units in 2023. In September 2024, the number of available units was 162, with occupancy rising to 47.1% in 2024 (Government of Quebec, 2024a and 2024b).

The LSA/RSA includes some 12 lodging establishments, mainly in Chibougamau and Chapais, as well as cottage rentals, campgrounds and unusual accommodations.

Social housing

In 2021, the social housing available in Quebec housed 3.5% of households, but this was still insufficient, with 50,700 households on the waiting list. For the Nord-du-Québec region, data on households residing in social housing is not available (ISQ, 2024).

The SHQ increased the number of social, community and affordable housing units by 32% between 2006 and 2023. In 2023, there were 271 social housing units in Chapais and Chibougamau, with 17 vacant units in October 2023. In Chapais, several Low-Rental Housing (HLM) units were available, while in Chibougamau, HLM units were obsolete and undergoing renovation.

Utilities

Water and sanitation

In the LSA/RSA, all Cree towns and communities are served by a drinking water distribution network. Chapais uses groundwater, while Chibougamau uses surface water. Mistissini and Oujé-Bougoumou also uses groundwater, with respective maximum volumes of 2,775 m³/day and 418 m³/day between 2009 and 2011. For wastewater, only Chibougamau has a treatment plant with an average flow of 12,465 m³/day. In Chapais, wastewater is discharged directly into the environment without treatment, but the town is planning to build a treatment plant. Mistissini and Oujé-Bougoumou have aerated pond treatment plants.

Landfill site

In the LSA/RSA, Chapais and Chibougamau each have an ecocenter, but only Chibougamau has an engineered landfill site (LET) with a maximum capacity of 300,000 m³ and an estimated residual capacity of 174,087 m³ in 2019. Residual materials from Chapais are transferred to this landfill. Chibougamau will also have a new composting facility with a capacity of 2,500 tonnes per year, operational in 2025, as soon as permits and authorizations have been issued. Mistissini and Oujé-Bougoumou have landfill sites for residual materials. Mistissini has created a new trench landfill (LEET) with a capacity of 200,000 m³ and an estimated lifespan of 20 years, operational until 2041. It also has an ecocenter and an organics management facility.

Health and social services and infrastructure

Health care facilities

The LSA/RSA comprises two health regions: the James Bay Regional Health and Social Services Centre (CRSSS) for the James Bay population, and the Cree Board of Health and Social Services of James Bay

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(CBHSSJB) for the Cree population. The CRSSS provides health and social services in Nord-du-Québec, with centres in Chapais, Chibougamau, Lebel-sur-Quévillon, Matagami and Radisson. Patients requiring specialized services can be transferred to Saguenay-Lac-Saint-Jean or Quebec City.

The town of Chibougamau is served by three healthcare facilities: the Centre de santé de Chibougamau, the Long-Term Care Centre (CHSLD) Boréal, and the Centre de protection et de réadaptation pour les jeunes en difficulté. The Centre de santé de Chibougamau (located approximately 170 km south of the Troilus mining project site) offers general and specialized care, as well as rehabilitation services, with a capacity of 32 beds. CHSLD Boréal also has 32 beds.

In 2023, the CRSSS de la Baie-James will employ 635 people. The Centre de santé de Chibougamau was understaffed, with 12 general practitioners in 2023 versus 15 in 2022, but had a team of specialists in various disciplines. In Chapais, the Centre de santé René Ricard offered general and specialized care services, employing four people in March 2023. The Chibougamau hospital and the Centre de santé René-Ricard employed 20 and 5 family physicians respectively.

The LSA/RSA includes three private seniors' residences: Manoir Providence (48 units) and Jardin des Aînés (23 units) in Chibougamau; and Le Manoir Pierre-Guénette (16 units) in Chapais.

In the Cree communities of the LSA/RSA, the CBHSSJB administers health services in Eeyou Istchee, with its head office in Chisasibi and a regional public health department in Mistissini. It manages Miyupimaatsiium Community Centers (MCCs) in each Cree community, offering a variety of medical and social services. The CBHSSJB also manages the 29-bed Chisasibi regional hospital, serving all nine Cree communities. A new Eeyou-Eenou regional health centre is currently under construction in Chisasibi to replace the existing hospital.

The CBHSSJB manages multi-service day centres (MSDCs) for people in social isolation, seniors, adults with special needs and people with mental health problems. MSDCs offer a variety of activities, including exercise, creative activities, traditional activities and hot lunches.

Mistissini residents benefit from a Miyupimaatsiium centre, an MSDC and a rehabilitation centre for Eeyou Istchee, with a hemodialysis unit. Oujé-Bougoumou has a Miyupimaatsiium centre, the Community Miyupimaatsiium Centre (CMC) Healing Center and the Oujé-Bougoumou MSDC.

In addition to the services provided by the CRSSS de la Baie-James and the MSDCs, the Corporation le Zéphir Chibougamau-Chapais offers several mental health services in Chibougamau.

The health sector is facing workforce availability issues, affecting the maintenance of services. In 2021, the Centre de santé de Chibougamau had to close a service due to a lack of nurses, and the Mistissini CMC reduced its hours and services in 2022 due to a lack of staff.

Police force and emergency services

The Sûreté du Québec provides police services in the LSA/RSA from the Chapais-Chibougamau station located in the town of Chibougamau. The Cree communities of Mistissini and Oujé-Bougoumou have their own Eeyou-Eenou municipal police forces. In 2023, the crime severity index (CSI) for Chapais and Chibougamau was 114.16, down 5.2% from 2022. The weighted classification rate for violent crimes

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decreased by approximately 42% between 2022 and 2023. In Mistissini, the average CSI between 2002 and 2010 was approximately 205. There is no recorded data for Oujé-Bougoumou.

For emergency services, there are fire stations in Chapais and Chibougamau, with around ten and 24 trained firefighters respectively. The SOPFEU station at the Chibougamau airport is the closest for forest fires. A regional Sécurité civile office in Chibougamau coordinates efforts in the event of force majeure. Mistissini and Oujé-Bougoumou also have fire departments. For pre-hospital emergency services, there are four vehicles in service: two in Chibougamau, one in Chapais and one on the Ashuapmushuan reserve. Jamesian first responders collaborate with Cree first responders for emergencies.

CMCs in the Eeyou Istchee Territory, including Mistissini and Oujé-Bougoumou, as well as the regional hospital in Chisasibi, offer emergency medical services and air evacuation. Urgent cases requiring intervention are transferred to the regional hospital or outside Eeyou Istchee territory. For communities without an airport, transfers are made from the Chibougamau airport. The Chapais and Chibougamau pre-hospital emergency service also appear to be facing a shortage of manpower, operating at half capacity by the end of 2021.

Social services

Two shelters for women and children victims of domestic violence are available in Eeyou Istchee, but none in the LSA/RSA. The Waswanipi shelter, which serves the LSA/RSA, has 18 beds, while the Waskaganish shelter serves the Cree coastal communities. The Cree Crime Victims Assistance Centre (CAVAC) has two reception points in Oujé-Bougoumou and Mistissini, and a CAVAC Saguenay-Lac-Saint-Jean assistance centre in Chibougamau. In Chibougamau, there is a shelter for abused women, l'Aquarelle, but none in Chapais. The women's centre Les Elles du Nord in Chibougamau and Les Essentielles in Chapais offer various services to support abused women. The Maison Oxygène Raymond-Ross in Chibougamau offers accommodation for fathers and children, as well as for men in difficulty.

The City of Chibougamau is home to Carrefour Communautaire de Chibougamau, which offers various services to ensure food security in Chibougamau, Chapais and surrounding areas, including collective kitchens, food banks and food distribution.

Education and childcare services and infrastructure

Education services

In the LSA/RSA, there are four preschools and elementary schools (three in Chibougamau and one in Chapais), three of which will have a full-time kindergarten class by 2023. Due to staff shortages, only the Chapais facility may remain open. The CSSBJ also includes two high schools (one in each municipality) and an adult education centre. Many positions are available in the LSA/RSA. The town of Chibougamau includes a Commission scolaire centrale Québec préscolaire school that offers courses in English, mainly for students from the Cree population, from elementary to high school. Post-secondary education services include the Centre de formation professionnelle de la Baie James (CFPBJ) and the Centre d'études collégiales de Chibougamau (CEC Chibougamau). In Matagami and Lebel-sur-Quévillon, the CFPBJ also offers three vocational training programs in the mining industry: ore extraction, ore

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processing machine operation and drilling and blasting. CEC Chibougamau offers eight training programs: three pre-university, four technical and one integration.

For the Cree communities of the LSA/RSA, the Cree School Board (CSB) manages education services in Eeyou Istchee, preserving Cree culture. It is responsible for primary, secondary and adult education programs, and supports post-secondary students. Mistissini has a preschool, elementary school and high school, with 600 and 408 students respectively in 2020; and Oujé-Bougoumou has a preschool, elementary school and high school, with 152 students in 2020. Adult education services and vocational training centres, grouped under the name Sabtuan, are offered in each community. In Mistissini, adult education includes a variety of programs (e.g., auto mechanics, carpentry, accounting, business start-up, orderly). In Oujé-Bougoumou, it includes general training and carpentry. No college or university training is offered in these communities. Apatisiwin Skills Development (ASD) supports Cree workers in their job search and skills development, with offices in each community and a coordinating office in Mistissini.

Child care

The town of Chapais has a 45-place early childhood centre (CPE), and Chibougamau has three, with a total of 198 places. Chibougamau also has a family daycare service for up to 179 children. In the Cree communities of the LSA/RSA, there are three daycare centres with a capacity of 230 places. Childcare services in the LSA/RSA are unsatisfactory, which is a reason for the departure and difficulty in filling vacancies. Chibougamau's CPE occupancy rate is 100%, with several children on waiting lists, while Chapais' occupancy rate is 87% (IRIS, 2025).

Transportation services and infrastructure

Road network

The RSA is served by three main roads: Route du Nord, Road 167 and Road 113. The Troilus mining project site is accessible by road from Chibougamau, Chapais and Mistissini. The junction to the Troilus mining project site is located around kilometre point (KP) 108 on the Route du Nord.

Route du Nord, a 405-km unpaved local road, connects Road 167 at KP 275 (about 15 km northeast of Chibougamau) and provides access to southeastern Eeyou Istchee. Inaugurated in 1993, it was built to access the Eastmain-1 and Eastmain 1-A-Rupert hydroelectric developments. Average annual daily traffic (AADT) on the Route du Nord has increased by 150% in recent years, from 100 vehicles per day in 2017 to 330 in 2023. The proportion of trucks on this road is considered high based on available data, at 33% in 2013.

Road 167, a paved national highway, connects the Saguenay-Lac-Saint-Jean region to Mistissini via Chibougamau. Traffic flow varies from section to section, with notable increases in recent years. Between Route du Nord and the intersection with Road Lake Mistassini, summer traffic flow was between 710 and 770 vehicles per day between 2018 and 2023. Trucking is restricted on this stretch, and the proportion of trucks is considered low (8% and 10% in 2003 and 2002). The section towards Mistissini sees a higher flow, reaching 1,030 to 1,127 vehicles in summer. The section between Route du Nord and Road 113 towards Chibougamau has a throughput of 1,138 to 1,233 vehicles per day, rising to 1,472 to 1,608 vehicles towards downtown Chibougamau. From Chibougamau to Road 113, throughput is 4,150 to

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4,325 vehicles per day. The proportion of trucks is notable, with 12% on the section between Chibougamau and Road 113. On the section bypassing Chibougamau, traffic is 70 vehicles per day, but the percentage of trucking is significant (24% in 2020).

Road 113, a national highway, links Lebel-sur-Quévillon to Road 167 near Chibougamau, and connects the region to Abitibi-Témiscamingue. The AADT and summer average daily flow between this road and Chapais are 2,168 and 2,403 vehicles per day respectively, with a high proportion of trucks. Towards Oujé-Bougoumou, traffic is 500 vehicles a day, rising to 533 in summer, then dropping to 432 and 265 vehicles a day on the following stretch.

Generally speaking, traffic flow is highly variable in the area, but the proportion of trucks is relatively high, depending on the sector. As Mistissini is the second most populous community in the LSA/RSA, after Chibougamau, traffic is relatively heavy. The most heavily used road segments lie between the two major communities of Chibougamau and Chapais. Traffic volumes are also high on the major Roads of Road 167 from the northern boundary of the town of Chibougamau, and Road 113 to Chapais and Oujé-Bougoumou. In Oujé-Bougoumou, road use is lower.

Forest roads

Numerous logging roads criss-cross the LSA/RSA. Along the Route du Nord, several multi-use logging roads, including R-1047 to the Troilus mining site and R1029 to Oujé-Bougoumou, link up with this road. Other forestry roads, mainly drivable, branch off from this main road and extend as far as the lakes surrounding the PDA. The PDA is also criss-crossed by drivable and non-drivable roads used as winter trails.

Bus and commercial transport

Two bus services are available in the region. Intercar offers one trip a week between Chibougamau and Saguenay-Lac-Saint-Jean. Autobus Maheux serves the corridor from Road 113 to Road 117 in Abitibi-Témiscamingue, as well as the corridor formed by Roads 109 and Billy-Diamond. They also serve the Abitibi-Témiscamingue region, including connections to Montreal and North Bay, and offer one trip per day between Val-d'Or and Chibougamau via Chapais. A public transit system, Chapais Ligne Verte, offers three trips a day between Chapais and Chibougamau. Kepa Transport, a joint venture of the Cree communities of Wemindji and Chisasibi, offers general and temperature-controlled freight services in Eeyou Istchee Baie-James and beyond.

Rail network

The Eeyou Istchee Baie-James region has 230 km of railroads operated by the Chemin de fer d'intérêt local du Nord du Québec (CFILNQ), a subsidiary of Canadian National (CN). The only section of railroad in the RSA links Chapais and Chibougamau, connecting to the Saguenay-Lac-Saint-Jean rail network to the east, but does not extend beyond Chapais to the west, and offers no passenger service. The reactivation of the section between Chapais and Grevet, currently a snowmobile trail, is under study to reconnect with the rail network of the southwestern region and Abitibi-Témiscamingue. An intermodal zone project in Chibougamau, the Centre de logistique intermodale de Chibougamau (CLIC), is also under study to create a transshipment site, primarily for Nemaska Lithium.

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Air transport

The LSA/RSA has several airport infrastructures. The Chibougamau-Chapais airport, located some 20 km south of Chibougamau, is served by Air Creebec with regular flights from Montreal-Trudeau International Airport. In 2023, the airport recorded 10,080 aircraft movements, including 8,548 for the transport of passengers, freight and mail, exceeding the values for 2022 and 2024. Private aircraft movements decreased by around 35% between 2022 and 2023. The Quebec government has allocated \$16.6 million to build a new terminal to increase capacity. A water aerodrome at Lake Mistissini is used by Waasheshkun Airways Ltd. There are also two heliports near Chibougamau: the Chibougamau heliport and Hydro-Québec's private heliport.

5.4.1.9 Cree land and resource use

The information presented here provides an overview of existing conditions for Cree land and resource use. A detailed description can be found in Chapter 19 of the ESIA.

For Cree communities, the PDA is located at the confluence of three traplines (M34, M39A and M40) used year-round by tallymen and their families. The RSA includes these three traplines as well as trapline M35A, located to the east of the PDA.

Camps

There are several Cree and outfitter camps in the PDA and RSA. Two Cree camps are located near Lake A, about 1.5 km from the mine, and are used year-round by the tallymen of trapline M34 and their families. Other Cree camps are located in the RSA, including four near the mine site access road. Two Nibiischii outfitting camps are on trapline M39A, near Canotaicane and Robineau lakes, and two Square-Tail Lodge camps are on trapline M40, near Troilus and Frotet lakes. Future camps are planned for lots M34, M39A and M40.

Transportation routes

Tallymen and land users access their traplines via the Route du Nord and the mine access road. Logging roads in the PDA and southern part of the RSA provide vehicular access to areas where forest resources have been harvested. The M34 trapline includes unmarked snowmobile trails, with two main trails leading from the camps near Lake A to the northern part of the trapline, which is inaccessible by vehicle. Land users also travel by motorboat or canoe in the RSA, with serviced portages.

Hunting and trapping

The mine site was built in a moose-hunting area, which fled during the mine operation phase, but has recently returned to the PDA. Several moose hunting areas are present in the RSA, notably around Robineau, Avranches and Canotaicane lakes, and in various parts of traplines M34, M39A, M40 and M35A. Migratory caribou have not been seen for a long time in the RSA, but woodland caribou are present around Canotaicane and Avranches lakes, and in parts of traplines M39A, M40 and M35A. Bears are abundant in the PDA and RSA, especially since the re-vegetation of the mine site. Some are hunted by land users for subsistence, following the "eat what you kill" rule. Beavers are present throughout the

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RSA, with two lodges in the PDA. They are trapped virtually everywhere on the traplines, mainly for subsistence. Waterfowl hunting in the PDA has been unsuccessful, so tallymen prefer to hunt this species elsewhere in the RSA. Dust from the mine affected spring waterfowl hunting. Land users also hunt ptarmigan and other birds, hare, and wolverine (trapped on trapline M35A over 40 years ago).

Fishing

Users of trapline M34 fish in Lake A and bodies of water north of the PDA, harvesting walleye, sucker, whitefish, pike and brook trout. Lake Boisfort is also an important fishing area, particularly for speckled trout. Lake Canotaicane is prized for its large sturgeon, speckled trout, walleye and pike. Users of lot M39A fish in Lake Robineau, harvesting walleye, pike and whitefish. Users of lot M40 fish in Lake Troilus, harvesting walleye, pike, whitefish, lake trout, speckled trout, sucker and longnose sucker.

Harvesting

Land users pick blueberries all over their traplines, especially near forest roads. They also gather medicinal plants such as Labrador tea, tree bark and larch in the RSA, but not near the PDA. Users of trapline M39A pick cranberries southwest of Lake Robineau.

Subsistence and wild food consumption

One tallyman estimates that wild food accounts for 70% of his diet, which he shares with around 60 members of his extended family. He harvests four moose a year. When friends and family participate, the harvest can reach 12 moose a year. Another tallyman harvests two moose in winter and shares them with family and friends, then hunts again in autumn. He eats wild foods twice a week, including ptarmigan, hare, beaver, moose meat, fish, waterfowl and bear. The tallymen of trapline M34 feel that the mine site does not affect their livelihood too much, although it has kept moose away during mining. Moose are beginning to return after five years of quiet.

Cultural sites and other valued features

Maskwawuti Hill, a former landmark for M34 land users, lies within the PDA, but is now only visible from certain angles due to the waste rock piles. Two birthplaces have been reported, one on plot M34 and the other on plot M39, both far from the PDA. Two burial sites are present on plot M34. A legend site with sasquatch footprints is located on plot M39A.

Other development projects

Since the mine closed, trapline M39A has seen logging activities and the development of a fishing camp at Robineau Lake by the Nibiischii Corporation, where large pike and walleye are caught. Nibiischii also organizes fishing expeditions for students. On terrain M40, Sayona and other mining companies are conducting mineral exploration, but their projects are less advanced than Troilus'.

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5.4.1.10 Land and resource use by Jamesian communities

The information presented here provides an overview of existing conditions for the use of land and resources by Jamesian communities. A detailed description can be found in Chapter 19 of the ESIA.

Provincial parks and conservation reserves

The RSA is located on two wildlife reserves: Lakes Albabel-Mistissini-Waconichi (AMW) and d'Assinica, managed by the Cree Nation of Mistissini through the Nibiischii Corporation. The Nibiischii Corporation fully manages the Albabel-Mistissini-Waconichi Lakes wildlife reserve and has temporarily assumed management of the Assinica wildlife reserve on behalf of the Oujé-Bougoumou Cree Nation. Hunting is reserved for the indigenous community, while sport fishing by the non-indigenous community is subject to restrictions and requires a valid fishing right of access.

The RSA includes several protected areas, including seven biological refuges - the closest of which is located around 5 km from the mine. It also includes a new park, Nibiischii National Park, managed by the Cree Nation of Mistissini, as well as the Tête-de-la-rivière-Rupert reserve, where all new mining activities are prohibited.

Recreation and tourism

Outdoor recreation includes all-terrain vehicles (ATVs) and snowmobiling, with ATV trails in Chapais and Chibougamau, and the Trans-Québec 93 snowmobile trail linking several communities. No official snowmobile trails cross the RSA. The Assinica and AMW Lakes wildlife reserves prohibit ATVs.

AMW lake wildlife reserve, the largest in Quebec, and the Assinica lake wildlife reserve are major tourist attractions, offering lodging, fishing, canoe-camping, kayak and paddleboard excursions, saunas, hiking trails, a marina and boat rentals. Lake Robineau offers a canoe-camping circuit. Rustic camping is available on the Assinica reserve.

Outfitters in the region include Pavillon Square-Tail Lodge in the RSA, offering lodging and fishing, and Broadback Outfitters on the Assinica reserve, accessible by floatplane, offering lodging, guided fishing and indigenous cultural activities. Indigenous people have the exclusive right to establish outfitting operations on Category II lands, with consent required for non-indigenous.

Navigation

In the RSA, there are no water bodies or waterways listed in the Navigable Waters Schedule of the *Canadian Navigable Waters Act* (CNWA). The hydrographic network is mainly made up of lakes and streams, limiting the types of navigation. Pleasure craft can navigate on most lakes, but some streams limit the type of craft. Permanent waterways in the RSA include the Broadback River, accessible from Camp Troilus at Square-Tail Lodge, Lake Frotet, and the streams between Lake Robineau and Lake Canotaicane. The Nibiischii Corporation offers a canoe-camping circuit departing from Lake Robineau. The Châtillon River could also be navigable.

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Resource utilization

The Troilus mine has three water supply wells, 2 of which are located in the PDA and one not far from the land-user camps near Lake A (PE43). These wells are available to Cree users whose camps are located near Lake A (PE43). Within the RSA, there are no underground wells.

In terms of mineral resources, the RSA comprises 3,940 active mining claims, of which 813 are owned in whole or in part by Troilus, as well as one mining lease, also owned by Troilus. All of these claims are held by 29 companies. These claims are located on Category III public lands.

In terms of forestry, the RSA is located in Management Unit (MU) 026-61, where the main tree species are spruce and jack pine. Logging opportunities for 2023-2028 are reduced compared to 2018-2023, mainly due to fire risks. Several lumber mills are located in Nord-du-Québec. It is also important to note that the PDA, and part of the RSA, include an area subject to interim measures for woodland caribou.

Hunting, trapping and fishing

On James Bay Territory, non-indigenous can, to a certain extent, hunt, trap and fish, but only under certain conditions and subject to certain limits and prohibitions. In particular, several species of mammals and fish are reserved for the exclusive for indigenous people.

The RSA is located in hunting zone 22 with FMU 91 and a small part of furbearer management unit (FMU) 87 at its southern boundary. Hunting bag limits apply only to non-indigenous, while trapping activities are reserved exclusively for indigenous, including for commercial purposes. Since the PDA and almost all of the RSA lies within the Albabel-Mistassini-et-Waconichi and Assinica Lakes wildlife reserves, hunting and trapping are prohibited for non-indigenous .

The RSA is located in fishing zone 22 south, where several species of fish are reserved for indigenous people. A fishing right of access issued by the Nibiischii Corporation is required for non-indigenous people. Certain sectors of the AMW and Assinica Lakes wildlife reserves impose fishing restrictions, such as mandatory catch-and-release or prohibition of fishing for certain species.

According to 2023 statistics from the Nibiischii Corporation, walleye is the most caught species in the LSA, accounting for nearly 94% of catches. The majority of catches took place in lakes Regnault, Avranches and Frotet, located in the Assinica wildlife reserve. Lake Regnault and Lake Frotet hosted the largest number of anglers, while Lake Lezai recorded the most successful catches, followed by Lake Avranches.

5.4.1.11 Community health

The information presented here provides an overview of health conditions for populations in terms of community context, environmental quality, physical health, mental health and social well-being and community safety, as well as the biophysical and social determinants of health. A detailed description is available in Chapter 22 of the ESIA.

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Community context

Demographic data

Some communities may have health outcomes that differ from those of the general population. The Cree communities of Mistissini and Oujé-Bougoumou have a strong indigenous identity (~93% vs. ~7%) and often speak non-official mother tongues (~50-75% vs. ~3-5%). The Jamesians mainly speak French, while the Crees speak more English. Between 2016 and 2021, the Cree population increased, while the Jamesian population decreased. The Jamesians live in more densely populated areas.

The Terres-Cries-de-la-Baie-James region has a majority of people identifying themselves as indigenous (~96%). Jamesians mainly speak French, while 80% of Crees speak a non-official mother tongue, and 3% have French as their mother tongue. The proportion of visible minorities is low in both regions, but higher in the rest of Quebec.

Income and income inequality

People with low incomes generally have poorer health outcomes. The prevalence of low after-tax income is higher in Chapais and Chibougamau than in Mistissini and Oujé-Bougoumou. In the health regions, the prevalence of low income is lower in the Nord-du-Québec region than in Québec as a whole, especially in the Terres-Cries-de-la-Baie-James region. Chapter 21 of the impact study assesses income and income inequality for the LSA and RSA.

Education

Education is strongly linked to health, as it influences income, employment and the ability to advocate for health care, while promoting job stability, financial security and social success, resulting in better health and lower morbidity and mortality.

In Chapais and Mistissini, a lower proportion of people had completed university programs by 2021 than in Chibougamau and Oujé-Bougoumou. In the health and social services regions, residents of Terres-Cries-de-la-Baie-James and Nord-du-Québec are less likely to have completed university studies than the overall Quebec population. Chapter 20 of the impact study assesses the level of education, infrastructure and education and childcare services in the LSA and RSA.

Housing

Data, although incomplete for Mistissini, Oujé-Bougoumou and the Terres-Cries-de-la-Baie-James health region, show that the percentage of dwellings requiring major repairs is nearly three times higher in these communities than in Chibougamau. This trend is also evident at the regional level, where the percentage of dwellings requiring major repairs is nearly three times higher in the Terres-Cries-de-la-Baie-James region than in Québec, and twice as high as in Nord-du-Québec.

Employment and working conditions

Working conditions and employment influence health, especially for people with low incomes and education, who are more exposed to precarious and dangerous jobs. Employment provides income and

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structure, while unemployment can lead to financial deprivation, psychological stress, unhealthy coping mechanisms such as substance abuse, and mental health issues such as depression, anxiety and increased suicide rates.

In 2021, unemployment rates in census subdivisions were below 10%, with the lowest rate in Chibougamau (3.7%), followed by Uujé-Bougoumou (5.1%), Chapais (5.6%) and the highest in Mistissini (6.2%). Unemployment rates show little variation between Cree and non-Cree communities. Regionally, the unemployment rate for Terres-Cries-de-la-Baie-James is slightly higher than for Nord-du-Québec and Québec, with similar rates (~8%) in the health region.

Access to health services and programs

Mistissini has a wide range of health and social services, including Awash services for pregnant women, children, youth and adults, as well as dental, X-ray, pharmacy, mental health and hemodialysis services. The Multi-Service Day Centre offers home and community care, while the Regional Healing Services Centre and the Regional Public Health Service provides a variety of health and wellness services.

The Uujé-Bougoumou Healing Centre offers emergency services, Awash services for pregnant women, infants and young children aged 0 to 9, and Uschiniichisuu youth aged 10 to 29, as well as dental, pharmaceutical, mental health and youth protection services. Uujé-Bougoumou also has a multiservice day centre with adapted transportation and related health services. A pediatrician is now available in Uujé-Bougoumou, and a specialized psychiatrist in Mistissini. A review via the Centre de répartition des demandes de services (CRDS) confirmed the need for patient consultations.

Chapais residents receive health care at the Centre de santé René-Ricard, with five family doctors and a walk-in emergency service. For specialized care, they often go to the Chibougamau or Saguenay-Lac-Saint-Jean hospitals. Chibougamau offers the most comprehensive range of healthcare services in the region, but faces recruitment challenges, particularly in psychosocial care.

Indigenous determinants of health

The CBHSSJB celebrates Eeyou/Eenou family and traditional values. As part of the Troilus mine project, Stantec consulted tallymen and their families. Consultations revealed concerns about land and resources, subsistence, water management, dust management, nuisance, safety and social impacts, including racial discrimination and conflicts related to traplines.

Environmental quality

Assessments of existing conditions with regard to atmospheric and acoustic conditions (i.e. air, light and noise), abiotic environments (soil, sediment and surface water) and country food (fish, wild meat and terrestrial and aquatic plants) are relevant to health. Detailed information on these assessments can be found in Chapter 8 (Atmospheric Environment), Chapter 9 (Noise Climate), Chapter 12 (Surface Water Quality) and Chapter 18 (Aquatic Fauna) of the ESIA, as well as in the Human Health and Ecological Risk Assessment (Chapter 22).

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Physical health

Recent data on perceived health are insufficient for healthy communities and regions. In 2014-2015, one in five people in Eeyou Istchee considered themselves to be in poor health, while Jamesians perceived themselves to be in very good health.

Health outcomes of interest include:

- In 2015, infant mortality rates in Terres-Cries-de-la-Baie-James were lower than in Quebec, but perinatal mortality rates were higher. The Jamesians had no cases of infant or perinatal mortality;
- From 2019 to 2021, premature and avoidable mortality rates were highest among the Jamesians, and comparable between the Crees and Quebec;
- In 2016, cancer diagnosis rates in Eeyou Istchee were slightly higher than before, but similar to the rest of Quebec. From 2017 to 2021, Nord-du-Québec had the highest cancer mortality rate;
- Diabetes among Eeyouch/Eenouch youth is a major concern, with an increase in diagnoses and management difficulties. Chronic diseases are the leading cause of death and hospitalization among Jamesians;
- Safe sex practices are more common among the Cree of Eeyou Istchee, but 40% of sexually active people did not use a condom in 2022. STIs and blood-borne diseases are more common in Eeyou Istchee;
- In 2014, nearly 6% of the population of Eeyou Istchee seriously considered or attempted suicide, twice as many as in the rest of Quebec. In 2021, suicide rates among Jamesians were 19.9 per 100,000, compared with 12.7 per 100,000 in the rest of Quebec.

Health factors of interest include:

- In 2014-2015, one-third of Eeyou Istchee Crees used drugs, mainly cannabis, and 10% used cocaine. From 2017 to 2018, there were 97 cases of serious intoxication, mostly among young people aged 15 to 29. Among Jamesians, 75% drink alcohol regularly, with abuse on the rise, and 30% smoke;
- In 2014-2015, more than a third of Eeyou Istchee residents were sedentary, with higher rates among women. Jamesians had higher levels of physical activity, with lower sedentary rates than the rest of Quebec;
- In 2014-2015, about two out of three Cree adults in Eeyou Istchee were obese, with a significant increase since 1991. Among Jamesians, obesity is also on the rise, with one in ten high school students considered obese in 2010-2011;
- Food security in Eeyou Istchee is a concern, especially for low-income families. In 2011, the cost of nutritious food was higher in Eeyou Istchee than in any other region of Quebec. The availability of basic nutritious foods has improved since then, but nutritious food choices remain limited in some communities;
- The median weekly cost of a nutritious grocery basket in Eeyou Istchee varies by region and family size. Food costs are about 30% higher than in Nord-du-Québec and 40% higher than in Montreal.

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Nutritious food is often inaccessible to single parents and low-income families, and one in four families in Eeyou Istchee lives on a low income;

- The Cree depend on traditional foods such as moose, goose, ptarmigan, caribou and whitefish. However, consumption of these foods has declined in favour of store-bought food, often ultra-processed and of poor nutritional quality;
- The rates of children and youth entering youth protection in Eeyou Istchee are alarmingly high, and higher than in any other region of Quebec. The school dropout rate remains higher than the Quebec average. From 2008 to 2012, nearly 20% of babies were born to teenage mothers, and 33.5% of mothers had less than 11 years of schooling, compared with 6% in the rest of Quebec.

Mental health and social well-being

Mental health and social well-being indicators show that perceived mental health is similar in Quebec and Nord-du-Québec, with comparable rates of perceived good health, unintentional injuries, suicidal ideation and PTSD diagnoses. However, Nord-du-Québec had significantly lower rates of psychological distress and anxiety disorders.

The sense of community belonging is higher in Nord-du-Québec (81.8%) than in the province of Quebec (57.2%), and life satisfaction is slightly higher in Nord-du-Québec (96.8%) than in Quebec (93.8%).

Rates of unmarried and common-law unions are higher in the Terres-Cries-de-la-Baie-James region (51.2%) than in Quebec (44.2%), while Nord-du-Québec has the lowest rates (37.9%). Rates of common-law marriage among Crees in the Terres-Cries-de-la-Baie-James region (15.4%) are half those of Jamesians in Nord-du-Québec (32.0%), and lower than those in Québec (23.3%).

Community safety

With regard to intimate partner violence, data from the Government of Canada (2020) shows that :

- 79% of victims of intimate partner violence in 2019 were women;
- Female victims of intimate partner violence are four times more likely than men to have feared their partner;
- Indigenous women in Canada (61%) are more likely to have experienced intimate partner violence in their lifetime than non-Indigenous women (44%);
- The 2SLGBTQI+ and women+ with disabilities also have a higher prevalence of domestic violence.

While there are no specific LSA and RSA data on other acts of violence and crime, the Royal Canadian Mounted Police (RCMP) (2014) indicates that Indigenous women are at greater risk of being victims of violent crime. Between 1980 and 2012, 1,181 female homicide cases were recorded, including 164 Indigenous women and 1,071 Indigenous girls, showing their over-representation among missing and murdered women in Canada. According to Statistics Canada (2023), Indigenous women are six times more likely to be victims of homicide than non-Indigenous women. Perpetrators of violent crimes against Indigenous women are mainly acquaintances (30%), spouses (29%), followed by family members and intimate relationships (RCMP, 2017).

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5.4.2 Archaeological and cultural heritage

5.4.2.1 Archaeological heritage

In 1993, an archaeological potential study was carried out for the corridor affected by the construction of the road and power line linking Chibougamau to the Troilus-Frotet mining complex (Arkéos 1993, Arkéos 1995). The study covers several prehistoric cultural periods (Late Paleoindian, Archaic and Woodland). A brief overview of historic Indigenous occupation was also provided. The region studied was inhabited by the Takouami (Montagnais) to the south and the Cree to the north, notably the Mistassins. The fur trade was an important factor in this period, as several trading posts, such as Ashuapmushuan and Mistassini, played a crucial role in the local economy.

The study identifies 77 areas of archaeological potential, classified into three levels: high, medium and low to nil. The determination of potential is based on environmental, archaeological and ethnohistorical criteria. High-potential areas are characterized by proximity to natural resources and favourable conditions for human settlements.

In 1995, an archaeological inventory was carried out to validate the data from the archaeological potential study. Nine contemporary sites (less than 25 years old) and one prehistoric site (EfFo-1) were discovered.

The EfFo-1 site is located on an esker along Line Lake, approximately 800 metres southeast of the access road to the Troilus mine site. The esker, with its good drainage, favours the growth of jack pine and cladonia. The excavation was carried out in three different locations, covering almost 20 square metres of open excavation. Typical podzol stratigraphy was observed, with levels disturbed by wind erosion.

Archaeological work at the EfFo-1 site yielded 2,649 lithic artefacts and 192 bone remains, mainly in chert from Lake Albanel. The remains were distributed over four areas, with a major concentration in Area 2. Lithic tools included bifaces, knives, scrapers and scrapers, suggesting hunting and hide-working activities.

The lithic tools and distribution of remains suggest a temporary seasonal camp where hunting and hide-working activities took place. The presence of two large areas on the site may indicate annual use by a small group of one or two families. The relative abundance of scrapers indicates a hide-working site at a time of year suitable for hunting and trapping game, possibly in autumn.

Surveys and visual inspections have uncovered important sites. No further recommendations are made for the EfFo-1 site, as the excavations were deemed sufficient to understand the settlement patterns of the region's prehistoric populations.

In September 2024, an additional archaeological inventory (Appendix G.6) was carried out by Stantec (Stantec Experts-conseils 2025). Test pits (n=232) were excavated around Lake A and the lakes of the Southwest Trough. A biface blank was found, but no other artifacts were associated with it. Following a declaration to the Ministère de la Culture et des Communications, the Borden code Effp-1 was assigned to the site. A visual inspection was carried out along the proposed access road to ensure that there were no outcrops that might have been used as a source of lithic material for tool production in prehistoric

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times. Although some outcrops showed traces of quartz or quartzite, no traces of extraction were observed.

5.4.2.2 Cultural heritage

Cultural heritage is intimately linked to elements of the Cree landscape and land use. The historic campsites discovered during the two archaeological inventory campaigns testify to recent use, while the prehistoric evidence from the EfFo-1 and EfFp-1 sites demonstrates millennia of use. Interviews have also identified a number of burial, birth, hunting and fishing sites of significance to the Eeyou.

In the RSA, lakes, islands and hills have a history and cultural significance for tallymen, their families and other land users. Environmental features become culturally significant as their use intensifies over time. The cultural significance of elements may be endemic to users within a trapline, or shared among users on a more regional scale. The same element can be significant to two groups without having the same cultural significance.

In the LSA, the range of hills east of the PDA is a culturally significant place for the Awashish and Neeposh families, but not for the same reasons. The Awashish family call these hills "Bear neck mountain," because of a hunting history shared by family members. For the Awashish family, the eastern foot of the hills represents the limit of their traditional territory, current boundaries notwithstanding. The Neeposh family also considers these hills to be culturally significant, serving the same function as natural boundaries between traplines in this area, but draws this boundary at the western foot of the hill.

5.4.2.3 Landscape

The information presented here provides an overview of current conditions for the regional and local landscape. A detailed description can be found in Chapter 23 of the ESIA.

Regional landscape

The regional landscape is dominated by boreal forest, with predominantly coniferous vegetation. Although vegetation often limits vistas, some high points offer panoramic views. The rivers, lakes and wetlands that cross the region also offer unobstructed views.

The viewshed of the LSA is marked by industrial mining landscapes, including buildings, stockpiles, a TSF and pits. The closed mine has been rehabilitated, allowing vegetation to re-establish itself. Observers of the area are mainly mine workers, as well as trappers and hunters using nearby campsites. An important landmark is the elevation to the south-east of the site, constituting the highest point in the visual basin. Apart from this elevated view, the mining installations are hidden by the relief and dense vegetation, except for a few viewpoints along the access roads.

Local landscape

The main feature of the local landscape is as follows.

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- The gentle, undulating relief limits the visual impact of industrial operations in the area. The footprints of previous mining operations are visible in the viewshed in the form of tailings elevations, similar in height to natural landforms. However, the slopes of these elevations are steeper and sparsely vegetated, creating a contrast in the landscape;
- Hydrography is dominated by the Bibou stream (CE2), which meanders through the heart of the valley with steeply sloping banks. The two existing pits are partially filled with water, and a body of water is also located within the TSF. Lake Amont (PE2) and Lake A (PE43) are two natural bodies of water that are important to the landscape and to land users;
- The vegetation is typical of the boreal forest, dominated by black spruce. The sunny slopes are dominated by birch, aspen and white spruce. Wetlands are characterized by low-lying vegetation, and the mine area is covered by herbaceous vegetation;
- In addition to the natural elements (vegetation, watercourses), the site's uses are marked by two transportation networks (road and electrical), operating infrastructures (water treatment plant, landfill, material storage, etc.), as well as hunting and trapping camps;
- Landscape components used for orientation include mining infrastructures, lake areas and relief;
- In terms of preferences, Cree land users have a stronger bond with the natural landscape, while workers interact primarily with the anthropogenic landscape associated with the mine;
- Six types of view are identified in the landscape according to the depth and quality of the visual field: panoramas, perspectives, closed, filtered, open and directed views;
- Six landscape units, grouped into two types, characterize the visual basin. Anthropogenic landscape units, industrial of mining type, include the built environment landscape unit (living and industrial sectors), the pit landscape unit, the TSF landscape unit and the waste rock pile landscape unit, including the unrestored waste rock pile sub-unit. Natural landscape units include the forest landscape unit and the peatland landscape unit.

5.4.2.4 Summary of gender-based analysis plus (GBA+)

Federal guidelines require a Gender-Based Analysis Plus (GBA+) to determine how subpopulations and subgroups within the LSA and RSA may be disproportionately impacted by the project. Sub-populations and sub-groups may include women, indigenous groups, visible minorities, people with disabilities, youth and seniors, among others, as well as groups with an intersection of these characteristics.

Qualitative and quantitative data were used to describe baseline conditions in diverse or distinct subgroups, where GBA+ factors may be relevant to understanding the impacts of a particular VC. Following a review of environmental conditions, GBA+ was integrated into the overall impact assessment for the applicable VCs (see section 7.7, chapter 7 of the ESIA report), and appropriate mitigation and follow-up measures were identified, where necessary.

These consultations have shown that the project is well received by local organizations. The restart of the former Troilus mine is seen as a positive economic and social opportunity for the region. However, social concerns have been raised regarding the hiring of new workers, many of whom will come from outside the area. This influx of new residents is well received, but raises issues relating to the integration of

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employees and their families, as well as working conditions at the mine (working hours, camp accommodation). Overall, Troilus has the opportunity to work towards equity by drawing on some of the solutions proposed during the consultations, and to demonstrate its social responsibility.

The information obtained during these consultations has helped to improve understanding of the Troilus mining project, namely how it is perceived, opinions on the project, identification of potential impacts on their individual, community, traditional and cultural lives, as well as developing mitigation measures to address issues, concerns and rights.

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