Appendix D. Sabina's Back River Blasting Plan for Plant Site and Portal Decline

GOLDER
MEMBER OF WSP

TECHNICAL MEMORANDUM

DATE April 23, 2021 **Project No.** 20412211-075-TM-Rev0-2600

TO Merle Keefe; Manager, Environmental Permitting, Sabina Gold & Silver Corp.

CC Dionne Filiatrault, Erin Salo (Golder)

FROM Sarah Proctor and Cam Stevens **EMAIL** SProctor@Golder.com

SABINA BACK RIVER BLASTING PLAN FOR PLANT SITE AND PORTAL DECLINE

1.0 INTRODUCTION

Sabina Gold & Silver Corp. (Sabina) has retained Golder Associates Ltd. (Golder) through Nuqsana Golder to develop a Blasting Plan (the Plan) associated with proposed blasting works at their Plant Site and Portal Decline at the Goose Site of the Back River Project. The purpose of the Plan is to assess the radius of which detonations may impact fish or fish habitat, and to provide mitigation measures to avoid the death of fish and harmful alteration, disruption, or destruction (HADD) of fish habitat. The Plan focuses on protecting valued ecosystem components for the Project, including Lake Trout (*Salvelinus namaycush*) and Arctic Grayling (*Thymallus arcticus)*.

2.0 PROJECT SETTING

The proposed blast locations (Plant Site and Portal Decline) are situated between two known fish bearing waterbodies including Goose Lake and Fox Creek. The blast locations are west of Fox Creek and east Goose Lake, both of which are fish-bearing waters, and south of the lower reach of Umwelt Outflow, which is non-fish bearing reach of Umwelt Outflow (Golder 2019).

Goose Lake is known to support populations of Arctic Grayling, Burbot (*Lota lota*), Lake Trout, Ninespine Stickleback (*Pungitius pungitius*), Round Whitefish (*Prosopium cylindraceum*), and Slimy Sculpin (*Cottus cognatus*) (Golder 2019). Known spawning shoals for fall-spawning species such as Lake Trout and Round Whitefish are located in the main body of Goose Lake, and greater than 1 km east of the blasting locations (Sabina 2015; Appendix V6). The waters closest to the Plant Site and Portal decline were assessed as having low potential for spawning and rearing fish based on substrate and location in Goose Lake (Sabina 2015, Appendix V6-6D, Table 3.3-5).

Fox Creek is known to seasonally support Slimy Sculpin and Arctic Grayling, spring-spawning species. Arctic Grayling young-of-year were observed in the Fox Creek during 2012 baseline fish and fish habitat assessments (Sabina 2015, Appendix V6-6C). While habitat data for the entire reach of Fox Creek was not documented, the entire reach of Fox Creek is conservatively assumed to provide spawning habitat for Arctic Grayling for the purposes of the Plan. Although channel depth in Fox Creek has not been documented, fish habitat assessments for watercourses of similar size have been completed within the Project area (e.g., Umwelt Outflow and Llama Outflow). These watercourses have been documented as shallow, with no potential habitat for overwintering fish (Sabina 2015, Appendix V6-6D). As such, Fox Creek is also expected to be shallow (i.e., less than 2 m), to be completely frozen to the creek during winter, and is not expected to provide suitable overwintering habitat for fish.

3.0 METHODS

Guidelines

To determine appropriate setback distances to protect fish and fish habitat from blasting activities for the Plant Site and Portal Decline, calculations derived from Fisheries and Oceans Canada (DFO) Guidelines for the Use of Explosives In or Near Canadian Fisheries (Wright and Hopky 1998) were applied. When using these calculations two scenarios were considered:

- Direct effects to fish caused by overpressure exceeding a site-specific limit of 50 kPa.
- Effects to spawning habitat by peak particle velocity (PPV) exceeding 13 mm/s.

The guideline for overpressure applies to all fish species and to all habitats supporting fish either throughout the year or only on seasonal basis. The guideline for peak particle velocity applies only to areas of fish-bearing watercourses or waterbodies where spawning habitat is present, and during appropriate spawning windows for the respective species. Site specific spawning windows for affected species are described under mitigation, if required.

Input Information

Calculations for setback distances to avoid impacts to fish and fish habitat were based on the following information:

- Shapefile for Goose Site layout received from Sabina on 18 February 2021.
- Shapefile for Goose Lake received from Sabina on 14 February 2020, offset by approximately 10 m and re-digitized within the area of interest for consistency with 2016 PhotoSAT Imagery.
- Shapefile for Fox Creek digitized based on 2016 PhotoSAT Imagery.
- Fish and fish habitat data collected during baseline assessments of waterbodies at Goose Site (Sabina 2015).
- Blast specification of 250 kg per delay in either bedrock or frozen overburden (assumed as frozen soil for calculation purposes) at the Plant Site blast location.
- Blast specifications of 100 kg per delay in bedrock at the Portal Decline blast location.

4.0 RESULTS

Plant Site

Calculations completed for the Plant Site blast location indicate that the setback distance for a 250 kg charge weight (per delay) is insufficient to avoid effects to fish and fish habitat in Fox Creek when detonated in rock (Table 1, Figure 1 and Figure 2). Manipulation of charge weights to achieve appropriate setbacks for the protection of fish and fish habitat are presented in Table 1, Figure 1, and Figure 2.

Table 1: Setback Distances for Plant Site Blast Location

Charge Weight Per Delay (kg)	Distance to Goose Lake (m)[b]	Distance to Fox Creek (m)[b]	Overpressure Setback (m)		Peak Particle Velocity Setback (m)	Scenario Outcome:
			Rock	Frozen Soil		
250[a]	232.2	107.8	**122.8**[c]	**113.5**[c]	**238.6**[d]	Setback for 250 kg charge weight (per delay) is appropriate to protect fish within Goose Lake but has potential to impact fish and fish habitat within Fox Creek.
190			107.0	98.9	**208.0**[d]	Setback for 190 kg charge weight (per delay) is appropriate to protect fish within Goose Lake and Fox Creek but has potential to impact spawning habitat in Fox Creek.
50			54.9	50.7	106.7	Setback for 50 kg charge weight (per delay) is appropriate to protect fish and fish habitat in Goose Lake and Fox Creek

(a) Proposed charge weight
(b) Distance measured from the closest point of blast location to respective waterbody
(c) Setback distance insufficient to protect fish within Fox Creek
(d) Setback distance insufficient to protect fish habitat within Fox Creek
Note: **Bold** indicates limiting factor; kg = kilograms; m = meters

Portal Decline

Calculations completed for the Portal Decline blast location indicate that the setback distance for a 100 kg charge weight (per delay) is sufficient to protect fish and fish habitat in Goose Lake and Fox Creek (Table 2, Figure 1 and Figure 2). Therefore, blasting at the specified charge weight (per delay) can occur at any time throughout the year, with no additional mitigation measures required.

Table 2: Setback Distances for Portal Decline Blast Location

Charge Weight Per Delay (kg)	Distance to Goose Lake (m)[b]	Distance to Fox Creek (m)[b]	Overpressure Setback (m)	Peak Particle Velocity Setback (m)	Scenario Outcome:
			Rock	Rock	
100[a]	250.6	696.2	77.6	150.9	Set back for 100 kg charge weight (per delay) is appropriate to protect fish and fish habitat in Goose Lake and Fox Creek.

(a) Proposed charge weight
(b) Distance measured from the closest point of blast location to respective waterbody
Note: kg = kilogram; m = meters

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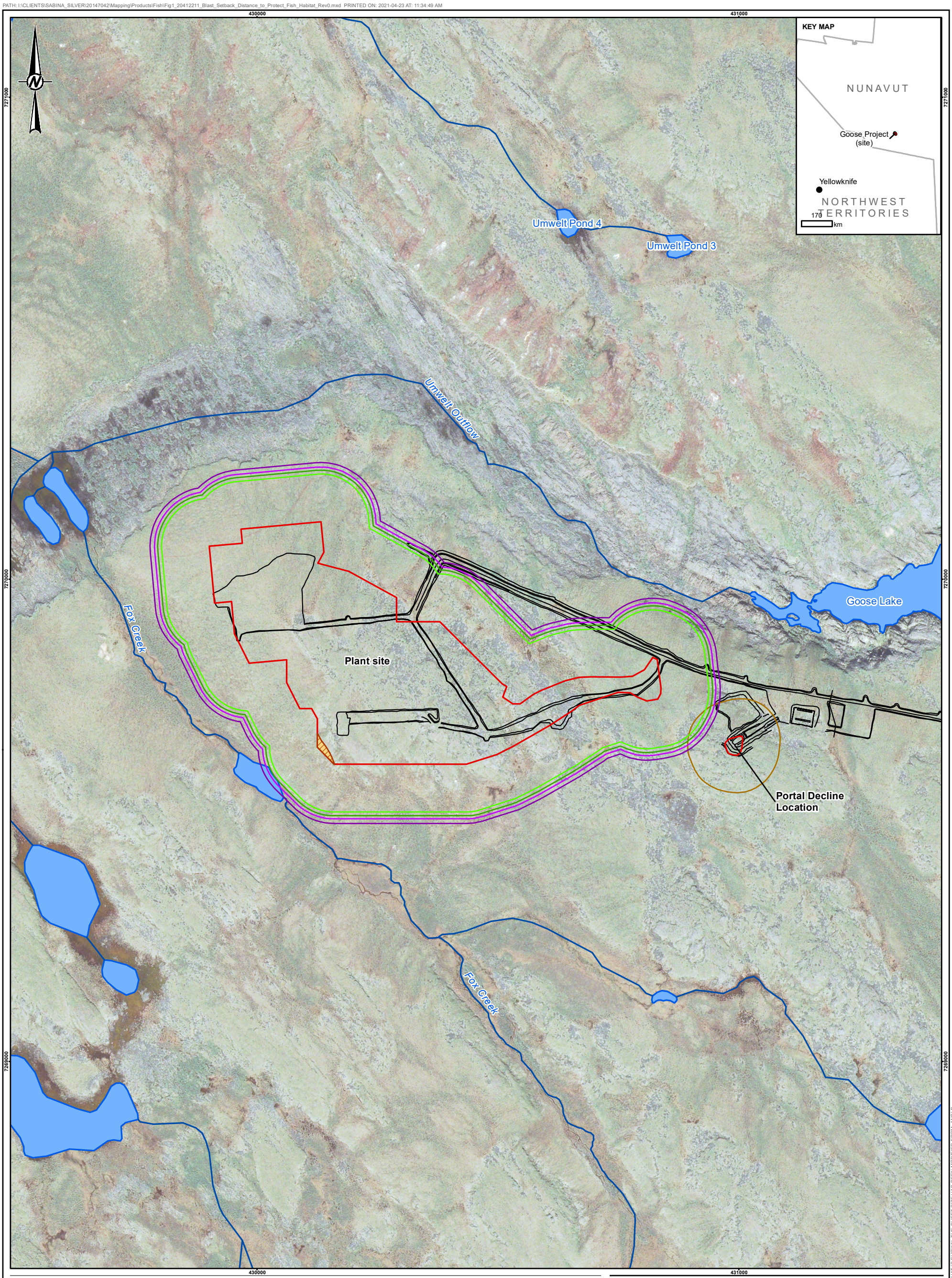

LEGEND

- 2020 AS-BUILT FOOTPRINT
- BLASTING LOCATION
- BLASTING LOCATION EXCULSION ZONE
- WATERCOURSE
- WATERBODY

BLAST LOCATION SETBACK

- PLANT SITE 122.8 m SETBACK FOR 250 kg CHARGE WEIGHT BLAST IN ROCK
- PLANT SITE 113.5 m SETBACK FOR 250 kg CHARGE WEIGHT BLAST IN FROZEN SOIL
- PLANT SITE 107.0 m SETBACK FOR 190 kg CHARGE WEIGHT BLAST IN ROCK
- PLANT SITE 98.9 m SETBACK FOR 190 kg CHARGE WEIGHT BLAST IN FROZEN SOIL
- PORTAL DECLINE LOCATION 77.6 m SETBACK FOR 100 kg CHARGE WEIGHT BLAST IN ROCK

0 250 500

1:7,500 METRES

REFERENCE(S)

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PROJECTION: UTM ZONE 13 DATUM: NAD 83

CLIENT
SABINA GOLD & SILVER CORP.

PROJECT
BACK RIVER PROJECT ENVIRONMENT AND PERMITTING

TITLE
SETBACK DISTANCE FOR THE OVERPRESSURE GUIDELINE (50 kPa) TO PROTECT FISH

CONSULTANT
GOLDER

YYYY-MM-DD	2021-04-23
DESIGNED	SP
PREPARED	SK
REVIEWED	SP
APPROVED	CS

PROJECT NO.	CONTROL	REV.	FIGURE
20412211		0	1

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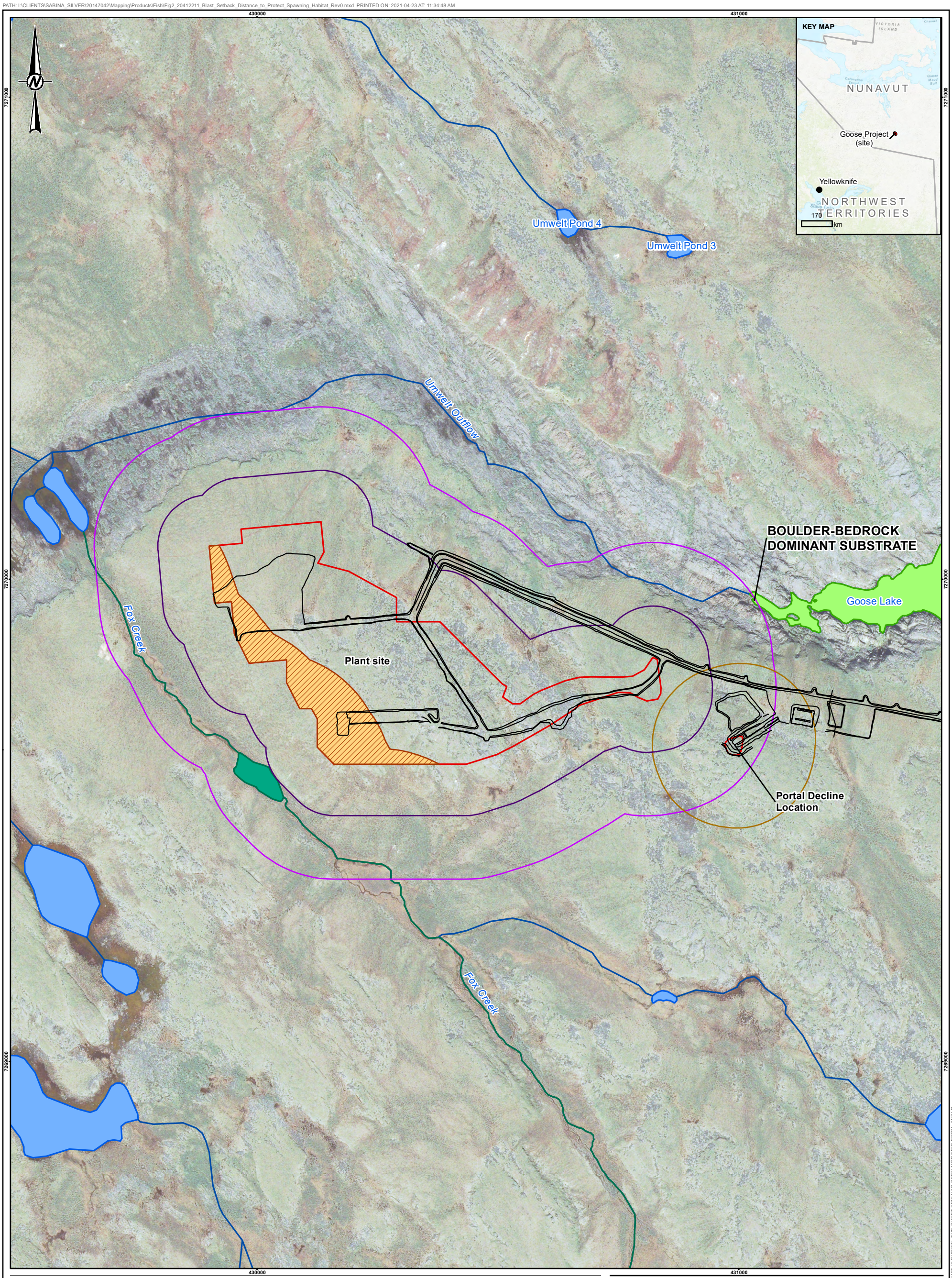

LEGEND

- 2020 AS-BUILT
- BLASTING LOCATION
- BLASTING LOCATION EXCULSION ZONE
- FOX CREEK AND POND – POTENTIAL TO SUPPORT SPAWNING AND REARING HABITAT FOR ARGR
- POND ON FOX CREEK – POTENTIAL TO SUPPORT SPAWNING AND REARING HABITAT FOR ARGR
- WEST BAY (NARROWS) OF GOOSE LAKE – LOW POTENTIAL TO SUPPORT SPAWNING AND REARING HABITAT FOR LKTR*
- WATERCOURSE
- WATERBODY

BLAST LOCATION SETBACK

- PLANT SITE 106.7 m SETBACK FOR 50 kg CHARGE WEIGHT BLAST IN ROCK OR FROZEN SOIL
- PLANT SITE 238.6 m SETBACK FOR 250 kg CHARGE WEIGHT BLAST IN ROCK OR FROZEN SOIL
- PORTAL DECLINE LOCATION 150.9 m SETBACK FOR 100 kg CHARGE WEIGHT BLAST IN ROCK

0 250 500
1:7,500 METRES

NOTE(S)

*THIS PORTION OF GOOSE LAKE IS NOT CONSIDERED SPAWNING HABITAT.

REFERENCE(S)

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CLIENT
SABINA GOLD & SILVER CORP.

PROJECT
BACK RIVER PROJECT ENVIRONMENT AND PERMITTING

TITLE
SETBACK DISTANCE FOR THE PEAK PARTICLE VELOCITY GUIDELINE (13 mm/s) TO PROTECT FISH HABITAT

CONSULTANT
GOLDER

YYYY-MM-DD	2021-04-23
DESIGNED	SP
PREPARED	SK
REVIEWED	SP
APPROVED	CS

PROJECT NO.	CONTROL	REV.	FIGURE
20412211		0	2

5.0 MITIGATION STRATGIES FOR PLANT SITE BLAST LOCATION

Spawning Window Avoidance for the Protection of Fish Habitat

It is recommended that blasting in the western portion of the Plant Site be completed outside of the spawning window for Arctic Grayling (see “exclusion zones” marked on Figure 1 and 2). The DFO restricted activity timing window for the protection of spring spawning fish and fish habitat (Nunavut Zone 2) is 1 May to 15 July of any given calendar year (DFO 2013). This timing window covers all spring spawning species (e.g., Arctic Grayling and Northern Pike (*Esox lucius*)). However, the timing of the early part of the window in May is not applicable to the Plan (e.g., spring freshet does not start until June, Northern Pike do not occur in the study area), while the later part of the window may not be protective of later stages of egg development of Arctic Grayling based on field observations. As such, a restricted timing window was developed for the Plan based on Arctic Grayling life history and baseline data for the Goose Site.

Arctic Grayling spawning migrations are closely tied to temperature; a rise in temperature to 4°C and spring flooding may be factors for the onset of migrations (Stewart et al. 2007). Spawning migrations may begin as early as late May but typically mid-June at the Goose Site, just after ice breakup, and spawning takes place over a two to three week period. Once spawning has occurred, fertilized eggs incubate for approximately 13-18 days depending on water temperature (Stewart et al. 2007, Richardson et al. 2001). Incubating eggs become highly sensitive to impacts of peak particle velocity (i.e., physical shock) during epiboly, which occurs approximately 5 days after fertilization at approximately 10°C for salmonids (Kolden and Aimone-Martin 2013).

With consideration of typical site conditions at the Back River Project, the recommended restricted timing window was defined as the spawning and hatching periods for Arctic Grayling to begin just prior to the peak freshet for a period of 40 days through both spawning and egg incubation stages. The restricted activity period may begin as early as Mid-May and continue to late-July, depending on local weather conditions for the construction year under review, and should be avoided while blasting to mitigate the effects of peak particle velocity on spawning habitat on Arctic Grayling. Avoiding blasting during this potentially sensitive time is considered to be a very protective strategy.

Charge Weight Manipulation for Protection of Fish and Fish Habitat

When considering blasting within the spawning and rearing period for Arctic Grayling, the following may apply:

- Because PPV from blasting at the proposed charge weight of 250 kg per delay has the potential to impact Arctic Grayling spawning habitat throughout Fox Creek, manipulation of charge weights is recommended to achieve an appropriate setback for blasting within the spawning window for Arctic Grayling. The reduction in weight is significant, and limits blasts to a 50 kg charge weight per delay (Table 1; Figure 2). This approach is recommended for blasting within the “exclusion zone” marked on Figure 2 and summarized in Table 3.

If considering blasting outside of the spawning and rearing window for Arctic Grayling, the following may still apply:

- Within the open-water season, overpressure from blasting at the proposed charge weight of 250 kg per delay may affect a small area within Fox Creek (Table 1; Figure 1). Reducing the charge weight to 190 kg per delay within the southwest corner of the Plant Site (“exclusion zone” marked on Figure 1; Table 3) is recommended to provide an appropriate setback distance for fish in Fox Creek for periods outside the spawning and rearing window for Arctic Grayling (Table 1; Figure 1).

Within most of the ice-covered season (i.e., when stream flows are not apparent), Fox Creek and any small ponds within the Fox Creek system are not expected to be provide overwintering habitat for fish because of frozen conditions extending to the creekbed. Therefore, Sabina's proposed blasting plan for the Plant Site does not pose any risks to fish and fish habitat during this period (Table 3).

Table 3: Charge Weight Restrictions Within Exclusion Zones by Season

Season	Exclusion Zone Reference	Charge Weight Per Delay (kg)
Arctic Grayling Spawning	PPV Guideline (Figure 2)	50
Open Water	Overpressure Guideline (Figure 1)	190
Ice-Covered	Overpressure Guideline (Figure 1)	250[1]

Note: kg = kilograms; PPV = peak particle velocity; [1] a heavier charge weight was not evaluated in this assessment

6.0 CLOSURE

We trust the Blasting Plan meets the expectation of Sabina and the proposed mitigation measures are acceptable. Please contact Sarah Proctor at (639) 317-7382 or Sarah_Proctor@Golder.com for any clarification, or to discuss further mitigation measures as required.

Sarah Proctor, B.Sc.
Aquatic Biologist

Cameron Stevens, MSc, PhD, PBiol
Associate, Fish Biologist

SP/CS/tt/jlb

https://golderassociates.sharepoint.com/sites/136792/project files/5 technical work/2600_fisheries/blast_plan/blasting plan/20412211-075-tm-rev0-2600-blasting plan_final/sabina back river blasting plan_plant site and portal decline.docx

Attachment: Appendix A - Lake Trout Spawning Survey Observations

7.0 REFERENCES

DFO (Fisheries and Oceans Canada). 2013. Nunavut Restricted Activity Timing Windows for the Protection of Fish and Fish habitat. Accessed March 1, 2021. Available at https://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/nu-eng.html.

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Richardson, E.S., Reist J.D., and C. K. Minns. 2011. Life History Characteristics of Freshwater Fishes Occurring in the Northwest Territories and Nunavut, with Major Emphasis on Lake Habitat Requirements. Can. MS Rpt. Fish. Aquat. Sci.2569: vii + 146 p.

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Wright, D.G and G. E. Hopkey. 1998. Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters. Accessed on March 2, 2021. Available at: http://publications.gc.ca/collections/Collection/Fs97-6-2107E.pdf.

APPENDIX A

Lake Trout Spawning Survey Observations

Lake Morphometry	Goose
Surface Area (m^2)	3,292,828
Max Depth (m)	29
Volume (m^3)	36,411,738
Shoreline Length (m)	18,603

Goose Property Area

N

430500 431500 432500 433500 434500

7272000 7271000 7270000

Approximate Location of Lake Trout

Potential Spawning Location Habitat Quality

- Excellent
- Good
- Fair

Shoreline Substrate

- Fines
- Gravel
- Cobble
- Boulder
- Bedrock

- Existing Exploration Camp
- Haul and Access Road
- Diversion Channel
- Water Intake
- Infrastructure
- Landfill
- Resource Pit
- Proposed Airstrip
- Tailings Impoundment Area Embankment
- Waste Rock Storage Area
- Camp\Plant Site
- Stockpile Location
- Quarry
- Potential Development Area (PDA)
- 1 m Isobath Interval
- 5 m Isobath Interval

1:12,500

0 250 500

Metres

Projection: NAD 1983 UTM Zone 13N

Sabina GOLD & SILVER CORP.

Rescan an ERM company

Figure 3.4-8

Lake Trout Spawning Survey Observations, Goose Lake, 2013

Appendix E. Vegetation Monitoring Program

TECHNICAL MEMORANDUM

DATE 10 January 2023 **Project No.** 21505757-135-TM-Rev0-7000

TO Merle Keefe
Sabina Gold & Silver Corp.

CC Dionne Filiatrault, Matthew Pickard, Corey De La Mare, Valerie Coenen

FROM Shannon O'Dwyer **EMAIL shannon.odwyer@wsp.com**

2022 VEGETATION MONITORING FIELD PROGRAM RESULTS - WINTER ROAD REALIGNMENT

1.0 INTRODUCTION

WSP Canada Inc. (WSP) was retained by Sabina Gold & Silver Corp. (Sabina) to implement a Vegetation Monitoring Program for the winter road designed to quantify the potential impacts on vegetation.

The Vegetation Monitoring Plan (VMP or Plan) outlines the approach for monitoring Mine-related vegetation impacts throughout the Mine life. The Plan has been developed following the requirements of the Nunavut Impact Review Board (NIRB) to Sabina (NIRB 2013), and to address the terms and conditions outlined in Project Certificate No. 007, as well as any commitments made by Sabina throughout the regulatory review process.

Vegetation monitoring includes the monitoring of vascular and non-vascular species abundance, richness (diversity), and vigour (health). This will be conducted through the establishment of fixed area, permanent monitoring plots in dominant vegetation associations within the Local Study Area (LSA) and Regional Study Area (RSA). The Environmental Impact Statement (EIS) for the Mine determined that winds are predominantly from the south during growing season (FEIS, Volume 4), and was used to guide where permanent vegetation monitoring plots will be established.

In July 2018 and 2019, paired vegetation monitoring plots were established along the winter ice road (WIR). Due to minor realignments of the WIR for 2022, new vegetation monitoring plots needed to be established. Aerial photos of some of the previously establish monitoring plots were also taken. This memo summarizes the results of the new plots.

2.0 STUDY AREA AND MONITORING LOCATIONS

The Back River Project (the Project) is located in western Nunavut in the West Kitikmeot Region within the continuous permafrost zone of the continental Canadian Arctic. The Project is composed of two main areas: the Marine Laydown Area (MLA), and the Goose Property Area, with a winter ice road (WIR) connecting the two (Figure 1). The MLA is located on the western shore of Southern Bathurst Inlet, approximately 130 km north of the Goose Property. A WIR will be utilized to transport supplies between the MLA and Goose Property during the winter months.

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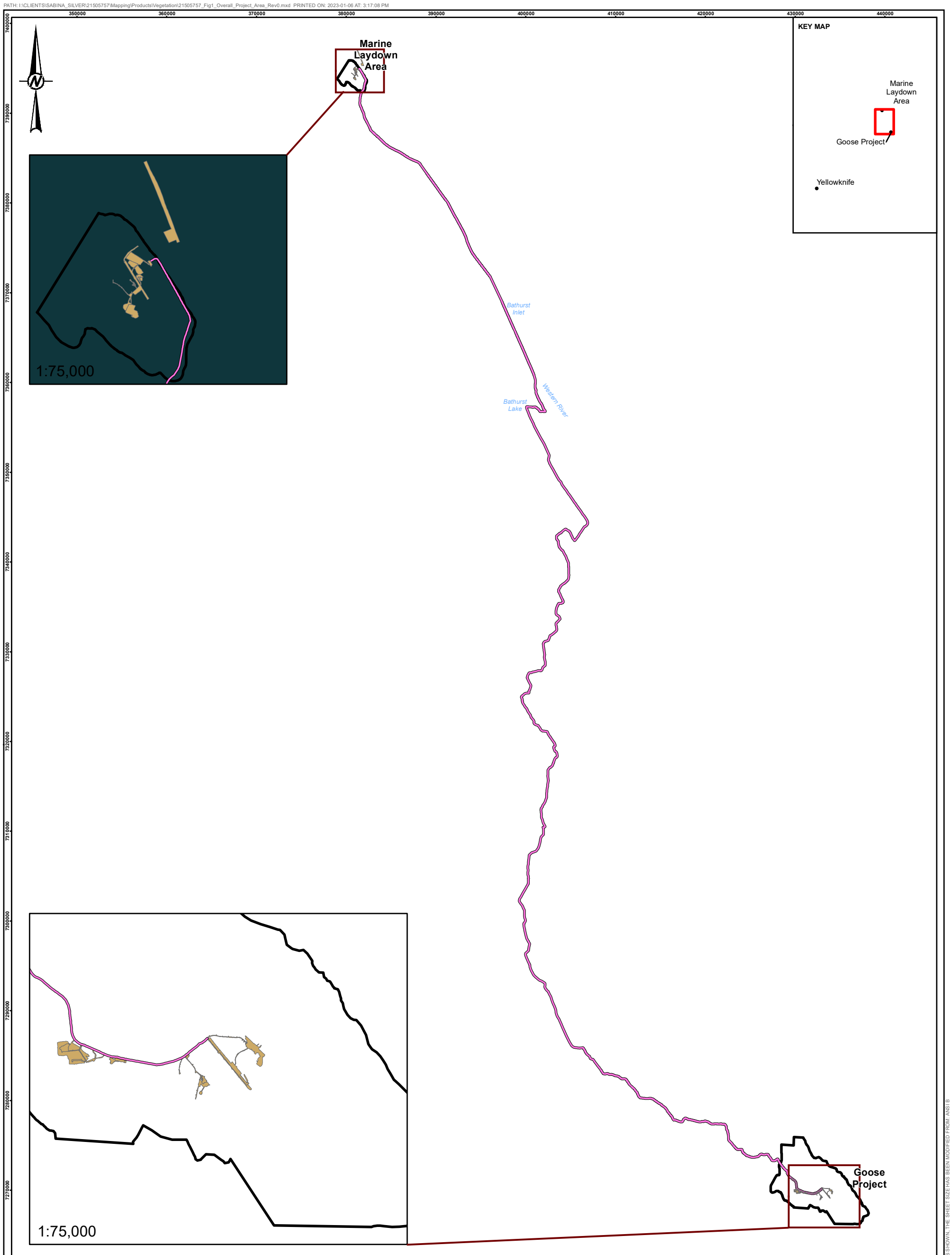

LEGEND

- WINTER ICE ROAD AS BUILT
- 2021 FOOTPRINT
- PROJECT AREA

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1:400,000 KILOMETRES

REFERENCE(S)

FOOTPRINT AND IMAGERY OBTAINED FROM CLIENT. TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENSE, ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 13 DATUM: NAD 83

CLIENT [redacted]

PROJECT
SABINA BACK RIVER PROJECT

TITLE
OVERALL PROJECT AREA

CONSULTANT

YYYY-MM-DD	2023-01-06
DESIGNED	CS
PREPARED	AM
REVIEWED	VC
APPROVED	SO

PROJECT NO.	CONTROL	REV.	FIGURE
21505757	7000/70	0	1

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Since a formal system of ecosystem classification does not exist for the Canadian Arctic, a preliminary classification system developed by Rescan (2013) for the Project Baseline was used for ecosite classification. This system involved incorporating data from other studies with previously developed site level ecosystem classification systems to delineate mappable ecological units with consistent vegetation associations, soil properties, and subject to a similar climate.

Broad ecosystem classes in the project area include: tundra, freshwater, marine, wetland, bedrock, riparian, and esker. Wetland/riparian ecosystems were defined according to (MacKenzie and Moran 2004), tundra was defined according to EBA (2002). Brief definitions and key characteristics of these ecosystem classes and specific vegetation associations are presented in the Back River Project: 2012 Ecosystems and Vegetation Baseline Report (Rescan 2013).

Vegetated ecosystems comprise approximately 70% of the LSA, 8% of which are wetland ecosystems. The most common ecosystem class mapped within the LSA was tundra, with the mesic dwarf-shrub tundra (TL), the dry sparse tundra (TH), and the shrubby tundra (TS) vegetation associations comprising greater than 50% of the LSA (Rescan 2013).

3.0 VEGETATION MONITORING PROGRAM OBJECTIVES

The main objectives of the VMP are:

- To measure plant species abundance and diversity at vegetation plots along the WIR, MLA and Goose site.
- Measure direct loss and indirect effects to plant communities as a result of the construction and operations of the WIR.
- Measure the distribution and abundance of non-native invasive plant species.
- Monitor and evaluate the effectiveness of mitigation measures.
- Identify unanticipated effects.
- Provide an early warning of undesirable change to the environment and to inform adaptive management strategies.

4.0 METHODS

Experimental vegetation plots were established within the WIR footprint and associated reference plots were established outside the WIR footprint but in close proximity, and within the same ecosystem class, vegetation association, and structural stage. The layout for each plot was a 1 x 1 m ground subplot design oriented to cardinal directions, with a unique plot ID tag placed in the northwest corner.

In July 2022, ten new WIR monitoring sites were established by a vegetation specialist to complete the following tasks:

- Collection of vegetation data at each monitoring site:
  - percent cover of all strata (shrubs, forbs, graminoids, bryophytes and lichens);
  - field identification of plant species abundance and diversity at vegetation plots along the WIR;

  - distribution and abundance of non-native invasive plant species;
  - average heights of plant species observed;
  - vigour (health) of all observed species;
- Determine percent cover of surface substrate (e.g., percent cover of surface water, litter, decaying wood, and live ground cover);
- Dominant structural stage, moisture regime, and nutrient regime;
- Wildlife sign (e.g., fecal pellets, browsing/grazing, beds, digging) observations, if present and
- Photo monitoring.

Estimates of lichen percent cover were made based on their habitat, whether ground-dwelling (terricolous) or rock lichens (saxicolous). Structural stage describes the existing dominant vegetation strata. Moisture and nutrient regimes signify the relative moisture and nutrient supply available to vegetation and are limiting factors in vegetation growth. The plant species present and soil information were used to estimate moisture and nutrient regimes.

Total vegetation abundance inclusive of all vegetation layers could add to more than 100% due to overlap in the layers (e.g., shrub layer, forb layer, graminoid layer). However, within a vegetation layer, abundance cannot add to more than 100%.

Qualitative analytical approaches were completed using an *in-situ* vigour class scale and were used to evaluate overall plant heath. Vigour classes closely follow the Ecological land Survey Site Description Manual (AEP 1994), as follows:

- 0 = very poor (>50% leaves necrotic);
- 1 = poor (31 to 50% leaves necrotic);
- 2 = fair (16 to 30% leaves necrotic);
- 3 = good (6 to 15% leaves necrotic); and
- 4 = very good (0 to 5% leaves necrotic).

A similar qualitative approach was also used to assign a disturbance class to each plot as follows:

- NA = No visible damage;
- Low = 0 to 25% vegetation in plot necrotic/damaged;
- Moderate = 26 to 50% of vegetation in plot necrotic/damaged;
- High = 51 to 75% of vegetation in plot necrotic/damaged, and;
- Very High = >75% of vegetation in plot necrotic/damaged, nearly no living vegetation.

Photographs were taken from the plot facing each cardinal direction and one overhead photograph of the plot. In addition, aerial photographs were taken of some of the previously established WIR vegetation monitoring plots.

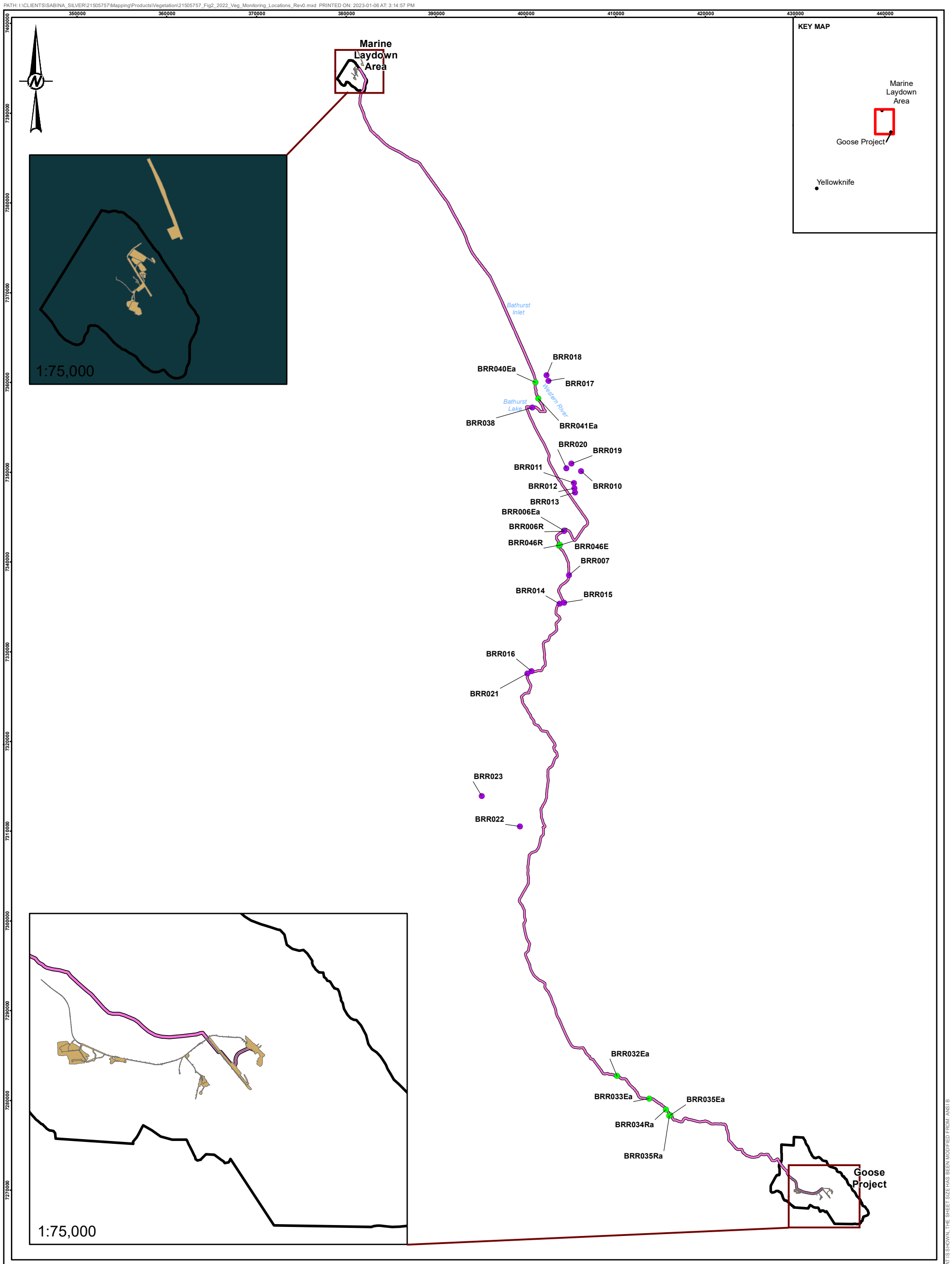
Appendix A includes a representative selection of these photographs. Figure 2 includes the locations of the 10 vegetation monitoring plots established in 2022 and the locations of aerial photographs taken of other WIR monitoring plots.

Several measures of vegetation species composition, abundance, structure and similarity were calculated to evaluate and compare plots. Species richness, the count or number of species present within a plot was calculated and abundance was evaluated as percent cover for each species. Plot structure was evaluated using surface substrate and stratum or layer percent cover, as well as average layer height. In order to compare differences in species composition between reference and experimental plots along the WIR, the Bray-Curtis dissimilarity index was calculated for plots within the same vegetation association. The Bray-Curtis measure of dissimilarity is based on species richness and abundance and ranges from 0 to 1, with 0 being absolute similarity (all species and abundance equal) and 1 being plots have no species in common.

A summary of plots established in 2022 and broad vegetative characteristics is provided in Table 1.

Table 1: 2022 WIR Plot Establishment Locations

New Plot ID	Plot Type	Easting	Northing	Plot Replaced	Vegetation Association	Structural Stage
BRR006Ea	Experimental	404245	7343468	BRR006E	Raised bog complex	Graminoid dominated
BRR032Ea	Experimental	410144	7282722	BRR032E	Dry-sparse tundra	Dwarf Shrub
BRR033Ea	Experimental	413758	7280230	BRR033E	Dry-sparse tundra	Dwarf Shrub
BRR034Ra	Reference	415602	7278982	BRR034R	Dry-sparse tundra	Dwarf Shrub
BRR035Ea	Experimental	416096	7278371	BRR035E	Dry-sparse tundra	Dwarf Shrub
BRR035Ra	Reference	415991	7278319	BRR035R	Dry-sparse tundra	Dwarf Shrub
BRR040Ea	Experimental	401054	7360005	BRR040E	Tussock meadow	Graminoid dominated
BRR041Ea	Experimental	401394	7358187	BRR041E	Mesic dwarf-shrub tundra	Dwarf Shrub
BRR046E	Experimental	403693	7341827	BRR045E	Mesic dwarf-shrub tundra	Dwarf Shrub
BRR046R	Reference	403778	7341887	BRR045R	Mesic dwarf-shrub tundra	Dwarf Shrub



LEGEND

- AERIAL PHOTOGRAPH
- 2022 VEGETATION MONITORING LOCATION
- WINTER ICE ROAD AS BUILT
- 2021 FOOTPRINT
- PROJECT AREA

0 10 20
1:400,000 KILOMETRES

REFERENCE(S)

FOOTPRINT AND IMAGERY OBTAINED FROM CLIENT. TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENSE, ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 13 DATUM: NAD 83

CLIENT [redacted]

PROJECT
SABINA BACK RIVER PROJECT

TITLE
2022 VEGETATION MONITORING LOCATIONS

CONSULTANT

YYYY-MM-DD	2023-01-06
DESIGNED	CS
PREPARED	AM
REVIEWED	VC
APPROVED	SO

PROJECT NO.	CONTROL	REV.	FIGURE
21505757	7000/70	0	2

5.0 RESULTS

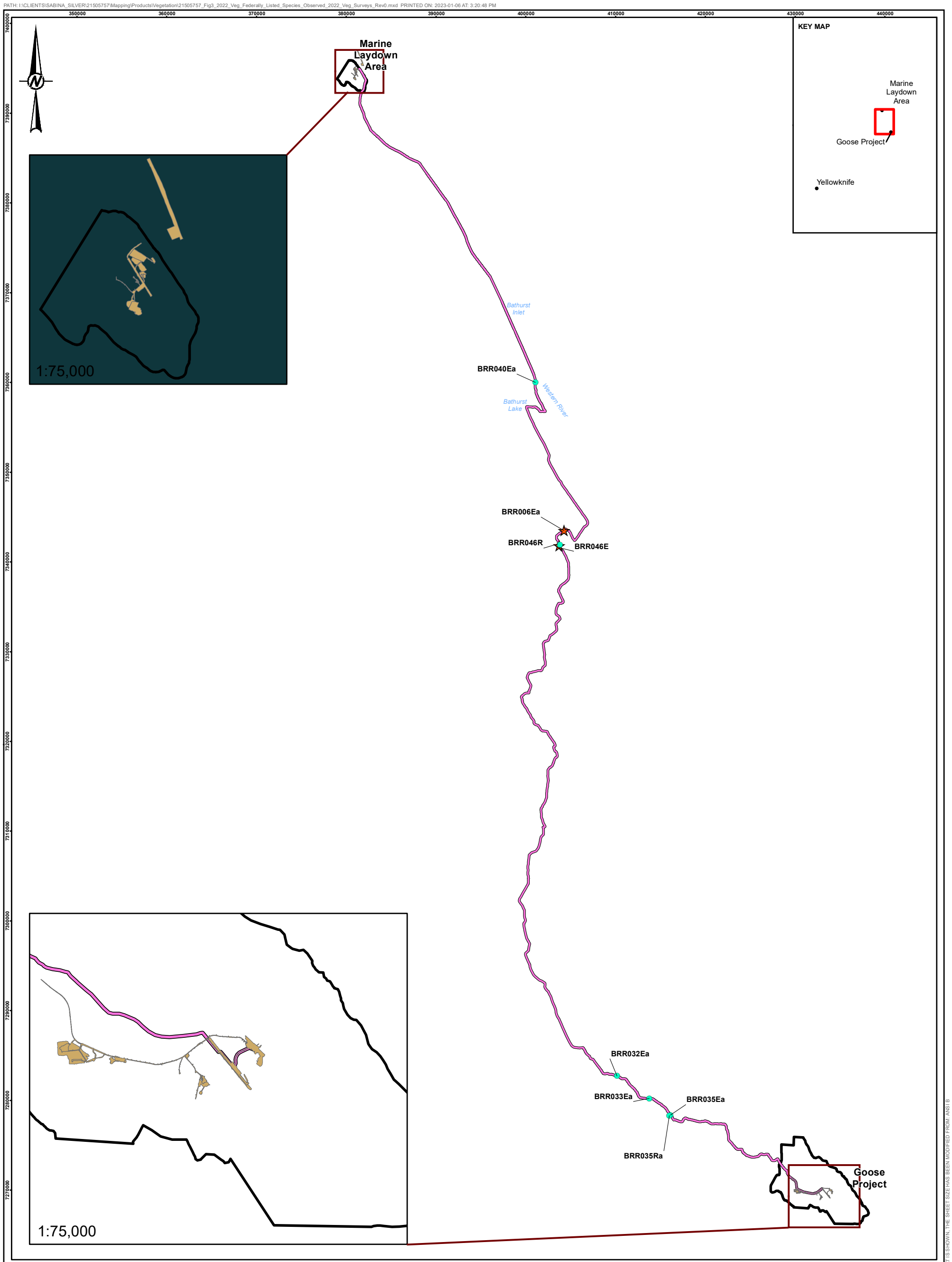
The 2022 vegetation surveys identified 37 vascular plant species in the Project area, of which 35 were identified to species level, one was identified to genus level and one to strata level. A total of 25 non-vascular plant species (7 bryophytes and 18 lichens) were identified during 2022 field surveys. Of these, 22 were identified to species and 3 specimens were identified to genus level. Appendix B provides a complete vascular and non-vascular species list which were recorded during field surveys. The most common and widespread vascular species found were arctic dwarf birch (*Betula nana*), alpine blueberry (*Vaccinium uliginosum*), lingonberry (*Vaccinium vitis-idaea*) and arctic white heather (*Cassiope tetragona*). The overall findings indicate that the majority of the areas surveyed consist of low-diversity vascular plant communities with species richness averaging 20 species per plot. No non-native invasive species plant species were observed during field surveys. However, there were six observed species listed by CESCC (2022) in Nunavut as vulnerable (S3) and one critically imperiled (S1) (Table 2, Figure 3). See Appendix B for species ranking definitions.

Red-stemmed feather moss *(Pleurozium schreberi)* is considered critically imperiled in Nunavut because it is generally a species that inhabits forests. It is rare in the arctic because it does not tolerate the lower nutrient level and harsher climate (Rohrer, 1993). Red-stemmed feather moss is not a listed species under the *Species at Risk Act* (SARA) or the list of Species at Risk in Nunavut 2021 (ECCC 2021). Globally this species is considered a G5, meaning it is secure due to a very extensive range, abundant populations or occurrences and little to no concern of decline. Although it is considered critically imperiled in Nunavut, it was observed in the Project area at both experimental and reference vegetation plots in 2018, 2019, 2021 and 2022 suggesting it may be locally common. It is possible that the Project area is near the edge of its range where found.

Table 2: Federally Listed Species Observed During 2022 Vegetation Surveys

Species	Common Name	Species Ranking in Nunavut[a]	Plot(s) observed
Graminoids			
Carex concinna	northern elegant sedge	vulnerable	BRR040Ea, BRR046E, BRR046R
Luzula spicata	spiked woodrush	vulnerable	BRR035Ra
Forbs			
Lupinus arcticus	Artic lupine	vulnerable	BRR006Ea, BRR046E, BRR046R
Bryophytes			
Dicranum fuscenscens	curly broom moss	vulnerable	BRR006Ea, BRR032Ea, BRR033Ea, BRR035Ra, BRR046E, BRR046R
Pleurozium schreberi	red-stemmed feather moss	critically imperiled	BRR006Ea, BRR046E
Lichen			
Gowardia nigricans	grey witch's-beard lichen	vulnerable	BRR035Ra
Masonhalea richardsonii	Arctic tumbleweed lichen	vulnerable	BRR032Ea, BRR033Ea, BRR035Ra, BRR046E, BRR046R

a) Species rankings are according to CESCC 2022.



LEGEND

2022 VEGETATION MONITORING LOCATIONS

- VULNERABLE SPECIES
- VULNERABLE AND CRITICALLY IMPERILED SPECIES
- WINTER ICE ROAD AS BUILT
- 2021 FOOTPRINT
- PROJECT AREA

0 10 20

1:400,000 KILOMETRES

REFERENCE(S)

FOOTPRINT AND IMAGERY OBTAINED FROM CLIENT. TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENSE, ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 13 DATUM: NAD 83

CLIENT [redacted]

PROJECT
SABINA BACK RIVER PROJECT

TITLE
FEDERALLY LISTED SPECIES OBSERVED DURING 2022 VEGETATION SURVEYS

CONSULTANT

YYYY-MM-DD	2023-01-06
DESIGNED	CS
PREPARED	AM
REVIEWED	VC
APPROVED	SO

PROJECT NO.	CONTROL	REV.	FIGURE
21505757	7000/70	0	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
0 25mm

Average height (Table 3) and average cover (Table 4) by vegetation strata were calculated based on vegetation association and treatment. Overall average heights of shrub, graminoid, bryophyte and lichen strata appear to be similar regardless of vegetation association. The largest differences in vegetation heights were observed in the graminoid strata. Total average heights for all strata across all vegetation associations for experimental and reference plots were also very similar. The overall vegetation cover in most plots was dominated by shrubs with fewer plots dominate by graminoids and lichen. The small data set does not allow for statistical comparison between experimental and reference plots.

Table 3: Average Vegetation Height by Strata

Vegetation Association	Average Vegetation Height (cm)				
	Shrub	Forb	Graminoid	Bryophyte	Lichen
Dry-sparse tundra (TH)					
Experimental	12.5	4.2	10.0	0.8	2.0
Reference	14.6	-	24.6	1.5	2.0
Mesic dwarf-shrub tundra (TL)					
Experimental	13.4	7.6	21.5	1.3	1.4
Reference	15.0	10.0	20.0	1.0	2.0
Tussock meadow (WT)					
Experimental	15.0	10.0	25.0	-	-

Table 4: Average Vegetation Cover by Strata

Vegetation Association	Average Cover (%)				
	Shrub	Forb	Graminoid	Bryophyte	Lichen
Dry-sparse tundra (TH)					
Experimental	55.0	0.7	0.4	10.3	33.3
Reference	60.0	0.0	1.5	10.5	22.5
Mesic dwarf-shrub tundra (TL)					
Experimental	40.0	0.7	35.0	18.0	8.0
Reference	70.0	4.0	5.0	5.0	20.0
Tussock meadow (WT)					
Experimental	6.0	1.0	30.0	0.0	0.0

Average surface substrate cover for each plot, which includes living and non-living ground cover, were calculated by vegetation association and treatment (Table 5). Overall differences in surface substrate between experimental and reference plots appear minor, and likely due to natural variability between plots.

Table 5: Average Surface Substrate Cover by Strata

Vegetation Association	Average Percent Cover (%)								
	Saxicolous Lichen	Terricolous Lichen	Vegetation	Moss	Bare Ground	Rock	Water	Litter	Animal Pellets
Dry-sparse tundra (TH)									
Experimental	50.2	30.8	<1.0	13.0	1.3	<1.0	0.0	3.4	0.0
Reference	61.6	21.9	<1.0	11.3	<1.0	1.4	0.0	3.4	0.0
Mesic dwarf-shrub tundra (TL)									
Experimental	56.9	9.9	0.0	20.1	<1.0	<1.0	0.0	11.9	0.0
Reference	66.0	20.0	0.0	10.0	0.0	0.0	0.0	2.0	0.0
Tussock meadow (WT)									
Experimental	61.0	0.0	0.0	1.0	1.0	6.0	1.0	30.0	0.0

Species richness, broken down by vascular and non-vascular species, was compared between experimental plots and reference plots by vegetation association (Table 6). Overall species richness was higher in the experimental plots than the reference plots, although this can likely be contributed to the small sample size. Species richness was highest in the mesic dwarf shrub tundra and lowest in the tussock meadow vegetation associations.

Table 6: Species Richness for Vascular and Non-Vascular Species by Vegetation Association and Treatment

Vegetation Association	Species Richness			
	Experimental		Reference	
	Vascular Species	Non-Vascular Species	Vascular Species	Non-Vascular Species
Dry Sparse Tundra (TH)	12	20	10	16
Mesic Dwarf-Shrub Tundra (TL)	23	15	18	12
Tussock Meadow (WT)	11	0	-	-

The Bray-Curtis dissimilarity index between the experimental plots and reference plots of each vegetation association is presented below (Table 7). Note there is no dissimilarity index value for the tussock meadow vegetation association as there were no reference plots in to compare with the experimental plot. Dissimilarity is low (between 0.26 and 0.50) for both vegetation associations evaluated. In other words, the plots within each vegetation association have a similar species composition.

Table 7: Dissimilarity Index Between Experimental and Reference Plots within Vegetation Association

Vegetation Association	Bray-Curtis Dissimilarity Index[a]
Dry Sparse Tundra (TH)	0.39
Mesic Dwarf-Shrub Tundra (TL)	0.42

a) Dissimilarity index number between 0-0.25 indicates no dissimilarity, 0.26-0.50 low dissimilarity, 0.51-0.75 moderate dissimilarity and 0.76-1.0 strong dissimilarity.

Average vigour was compared between vegetation associations and treatment (Table 8). Overall average vigour was between fair and good with the reference plots having slightly higher average vigour.

Table 8: Average Vigour of Observed Species by Vegetation Association and Plot Type

Vegetation Association	Average Vigour[a]	
	Experimental	Reference
Dry Sparse Tundra (TH)	2.75	2.88
Mesic Dwarf-shrub Tundra (TL)	2.78	2.96
Tussock Meadow (WT)	2.27	-

a) Average vigour is calculated by assessing the vigour of each species and averaging across plots based on the scale poor=1. fair=2, good=3, excellent=4

An overall summary of structural stage, moisture regime and nutrient regime for the monitored vegetation plots is in Table 9. The only structural stages observed were dwarf shrub and graminoid. The disturbance level due to the WIR was recorded as none for each of the monitoring plots. Moisture regimes varied from xeric to subhygric and nutrient regimes varied from poor to very poor.

Table 9: Summary of Structural Stage, Moisture Regime and Nutrient Regime

Plot name	Plot Type	Structural Stage	Disturbance Level	Moisture Regime	Nutrient Regime
Dry Sparse Tundra (TH)					
BRR032Ea	Experimental	Dwarf Shrub	NA	Xeric	Very Poor
BRR033Ea	Experimental	Dwarf Shrub	NA	Xeric	Poor
BRR034Ra	Reference	Dwarf Shrub	NA	Xeric	Poor
BRR035Ea	Experimental	Dwarf Shrub	NA	Xeric	Poor
BRR035Ra	Reference	Dwarf Shrub	NA	Xeric	Poor
Mesic Dwarf-Shrub Tundra (TL)					
BRR006Ea	Experimental	Dwarf Shrub	NA	Mesic	Poor
BRR041Ea	Experimental	Graminoid	NA	Submesic	Poor
BRR046E	Experimental	Dwarf Shrub	NA	Submesic	Poor
BRR046R	Reference	Dwarf Shrub	NA	Submesic	Poor
Tussock Meadow (WT)					
BRR040Ea	Experimental	Graminoid	NA	Subhygric	Poor

6.0 RECOMMENDATIONS

The vegetation plots assessed during the 2022 field program are only a small subset of the total WIR vegetation monitoring program. They represent areas that have been realigned since the original plots were established in 2018. The next WIR vegetation monitoring event, which will be after three years of WIR construction has occurred, will be a more comprehensive assessment of all the established plots and analysis of plot data. At that time data analysis can be conducted to focus on evaluating trends and determining if there are statistical differences in plant species composition and abundance between impacted experimental WIR plots and reference plots.

In future vegetation monitoring programs where species listed by the CESSC is observed, a collection of the species is recommended. These collections can be sent to a taxonomist for expert verification.

Annual photographic monitoring of the WIR is a requirement of the VMP and is to be conducted each summer following construction of the WIR.

7.0 CLOSURE

This technical memo was prepared and reviewed by the undersigned.

WSP Canada Inc.

Shannon O'Dwyer, B.Sc., P.Biol.
Terrestrial Ecologist

Valerie Coenen
Senior Terrestrial Ecologist, B.Sc, RT(Ag), EP

Attachments: Appendix A – Photographs
Appendix B – 2022 Species List

https://golderassociates.sharepoint.com/sites/157975/project files/6 deliverables/02 issued/21505757-135-tm-reva-7000-veg field summary/client comments/21505757-135-tm-reva-7000-2022 vegetation program summary 15dec_22_sbb.docx

8.0 REFERENCES

AEP (Alberta Environment and Parks) (formerly ESRD). 1994 Ecological Land Survey Site Description Manual. Alberta Environmental Protection. Resource Information Branch, Finance, Land Information and Program Support Services. Edmonton, Alberta.

CESCC (Canadian Endangered Species Conservation Council). 2022. *Wild Species 2020: The General Status of Species in Canada.* National General Status Working Group: 172 pp.

ECCC (Environment and Climate Change Canada). 2021. Species at Risk in Nunavut 2021. Available at https://www.canada.ca/en/environment-climate-change/services/species-risk-education-centre/species-risk-nunavut-2021.html#toc44. Accessed January 9, 2023.

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Rohrer, J.R. *Pleurozium schreberi.* In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico [Online]. 22+ vols. New York and Oxford. Vol 28. http://floranorthamerica.org/Pleurozium_schreberi#Distribution. Accessed December 14, 2022.

APPENDIX A

Photographs

Photo 1: BRR006Ea, mesic dwarf-shrub tundra - July 19, 2022

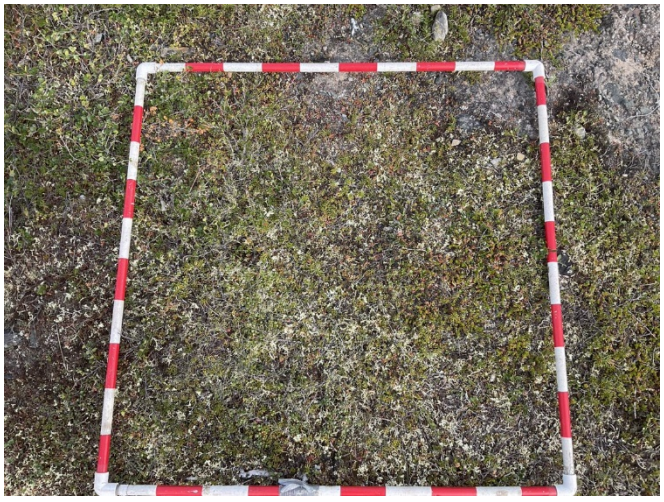

Photo 2: BRR032Ea, dry sparse tundra - July 20, 2022

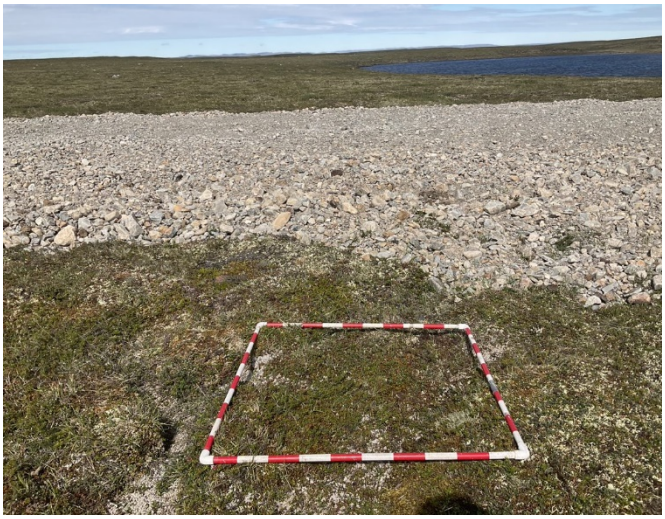

Photo 3: BRR033Ea, dry sparse tundra - July 20, 2022

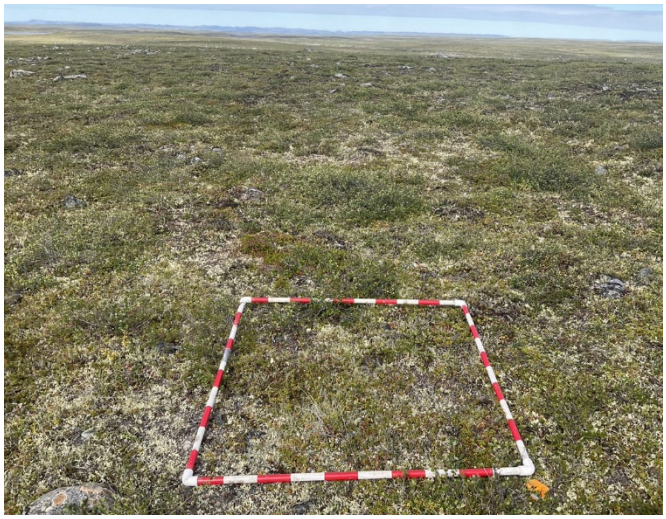

Photo 4: BRR034Ra, dry sparse tundra - July 20, 2022

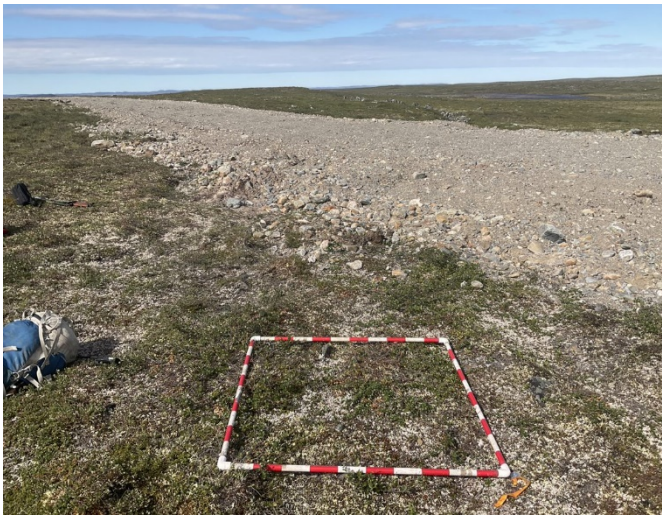

Photo 5: BRR035Ea, dry sparse tundra
July 20, 2022

Photo 6: BRR035Ra, dry sparse tundra
July 20, 2022

Photo 7: BRR040Ea, tussock meadow
July 19, 2022

Photo 8: BRR041Ea, mesic dwarf-shrub tundra
July 21, 2022

Photo 9: BRR046E, mesic dwarf-shrub tundra
July 19, 2022

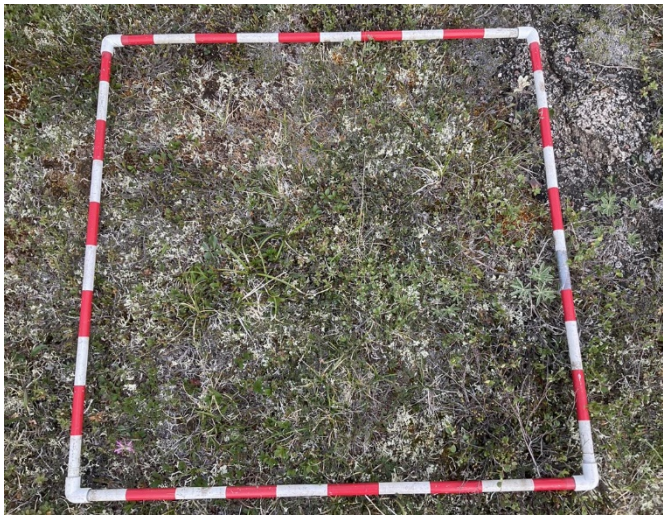

Photo 10: BRR046R, mesic dwarf-shrub tundra
July 19, 2022

Photo 11: BRR006R, raised bog complex
July 21, 2022

Photo 12: BRR007, mesic dwarf-shrub tundra
July 21, 2022

Photo 13: BRR014, mesic dwarf-shrub tundra
July 21, 2022

Photo 14: BRR015, dry sparse tundra
July 21, 2022

Photo 15: BRR016, dry sparse tundra
July 21, 2022

Photo 16: BRR021, dry sparse tundra
July 21, 2022

Photo 17: BRR038, mesic dwarf-shrub tundra
July 21, 2022

APPENDIX B

2022 Species List

Table B1: Species Observed During 2022 Field Surveys

Scientific Name	Common Name	Species Ranking in Nunavut[(a)]
Shrubs		
Arctous rubra	red bearberry	apparently secure
Betula nana	arctic dwarf birch	apparently secure
Cassiope tetragona	arctic white heather	secure
Dryas integrifolia	entire-leaved mountain avens	secure
Empetrum nigrum	black crowberry	secure
Kalmia polifolia	bog laurel	apparently secure
Kalmia procumbens	alpine azalea	apparently secure
Rhododendron lapponicum	Lapland rosebay	apparently secure
Rhododendron tomentosum	narrow-leaved Labrador tea	apparently secure
Salix arctica	arctic willow	secure
Salix arctophila	northern willow	secure
Salix herbacea	snowbed willow (new England dwarf willow)	secure
Salix reticulata	net-veined willow	secure
Salix species	willow species	not applicable
Vaccinium uliginosum	alpine bilberry	secure
Vaccinium vitis-idaea	rock cranberry (lingonberry)	apparently secure
Forbs		
Bistorta vivipara	alpine knotweed	secure
Equisetum arvense	field horsetail	secure
Lupinus arcticus	arctic lupine	vulnerable
Oxytropis arctica	arctic locoweed	apparently secure
Pedicularis labradorica	Labrador lousewort	apparently secure
Pedicularis lanata	woolly lousewort	apparently secure
Pedicularis lapponica	Lapland lousewort	apparently secure
Saussurea angustifolia	narrow-leaf saw-wort	apparently secure
Tofieldia coccinea	northern false asphodel	apparently secure
Graminoids		
Anthoxanthum monticola	alpine sweet grass	secure
Calamagrostis lapponica	Lapland reed grass	apparently secure
Carex aquatilis	water sedge	secure
Carex bigelowii	Bigelow's sedge	secure
Carex concinna	northern elegant sedge	vulnerable
Carex scirpoidea	bulrush sedge	secure
Carex vaginata	sheathed sedge	apparently secure
Eleocharis quinqueflora	few-flowered spikerush	unrankable
Eriophorum vaginatum	tussock cotton-grass	apparently secure
Graminoid species	grass species	not applicable
Luzula spicata	spiked wood rush	vulnerable

Table B1: Species Observed During 2022 Field Surveys

Scientific Name	Common Name	Species Ranking in Nunavut[a]
Triglochin palustris	marsh arrowgrass	apparently secure
Bryophytes		
Alectoria ochroleuca	green witch's hair	apparently secure
Aulacomnium turgidum	mountain groove moss	apparently secure
Dicranum fuscescens	curly broom moss	vulnerable
Pleurozium schreberi	red-stemmed feather moss	critically imperiled
Polytrichum commune	common haircap moss	not present
Racomitrium lanuginosum	hoary rock moss	apparently secure
Tomentypnum falcifolium	sickle-leaved golden moss	not present
Lichen		
Arctocetraria andrejevii	thin-man's Iceland moss lichen	apparently secure
Bryocaulon divergens	arctic pretzel lichen	apparently secure
Cetraria islandica	true Icelandic lichen	apparently secure
Cladonia gracilis	smooth pixie lichen	apparently secure
Cladonia mitis	green reindeer lichen	unranked
Cladonia rangiferina	gray reindeer lichen	secure
Cladonia species	cladonia species	not applicable
Cladonia stellaris	star-nosed reindeer lichen	secure
Cladonia stygia	black-footed reindeer lichen	apparently secure
Dactylina arctica	arctic butterfingers lichen	apparently secure
Flavocetraria cucullata	curled snow lichen	apparently secure
Flavocetraria nivalis	crinkled snow lichen	apparently secure
Gowardia nigricans	gray witch's beard lichen	vulnerable
Masonhalea richardsonii	arctic tumbleweed lichen	vulnerable
Peltigera aphthosa	silver-edged freckle pelt lichen	apparently secure
Peltigera species	pelt lichen species	not applicable
Stereocaulon paschale	cottontail foam lichen	apparently secure
Thamnolia vermicularis	universal whiteworm lichen	apparently secure

a) Species rankings according to CESCC 2022 are:

b) Secure - At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.

c) Apparently secure - At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

d) Vulnerable - At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

e) Critically imperiled - At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

f) Unranked - National or subnational conservation status not yet assessed.

g) Not applicable - A conservation status rank is not applicable because the species is not a suitable target for conservation activities. This includes exotic species (that have been moved beyond their natural range as a result of human activity) or accidental species (naturally occurring infrequently and unpredictably outside their usual range).

Appendix F. Pre-Shipment Equipment Cleaning

PRE-SHIPMENT EQUIPMENT CLEANING

Objective:

All equipment and bulk supplies must arrive to the Back River Project site in a condition free of any soil or plant debris to minimize the risk of invasive plant introduction.

Requirements:

Expediter - Expediter must inspect each item of equipment and bulk supplies prior to shipment. Inspection to focus on wheels, tracks, skids, buckets, scoops, undercarriage, and packing material. If any soil is identified, the below cleaning procedures should be followed. Confirmation that equipment is clean must be documented (e.g. as a column to be initialed on the shipping/flight manifest or completion of Form A Expediter Verification).

Designated site personnel -If absence of soil or plant matter is discovered upon offload, on-site cleaning should follow the cleaning protocols below, but minimize or eliminate the use of water and ensure any removed material is contained, collected and disposed of as directed by Environment personnel.

Cleaning measures:

Equipment and bulk supplies can be cleaned using brooms, brushes, shovels, water, or compressed air. Areas of particular concern include tires, tracks, skids, buckets, scoops and packing materials.

Remove clumps of accumulated soil, plant material or crop debris from openings, tracks, skids, wheels, buckets, scoops, and packing materials using a hand scraper, shovel, broom, or wire brush. If required, use water or compressed air to remove any remaining material. Pay extra attention to areas where soil or plant debris can accumulate (i.e., tires or undercarriage).

For hydrovac trucks which have been previously been used, cleaning includes the inside of the tank and any implement in contact with soil.

Sabina
GOLD & SILVER CORP.

]

Form A
Expediter Verification Equipment Free of Soil/Plant Debris

We, NEAS INC. (the Expediter) verify that all equipment and bulk supplies shipped to the Back River site on 23/08/22 - 12/09/22 (date YY/MM/DD) via MV DONAUGRACHT + ANJAQ (shipment identifier) has been individually inspected by us, and is confirmed to be free of soil and plant debris on shipment. The equipment and bulk supplies shipped is listed below, or is identified in the attached copy of the shipping manifest, along with individual confirmation that it is free of soil or plant debris.

DARRYL WALKER		28/03/23
Name of Expediter representative	Signature	Date

Sabina
GOLD & SILVER CORP.

]

Equipment	Expediter rep.initial confirming item is clean
2014 Manac 13353A000 52 ft Tri/A Step Deck Trailer	DW
2007 Ground Heater E100 126000 BTU Ground Heater	DW
28 ft 5A6 Athey Wagon	DW
Quantity of (5) 40 ft Rig Mats	DW
2006 Bombardier BR350 Snow Cat	DW
2006 Bombardier BR350 Snow Cat	DW
2005 Manac 36 ft Tri/A Extendable Step Deck Trailer	DW
Tucker	DW
Fuel drums	DW
2007 Kenworth T800B 8x6 Tri/A Day Cab Truck Tractor	DW
2007 Kenworth T800B 8x6 Tri/A Day Cab Truck Tractor	DW
2009 Manac 14352A00 Tri/A 53 ft - 72 ft Extendable Step Deck Trailer	DW
2007 Thru-Way 51 ft Tri/A Extendable Step Deck Trailer	DW
2007 Thru-Way 51 ft Tri/A Extendable Step Deck Trailer	DW
2006 Manac 14350A00 50 ft Tri/A Extendable Step Deck Trailer	DW
2002 Manac 14348905 48 ft Tri/A Extendable Step Deck Trailer	DW
1998 Thru-Way 51 ft Tri/A Extendable Step Deck Trailer	DW
2011 Lode King 53 ft Tri/A Step Deck Trailer	DW
2009 Lode King 53 ft Tri/A Step Deck Trailer	DW
2007 Lode King 53 ft Tri/A Step Deck Trailer	DW
2005 Lode King 53 ft Tri/A Step Deck Trailer	DW
2002 Manac 13353105 53 ft Tri/A Step Deck Trailer	DW
1998 Manac Tri/A Step Deck Trailer	DW
1997 Manac 48 ft Tri/A Extendable Step Deck Trailer	DW
2000 Foremost Nodwell Chieftain C Crawler Carrier	DW
2007 Titan Portable Concrete Mixer	DW
2008 Stewart S/A Dolly	DW
1980 TIA Dolly	DW
Plow truck	DW
Peterbuilt water / recovery truck	DW
Sewer tank	DW
Potable water pump house	DW
8 X Trucks -ARS	DW
Aerial lift	DW
2012 Landoll 930C T/A Sliding Axle Trailer	DW

2011 Raja 52 ft Tri/A Extendable Step Deck Trailer	
2011 Manac 52 ft Tri/A Extendable Step Deck Trailer	
2007 Manac 51 ft Tri/A Extendable Step Deck Trailer	
2006 Manac 14352905 52 ft Tri/A Extendable Step Deck Trailer	
2013 Lode King 52 ft Tri/A Step Deck Trailer	
2011 Manac 14352A000 52 ft Tri/A Extendable Step Deck Trailer	
2003 Load King 102LT 51 ft Tri/A Step Deck Trailer	
CAT 6015	
Cat 775 -1	
CAT 980	
Sandvik 650i	
Kalmar RoRo Lift Truck	
CAT 160M	
2016 Blue Bird Vision 47 passenger	
2015 Blue Bird Vision 31 passenger	
1989 OshKosh	